

**University of Mississippi
School of Engineering
2024 Catalog**

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Engr 610: Data Communications Protocols

School of Engineering

Introduction to modern protocols. Layering of communications processes including the OSI model, TCP/IP. Standard communications functions and how they are achieved under the framework of these protocols. Performance analysis and error control.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 610

Subject Areas

- [Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Engr 352: Socio-Technology II

School of Engineering

Social-technological-environmental systems, problems; natural laws, their impact on the socioeconomic structure, decision making, optimization; lectures, films, demonstrations; for nonengineering students.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 352

Subject Areas

- [Engineering, General](#)

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Engs 504: Remote Sensing Fundamentals

School of Engineering

This course is focused on providing an introduction to the basic principles and techniques of digital image processing. Included is treatment of: digital data storage formats, data volumes, and elements of digital image processing systems; geometric and radiometric correction; image enhancement; image classification; and multitemporal image analysis.

1 Credit

Prerequisites

- (Math 121 and 123) or Math 125 required.

Instruction Type(s)

- Indep Study: Independent Study for Engs 504

Subject Areas

- [Engineering_Other](#)

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Engr 622: Advanced Electromagnetic Theory

School of Engineering

Lectures on recent developments in electromagnetic theory.

3 Credits

Prerequisites

- [Engr 721: Advanced Electrodynamics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 622

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 672: Viscoelasticity

School of Engineering

Integral and differential operator forms of constitutive relationships, relaxation and creep characteristics, integran and Fourier transform methods. Laplace transform methods and approximate inversion techniques. Dynamic response problems and temperature-dependent effects. Nonlinear behavior characterization.

3 Credits

Prerequisites

- [Engr 617: Continuum Mechanics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 672

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Civil Engineering, General](#)

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Engr 652: Advanced Compiler Design

School of Engineering

Investigation into the theory of lexical analysis, syntax-directed translation, type checking, code generation, code optimization, and compiler project coordination.

3 Credits

Prerequisites

- [Csci 525: Compiler Construction](#)

Instruction Type(s)

- Lecture: Lecture for Engr 652

Subject Areas

- [Laser and Optical Engineering](#)
- [Computer Science](#)

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Engr 694: Research Topics in Eng. Science II

School of Engineering

Individual research in selected areas of interest.

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 694

Subject Areas

- [Engineering, General](#)

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Engr 669: Chemical Reaction and Reactor Analysis I

School of Engineering

Single and multiple reacting systems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 669

Subject Areas

- [Engineering, General](#)
- [Chemical Engineering](#)

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Engr 607: Statistical Thermodynamics

School of Engineering

Thermodynamic properties of gases; introduction to quantum mechanics; distribution functions; partition functions, properties of real gases; problems in ionized gases.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 607

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 713: Hydrodynamic Stability

School of Engineering

General theory of stability; stability of a hydrodynamic system; normal mode analysis; initial value problems; energy dissipation; small and finite disturbances.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 713

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 605: Convective Heat and Mass Transfer

School of Engineering

A study of heat and mass transfer by classical methods; includes laminar and turbulent flow, entrance region convection, variable fluid properties, aerodynamic heating, free convection.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 605

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 678: Elasticstability

School of Engineering

Concepts of stability of equilibrium; buckling of beams, plates and shells under various loadings; approximations of eigenvalues; flutter of elastic systems, wings, panels, and hydrofoils.

3 Credits

Prerequisites

- [Engr 671: Elasticity](#)

Instruction Type(s)

- Lecture: Lecture for Engr 678

Subject Areas

- [Engineering, General](#)
- [Engineering Mechanics](#)
- [Civil Engineering, General](#)

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Engr 450: Product Design and Development

School of Engineering

Modern tools and methods for product design and development.

3 Credits

Prerequisites

- [Engr 321: Thermodynamics](#)
- [Engr 330: Engineering Systems Analysis and Design](#)
- [Econ 310: Engineering Economy](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 450

Subject Areas

- [Engineering, General](#)

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Engr 624: Active Microwave Circuits

School of Engineering

Microwave semiconductor sources, noise in linear circuits; microwave transistor amplifiers; parametric amplifiers; theory of nonlinear oscillators.

3 Credits

Prerequisites

- [Engr 723: Passive Microwave Circuits](#)

Instruction Type(s)

- Lecture: Lecture for Engr 624

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 111: Engineering Fundamentals Lab

School of Engineering

This hands-on lab course complements Engr 101 by focusing on the practical application of concepts and skills learned in the classroom. Through team-based projects and experiments, students will implement problem-solving techniques, explore design processes, and develop technical skills essential for success in various engineering, computer science, and geology fields.

1 Credit

One-way corequisites

- [Engr 101: Engineering Fundamentals](#)

Instruction Type(s)

- Laboratory: Laboratory for Engr 111

Subject Areas

- [Engineering, General](#)

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Engr 645: Contaminant Transport

School of Engineering

Conceptual and mathematical models for the transport of contaminants in natural systems. Primary attention given to contaminant transport in aquifers, with secondary attention given to transport in the unsaturated zone, in the atmosphere, and at the water atmosphere boundary.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 645
- Lecture: Compressed Video for Engr 645

Subject Areas

- [Environmental/Environmental Health Engineering](#)
- [Geological/Geophysical Engineering](#)

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Engr 654: Information Systems Principles

School of Engineering

Introduction to the theory and practice related to the development and operation of information systems. Study of database management principles, data management systems, and general purpose software for data management systems. System and performance evaluation.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 654

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 559: Elements of Robotics

School of Engineering

This course will concentrate on the mechanical aspects of robotic manipulators, including manipulator kinematics, dynamics, and trajectory generation. This course will provide a thorough treatment of the fundamental skills underlying the use and mechanics of manipulators.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 559

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 779: Special Topics in Solid Mechanics

School of Engineering

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 779

Subject Areas

- [Engineering, General](#)
- [Engineering Mechanics](#)
- [Civil Engineering, General](#)

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C OP 300: Cooperative Education

School of Engineering

Co-op provides students with real-world work experiences and various professional development opportunities within their field of study. To be qualified for a co-op, students must have a minimum 2.5 overall GPA with at least 30 hours, be offered a position to work a minimum of 37.5 hours per week for the full duration of the term, as defined by the UM Academic Calendar (or a minimum of 12 weeks during the summer), and gain approval from their department chair to participate as an official University of Mississippi School of Engineering co-op.

1 Credit

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Pract/Inter: Pract/Inter for C OP 300

Subject Areas

- [Engineering, General](#)

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Manf 325: Principles of Ops & Supply Chain Mgmt

School of Engineering

This course provides an introduction to fundamental principles and practices related to operations management and value chains. Topics include structural (e.g., capacity, facility, technical, and logistical & supply chain), and infrastructural (e.g., workforce, production planning, materials control, performance measures, and organization renewal and improvement) issues in operations of an organization with particular emphasis placed on the manufacturing sector. Students will utilize basic statistics to formulate operations and supply chain fundamentals.

3 Credits

Prerequisites

- Students must be enrolled Center of Manufacturing Excellence (CME)

Instruction Type(s)

- Lecture: Lecture for Manf 325

Subject Areas

- [Operations Management and Supervision](#)

Related Areas

- [Business Administration and Management, General](#)
- [Business/Managerial Operations, Other](#)
- [Logistics, Materials, and Supply Chain Management](#)
- [Project Management](#)

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Engs 626: Community Growth

School of Engineering

This course focuses on the use of remote sensing and GIS technologies to facilitate urban planning and infrastructure development for community growth. It introduces to students various aspects of urban growth, such as the effect of urbanization on local and regional environments, and the impact of urbanization on the biophysical characteristics that influence human health. Other important issues, such as urban growth and economic development, public health and safety, traffic and transportation infrastructure, and quality of life are also explored.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 626
- Indep Study: Online Program for Engs 626

Subject Areas

- [Engineering, Other](#)

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Engr 309: Statics

School of Engineering

Vector algebra, resultants, equilibrium, friction, centroids, inertia, trusses, machines and frames, beam shear and moments.

3 Credits

Prerequisites

- Co-Requisites: Math 263 and Phys 211.
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 309

Subject Areas

- [Engineering, General](#)

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Engr 608: Physical Gas Dynamics

School of Engineering

Microscopic aspects of gas dynamics; elementary kinetic theory, development of Boltzmann equation, Chapman-Enskog development, collisional processes; transport properties.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 608

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engs 620: Geospatial Information Technology

School of Engineering

This course is an introduction to the integration of the foundational components of geo-spatial information science and technology into a geographic information system (GIS). Numerous practical and applied geospatial techniques are introduced to demonstrate the use of geospatial information technology to the real world. As a case based course, students work through four distinct sections in the geospatial information technology workflow: 1. Data Collection 2. Data Preparation 3. Data Analysis 4. Data Presentation The components include the fundamentals of geodesy, GPS, cartographic design and presentation, image interpretation, and spatial statistics/analysis. The course addresses the manner in which the components are merged in a geospatial information system.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 620
- Indep Study: Online Program for Engs 620

Subject Areas

- [Engineering, Other](#)

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Engr 646: Advanced Stratigraphy

School of Engineering

Advanced problems in stratigraphy.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 646

Subject Areas

- [Engineering, General](#)
- [Geology/Earth Science, General](#)

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C OP 201: CO-OP Work Experience

School of Engineering

Work experience in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest.

Z grade

Consent of Department Chairperson Required.

1 - 6 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 201

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 323: Fluid Mechanics

School of Engineering

Physical properties of fluids, fluid statics, control volume approach (mass momentum and energy conversation), Bernoulli equation, dimensional analysis, friction and head loss, flow in closed conduits, forces over immersed bodies, turbomachinery, Navier-Stokes equations.

3 Credits

Prerequisites

- [Phys 211: Physics for Science & Engineering I](#)
- Engr 323 Requires: One Way-Co-Requisite Engr 309 and Math 264
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 323
- Lecture: Web-based Lecture for Engr 323

Course Fee(s)

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Engineering, General](#)

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Engr 635: Optimization

School of Engineering

Theory and practice of optimization, analytical and numerical methods for single- and multivariable functions; functions of continuous variable.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 635

Subject Areas

- [Engineering, General](#)

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Engr 345: Engineering Economy

School of Engineering

Principles of economics for engineers, including time value of money, depreciation, cost concepts/estimation, return of investment; evaluating alternatives of projects through financial and profitability analysis.

3 Credits

Corequisites

- [Engr 431: Fundamentals of Systems Engineering](#)

Instruction Type(s)

- Lecture: Lecture for Engr 345

Subject Areas

- [Engineering, General](#)

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Engr 313: Introduction to Materials Science

School of Engineering

Fundamental concepts of materials science including the structure and properties of materials and their relationship to material selection and system design. The internal structures of metals, ceramics, and polymers are examined to develop an understanding of their mechanical, electrical, physical, and chemical properties.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 313

Subject Areas

- [Engineering, General](#)

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Manf 251: Manufacturing Processes

School of Engineering

A survey of manufacturing technologies applicable to manufacturing processes covering the spectrum from large scale materials processing through microelectronic and electromechanical systems.

3 Credits

Prerequisites

- [Manf 152: Intro to Engineering & Manufacturing II](#)

Corequisites

- [Manf 252: Product Realization Laboratory](#)

Instruction Type(s)

- Lecture: Lecture for Manf 251

Subject Areas

- [Mechanical Engineering](#)

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Engr 551: Engineering Thermodynamics

School of Engineering

Advanced classical thermodynamics of systems of constant composition; emphasis on topics particularly useful to thermodynamic analysis in engineering.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Engr 551

Subject Areas

- [Engineering, General](#)
- [Environmental/Environmental Health Engineering](#)
- [Mechanical Engineering](#)

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Engr 321: Thermodynamics

School of Engineering

Equilibrium, thermodynamic variables, equations of state, first and second laws of thermodynamics, single and multiphase systems.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- [Math 262: Unified Calculus & Analytic Geometry II](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 321
- Lecture: Web-based Lecture for Engr 321

Course Fee(s)

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Engineering, General](#)

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Engr 420: Engineering Analysis III

School of Engineering

Solution of ordinary and partial differential equations arising from physical, chemical and transport systems of different coordinates by series expansions and separation of variables. Solutions of linear systems of algebraic equations.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 420
- Lecture: Web-based Lecture for Engr 420

Subject Areas

- [Engineering, General](#)

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Engr 714: Coastal Hydrodynamics

School of Engineering

Water wave theory; tides, hurricane surges, harbor resonance, interaction of waves and structures; estuary dynamics; stratified flows; salinity intrusion; modeling.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 714

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 609: Time Series Analysis

School of Engineering

Study of random processes and methods for analyzing random signals. Topics include stationarity, ergodicity, correlation, coherence, continuous and digital spectral analysis, data sampling considerations, and filtering.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 609

Subject Areas

- [Engineering, General](#)
- [Electrical and Electronics Engineering](#)
- [Computer Science](#)

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Engr 431: Fundamentals of Systems Engineering

School of Engineering

Systems engineering principles in the context of complex systems, encompassing diverse components like hardware, software, and human involvement while emphasizing the importance of stakeholders in coordinating design and management activities to meet requirements and satisfy stakeholder needs, drawing from best practices.

3 Credits

Prerequisites

- Junior Standing Required

Corequisites

- [Engr 345: Engineering Economy](#)

Instruction Type(s)

- Lecture: Lecture for Engr 431

Subject Areas

- [Computer Science](#)

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Manf 255: Lean I: Standardized Work & Takt Time

School of Engineering

Experiential learning about takt time, line balancing, standard work, and process documentation.

1 Credit

Prerequisites

- [Manf 251: Manufacturing Processes](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Manf 255

Subject Areas

- [Mechanical Engineering](#)

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Engs 633: Microwave Filters

School of Engineering

Error correction for microwave network analyzers. Multiconductor transmission lines, voltage, and current eigenvectors. Lumped element filter prototypes, commensurate filters, impedance inverters.

2 Credits

Prerequisites

- [Engr 723: Passive Microwave Circuits](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engs 633

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 582: Interdisciplinary Field Projects

School of Engineering

Interdisciplinary field projects for geologists, geological engineers, and civil engineers. For example, the course may cover waste management design or offshore drilling and sampling, or mineral recovery projects.

1 - 6 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 582

Subject Areas

- [Engineering, General](#)

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Engs 612: Remote Sensing Fundamentals

School of Engineering

This course emphasizes basic remote sensing concepts and aerial photographic data collection and analysis. The Remote Sensing Fundamentals course is focused on understanding the basic principles on which remote sensing is based in general, and how aerial photographic data are acquired and analyzed in particular. Included is treatment of: electromagnetic radiation principles; energy interaction with the atmosphere and earth surface features; analog vs. digital imagery; ground truth considerations; films, analog and digital cameras; basic principles of photogrammetry; mapping from aerial photographs and digital orthophoto production; and an introduction to aerial photographic interpretation.

1 Credit

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 612
- Indep Study: Online Program for Engs 612

Subject Areas

- [Engineering, Other](#)

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Manf 451: Manf Design-Product Realization

School of Engineering

Students will ideate a product and take that product through conceptual design and initial marketing. The course will address aspects of finance, advertising, marketing, and business development. It will also introduce project management/operation in a manufacturing business and prototype development

1 Credit

Prerequisites

- [Manf 351: Manufacturing Product/Process Design](#)
- Students must be enrolled Center of Manufacturing Excellence (CME)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Manf 450: Practical Problem Solving in Manf](#)

Instruction Type(s)

- Lecture: Lecture for Manf 451

Subject Areas

- [Mechanical Engineering](#)

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Engr 627: Ray Methods in Electromagnetics

School of Engineering

Application of the Geometric Theory of Diffraction (GTD) to electromagnetic scattering problems, scattering from a half plane, reflection from planar and curved surfaces, diffraction from straight and curved edges and wedges.

2 - 3 Credits

Prerequisites

- [Engr 721: Advanced Electrodynamics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 627

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 636: Groundwater Mechanics

School of Engineering

This course focuses on the physics of subsurface flow and transport, including mass and momentum conservation, storage, compressibility, capillarity and Darcy's Law in porous media. Governing equations, critical assumptions and boundary and initial conditions for models of single and multiphase flow and transport in porous and fractured media are explored.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 636

Subject Areas

- [Civil Engineering, General](#)
- [Geological/Geophysical Engineering](#)

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Engr 674: Fracture Mechanics

School of Engineering

Stress fields near crack tips; modes of fracture; stress intensity factors; numerical methods. Critical stress intensity; fracture toughness. Energy considerations; the J-Integral. Crack-tip plasticity; small-scale yielding; crack-opening displacement. Fatigue; cyclic deformation; fatigue crack initiation.

3 Credits

Prerequisites

- [Engr 617: Continuum Mechanics](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 674

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Civil Engineering, General](#)

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Engr 613: Exp Method in Aerodynamics/Aeroacoustics

School of Engineering

Principles of experimentation; intrusive/non-intrusive methods of measuring static and dynamic phenomena; jet and wind tunnel testing considerations; anechoic facility testing.

3 Credits

Prerequisites

- [Engr 609: Time Series Analysis](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 613

Subject Areas

- [Engineering, General](#)
- [Physics, General](#)
- [Mechanical Engineering](#)

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Engr 715: Applied Hydro- and Aeromechanics I

School of Engineering

Subsonic internal and external hydro- and aeromechanics; effects of compressibility, cavitations and viscosity; airfoils and finite wings, turbomachinery, slender bodies, wakes and trails.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 715

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 363: Introductory Electric Circuit Laboratory

School of Engineering

Circuit elements and instruments; experiments dealing with series and two port networks, voltage, current, average and complex power.

1 Credit

Instruction Type(s)

- Laboratory: Laboratory for Engr 363

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Manf 396: Special Topics in Manufacturing

School of Engineering

Special topics course taught by a Center for Manufacturing Excellence faculty or staff member.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Manf 396
- Lecture: Study Abroad for Manf 396

Subject Areas

- [Manufacturing Engineering](#)

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Engr 728: Adv Numerical Methods in Electromagnetic

School of Engineering

Advanced topics in the formulation and numerical solution of electromagnetic problems using current computational tools.

3 Credits

Prerequisites

- [Engr 721: Advanced Electrodynamics](#)
- [Engr 626: Numerical Methods in Electromagnetics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 728

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engs 685: Business Geographics

School of Engineering

This course introduces students to the fundamental geospatial concepts and methods that are used by business geographers. Businesses face continued pressure to not only develop their products but also determine the best methods for finding customers or delivering their products. Due to the ease of obtaining geospatial data related to business, many business owners are attempting to apply geographic techniques to make better use of the data to become more competitive. Unfortunately, most business analysts are unfamiliar with geographic techniques. The course introduces students to key concepts in the field of business geographics such as the motivation for using geospatial technology in business applications, the different geographic data sets available for use by business analysts, and modeling of spatial data for business application. A second component familiarizes students with actual GIS software in the context of business geographic applications, providing students with hands-on examples of the use of geospatial technology. Not only do the students learn the basic theory behind the techniques, but they also will gain practical skills by actually using the software in a hands-on application-based laboratory environment. Therefore, the students will have confidence that they can actually perform some of the tasks themselves.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 685

Subject Areas

- [Engineering, Other](#)

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Engr 196: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 196

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 642: X-Ray Diffraction Analysis

School of Engineering

4 Credits

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Geology/Earth Science, General](#)

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Engr 501: Fundamentals of Computer Science

School of Engineering

Survey of fundamental topics in computer science including machine, assembler and high-level languages, design of assemblers, loaders, macro processors and compilers, operating system concepts, and other material essential for graduate work in computer science.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 501

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 679: Wave Propagation

School of Engineering

Elastic waves, loss mechanisms and attenuation, sources for elastic waves, waves in layered media, effects of gravity, curvature and viscosity, Rayleigh's principle.

3 Credits

Prerequisites

- [Engr 671: Elasticity](#)

Instruction Type(s)

- Lecture: Lecture for Engr 679

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 600: Advanced Geochemistry

School of Engineering

Application of chemical principles to geological problems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 600

Subject Areas

- [Engineering, General](#)
- [Geological/Geophysical Engineering](#)

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Engr 310: Engineering Analysis I

School of Engineering

An introduction to linear algebra: systems of linear equations, eigenvalues and eigenvectors. An introduction to numerical methods, including engineering applications. An introduction to concepts in probability theory and statistical methods. Computer-based solutions will be included in all topical areas.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 310
- Lecture: Web-based Lecture for Engr 310
- Lecture: Study Abroad for Engr 310

Course Fee(s)

Online, Internet, or Web-based

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- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Engineering, General](#)

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Engr 717: Special Topics in Thermal Science

School of Engineering

Selected topics of an advanced nature. May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 717

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 496: Special Topics in Engineering Science

School of Engineering

Special Topic Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 496
- Lecture: Study Abroad for Engr 496
- Lecture: Study Abroad/w Campus Meeting

Subject Areas

- [Engineering, General](#)

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Engr 696: Seminar in Environmental Engineering

School of Engineering

Presentations on topics in environmental engineering/science by faculty, visiting lecturers, and graduate students.

May be repeated for credit.

1 Credit

Instruction Type(s)

- Seminar: Seminar for Engr 696

Subject Areas

- [Engineering, General](#)
- [Geological/Geophysical Engineering](#)
- [Civil Engineering, General](#)

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Engr 360: Electric Circuit Theory

School of Engineering

Fundamental circuit concepts and laws, network analysis and theorems, AC steady-state response, AC power, coupled circuits.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- [Phys 211: Physics for Science & Engineering I](#)
- Engr 360 Requires: One Way-Co-Requisite Phys 212
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 360
- Lecture: Web-based Lecture for Engr 360

Course Fee(s)

Online, Internet, or Web-based

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- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 688: Current Issues in Telecommunications

School of Engineering

Survey of modern communication systems, practices, technology, business applications, and regulatory issues. Wireless systems, protocols, problems in propagation, spectral allocation, and modulation techniques. Asynchronous Transfer Mode and B-ISDN. Use of satellites for personal communications.

3 Credits

Prerequisites

- [TC 501: Foundations of Communications](#) (Minimum grade: C)
- [ELE 534: Wireless Mobile Communications](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 688

Subject Areas

- [Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Engr 657: Timesharing Computer Systems

School of Engineering

A study of the major design goals, implementation concepts and mechanisms of timesharing systems, including motivation for the development of timesharing systems and discussions of the hardware/software concepts important to timesharing system implementation.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 657

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Manf 252: Product Realization Laboratory

School of Engineering

Hands-on introduction to manufacturing processes including prototype development techniques as an intrinsic part of the design process. Fundamentals of manufacturing including machining, welding, casting, and rapid prototyping introduced through lecture, films, laboratories, projects, and field trips.

1 Credit

Prerequisites

- Students must be enrolled Center of Manufacturing Excellence (CME)

Corequisites

- [Manf 251: Manufacturing Processes](#)

Instruction Type(s)

- Laboratory: Lab for Manf 252

Subject Areas

- [Mechanical Engineering](#)

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Manf 465: Applications in Ops & Supply Chain Mgmt

School of Engineering

This course provides an understanding of scope of operations management and value chains. Topics include structural (e.g., capacity, facility, technical, and logistical & supply chain), and infrastructural (e.g., workforce, production planning, materials control, performance measures, and organization renewal and improvement) issues in operations of an organization. Students will utilize basic statistics to formulate operations and supply chain fundamentals.

3 Credits

Prerequisites

- Junior Standing Required

Instruction Type(s)

- Lecture: Lecture for Manf 465

Subject Areas

- [Manufacturing Engineering](#)

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Engr 590: Finite Element Analysis I

School of Engineering

Introduction to the finite element method; formulation of linear BVP arising in engineering analysis; solution of model problems in 1D and 2D; shape functions and numerical integration; element formulations; applications in solid and fluid mechanics.

3 Credits

Prerequisites

- Prerequisite: Math 353 or graduate standing

Instruction Type(s)

- Lecture: Lecture for Engr 590
- Lecture: Web based lecture for Engr 590

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 515: Acoustics

School of Engineering

Mathematical description of sound propagation with various boundary conditions.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Cross-listed Courses

- [Phys 521: Acoustics](#)

Instruction Type(s)

- Lecture: Lecture for Phys 521

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Manf 250: Graphics/Solid Modeling

School of Engineering

Computer-based sketching and modeling, interpretation of drawings, and an introduction to the theory and utilization of modern CAD/CAM/CAE systems.

1 Credit

Prerequisites

- Students must be enrolled Center of Manufacturing Excellence (CME)

Instruction Type(s)

- Lecture: Lecture for Manf 250

Course Fee(s)

Mechanical Engineering

- \$50.00

Subject Areas

- [Mechanical Engineering](#)

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Engr 725: Antennas

School of Engineering

Aperture antennas, array synthesis, linear antennas, thin-wire antennas, traveling-wave antennas, frequency independent antennas; reciprocity principle and receiving antennas.

3 Credits

Prerequisites

- [ELE 525: Introduction to Antennas](#)

Instruction Type(s)

- Lecture: Lecture for Engr 725

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 625: Adv. Topics in Computational Mechanics

School of Engineering

This course will introduce commonly used numerical computation and optimization algorithms and how they can be used to solve practical engineering problems. This course will help students develop mathematical and computational skills as well as the background required to use commercial solvers.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 625

Subject Areas

- [Mechanical Engineering](#)

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Engr 666: Fault Tolerant Computing

School of Engineering

Reliability, safety, availability, maintainability, and performance modeling; fault-tolerant design in VLSI; software reliability growth models; fault-tolerant data structures and algorithms; design diversity; self-stabilizing fault tolerance; Byzantine failures; performance and reliability tradeoffs.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 666

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 415: Engineering Acoustics I

School of Engineering

Development of analytical basis for acoustic wave production and propagation. Specific attention will be devoted to governing equations, energetics, propagation, and production of three-dimensional acoustic waves.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- [Phys 212: Physics for Science & Engineering II](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 415

Subject Areas

- [Engineering, General](#)

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Engr 712: Statistical Theory Turbulent Diffusion

School of Engineering

Molecular and turbulent diffusion theories; dispersion of dissolved and suspended matter in closed conduits, streams, lakes, estuaries, oceans.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 712

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 656: Operating Systems Design Concepts

School of Engineering

Design objectives of operating systems. Sequential and concurrent processes, processor management, memory management, scheduling algorithms, resource protection. System design and performance evaluation.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 656

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 620: Advanced Remote Sensing

School of Engineering

Lecture and laboratory study of advanced topics in remote sensing, including classification and georeferencing.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 620
- Lecture/Lab: Compressed Video for Engr 620

Subject Areas

- [Engineering, General](#)
- [Geology/Earth Science, General](#)

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Engs 682: Remote Sensing to Ecological Modeling

School of Engineering

Remote sensing offers the opportunity to track episodic and catastrophic events in landscapes through time crop maturation, variation in precipitation, floods and to monitor long-term changes resulting from vegetation succession, climatic variation, and human land use. Variables derived from remote sensing can be combined with empirical models to estimate biophysical parameters, which, in turn, can be used to assess ecosystem status and predict species distributions based on resource requirements. This course trains students in cutting-edge techniques and applications of remote sensing to a broad spectrum of issues related to ecological modeling. Students are introduced to the components of an ecosystem and interactions among those components, the suite of data sets available for mapping terrestrial and aquatic ecosystems, ecosystem metrics that can be derived from the latter data, and methods for modeling individual species, multiple species, communities, and ecosystems. The course addresses not only the many opportunities for applying remote sensing data but also the constraints, and considers how such applications can be used to guide ecological assessments, decision making, and adaptive management. Concepts are reinforced with case studies at multiple spatial and temporal levels.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 682
- Indiv Based: Online Program for Engs 682

Subject Areas

- [Engineering, Other](#)

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Engr 497: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 497
- Lecture: In-Country Program for Engr 497

Subject Areas

- [Engineering, General](#)

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Engr 100: Introduction to Engineering

School of Engineering

The purpose of this course is to provide students with an introduction to the problem-solving methods that engineers use when applying scientific principles for the creation of realistic solutions to everyday technical problems.

3 Credits

Prerequisites

- Enrollment limited to students having earned fewer than 45 credit hours.

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 100
- Lecture/Lab: Compressed Video for Engr 100
- Lecture/Lab: Web-based Lecture/Lab for Engr 100

Course Fee(s)

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 451: General Engineering Senior Design I

School of Engineering

Introduction to the engineering design process, guiding students through the various stages from initial planning to the development of conceptual designs, emphasizing skills such as requirements analysis and the cultivation of a systems thinking mindset to develop a holistic approach to engineering challenges. Part 1 of a two-semester sequence.

2 Credits

Prerequisites

- [Econ 310: Engineering Economy](#) (Minimum grade: C-)
- [Engr 431: Fundamentals of Systems Engineering](#) (Minimum grade: C-)
- [Engr 321: Thermodynamics](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Engr 451

Subject Areas

- [Engineering, General](#)

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School of Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Departments](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Admission and Transfer Policies

All Applicants

To be admitted to the School of Engineering (Engineering), a student must be admitted to the University of Mississippi (UM) and meet certain academic requirements.

Freshman Applicants

For direct admission into one of the School of Engineering's degree programs, a student must meet either of the following criteria:

- 24 or higher on the Math portion of the ACT (or SAT equivalent)
- Minimum core high school GPA of 3.2 (no ACT/SAT required).

School of Engineering degree programs require strong mathematics skills. Entering a degree program without one of the following prerequisites may result in more than eight semesters of study:

- 24 or higher on the Math portion of the ACT (or SAT equivalent)
- 76 or higher on the ALEKS PPL Placement Assessment
- B or higher in MATH 125 (or in MATH 121 and 123), or a higher mathematics course.

Change of Major Applicants and Transfer Applicants

For a current UM student or a transfer student from another domestic institution to declare a major within the School of Engineering, the student must have a cumulative collegiate GPA of 2.25 or higher on a minimum of 12 hours on a quality grade scale AND meet one of the following:

- 24 or higher on the Math portion of the ACT (or SAT equivalent)
- 76 or higher on the ALEKS PPL Placement Assessment
- B or higher in MATH 125 (or in both MATH 121 and 123), or a higher mathematics course.

International Applicants

Upon admission to the University in accordance with International Programs requirements, admission to Engineering has an additional component. Though an ACT or SAT score is not required for admission for students who were educated outside the US, international students who intend to seek a degree in Engineering, Mathematics, Chemistry, and other physical science disciplines that require registration in Calculus 1 (Math 261) in their freshman year, must meet either of the following requirements:

- Cambridge O Level International Examination (Math) or equivalent with a passing grade of C or higher, or minimum ACT Mathematics score of 24 (or SAT equivalent)
- 76 or higher on the ALEKS PPL Placement Assessment.

Academic Regulations

General Education Core Curriculum

The general education requirements of the undergraduate degree programs of the School of Engineering are consistent with The University of Mississippi's tradition of educating engineering leaders through the school's strong interaction with the university's liberal arts programs. Further, these requirements are established to fulfill the school's published mission of preparing "students with a broad-based education" intended to develop "leadership skills" and "communication skills."

The core/general education requirements for the School of Engineering include Writ 101, Writ 102; Math 261-262; and a minimum of 8 credit hours of laboratory science courses as specified by each department.

In addition, 18 credit hours as described below must be taken, but students should check with their department to learn the specific course requirements for an individual program.

Fifteen Credits of Liberal Arts

Students must complete at least 15 semester hours of liberal arts course work. At least 6 credit hours must be in the social/behavioral sciences, at least 3 semester hours from humanities, and at least 3 semester hours from fine arts. The last 3 semester hours can be from humanities, fine arts, or modern or ancient languages. For the purpose of these requirements, social/behavioral sciences will include anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), liberal arts (Liba 203, Liba 313), and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements). Humanities will include African American studies (Aas 201, 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201, 202), history (Hst), liberal arts (Liba 202, 305, 312), literature (Eng 103, 220-226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements). Fine arts will include courses in art history (AH), Danc 200, liberal arts (Liba 130, 204, 314), music (Mus 101-105), theater (Thea). Courses emphasizing the enhancement of skills and performance will not fulfill this requirement. Modern or ancient language courses include courses in Ancient Greek (Gr), Arabic (Arab), Chinese (Chin), French (Fr), German (Germ), Italian (Ital), Japanese (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish (Span), and Swahili (Swa).

Three credits of additional general education course work

Students must complete an additional 3 semester hours of course work beyond the 15 hours required above. These additional 3 hours are to be composed of any additional fine arts, humanities, or social science course work (as defined above) or any combination of credits from the courses listed below:

Course	Course Title	Credits
AS 301	Air Force Leadership Studies I	3
AS 302	Air Force Leadership Studies II	3
Bus 250	Legal Environment of Business	3
Bus 271	Business Communication	3
Edld 110	Chancellor's Leadership Class I	1
Edld 111	Chancellor's Leadership Class II	1
Edld 120	Introduction to Leadership Studies	3
Edld 220	Foundations of Leadership Studies	3
Engr 400	Leadership and Professionalism in Engineering	1
Mgmt 371	Principles of Management	3
GB 370	Entrepreneurship and Management	3
Msl 102	Military Science I: Basic Leadership & Management	3
Nsc 211	Naval Leadership and Management I	3
Spch 102	Fundamentals of Public Speaking	3
Spch 105	Business/Professional Speech	3

Cooperative Education Program

A student desiring to participate in the new School of Engineering Professional Practice Program (Cooperative Education) must obtain approval from his or her department chair. The three defined co-op work terms are fall, spring, and full summer as defined by the UM Academic Calendar. Students desiring to enroll in the program will be registered for C OP 300 and have an approved internship offer for a minimum of 37.5 hours per week for the full duration of the academic term (or a minimum of 12

weeks during the summer). Enrollment status during a co-op work term is equivalent to a full academic load at the University of Mississippi. The Engineering Dean's Office will administratively enroll co-op students. The enrolled co-op student is considered full-time for insurance purposes and the deferment of loan re-payment. C OP 300 may serve as a prerequisite for departmental technical elective credit-bearing courses.

Students participating in a co-op work term must submit required documentation to the School of Engineering Dean's Office to remain in good standing.

School of Engineering Overall Degree Requirements

Basic Degree Requirements

All of the curricula of the School of Engineering leading to a Bachelor of Science or Bachelor of Engineering degree are four-year curricula. The curricula requirements for the degrees of Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Computer Science, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, Bachelor of Science in Geology, Bachelor of Science in Mechanical Engineering, and Bachelor of Engineering are listed in their respective sections of the catalog.

Technical Electives

In some programs, students are allowed to choose a coherent group of courses from appropriate areas to permit the student to pursue particular topics in more depth than provided by required courses or to complement the student's major area of study. Selection of these courses should be made in consultation with and approved by the student's department chair/adviser.

Minors

Students pursuing any of the ten degree programs within the School of Engineering may choose to declare a minor. A minor field may be any discipline that offers a minor at the University of Mississippi with the exception of chemistry for chemical engineering students, geology for geological engineering students, and computer science for electrical engineering students pursuing the computer engineering option. The required courses and number of hours for each minor field can be found in the university undergraduate catalog. However, no more than 8 credit hours from courses required by the engineering degree may be used toward fulfillment of the minor requirements. A minor is available for students pursuing the Bachelor of Engineering (B.E.) degree if different from the emphasis area within the B.E. program. The engineering math minor is available for all students of the School of Engineering and requirements are specified. The engineering math minor is exempt from this minor policy.

Advising

Each entering freshman and transfer student is assigned to a member of the School of Engineering faculty in their department who acts as the student's adviser. Students are required to schedule regular conferences with their adviser. In addition, students are encouraged to confer with their advisers or other faculty members as the need arises at times other than the regularly scheduled conferences. A record of advising meetings and degree progress is maintained by the department in which the student is majoring. The purpose for the faculty advising is to ensure that students are completing the appropriate required courses in the proper prerequisite order to meet graduation requirements that have been previously specified to meet ABET, the Institutions of Higher Learning (IHL), university, and other criteria.

Honor Code Policy

Honor System

The purpose of the School of Engineering honor system is to inculcate in each student the highest standard of personal integrity and professional responsibility. The honor pledge below stresses student honesty both in and out of the classroom. For dealing with infractions, the School of Engineering adopted the University policy "Student Academic Conduct and Discipline".

"I PLEDGE MYSELF TO UPHOLD THE HIGHEST STANDARDS OF HONESTY IN MY UNIVERSITY LIFE
AND I WILL NOT TOLERATE DISHONESTY ON THE PART OF OTHERS."

Application for Degree

During the semester prior to completing degree requirements for a particular degree, each student is required to make formal application for that degree. The process includes the student completing the Degree Application found on the School of Engineering website under Current Students. This application must be submitted to the student's department for review. With departmental approval, the Engineering Dean's Office will then authorize the student's Diploma Application in MyOleMiss. When the student completes the Diploma Application, the student is considered an official candidate for graduation for the specified term. The Dean's office will verify whether all degree requirements have been fulfilled using the Degree Audit system. In addition to University GPA requirements, all undergraduate degree programs in the School of Engineering require that students earn a GPA of at least 2.00 in all courses taken from the School of Engineering applicable to their degree. The Dean's office then certifies degrees that have been fulfilled in a Degree Confirmation report to the Office of the Registrar for the granting of the diploma.

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Engr 591: Engineering Analysis I

School of Engineering

Application of higher mathematics to engineering problems; special emphasis on the expression of engineering problems in mathematical terminology.

3 Credits

Prerequisites

- Pre-requisite: Math 353 or Graduate Standing
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Engr 591

Subject Areas

- [Engineering, General](#)

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C OP 302: CO-OP Work Experience

School of Engineering

Similar to the 200 series, but offering more difficult and responsible job assignments.

Consent of Department Chairperson Required.

1 - 6 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 302

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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Manf 496: Special Topics in Manufacturing

School of Engineering

Special topics course taught by a Center for Manufacturing Excellence faculty or staff member.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Manf 496

Subject Areas

- [Manufacturing Engineering](#)

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C OP 401: CO-OP Work Experience

School of Engineering

Similar to the 300 series, but demanding higher levels of initiative, creativity, responsibility, and leadership.

Z grade

Consent of Department Chairperson Required.

1 - 6 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 401

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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Engs 611: Geospatial Science Primer

School of Engineering

This is a course in analysis of spatial measurement systems. Emphasis is placed upon analysis of measurement systems required to produce geodetic reference frameworks (e.g., GPS baseline networks) and map products (e.g., orthophotos, feature databases, and surface models).

1 Credit

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 611
- Indep Study: Online Program for Engs 611

Subject Areas

- [Engineering, Other](#)

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Engr 407: Legal and Moral Aspects of Engineering

School of Engineering

Professional conduct, registration and licensing, contracts, regulations, and responsibilities to society.

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 407

Subject Areas

- [Engineering, General](#)

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Engr 101: Engineering Fundamentals

School of Engineering

This course introduces first-year students to core engineering, computer science, and geology concepts, provides guidance for exploring various School of Engineering majors, and helps develop essential problem-solving and academic skills. Students will engage in team-based problem solving, perform individual-based critical thinking exercises, and learn strategies for a successful transition to college life.

2 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 101

Subject Areas

- [Engineering, General](#)

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Engs 672: Remote Sensing and the Environment

School of Engineering

This course introduces the fundamental principle and applications of remote sensing of terrestrial and aquatic environments. The course starts with principles of electromagnetic radiation, its interaction with the atmosphere, and its interaction with Earth's surface. Next is an overview of various remote sensing data, including different sensor platforms and data characteristics. There are three separate units that focus on applications of remote sensing of land cover, land use, and aquatic environments. These are followed by a review of methods for transforming and classifying spectral data, including principal components analysis, supervised and unsupervised algorithms, and multispectral and multi-temporal transformations. Next is a discussion of detection of environmental change and a module on accuracy assessment that focuses on how to assess the quality of remote sensing analyses and their results. Finally, the volume concludes with several units on real life case studies around the world and the use of remote sensing to evaluate them.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 672
- Indiv Based: Online Program for Engs 672

Subject Areas

- [Engineering, Other](#)

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Engr 671: Elasticity

School of Engineering

Classical solutions; complex variable solutions, nonlinear elasticity, thermoelasticity, crack propagation, punch problems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 671
- Lecture: Compressed Video for Engr 671

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Civil Engineering, General](#)

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Engr 615: Analytical Petroleum Geology

School of Engineering

Analysis and design of petroleum exploration and production programs.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 615

Subject Areas

- [Engineering, General](#)
- [Geology/Earth Science, General](#)

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Engr 390: Professional Communication for Engineers

School of Engineering

This course provides students with written and oral communication skills to respond to a variety of professional situations and audiences including government, industry, the general public, and fellow engineers.

3 Credits

Prerequisites

- [Writ 102: First-Year Writing II](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 390

Subject Areas

- [Technical and Scientific Communication](#)

Related Areas

- [Advertising](#)
- [International and Intercultural Communication](#)
- [Public Relations, Advertising, and Applied Communication](#)
- [Public Relations, Advertising, and Applied Communication, Other](#)
- [Public Relations/Image Management](#)

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Engr 453: Prob and Stat Analyses in Engr Design

School of Engineering

Introduction to probability, statistics, uncertainty, and reliability. Application of common continuous and discrete probability distributions. Design under uncertainty and elementary decision analysis. Simulation of random variables. Applications in natural and man-made materials, hydrological and geological conditions and other natural processes and engineering design.

3 Credits

Prerequisites

- [Math 263: Unified Calculus & Analytic Geometry III](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 453

Subject Areas

- [Engineering, General](#)

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Engs 614: Remote Sensing and Digital Images

School of Engineering

This course is an introduction to digital image processing. Remote Sensing and Digital Images is focused on providing an introduction to the basic principles and techniques of digital image processing. Included is treatment of: digital data storage formats, data volumes, and elements of digital image processing systems; geometric and radiometric correction; image enhancement; image classification; and multitemporal image analysis.

1 Credit

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 614
- Indep Study: Online Program for Engs 614

Subject Areas

- [Engineering, Other](#)

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Engr 637: Groundwater Modeling

School of Engineering

Analysis and synthesis of hydrology problems. Conceptual modeling process, parameter estimation, model validation and model prediction. Mathematical models for steady and transient flow and transport. Applications to well hydraulics, water supply, regional flow, recharge and infiltration, subsidence, sea water intrusion, surface water/groundwater interaction, groundwater pollution and geotechnical problems. Case studies.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 637

Subject Areas

- [Geotechnical and Geoenvironmental Engineering](#)
- [Geological/Geophysical Engineering](#)

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Engr 322: Transport Phenomena

School of Engineering

Conservation of momentum, energy and mass, transport coefficients, balances in differential form.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Engr 321: Thermodynamics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 322

Subject Areas

- [Engineering, General](#)

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Engr 650: Radar Remote Sensing

School of Engineering

Concepts of radar imaging, imagine systems, image characteristics. Digital processing of SAR images to extract information on Earth's surface.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 650

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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C OP 301: CO-OP Work Experience

School of Engineering

Similar to the 200 series, but offering more difficult and responsible job assignments.

Z grade

Consent of Department Chairperson Required.

1 - 6 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 301
- Internship: Washington Internship Program
- Internship: UM Internship Experience for C OP 301

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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Engr 330: Engineering Systems Analysis and Design

School of Engineering

Mathematical modeling and solution techniques to determine system response and design parameter selection to meet the performance and stability considerations of basic engineering systems including mechanical, electrical, electromechanical, thermal, hydraulic, and feedback control systems. Case studies.

3 Credits

Prerequisites

- [Phys 212: Physics for Science & Engineering II](#)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for Engr 330
- Lecture: Web-based Lecture for Engr 330

Subject Areas

- [Engineering, General](#)

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Engr 452: General Engineering Senior Design II

School of Engineering

Practical execution of the engineering design process and concludes with a capstone presentation and report. This course involves teamwork, where students collaborate and report on their progress and outcomes. It integrates knowledge from thermodynamics, project management, systems engineering, safety, environmental considerations, and economics to guide students through the design process.

1 Credit

Prerequisites

- [Engr 451: General Engineering Senior Design I](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Engr 452

Subject Areas

- [Engineering, General](#)

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Engr 596: Special Projects in Engineering Science

School of Engineering

Special topics course or investigation under the direction of Engineering faculty or staff member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 596
- Indiv Based: Compressed Video for Engr 596
- Indiv Based: Study Abroad for Engr 596

Subject Areas

- [Engineering, General](#)

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Engr 611: Aeroacoustics

School of Engineering

Theory of aerodynamic sound generation; jet noise; boundary layer noise; turbo machinery noise; helicopter noise; sonic booms; atmospheric effects of propagation.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 611

Subject Areas

- [Engineering, General](#)
- [Physics, General](#)
- [Mechanical Engineering](#)

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Engr 659: Advanced Information Retrieval

School of Engineering

Theoretical aspects of information retrieval. Comparison and evaluation of techniques for enhancement of recall and precision performance. Design of user/system interface; applications of natural language processing. Experimental and intelligent information retrieval systems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 659

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 593: Approximate Methods of Engr Analysis I

School of Engineering

Application of approximate methods to solve boundary value and eigen-value problems; approximate analytical methods (series solutions); variational principles and numerical methods (finite difference, finite element, computer simulation).

3 Credits

Prerequisites

- Pre-requisite: Math 353 or Graduate Standing
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Engr 593
- Lecture: Compressed Video for Engr 593

Subject Areas

- [Engineering, General](#)

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C OP 501: CO-OP Work Experience

School of Engineering

Similar to the 400 series, but with job assignments offering more challenge and responsibility for the advanced student.

Z grade

1 - 3 Credits

Prerequisites

- Consent of Department Chairperson Required
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Internship: Internship for C OP 501

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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Engr 400: Leadership & Professionalism in Engineer

School of Engineering

This seminar will introduce students to leadership and entrepreneurial skills necessary for today's engineering industry. The importance of professionalism in engineering will be emphasized.

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Seminar: Seminar for Engr 400

Subject Areas

- [Engineering, General](#)

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Engs 674: Geospatial Data Synthesis and Modeling

School of Engineering

The analysis and synthesis of geospatial data require complex operations in a variety of data processing environments. This can effectively lead to direct scientific results, policy decisions, or to specific combination of data sets which can serve as input to spatial, process, or simulation models with explanatory and predictive capabilities. This course provides students with detailed conceptual and analytical methods, and the knowledge to support synthesis and modeling of geospatial data in the solution of scientific and policy problems. Typically, these problems require a variety of data sources, each with unique characteristics, models, formats, and error levels. Combination of the data sources is a significant difficulty and requires expertise concerning the data themselves and the methods of data integration, processing, error correction and modeling. After attaining a thorough understanding of geospatial data concepts, some of the specific tools such as spatial modeling, geo-statistics, spatial statistics, simulation, visualization, and integrated raster/vector environments, are examined. The application of these tools to specific data sets forms the concluding phase of the course and leads to application.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 674
- Indiv Based: Online Program for Engs 674

Subject Areas

- [Engineering, Other](#)

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School of Engineering

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Engr 689: Control of Robotics Manipulators

School of Engineering

Covers topics of robot control such as the linearization of nonlinear models, controller design, adaptive control of robot arm motion, and control of forces and torques exerted on an object by the end-effector.

3 Credits

Prerequisites

- [Engr 559: Elements of Robotics](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 689

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Manf 450: Practical Problem Solving in Manf

School of Engineering

Intensive training on a manufacturing factory floor. This course will introduce practical problem solving using the scientific method using well established approaches in manufacturing.

3 Credits

Prerequisites

- [Manf 350: Standardized Work/Takt Time](#)
- Students must be enrolled Center of Manufacturing Excellence (CME)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Manf 450

Subject Areas

- [Mechanical Engineering](#)

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Engr 614: Geometrics

School of Engineering

Map analysis of spatial geological data as applied to petroleum, coal, ore, and geotechnical exploration and evaluation.

3 Credits

Cross-listed Courses

- [Geol 614: Advanced Geographic Information Systems](#)

Subject Areas

- [Engineering, General](#)
- [Geological Engineering](#)
- [Geology/Earth Science, General](#)

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Engr 693: Research Topics in Engineering Science I

School of Engineering

Individual research in selected areas of interest. May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 693

Subject Areas

- [Engineering, General](#)

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C OP 502: CO-OP Work Experience

School of Engineering

Similar to the 400 series, but with job assignments offering more challenge and responsibility for the advanced student.

Z grade

3 Credits

Prerequisites

- Consent of Department Chairperson Required
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Internship: Internship for C OP 502

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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Manf 475: Applications in Advanced Manufacturing

School of Engineering

This course introduces the vast field of advanced manufacturing and covers the integration of conventional manufacturing with advanced technologies to diagnose operational flaws and improve manufacturing processes. Fundamental topics will include a survey of advanced, smart, and digital manufacturing applications.

3 Credits

Prerequisites

- Junior Standing Required

Instruction Type(s)

- Lecture: Lecture for Manf 475

Subject Areas

- [Industrial Engineering](#)

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Manf 397: Special Topics in Manufacturing

School of Engineering

Special topics course taught by a Center for Manufacturing Excellence faculty or staff member.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Manf 397

Subject Areas

- [Manufacturing Engineering](#)

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Engr 573: Environmental Remediation

School of Engineering

Characterization and remediation of contaminated soil ground water, and surface water. Sources of contamination, regulations, health effects, sampling, monitoring, analysis and remediation technologies. Non-point source pollution and best management practices.

3 Credits

Prerequisites

- C E 471 or Engr 322 or G E 450 or graduate standing.
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Engr 573

Subject Areas

- [Engineering, General](#)
- [Environmental/Environmental Health Engineering](#)
- [Civil Engineering, General](#)

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Manf 152: Intro to Engineering & Manufacturing II

School of Engineering

Further exploration of technical and managerial aspects of manufacturing. Students will learn techniques, develop skills, and begin to employ methodologies utilized by successful manufacturing professionals.

1 Credit

Prerequisites

- [Manf 150: Intro to Engineering / Manufacturing](#)

Instruction Type(s)

- Lecture: Lecture for Manf 152

Subject Areas

- [Multi-/Interdisciplinary Studies, Other](#)

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Engr 648: Numerical Modeling in Geoscience & Engr

School of Engineering

Numerical methods in geomechanics, including processes in groundwater, soil and rock mechanics. Solutions of ordinary and partial differential equations will be approximated, emphasizing finite-difference methods. Introduction to finite element methods and boundary element methods.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 648

Subject Areas

- [Engineering Science](#)
- [Geological/Geophysical Engineering](#)

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Engs 523: Sensors and Platforms

School of Engineering

This course introduces students to the basic design attributes of imaging sensor systems and the various platforms on which they operate. In this course, the student will gain an understanding of remote sensing systems, review the history of sensor technology, and familiarize themselves with the characteristics of remote sensing sensors and platforms.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 523

Subject Areas

- [Engineering_Other](#)

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Engr 604: Fluid Dynamics II

School of Engineering

Navier-Stokes equation, viscous flow, boundary layer, laminar and turbulent flow, open channel flow, flow in porous media.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 604

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 661: Computer Networks II

School of Engineering

Continued analysis of loosely coupled computer communication, constraints on intercomputer communication, communication protocols, and network services. LAN data link protocols, transport services, and other high-level network functions are examined in detail.

3 Credits

Prerequisites

- [Csci 561: Computer Networks](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 661

Subject Areas

- [Engineering, General](#)
- [Computer Engineering, General](#)
- [Computer Science](#)

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Engr 706: Adv Waste Treat Proc in Sanitary Eng

School of Engineering

An intensive study of the biological processes used for the treatment of domestic sewage and intensive study of the biological processes used for the treatment of domestic sewage and industrial wastes, with special emphasis on environmental factors that affect process rates and efficiencies.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 706

Subject Areas

- [Engineering, General](#)
- [Geological/Geophysical Engineering](#)
- [Civil Engineering, General](#)

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Engr 553: Heat Transfer

School of Engineering

Transient and multidimensional heat conduction, free and forced convection, thermal radiation; design of heat transfer systems; analytical and numerical methods.

3 Credits

Prerequisites

- (Engr 323 & Engr 420) or Graduate Standing.

Instruction Type(s)

- Lecture: Lecture for Engr 553
- Lecture: Web-based Lecture for Engr 553

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 601: Compressible Flow

School of Engineering

General equations, one-dimensional gas dynamics; shocks and waves, two-dimensional flows, perturbation theory; similarity rules, effects of viscosity and conductivity.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 601

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 729: Special Topics in Electromagnetic Theory

School of Engineering

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 729

Subject Areas

- [Laser and Optical Engineering](#)
- [Engineering, General](#)

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Engs 606: Computer Networks

School of Engineering

Analysis of loosely coupled computer communication; communication protocols and network services, an open systems interconnection model is presented and compared to selected examples of computer networks (for computer engineering/telecommunications majors).

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engs 606

Subject Areas

- [Engineering, General](#)
- [Computer Engineering, General](#)
- [Computer Science](#)

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Engr 720: Advanced Turbulence

School of Engineering

Analytical, theoretical, and numerical approaches to turbulence; turbulence modeling.

3 Credits

Prerequisites

- [Engr 711: Turbulence](#)

Instruction Type(s)

- Lecture: Lecture for Engr 720

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 618: Vadose Zone Hydrology

School of Engineering

Theory and application of physical properties and processes governing transport of mass and energy in unsaturated geologic media. Primary attention given to occurrence and movement of water in vadose-zone soil environments; secondary attention given to transport of soil gas and heat. Experimental methods and analytical and numerical models are introduced.

3 Credits

One-way corequisites

- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for Engr 618

Subject Areas

- [Hydrology and Water Resources Science](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Geology/Earth Science, General](#)
- [Paleontology](#)

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Engr 662: Advanced Artificial Intelligence

School of Engineering

Advanced aspects of artificial intelligence. Logical foundations of AI. Machine learning, planning, representation of common-sense knowledge, image understanding. Intensive study of artificial intelligence programming techniques and languages.

3 Credits

Prerequisites

- [Csci 531: Artificial Intelligence](#)

Instruction Type(s)

- Lecture: Lecture for Engr 662

Subject Areas

- [Computer Science](#)
- [Artificial Intelligence](#)

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Engr 351: Socio-Technology I

School of Engineering

Social-technological-environmental systems, problems; natural laws, their impact on the socioeconomic structure, decision making, optimization; lectures, films, demonstrations; for nonengineering students.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 351

Subject Areas

- [Engineering, General](#)

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Engr 594: Approximate Methods of Engr Analysis II

School of Engineering

Application of approximate methods to solve boundary value and eigen-value problems; approximate analytical methods (series solutions); variational principles and numerical methods (finite difference, finite element, computer simulation).

3 Credits

Prerequisites

- Pre-requisite: Math 353 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Engr 594

Subject Areas

- [Engineering, General](#)

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Engr 643: Advanced Geomorphology

School of Engineering

Surface processes associated with specific physiographic districts.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 643

Subject Areas

- [Engineering, General](#)
- [Geology/Earth Science, General](#)

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Manf 470: Principles of Lean Six Sigma

School of Engineering

This course will provide undergraduates with a working knowledge of the Lean Six Sigma process improvement methodology.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Manf 470

Subject Areas

- [Engineering, General](#)

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G E 681: Applications in Geophysics

School of Engineering

Design and analysis of geophysical field problems. (4 lab hours).

May be repeated for a maximum of 6 hours.

3 Credits

Prerequisites

- G E 405 or G E 577

Instruction Type(s)

- Lab: Laboratory for G E 681

Subject Areas

- [Geological/Geophysical Engineering](#)

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Minor - Manufacturing

- [Minor - Manufacturing](#)

Minor - Manufacturing

Description

University of Mississippi undergraduate students who apply to and are selected for admission into the Center for Manufacturing Excellence (CME) program may obtain a minor in manufacturing. This minor consists of 18 hours of required, specialized Manf coursework. Interested students may consult their academic departments for additional information on Manf minor coursework that might be used to concurrently fulfill degree requirements.

Course Requirements

The 18 hours of required courses include Manf 150, Manf 152, Manf 251, Manf 252, Manf 253, Manf 255, Manf 351, Manf 353, Manf 355, and Manf 455. For CME Students in the School of Business Administration, MANF 253 will be applied as a course substitute for MGMT 493 as credit toward degree requirements. Additional optional electives are available beyond the 18 required hours for further manufacturing experience and student development. A list of these electives and their scheduled offerings is available through the CME.

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School of Engineering

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Departments

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Mechanical Engineering

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Telecommunications

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Engs 627: Applied Probability Modeling

School of Engineering

Concepts of probability modeling for applications. Fundamentals of statistical experiments, events, probability laws, conditional probability, random variables, expectation and conditional expectation, introduction to and applications of Markov chains, papers from literature.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engs 627

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 592: Engineering Analysis II

School of Engineering

Application of higher mathematics to engineering problems; special emphasis on the expression of engineering problems in mathematical terminology.

3 Credits

Prerequisites

- Pre-requisite: Math 353 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Engr 592

Subject Areas

- [Engineering, General](#)

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Engr 649: Advanced Foundation Engineering

School of Engineering

Earth pressure theories; bearing capacity; control of groundwater in excavation, shoring, and underpinning; foundations subjected to dynamic forces.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 649

Subject Areas

- [Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Civil Engineering, General](#)

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Engr 197: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 197

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 683: Advanced Physical Metallurgy

School of Engineering

Discussion of microstructural relationships for understanding material behavior. Topics include defect structure, solidification, transformation mechanisms and kinetics, and microstructural modification techniques.

3 Credits

Prerequisites

- [M E 530: Physical Metallurgy](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 683

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Materials Science](#)

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Minor - Engineering

- [Minor - Engineering](#)

Minor - Engineering

Description

Students pursuing a degree from outside the School of Engineering may choose to minor in engineering. Students in the School of Accountancy and the School of Business Administration may choose to minor in engineering with an emphasis in manufacturing through the Center for Manufacturing Excellence.

Course Requirements

Students interested in the engineering minor should acquaint themselves with the mathematics, chemistry, and physics courses that are typically prerequisites to engineering courses. The minor includes 3 credit hours of one programming course selected from Csci 111, 251, 259, or Ch E 251; at least 6 credit hours selected from Engr 309, 312, 313, 321, 322, 323, 360; and 9 credit hours of additional course work offered by departments within the School of Engineering with the exception of the following: Csci 103, 191, 203; all 100-level Geol courses other than Geol 103. A minimum grade of C is required in all 18 credit hours of applicable minor course work. At least 6 credit hours must be completed in residence. Exception: Computer science and geology majors from the School of Engineering are still eligible to have the engineering minor as long as said required 9 credit hours are earned from engineering departments other than their major.

For students in the School of Accountancy or the School of Business Administration who would like to obtain a minor in engineering with an emphasis in manufacturing, 18 hours of specialized course work are required. Also, the basic math and science courses would be specified within the minor as follows: Math 261-262 to satisfy their school math requirement; Physics 211-212 plus 221-222 labs to satisfy their science/lab experience; plus the following required 18 credit hours: Math 263, Engr 313, Manf 251, Manf 254, Accy/Bus equivalent of Manf 450 - Senior Design Team Course (as an accounting/business student team member), Accy/Bus equivalent of Manf 451 - Senior Design Team Course (as an accounting/business team member).

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Engs 673: Advanced Digital Image Processing

School of Engineering

This course teaches students advanced concepts in digital image processing, with explanations and examples that demonstrate how the topics can be applied to remotely sensed images. The course begins with a review of resolution, including spatial, spectral, temporal, and radiometric resolutions. Then the student has the option to choose between the next two modules; discrete image transforms and image quality metrics. The coverage of discrete image transforms includes theory and examples of sinusoidal, rectangular-waveform, eigen-based, and wavelet transforms. The unit on image quality metrics includes information about manual ratings, mean-square-error, signal-to-noise ratios, etc. After these two modules are completed, the student has the option of three more modules: image enhancement and restoration, image compression, and automated image analysis. For image enhancement, the student is introduced to noise models, as well as various spatial and spectral filters for noise removal. The image compression module introduces the student to transform-based compression schemes, with examples of lossy and lossless schemes. Finally, the automated image analysis module introduces the theory and practical application of 1) segmentation methods, including windowing, thresholding, edge detection, and morphological processing; 2) feature extraction methods, such as shape and texture features; and 3) feature reduction and optimization methods.

3 Credits

Prerequisites

- [Engs 624: Introduction to Digital Image Processing](#)

Instruction Type(s)

- Indiv Based: Individual Based for Engs 673
- Indiv Based: Online Program for Engs 673

Subject Areas

- [Engineering, Other](#)

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C OP 402: CO-OP Work Experience

School of Engineering

Similar to the 300 series, but demanding higher levels of initiative, creativity, responsibility, and leadership.

Consent of Department Chairperson Required.

1 - 6 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 402

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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Engr 716: Applied Hydro- and Aeromechanics II

School of Engineering

Transonic, supersonic, and hypersonic aerodynamics including viscous effects; blunt bodies and the associated shock layer, aerodynamic heating, ablation.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 716

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 606: Numerical Heat Transfer and Fluid Flow

School of Engineering

Study of numerical methods for solving conduction, convection, and mass transfer problems, including numerical solution of Laplace's equation, Poisson's equation, Navier-Stokes equations, and the general equations of convection.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 606

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engs 681: Advanced Sensor Systems Data Collection

School of Engineering

Advanced sensors in remote sensing contribute every day to the imaging capabilities for monitoring Earth's environment and what effect humans are having on it. This course assumes that the student has taken the basic sensors and platforms course which has introduced the sensors and platforms that accomplish essential data collection and have done it masterfully for years. Advanced Sensors is organized into several units that demonstrate the newest active and passive sensors including advanced synthetic aperture radar, lidar, radiometers, spectrometers, microwave sounders, advanced hyperspectral sensors, and the advanced platforms which carry these sensors. This course will delve deeper into the mathematical theory behind sensors such as RADAR, LIDAR, and synthetic aperture radar interferometry operations and will illustrate sensors and platforms using as examples the current advanced sensors aboard satellites such as ENVISAT, GRACESAT, and ADEOS I and II. Operation of advanced aircraft and balloon payloads such as TOP HAT and BOOMERANG will also be investigated. The course will close by looking at the future to determine tomorrow's advanced sensors and students will realize that today's advanced technologies will become tomorrow's basic technologies.

3 Credits

Prerequisites

- [Engs 523: Sensors and Platforms](#)

Instruction Type(s)

- Indiv Based: Individual Based for Engs 681
- Indiv Based: Online Program for Engs 681

Subject Areas

- [Engineering, Other](#)

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Engr 201: Computer Aided Design for Engineering

School of Engineering

This course provides basic understanding of engineering drawings and computer-aided design for engineering applications.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 201
- Lecture: Web-based Lecture for Engr 201

Subject Areas

- [Engineering, General](#)

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Engr 797: Dissertation

School of Engineering

No grade

1 - 18 Credits

Instruction Type(s)

- Dissertation: Dissertation for Engr 797

Subject Areas

- [Engineering, General](#)

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Engr 616: Isotope Hydrogeology

School of Engineering

Applications of stable and radioactive isotopes for solving environmental and low-temperature geologic problems. Problems that will be addressed include measurement techniques and limitations, tracing the origin of water and contaminants in natural systems, applications for global climate change and paleoclimates, quantifying infiltration and groundwater travel rates, and age dating of water.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 616

Subject Areas

- [Engineering, General](#)
- [Geological Engineering](#)
- [Geology/Earth Science, General](#)

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Engr 699: Special Topics in Engineering Science

School of Engineering

Individual design or research projects in selected areas of interest. May be repeated for credit.

1 - 6 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 699

Subject Areas

- [Engineering, General](#)

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School of Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Departments](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Leadership

- Viola Acoff - Dean of Engineering and Professor of Mechanical Engineering

Contact

227 Brevard Hall
University, MS 38677
deanengr@olemiss.edu
<http://www.engineering.olemiss.edu/>

Overview

The School of Engineering offers Bachelor of Science (B.S.) degrees in biomedical engineering, chemical engineering, civil engineering, computer engineering, computer science, electrical engineering, general engineering, geology, geological engineering and mechanical engineering. The school also offers a Bachelor of Engineering (B.E.) degree.

History/Mission/Purpose

History - Founded in 1900, the School of Engineering is the third oldest school of the university and is the oldest engineering school in the state. Instruction in engineering dates from 1854 when a Department of Engineering was established by the Board of Trustees to complement a strong program in the natural sciences.

Vision Statement - The School will positively transform lives and communities through innovative engineering education and discovery.

Mission Statement - The School capitalizes on its engineering science tradition, a low student to faculty ratio, and a rich liberal arts environment to give future professionals deep technical abilities, the capacity to adapt to the rapid changes in engineering, and the interdisciplinary background to help them excel in a competitive world.

Statement of Goals - The School aims to:

- Ensure an environment conducive to learning, teaching, and research. This includes a diverse and multicultural first-rate faculty, staff and students and state-of-the-art facilities.
- Provide top-quality ABET accredited undergraduate programs suitable for the 21st century.
- Foster vibrant graduate programs and perform quality research in line with national trends and achieve national recognition in selected areas.
- Establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia.
- Make significant contribution to the technological and economic development of the State of Mississippi and the region through education, research, and service.
- Increase the visibility of the School of Engineering locally and nationally.

Accreditation

The following undergraduate engineering programs are accredited by the Engineering Accreditation Commission of ABET,

<http://www.abet.org>: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, and Bachelor of Science in Mechanical Engineering. The Bachelor of Science in Computer Science (BSCS) program of the Department of Computer and Information Science is accredited as a Computer Science program by the Computing Accreditation Commission (CAC) of ABET
<https://www.abet.org>.

Other Information

Cooperative education, or co-op, provides students with the opportunity to gain hands-on experience by taking a semester or two to work with seasoned engineers and other professionals. Engineering students typically begin a co-op following their sophomore or junior year when they have completed enough major-specific courses to contribute in a professional setting.

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Engr 667: Mass Transfer I

School of Engineering

Unified treatment of momentum, energy, and mass transport with emphasis on mass transport and transfer in flowing, non-isothermal, multicomponent, reacting systems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 667

Subject Areas

- [Engineering, General](#)
- [Chemical Engineering](#)

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Manf 351: Manufacturing Product/Process Design

School of Engineering

Development of product and process design for manufactured products to achieve business objectives.

1 Credit

Prerequisites

- [Manf 353: Accounting & Financial Mgmt for Manf](#)

One-way corequisites

- [Manf 355: Lean II: Continuous Flow/Layout](#)

Instruction Type(s)

- Lecture: Lecture for Manf 351

Subject Areas

- [Mechanical Engineering](#)

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Engr 402: Engineering Fundamentals

School of Engineering

Review of fundamentals of engineering, including mathematics, chemistry, statics, dynamics, mechanics of materials, fluid mechanics, thermodynamics, electric circuit, material science, engineering economics and ethics. Discipline specific subjects such as chemical, civil, electrical, environmental, and mechanical engineering will be reviewed depending on the composition of the class.

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 402
- Lecture: Lecture for Engr 402

Subject Areas

- [Engineering, General](#)

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Engr 311: Intermediate Mechanics

School of Engineering

Equilibrium of frames and machines; concepts of work and energy, impulse and momentum; friction, rotating frames of reference, kinetics and kinematics of rigid bodies; free and forced vibrations.

3 Credits

Prerequisites

- [Engr 309: Statics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 311

Subject Areas

- [Engineering, General](#)

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Engr 690: Finite Element Analysis II

School of Engineering

Three-dimensional element formulations; nonlinear analysis; dynamic response, time-dependent behavior; advanced mesh-generation techniques.

3 Credits

Prerequisites

- [Engr 590: Finite Element Analysis I](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 690

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Civil Engineering, General](#)

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Engr 585: Mechanics of Composite Materials I

School of Engineering

Development of constitutive laws governing the hygro-thermo-mechanical response of composite material systems. Micromechanical and macromechanical modeling, laminate theory, definition and comparison of failure criteria. Damage modeling and fatigue studies.

3 Credits

Prerequisites

- Pre-requisite: Engr 312 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Engr 585

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 686: Multimedia Technologies II

School of Engineering

The design of appropriate instructional material using interactive video production techniques including sound and graphics. Technical analysis of requirements and design tradeoffs. The economics of video disc production will be discussed.

3 Credits

Prerequisites

- [TC 585: Multimedia Technologies I](#)

Instruction Type(s)

- Lecture: Lecture for Engr 686

Subject Areas

- [Engineering, General](#)
- [Electrical and Electronics Engineering](#)
- [Computer Science](#)

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Engr 670: Chemical Reaction & Reactor Analysis II

School of Engineering

Single and multiple reacting systems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 670

Subject Areas

- [Engineering, General](#)
- [Chemical Engineering](#)

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Engr 633: Process Dynamics and Control I

School of Engineering

Design of control systems for chemical processes and selected topics of an advanced nature.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 633

Subject Areas

- [Engineering, General](#)
- [Chemical Engineering](#)

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Engr 702: Finite Element Analysis of Fluid Flows

School of Engineering

Applications of FEM for fluid flow simulation; discussion on current developments; research on individual projects.

3 Credits

Prerequisites

- [Engr 590: Finite Element Analysis I](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 702

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 597: Special Projects in Engineering Science

School of Engineering

Special topics course or investigation under the direction of Engineering faculty or staff member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 597
- Indiv Based: Compressed Video for Engr 597
- Indiv Based: Web based Indiv Based Study for Engr 597

Subject Areas

- [Engineering, General](#)

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Engr 692: Special Topics in Engineering Science II

School of Engineering

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 692

Subject Areas

- [Engineering, General](#)

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Engr 612: Aeroelasticity

School of Engineering

Study of structural deformations due to time-dependent fluid flow phenomena over surfaces; effects of gusts and turbulence; structural design criteria.

3 Credits

Prerequisites

- [Engr 558: Vibration Analysis](#)

Instruction Type(s)

- Lecture: Lecture for Engr 612

Subject Areas

- [Engineering, General](#)
- [Physics, General](#)
- [Mechanical Engineering](#)

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Engr 571: Service Learning in Water Treatment

School of Engineering

This course combines academic material and service activities towards developing and/or testing community-based drinking water treatment systems. Topics include: world water issues; water quality standards; chemical and biological parameters; laboratory testing; pipe flow; drinking water unit processes; hands-on development and/or testing of a water treatment system; report writing; and professional presentations.

3 Credits

Prerequisites

-

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 571

Subject Areas

- [Engineering, General](#)

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Engs 624: Introduction to Digital Image Processing

School of Engineering

This course introduces students to the fundamental principles of digital image processing applied to remotely sensed data. The course begins with a review of the remote sensing process. Methods of obtaining digital remotely sensed data are then reviewed including digital systems (e.g., scanners, pushbroom sensors) and the process of hardcopy digitization. Fundamental statistical analysis techniques are then reviewed. Typical digital image processing system characteristics are described with reference to the major software providers. Methods of radiometric correction are introduced including those based on radiative transfer modeling and image-to-image normalization. Image-to- image and image-to-map geometric correction algorithms are described. Image enhancement algorithms that can be used to enhance subtle characteristics for improved visual examination are discussed. Digital methods of extracting information from remotely sensed data are summarized including the key elements of supervised and unsupervised classification and accuracy assessment. The final module describes the logic and algorithms used to perform digital change detection.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 624
- Indep Study: Online Program for Engs 624

Subject Areas

- [Engineering, Other](#)

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Engs 683: Land Use and Land Cover Applications

School of Engineering

The purpose of this course is to introduce to students the fundamental considerations in creating, updating, assessing, and using land cover and land use information that has been derived from remotely sensed data. Each unit addresses multiple concepts that allow students to answer important questions concerning land cover and land use applications. Students begin with an introduction to the definitions, delineations, and brief histories of land use and land cover information. Next, students focus on data exploration and image classification, including the creation process. The method of detecting change in land use and land cover and the associated updates are outlined and reviewed. Accuracy and assessment of land use and land cover information is also examined, including a discussion on analysis systems. The course also addressed the use of information for predictions of the impact of future decisions and prescriptions for best land management practices and goals. Concepts are illustrated with detailed real world case studies and student exercises.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 683
- Indiv Based: Online Program for Engs 683

Subject Areas

- [Engineering](#), [Other](#)

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Engr 684: Advanced Mechanical Metallurgy

School of Engineering

Discussion of mechanical and metallurgical fundamentals to explain the mechanical behavior of engineering materials. Applications to tensile and torsional loading, hardness, fatigue, creep, and embrittlement included.

3 Credits

Prerequisites

- [M E 531: Mechanical Behavior of Engr Materials](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 684

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Materials Science](#)

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Engr 644: Carbonate Petrology

School of Engineering

Advanced problems in carbonate rock genesis and distribution.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 644

Subject Areas

- [Engineering, General](#)
- [Geology/Earth Science, General](#)

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Engr 555: Field Testing & Insr. in Geotech. Engr.

School of Engineering

Principles, mechanisms, and interpretation of traditional and modern field testing techniques; principles and applications of geotechnical instrumentation to monitor and measure the behavior of structures; geotechnical measurement with the engineering point of view.

3 Credits

Prerequisites

- [C E 431: Soil Mechanics I](#)

Instruction Type(s)

- Lecture: Lecture for Engr 555

Subject Areas

- [Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)

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Engs 621: Orbital Mechanics

School of Engineering

Since the beginning of civilization orbital mechanics has played a large role in a person's grasp of what happens in the universe. People like Aristotle, Ptolemy, Copernicus, Kepler, Newton, and Einstein were giants in this field, but with the advent of the Space Age on October 4, 1957, a familiarity with orbital mechanics became essential for space scientists and especially scientists concerned with remote sensing to understand satellite applications. Today, a good knowledge of orbital mechanics enables a remote sensing technologist to locate where an image has been taken, determine what hour the image was taken, and when the next imaging opportunity will be possible. Additionally a student can determine what happens to a remote sensing satellite when an orbit changes due to a deliberate maneuver or an orbital perturbation. This course uses elementary principles of mathematics, physics, and mechanics to introduce the student to the traditional science required to place a spacecraft into orbit, keep it there, determine its position, and maneuver it.

3 Credits

Prerequisites

- (Math 121 and 123) or Math 125 required.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 621
- Indiv Based: Online Program for Engs 621

Subject Areas

- [Geological and Earth Sciences/Geosciences, Other](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geology/Earth Science, General](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Engr 577: Geophysics I

School of Engineering

Gravity and magnetic theory and methods.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 577

Subject Areas

- [Engineering, General](#)
- [Environmental/Environmental Health Engineering](#)
- [Geological/Geophysical Engineering](#)

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Engr 641: Clay Petrology

School of Engineering

3 Credits

Subject Areas

- [Engineering, General](#)
- [Geology/Earth Science, General](#)

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Engr 653: Computer Structures

School of Engineering

In-depth study of the upper levels of computer structure (down to the internal register transfer level) including design choices, design needs, and structural variations in organizing processors, memories, I/O devices, controllers, and communication links. An extensive review of several current machines is made.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 653

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 718: Coding for Error Code

School of Engineering

This course provides a working knowledge of the use of codes to minimize error in the transmission of data using block and convolutional codes.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 718

Subject Areas

- [Artificial Intelligence](#)
- [Electrical and Electronics Engineering](#)

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Engr 207: Graphics I

School of Engineering

Practical engineering application of AutoCAD (Computer-Aided Design) software in two-dimensional and three-dimensional conceptual design projects and assignments.

1 Credit

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 207
- Lecture/Lab: Web-based Lecture/Lab for Engr 207

Course Fee(s)

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 663: Advanced Rate and Equilibrium Processes

School of Engineering

Selected topics in fluid mechanics, heat transfer, mass transfer, and other physical separations important to chemical plant design and operation. May be repeated for credit.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 663

Subject Areas

- [Engineering, General](#)
- [Chemical Engineering](#)

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Manf 497: Special Topics in Manufacturing

School of Engineering

Special topics course taught by a Center for Manufacturing Excellence faculty or staff member.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Manf 497

Subject Areas

- [Manufacturing Engineering](#)

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Engr 749: Special Topics in Soil Science

School of Engineering

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 749

Subject Areas

- [Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Civil Engineering, General](#)

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Engr 691: Special Topics in Engineering Science I

School of Engineering

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 691

Subject Areas

- [Engineering, General](#)

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School of Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Departments](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Degrees Offered

The programs of study offered by the School of Engineering are chemical engineering, civil engineering, computer & information science, electrical engineering, geology & geological engineering, and mechanical engineering.

The four-year Bachelor of Science curricula in these fields are designed to prepare students for the practice of the profession of engineering.

The four-year Bachelor of Engineering curricula are extremely broad and are designed to provide students the opportunity to gain an understanding of engineering, scientific, and technical knowledge that will enhance their career objectives in such areas as, for example, engineering science, medicine, law, military, management, and sales.

The School of Engineering offers through its graduate program the Master of Science and Doctor of Philosophy degrees in engineering science.

[College of Liberal Arts](#)

[Computer & Information Science](#)

- [B.A. in Computer Science](#)

[School of Engineering](#)

- [B.S. in Engineering](#)
 - [Emphasis - Aerospace Engineering](#)
 - [Emphasis - Aerospace Studies](#)
 - [Emphasis - Business Administration](#)
 - [Emphasis - Entrepreneurship](#)
 - [Emphasis - Global Security Studies](#)
 - [Emphasis - Intelligent Security Studies](#)
 - [Emphasis - Manufacturing](#)
 - [Emphasis - Military Science](#)
 - [Emphasis - Naval Science](#)
 - [Emphasis - Pre-Med Studies](#)
 - [Standard Option](#)

[Biomedical Engineering](#)

- [B.S.B.E. in Biomedical Engineering](#)
 - [Emphasis - Biodevices](#)
 - [Emphasis - Bioinformatics](#)
 - [Emphasis - Biomolecular](#)
 - [Emphasis - Pre Med](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Biomedical Engineering](#)

- [Ph.D. in Engineering Science](#)
 - [Emphasis - Biomedical Engineering](#)

[Chemical Engineering](#)

- [B.S.Ch.E. in Chemical Engineering](#)
 - [Emphasis - Biotechnology](#)
 - [Emphasis - Environmental](#)
 - [Emphasis - Manufacturing](#)
 - [Emphasis - Materials](#)
 - [Pre-Med Option](#)
 - [Standard Option](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Chemical Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Materials Science and Engr](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Chemical Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Materials Science and Engr](#)

[Civil Engineering](#)

- [B.S.C.E. in Civil Engineering](#)
 - [Emphasis - Environmental](#)
 - [Emphasis - Standard](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Civil Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Civil Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr](#)

[Computer & Information Science](#)

- [B.S.C.S. in Computer Science](#)
 - [Emphasis - Computer Security](#)
 - [Emphasis - Data Science](#)
- [B.S.D.S. in Data Science](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Computer Science](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Computer Science](#)

[Electrical and Computer Engineering](#)

- [B.S.Cp.E. in Computer Engineering](#)
 - [Emphasis - Manufacturing](#)
 - [Standard Option](#)
- [B.S.E.E. in Electrical Engineering](#)
 - [Emphasis - General Program](#)
 - [Emphasis - Manufacturing](#)
- [M.S. in Engineering Science](#)

- [Emphasis - Computer Engineering](#)
- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)
- [Emphasis - Telecommunications](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Computer Engineering](#)
 - [Emphasis - EE \(Electromagnetics\)](#)
 - [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [B.S.G. in Geology](#)
- [B.S.G.E. in Geological Engineering](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Geological Engineering](#)
 - [Emphasis - Geology](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Geological Engineering](#)
 - [Emphasis - Geology](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [B.S.M.E. in Mechanical Engineering](#)
 - [Emphasis - Manufacturing](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr.](#)
 - [Emphasis - Mechanical Engineering](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr.](#)
 - [Emphasis - Mechanical Engineering](#)

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Manf 355: Lean II: Continuous Flow/Layout

School of Engineering

Experiential learning of techniques used by businesses and industries for creating efficient plant layouts, eliminating non-value-added activities, and reducing waste.

1 Credit

Prerequisites

- [Manf 255: Lean I: Standardized Work & Takt Time](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Manf 355

Subject Areas

- [Mechanical Engineering](#)

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Engr 685: Mechanics of Composite Materials II

School of Engineering

Advanced techniques of modeling and analyzing the behavior and response of composite material systems. Nonlinear behavior, both constitutive and geometric. Emphasis on the use of finite element analysis, computational simulation.

3 Credits

Prerequisites

- [Engr 585: Mechanics of Composite Materials I](#) (Minimum grade: C)
- [Engr 590: Finite Element Analysis I](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 685

Subject Areas

- [Engineering, General](#)
- [Materials Science](#)
- [Mechanical Engineering](#)

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Engr 680: Advanced Acoustics

School of Engineering

Advanced course in theoretical acoustics. The course will treat the acoustic wave equations for a variety of actual physical situations.

3 Credits

Prerequisites

- [Phys 521: Acoustics](#) (Minimum grade: C)
- [Engr 515: Acoustics](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engr 680

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 626: Numerical Methods in Electromagnetics

School of Engineering

Formulation and numerical solution of electromagnetic problems using current computational tools.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 626

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Manf 253: Strategic Planning

School of Engineering

A comprehensive study of the strategic management process involving the formulation and implementation of strategies at the corporate, business, and functional levels of a manufacturing organization.

3 Credits

Prerequisites

- Students must be enrolled Center of Manufacturing Excellence (CME)

One-way corequisites

- [Manf 150: Intro to Engineering / Manufacturing](#)

Instruction Type(s)

- Lecture: Lecture for Manf 253

Subject Areas

- [Mechanical Engineering](#)

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Engr 721: Advanced Electrodynamics

School of Engineering

Boundary-value problems. Green's functions, general transmission systems, coupled transmission systems, microwave optics, scattering.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 721

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 664: Theory of Concurrent Programming

School of Engineering

Topics in the theory of concurrent programming. Models of concurrency. Programming logics. Emphasis on the formal specification and verification of concurrent programs. Case studies drawn from several areas of computer science.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 664

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 602: Lithostratigraphy

School of Engineering

Quantitative map and lithofacies analysis for the purpose of defining and evaluating depositional systems using surface and subsurface data.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 602

Subject Areas

- [Engineering, General](#)
- [Geological/Geophysical Engineering](#)

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Engr 312: Mechanics of Materials

School of Engineering

Mechanics of deformable bodies; stress, strain, Hooke's Law, axial loading, bending, torsion, and column problems; introduction to statically indeterminate problems. Laboratory demonstrations of buckling of columns and deflection of beams, plane stress analysis.

3 Credits

Prerequisites

- [Engr 309: Statics](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 312

Subject Areas

- [Engineering, General](#)

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Engs 671: Digital Topographic Mapping

School of Engineering

This course introduces students to the fundamental concepts and methods of topographic mapping. Maps have been used for centuries to catalog and view the arrangement of things on the Earth's surface. Topographic maps are the most widely used form of all maps as they portray both natural features, manmade objects, and the shape and elevation of the land. Unit 1 describes the role of mapping in ancient and modern society along with the nature of maps and the basic principles of coordinate systems and map projections. Unit 2 reviews data collection techniques including: land surveying techniques, the Global Positioning System, and remote sensing data collection. Unit 3 focuses on cartographic operations; it explains methods of graphic communication and techniques for labeling, generalization and map conflation. Unit 4 familiarizes students with Digital Elevation Models and surface modeling. Triangular Irregular Network and Grid data structures are studied along with various interpolation techniques to reconstruct digital surfaces from measured points. Unit 5 explores various tools to visualize and analyze topographic data.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 671
- Indiv Based: Online Program for Engs 671

Subject Areas

- [Engineering, Other](#)

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Engr 296: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 296

Subject Areas

- [Engineering Science](#)
- [Engineering, General](#)

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Engs 610: Telecommunication Network Engineering

School of Engineering

Team design project developed in cooperation with industry. Students accomplish the design and document the results in a report and in an oral presentation.

3 Credits

Prerequisites

- [Engr 653: Computer Structures](#) (Minimum grade: C)
- [Engs 603: Analysis of Algorithms](#) (Minimum grade: C)
- [Engs 606: Computer Networks](#) (Minimum grade: C)

Instruction Type(s)

- Lecture: Lecture for Engs 610

Subject Areas

- [Laser and Optical Engineering](#)
- [Computer Science](#)

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Engr 697: Thesis

School of Engineering

No grade

1 - 12 Credits

Instruction Type(s)

- Thesis: Thesis for Engr 697

Subject Areas

- [Engineering, General](#)

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Engr 660: Software Engineering II

School of Engineering

Software quality assurance, software testing techniques, software testing strategies, software maintenance, and configuration management.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 660

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 695: Seminar

School of Engineering

Papers by faculty, visiting lecturers, and graduate students. May be repeated for credit.

1 Credit

Instruction Type(s)

- Seminar: Seminar for Engr 695

Subject Areas

- [Engineering, General](#)

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Engr 665: Thermodynamics of Chemical Systems

School of Engineering

Phase and reaction equilibria in multicomponent chemical engineering applications; non-ideal considerations.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 665

Subject Areas

- [Engineering, General](#)
- [Chemical Engineering](#)

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Engr 396: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 396

Subject Areas

- [Engineering, General](#)

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Engr 502: Software Systems

School of Engineering

Survey of fundamental topics in computer science, including machine, assembler, and high-level languages, design of assemblers, loaders, macro processors and compilers, operating system concepts, and other material essential for graduate work in computer science.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 502

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 340: Engineering Geology

School of Engineering

Introduction to properties and mechanics of earth materials: rock, soils and groundwater. Weathering and soil-forming processes. Geophysical methods. Hazards including mass wasting, subsidence, expansive soils, floods and earthquakes. Earth dams and dam foundations.

4 Credits

Prerequisites

- [Chem 105: General Chemistry I](#) (Minimum grade: C)
- Co-Requisites: Phys 211 or Phys 213

One-way corequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 340

Subject Areas

- [Engineering, General](#)

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Engr 723: Passive Microwave Circuits

School of Engineering

Guided electromagnetic waves, linear multiports, computer analysis and optimization of microwave circuits, multiconductor transmission lines, filters.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 723

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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C OP 202: CO-OP Work Experience

School of Engineering

Work experience in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest.

Consent of Department Chairperson Required.

1 - 6 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 202

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Engr 361: Electric Circuit Laboratory

School of Engineering

Circuit elements and instruments; experiments dealing with series and two-port networks, voltage, current, power, vars.

1 Credit

Prerequisites

- [Engr 360: Electric Circuit Theory](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Engr 361

Subject Areas

- [Engineering, Other](#)
- [Engineering, General](#)

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Manf 150: Intro to Engineering / Manufacturing

School of Engineering

This course will introduce students to the engineering and professional disciplines related to manufacturing including the leadership and entrepreneurial skills necessary in today's manufacturing and engineering industry.

1 Credit

Prerequisites

- Students must be enrolled Center of Manufacturing Excellence (CME)

Instruction Type(s)

- Lecture: Lecture for Manf 150

Subject Areas

- [Mechanical Engineering](#)

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Engr 598: Special Projects in Engineering Science

School of Engineering

Special topics course or investigation under the direction of Engineering faculty or staff member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for Engr 598
- Indiv Based: Compressed Video for Engr 598

Subject Areas

- [Engineering, General](#)

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Engr 687: Special Functions for Applications

School of Engineering

Polynomials, basic special functions, series and integral solutions of differential equations, asymptotic methods, properties of major special functions, applications.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 687

Subject Areas

- [Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Engs 603: Analysis of Algorithms

School of Engineering

Introduction of the analysis of computer algorithms as well as concepts of computational complexity; sorting, matrix multiplication, other (for computer engineering/telecommunications majors).

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engs 603

Subject Areas

- [Engineering, General](#)
- [Computer Science](#)

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Engr 673: Plasticity

School of Engineering

Introduction to the physical foundations of plasticity. Modern treatments of constitutive theory (including thermodynamics and internal variables). Theory of yield plasticity and dynamic plasticity.

3 Credits

Prerequisites

- [Engr 617: Continuum Mechanics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 673

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)
- [Civil Engineering, General](#)

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C OP 503: CO-OP Work Experience

School of Engineering

Similar to the 400 series, but with job assignments offering more challenge and responsibility for the advanced student.

Z grade

3 Credits

Prerequisites

- Consent of Department Chairperson Required

Instruction Type(s)

- Internship: Internship for C OP 503

Subject Areas

- [Basic Skills and Developmental/Remedial Education, General](#)

Related Areas

- [Career Exploration/Awareness Skills](#)
- [Developmental/Remedial English](#)
- [Second Language Learning](#)

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School of Engineering

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[School of Engineering](#)

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- [C OP 302: CO-OP Work Experience](#)
- [C OP 401: CO-OP Work Experience](#)
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- [C OP 501: CO-OP Work Experience](#)
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- [Engr 111: Engineering Fundamentals Lab](#)
- [Engr 196: Special Topics in Engineering Science](#)
- [Engr 197: Special Topics in Engineering Science](#)
- [Engr 201: Computer Aided Design for Engineering](#)
- [Engr 207: Graphics I](#)
- [Engr 296: Special Topics in Engineering Science](#)
- [Engr 297: Special Topics in Engineering Science](#)
- [Engr 307: Technical Communications](#)
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- [Engr 323: Fluid Mechanics](#)
- [Engr 323: Fluid Mechanics](#)
- [Engr 330: Engineering Systems Analysis and Design](#)
- [Engr 330: Engineering Systems Analysis and Design](#)
- [Engr 340: Engineering Geology](#)
- [Engr 340: Engineering Geology](#)
- [Engr 345: Engineering Economy](#)
- [Engr 351: Socio-Technology I](#)

- [Engr 352: Socio-Technology II](#)
- [Engr 360: Electric Circuit Theory](#)
- [Engr 360: Electric Circuit Theory](#)
- [Engr 361: Electric Circuit Laboratory](#)
- [Engr 361: Electric Circuit Laboratory](#)
- [Engr 363: Introductory Electric Circuit Laboratory](#)
- [Engr 363: Introductory Electric Circuit Laboratory](#)
- [Engr 390: Professional Communication for Engineers](#)
- [Engr 396: Special Topics in Engineering Science](#)
- [Engr 397: Special Topics in Engineering Science](#)
- [Engr 400: Leadership & Professionalism in Engineer](#)
- [Engr 402: Engineering Fundamentals](#)
- [Engr 407: Legal and Moral Aspects of Engineering](#)
- [Engr 410: Engineering Analysis II](#)
- [Engr 410: Engineering Analysis II](#)
- [Engr 415: Engineering Acoustics I](#)
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- [Engr 420: Engineering Analysis III](#)
- [Engr 431: Fundamentals of Systems Engineering](#)
- [Engr 450: Product Design and Development](#)
- [Engr 450: Product Design and Development](#)
- [Engr 451: General Engineering Senior Design I](#)
- [Engr 452: General Engineering Senior Design II](#)
- [Engr 453: Prob and Stat Analyses in Engr Design](#)
- [Engr 496: Special Topics in Engineering Science](#)
- [Engr 497: Special Topics in Engineering Science](#)
- [Engr 501: Fundamentals of Computer Science](#)
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- [Engr 559: Elements of Robotics](#)
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- [Engr 600: Advanced Geochemistry](#)
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- [Engr 602: Lithostratigraphy](#)
- [Engr 603: Fluid Mechanics I](#)
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- [Engr 605: Convective Heat and Mass Transfer](#)
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- [Engr 626: Numerical Methods in Electromagnetics](#)
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- [Engr 633: Process Dynamics and Control I](#)
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- [Engs 683: Land Use and Land Cover Applications](#)
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- [Manf 475: Applications in Advanced Manufacturing](#)
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Biomedical Engineering

- [BME 200: Introduction to Biomedical Engineering](#)
- [BME 222: Biomaterials](#)
- [BME 256: Programming for Biomedical Engineering](#)
- [BME 301: Bioinstrumentation](#)
- [BME 305: Bioengineering Thermodynamics & Kinetics](#)
- [BME 311: Biomechanics](#)
- [BME 313: Physiology for Biomedical Engineering](#)
- [BME 314: Biomedical Measurement](#)
- [BME 315: Physiology for Biomedical Engineering II](#)
- [BME 320: Bioseparations](#)
- [BME 322: Sensors and Nanodevices in BME](#)
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- [BME 350: Immunoengineering](#)
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- [BME 462: Biomedical Engineering Senior Design II](#)
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- [BME 520: Biochemical Process Engineering](#)
- [BME 522: Immunoengineering](#)
- [BME 523: Molecular and Cellular Biophysics](#)
- [BME 524: Microscopy for Engineers](#)
- [BME 600: Graduate Professional Development](#)
- [BME 601: Biomedical Engineering Seminar](#)

Chemical Engineering

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- [Ch E 540: Coating Materials Process & Applications](#)
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- [Ch E 545: Colloid and Surface Science](#)
- [Ch E 547: Surfactant Science and Applications](#)
- [Ch E 550: Membrane Science and Engineering](#)
- [Ch E 560: Advanced Transport Phenomena I](#)
- [Ch E 561: Advanced Transport Phenomena II](#)
- [Ch E 593: Graduate Projects in Chemical Engr](#)
- [Ch E 660: Advanced Transport Phenomena I](#)
- [Ch E 661: Advanced Transport Phenomena II](#)
- [Engr 540: Environmental Organic Transport Phenomenon](#)
- [Engr 542: Molecular Modeling of Nano Materials](#)
- [Engr 544: Synth and Fab of Nano Materials](#)
- [Engr 545: Polymer Nanocomposites](#)

[Civil Engineering](#)

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- [C E 102: Introduction to Civil Engineering II](#)
- [C E 103: Introduction to Civil Engineering Lab](#)
- [C E 205: Civil Engineering Laboratory I](#)
- [C E 206: Introduction to Surveying](#)
- [C E 207: Surveying](#)

- [C E 208: Civil Engineering Graphics I](#)
- [C E 301: Environmental and Water Resources Lab](#)
- [C E 302: Mechanics Laboratory](#)
- [C E 303: Materials Laboratory](#)
- [C E 305: Civil Engineering Laboratory II](#)
- [C E 310: Introduction to Structural Mechanics](#)
- [C E 311: Structural Analysis](#)
- [C E 315: Civil Engineering Materials](#)
- [C E 325: Intermediate Dynamics](#)
- [C E 371: Intro to Environmental Engineering](#)
- [C E 401: Civil Engineering Fundamentals](#)
- [C E 402: Soil Mechanics Laboratory](#)
- [C E 405: Civil Engineering Laboratory III](#)
- [C E 412: Design of Concrete Structures](#)
- [C E 413: Steel Design](#)
- [C E 414: Advanced Concrete Design](#)
- [C E 417: Construction Engineering and Management](#)
- [C E 421: Matrix Analysis of Structures](#)
- [C E 431: Soil Mechanics I](#)
- [C E 433: Foundation Engineering](#)
- [C E 435: Advanced Geotechnical Engineering](#)
- [C E 452: Civil Engineering Analysis](#)
- [C E 454: Engineering Design I](#)
- [C E 455: Civil Engineering Design I](#)
- [C E 456: Civil Engineering Design II](#)
- [C E 471: Environmental Engineering I](#)
- [C E 472: Water Resources Engineering](#)
- [C E 481: Transportation Engineering I](#)
- [C E 495: Geospatial Analysis for Engr & Vis Apps](#)
- [C E 497: Civil Engineering Projects](#)
- [C E 500: Geographic Information Systems Engr Sci](#)
- [C E 511: Structural Dynamics](#)
- [C E 513: Advanced Steel Design](#)
- [C E 514: Pre-Stressed Concrete Design](#)
- [C E 516: Bridge Engineering](#)
- [C E 521: Advanced Mechanics of Materials](#)
- [C E 531: Soil Mechanics II](#)
- [C E 536: Designing with Geosynthetics](#)
- [C E 541: Flow in Open Channels](#)
- [C E 542: Flow in Porous Media](#)
- [C E 543: Sediment Transport](#)
- [C E 561: Civil Engineering Systems](#)
- [C E 570: Infrastructure Management](#)
- [C E 572: Stormwater Engineering and Management](#)
- [C E 574: Wastewater Engineering](#)
- [C E 575: Drinking Water Engineering](#)
- [C E 578: Agricultural Conservation for Eng & Sci](#)
- [C E 581: Transportation Engineering II](#)
- [C E 585: Highway Pavements](#)
- [C E 590: Airport Planning and Design](#)
- [Engr 541: Foundations of Nano Engineering and Sci](#)
- [Engr 547: Characterization MethodsforNanomaterials](#)

Computer & Information Science

- [CIS 111: Computer Science I](#)
- [CIS 112: Computer Science II](#)
- [CIS 113: Honors Computer Science I](#)
- [CIS 211: Computer Science III](#)

- [CIS 251: Programming for Engineering and Sciences](#)
- [CIS 256: Programming in Python](#)
- [CIS 333: Digital Design and 3D Printing](#)
- [CIS 356: Data Structures in Python](#)
- [CIS 427: Network Security](#)
- [CIS 447: Immersive Media](#)
- [Csci 103: Survey of Computing](#)
- [Csci 111: Computer Science I](#)
- [Csci 112: Computer Science II](#)
- [Csci 113: Honors Computer Science I](#)
- [Csci 191: Office Applications](#)
- [Csci 192: Computing Applications](#)
- [Csci 193: Personal Computer Systems](#)
- [Csci 203: Introduction to Computational Media](#)
- [Csci 211: Computer Science III](#)
- [Csci 223: Computer Org. & Assembly Language](#)
- [Csci 251: Programming for Engineering and Sciences](#)
- [Csci 256: Programming in Python](#)
- [Csci 259: Programming in C++](#)
- [Csci 300: Social Responsibility in Comp. Science](#)
- [Csci 305: Software for Global Use](#)
- [Csci 311: Models of Computation](#)
- [Csci 323: Systems of Programming](#)
- [Csci 325: Foundations of Computer Security](#)
- [Csci 333: Digital Design and 3D Printing](#)
- [Csci 343: Fundamentals of Data Science](#)
- [Csci 345: Information Storage and Retrieval](#)
- [Csci 353: Introduction to Numerical Methods](#)
- [Csci 354: Web Programming](#)
- [Csci 356: Data Structures in Python](#)
- [Csci 361: Introduction to Computer Networks](#)
- [Csci 387: Software Design and Development](#)
- [Csci 390: Special Topics in Programming](#)
- [Csci 391: Computer Graphics](#)
- [Csci 405: Computer Simulation](#)
- [Csci 423: Introduction to Operating Systems](#)
- [Csci 425: Code Generation and Optimization](#)
- [Csci 426: System Security](#)
- [Csci 427: Network Security](#)
- [Csci 431: Robotics Programming](#)
- [Csci 433: Algorithm and Data Structure Analysis](#)
- [Csci 443: Advanced Data Science](#)
- [Csci 444: Information Visualization](#)
- [Csci 447: Immersive Media](#)
- [Csci 450: Organization of Programming Languages](#)
- [Csci 458: Mobile Application Development](#)
- [Csci 475: Introduction to Database Systems](#)
- [Csci 487: Senior Project](#)
- [Csci 490: Special Topics](#)
- [Csci 491: Special Topics in Computer Security](#)
- [Csci 492: Special Topics in Data Science](#)
- [Csci 500: Fundamental Concepts in Computing](#)
- [Csci 501: Fundamental Concepts in Systems](#)
- [Csci 502: Fundamental Concepts in Algorithms](#)
- [Csci 503: Fundamental Concepts in Languages](#)
- [Csci 517: Natural Language Processing](#)
- [Csci 520: Formal Theory of Computer Languages](#)
- [Csci 521: Computer Systems Engineering](#)
- [Csci 523: Operating Systems](#)
- [Csci 524: Distributed Operating System Design](#)

- [Csci 525: Compiler Construction](#)
- [Csci 526: Parallel Computing](#)
- [Csci 530: Computer Architecture and Design](#)
- [Csci 531: Artificial Intelligence](#)
- [Csci 533: Analysis of Algorithms](#)
- [Csci 541: Expert Systems and Logic Programming](#)
- [Csci 543: Data Mining](#)
- [Csci 547: Digital Image Processing](#)
- [Csci 550: Program Semantics and Derivation](#)
- [Csci 551: Computer System Performance Analysis](#)
- [Csci 554: Web Architecture and Programming](#)
- [Csci 555: Functional Programming](#)
- [Csci 556: Multiparadigm Programming](#)
- [Csci 557: GPU Computing](#)
- [Csci 561: Computer Networks](#)
- [Csci 562: Software Engineering I](#)
- [Csci 575: Database Systems](#)
- [Csci 581: Special Topics in Computer Science I](#)
- [Csci 582: Special Topics in Computer Science II](#)
- [Csci 632: Machine Learning](#)
- [Csci 658: Software Language Engineering](#)
- [Csci 663: Software Families](#)
- [Csci 665: Wireless and Sensor Networks](#)

Electrical and Computer Engineering

- [Cp E 421: Embedded Systems Design](#)
- [Cp E 431: Computer Architecture](#)
- [Cp E 432: Testing of Computing Systems](#)
- [Cp E 461: Senior Design in Computer Engineering I](#)
- [Cp E 462: Senior Design in Computer Engineering II](#)
- [ECE 361: Design and Design Tools in ECE](#)
- [El E 100: Introduction to Electrical Engineering](#)
- [El E 235: Principles of Digital Systems](#)
- [El E 236: Digital Systems Laboratory I](#)
- [El E 237: Electrical Engineering Tools and Toys](#)
- [El E 322: Electric Circuit II](#)
- [El E 331: Signals and Systems](#)
- [El E 337: Digital Systems Laboratory II](#)
- [El E 340: Electrical Engineering Analysis I](#)
- [El E 341: Theory of Fields](#)
- [El E 351: Electronics Circuits I](#)
- [El E 352: Electronics Circuits II](#)
- [El E 353: Electronics Laboratory](#)
- [El E 357: Electrical Engineering Problems I](#)
- [El E 367: Computer-Aided Design in Electrical Engr](#)
- [El E 385: Advanced Digital Systems](#)
- [El E 386: Advanced Digital Systems Laboratory](#)
- [El E 391: Probability and Random Signals](#)
- [El E 415: Telecommunications Laboratory](#)
- [El E 425: Local Area Networks](#)
- [El E 431: Theory of Control Systems](#)
- [El E 432: Robotics Laboratory](#)
- [El E 433: High Frequency and Microwave Laboratory](#)
- [El E 441: Electromagnetic Theory I](#)
- [El E 442: Electromagnetic Theory II](#)
- [El E 443: Network Analysis and Synthesis](#)
- [El E 447: Modulation, Noise, and Communications](#)
- [El E 451: Electrical Energy Conversion](#)

- [El E 453: Solid State Devices](#)
- [El E 461: Sr. Design in Electrical Engineering I](#)
- [El E 462: Sr. Design in Electrical Engineering II](#)
- [El E 481: Fund. Low Power Dig. VLSI Design](#)
- [El E 482: Digital CMOS VLSI Design](#)
- [El E 485: Microprocessor Systems Engineering](#)
- [El E 486: Microprocessor Systems Engr Lab](#)
- [El E 487: Digital Signal Processing Laboratory](#)
- [El E 521: Electrical Engineering Projects I](#)
- [El E 522: Electrical Engineering Projects II](#)
- [El E 523: Microwave Engineering](#)
- [El E 525: Introduction to Antennas](#)
- [El E 533: Electronic Properties of Materials](#)
- [El E 534: Wireless Mobile Communications](#)
- [El E 535: Digital Communications](#)
- [El E 536: Introduction to Quantum Computing](#)
- [El E 561: Microwave Circuit Design](#)
- [El E 586: Digital Signal Processing](#)

Geology & Geological Engineering

- [G E 301: Geological Eng. Design Field Camp 1](#)
- [G E 305: Geomechanics](#)
- [G E 401: Geological Eng. Design Field Camp 2](#)
- [G E 405: Engineering Geophysics](#)
- [G E 413: Prob. & Stat. Analyses in Eng. Design](#)
- [G E 415: Petroleum Geology](#)
- [G E 420: Subsurface Site Characterization](#)
- [G E 421: Geological Engineering Design](#)
- [G E 430: Geological Field Studies I](#)
- [G E 436: Field Camp G E Design](#)
- [G E 450: Hydrogeology](#)
- [G E 470: Intro. to Geographic Information System](#)
- [G E 490: Directed Studies and Projects](#)
- [G E 503: Environmental Geochemistry](#)
- [G E 507: Regional Geological Engineering](#)
- [G E 510: Remote Sensing](#)
- [G E 511: Spatial Analysis](#)
- [G E 513: Economic Geology](#)
- [G E 525: Engineering Seismology](#)
- [G E 530: Advanced Geomechanics](#)
- [G E 540: Rock Mechanics](#)
- [G E 555: Introduction to Mining Engineering](#)
- [G E 577: Geophysics I](#)
- [G E 591: Special Topics](#)
- [G E 635: Advanced Rock Mechanics](#)
- [Geol 101: Physical Geology](#)
- [Geol 102: Historical Geology](#)
- [Geol 103: Earth Dynamics](#)
- [Geol 104: Environmental Geology - Hazards](#)
- [Geol 105: Environmental Geology - Resources](#)
- [Geol 106: Earth History](#)
- [Geol 107: Introduction to Oceanography](#)
- [Geol 111: Physical Geology Laboratory](#)
- [Geol 112: Historical Geology Laboratory](#)
- [Geol 114: Environmental Geology-Hazards Laboratory](#)
- [Geol 115: Environmental Geology - Resources Lab](#)
- [Geol 120: Dinosaurs](#)
- [Geol 203: Earth Dynamics Laboratory Content](#)

- [Geol 221: Mineralogy](#)
- [Geol 222: Elementary Petrology](#)
- [Geol 225: Mineralogy & Elementary Petrology](#)
- [Geol 303: Structural and Tectonic Geology](#)
- [Geol 305: Geomorphology](#)
- [Geol 309: Invertebrate Paleontology](#)
- [Geol 314: Sedimentology and Stratigraphy](#)
- [Geol 410: Coastal and Reef Dynamics](#)
- [Geol 420: Optical Mineralogy](#)
- [Geol 500: Intro. to Geographic Information Systems](#)
- [Geol 505: Hydrogeology](#)
- [Geol 517: Global Tectonics](#)
- [Geol 518: Quantitative Methods in Geo. & Geo Eng](#)
- [Geol 520: Advanced Igneous and Metamorphic Petrology](#)
- [Geol 530: Geology Field Studies](#)
- [Geol 535: Geochemistry](#)
- [Geol 610: Earth Science Projects](#)
- [Geol 614: Advanced Geographic Information Systems](#)
- [Geol 615: Geostatistics](#)
- [Geol 630: Coastal Plain Geology](#)
- [Geol 643: Advanced Geomorphology](#)
- [Geol 645: Advanced Sedimentation](#)
- [Geol 646: Advanced Stratigraphy](#)
- [Geol 647: Sedimentary Petrology](#)
- [Geol 648: Metamorphic Petrology](#)
- [Geol 649: Pedology](#)
- [Geol 690: Scientific Writing](#)
- [Geol 697: Thesis](#)

Mechanical Engineering

- [Engr 523: Engineering Thermal Management](#)
- [Engr 546: Micro/Nanoscale Fabrication](#)
- [Engr 554: Computational Heat Transfer](#)
- [M E 101: Introduction to Mechanical Engineering](#)
- [M E 201: Engineering Graphics Fundamentals](#)
- [M E 324: Introduction to Mechanical Design](#)
- [M E 325: Intermediate Dynamics](#)
- [M E 326: Machine Learning for Engineers](#)
- [M E 401: Thermo-fluid Dynamics](#)
- [M E 402: Elements of Propulsion](#)
- [M E 406: Alternative Energy Systems](#)
- [M E 416: Structures and Dynamics Laboratory](#)
- [M E 417: Projects](#)
- [M E 418: Projects](#)
- [M E 419: Energy and Fluids Laboratory](#)
- [M E 426: Kinematics: Analysis and Synthesis](#)
- [M E 428: Dynamics of Machinery](#)
- [M E 437: Mechanical Engineering Design I](#)
- [M E 438: Mechanical Engineering Design](#)
- [M E 521: Projects](#)
- [M E 522: Projects](#)
- [M E 523: Special Topics in Mechanical Engineering](#)
- [M E 524: Special Topics in Mechanical Engineering](#)
- [M E 525: Advanced Dynamics](#)
- [M E 527: Materials Processing](#)
- [M E 529: Aerodynamics](#)
- [M E 530: Physical Metallurgy](#)
- [M E 531: Mechanical Behavior of Engr Materials](#)

- [M E 533: Electronic Properties of Materials](#)
- [M E 534: Properties and Selection of Materials](#)
- [M E 535: Experimental Stress Analysis](#)
- [M E 537: Mechatronic Systems Engineering](#)
- [M E 541: Theory and Use of CAD and Solid Modeling](#)
- [M E 543: Linear Systems and Controls](#)

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Engr 307: Technical Communications

School of Engineering

Fundamentals of speech and oral presentation, business communications, technical reporting, and problem solution layout.

2 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 307

Subject Areas

- [Engineering, General](#)

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Manf 452: Manf Design-Product Realization, II

School of Engineering

Students will take a product from initial design, through design and process improvement, to final production and sales. The course will address aspects of project management/operation in a manufacturing business such as personnel, process development, scheduling, supply chain, quality control, etc.

2 Credits

Prerequisites

- [Manf 451: Manf Design-Product Realization](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Manf 452

Subject Areas

- [Mechanical Engineering](#)

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Manf 254: Continuous Flow/Layout

School of Engineering

Intensive training on a manufacturing factory floor. This course will introduce students to how to observe, grasp current condition, and document. This course will introduce continuous flow and layout with focus on human movement.

3 Credits

Prerequisites

- [Manf 150: Intro to Engineering / Manufacturing](#)
- Students must be enrolled Center of Manufacturing Excellence (CME)
- Manf 254 Requires: One Way-Co-Requisite Manf 251

Instruction Type(s)

- Lecture: Lecture for Manf 254

Subject Areas

- [Mechanical Engineering](#)

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School of Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Departments](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Distinguished Faculty and Staff Awards

Frederick A.P. Barnard Distinguished Professorships

Frederick A.P. Barnard Distinguished Professors are recognized for their excellence and innovation in teaching and research.

- **James G Vaughan** - DIRECTOR OF THE CENTER FOR MANUFACTURING EXCELLENCE AND FAP BARNARD DISTINGUISHED PROFESSOR OF MECHANICAL ENGINEERING (1998)
- **SAM SHU-YI WANG** - DIRECTOR EMERITUS, NATIONAL CENTER FOR COMPUTATIONAL HYDROSCIENCE AND ENGINEERING AND F.A.P.BARNARD DISTINGUISHED PROFESSOR EMERITUS OF MECHANICAL ENGINEERING (1988)

Distinguished Research and Creative Achievement Award

- **ATEF Z ELSHERBENI** - ASSOCIATE DEAN FOR RESEARCH & GRADUATE PROGRAMS, DIRECTOR OF MICRO SYSTEMS LABORATORY, DIRECTOR OF CAD LABORATORY AND PROFESSOR OF ELECTRICAL ENGINEERING (2012)
- **SAM SHU-YI WANG** - DIRECTOR EMERITUS, NATIONAL CENTER FOR COMPUTATIONAL HYDROSCIENCE AND ENGINEERING AND F.A.P.BARNARD DISTINGUISHED PROFESSOR EMERITUS OF MECHANICAL ENGINEERING (2008)

Staff Council Award - EEO3

- **Elizabeth D Stidham** - SPONSORED PROGRAMS ACCOUNTANT (2006)

Staff Council Award - EEO4

- **Sheree G Jones** - SENIOR SECRETARY (2011)

School of Engineering, Junior Faculty Research Award

- **Elizabeth Kaye Ervin** - ASSOCIATE PROFESSOR OF CIVIL ENGINEERING (2012)
- **Yixin Chen** - ASSOCIATE PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2011)
- **Ahmed Hajmohammad-Khalil Al-Ostaz** - PROFESSOR OF CIVIL ENGINEERING (2010)
- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (2009)
- **Fan Yang** - ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING (2008)
- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2007)
- **Mustafa Muhammad Matalgah** - ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING (2006)
- **GAREY A FOX** - ASSISTANT PROFESSOR OF CIVIL ENGINEERING (2005)
- **Robert M Holt** - ASSOCIATE PROFESSOR OF GEOLOGY AND GEOLOGICAL ENGINEERING (2004)
- **Alexander Borisovitch Yakovlev** - ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING (2003)
- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF

Outstanding Staff Award

A staff member of the School of Engineering who has demonstrated exemplary service, leadership, and commitment.

- **Jeffery Anthony Hubbard** - NETWORK ADMINISTRATOR (2012)
- **Carrie Dawn Long** - ADMINISTRATIVE SECRETARY (2011)
- **Aubrey D Bolen** - ADMINISTRATIVE COORDINATOR I (2010)
- **Bethany Ferguson LaValley** - Coordinator of Professional Development-CMSE (2010)
- **DOROTHY ANNE LLOYD** - SENIOR SECRETARY (2009)
- **MARTYE F HICKMAN** - SUPERVISOR, ELECTRICAL ENGINEERING SHOPS (2008)
- **BERNICE HEROD** - SENIOR ADMINISTRATIVE SECRETARY (2007)
- **GENE LAMAR WALKER** - Instrument Technician (2006)
- **Cathy A Grace** - LECTURER IN GEOLOGY AND GEOLOGICAL ENGINEERING (2005)
- **GARY W DENNING** - SENIOR ELECTRONICS TECHNICIAN (2004)
- **GENE LAMAR WALKER** - Instrument Technician (2003)
- **DORIS T VINSON** - SENIOR SECRETARY (2002)
- **R. B. PRIVETT** - ASSISTANT TO THE DEAN, SCHOOL OF ENGINEERING (2001)

School of Engineering, Senior Faculty Research Award

- **Ahmed Hajmohammad-Khalil Al-Ostaz** - PROFESSOR OF CIVIL ENGINEERING (2012)
- **ATEF Z ELSHERBENI** - ASSOCIATE DEAN FOR RESEARCH & GRADUATE PROGRAMS, DIRECTOR OF MICRO SYSTEMS LABORATORY, DIRECTOR OF CAD LABORATORY AND PROFESSOR OF ELECTRICAL ENGINEERING (2011)
- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2010)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2009)
- **Prabhakar R Mantena** - PROFESSOR OF MECHANICAL ENGINEERING (2008)
- **SAM SHU-YI WANG** - DIRECTOR EMERITUS, NATIONAL CENTER FOR COMPUTATIONAL HYDROSCIENCE AND ENGINEERING AND F.A.P.BARNARD DISTINGUISHED PROFESSOR EMERITUS OF MECHANICAL ENGINEERING (2007)
- **ATEF Z ELSHERBENI** - ASSOCIATE DEAN FOR RESEARCH & GRADUATE PROGRAMS, DIRECTOR OF MICRO SYSTEMS LABORATORY, DIRECTOR OF CAD LABORATORY AND PROFESSOR OF ELECTRICAL ENGINEERING (2006)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (2005)
- **AJIT SADANA** - PROFESSOR OF CHEMICAL ENGINEERING (2004)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2003)
- **SAM SHU-YI WANG** - DIRECTOR EMERITUS, NATIONAL CENTER FOR COMPUTATIONAL HYDROSCIENCE AND ENGINEERING AND F.A.P.BARNARD DISTINGUISHED PROFESSOR EMERITUS OF MECHANICAL ENGINEERING (2002)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (2001)

Faculty Achievement Award

The Faculty Achievement Award is given annually to recognize unusual effort in the classroom, involvement with students, and active scholarship.

- **John H O'Haver** - DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION AND PROFESSOR OF CHEMICAL ENGINEER (2011)
- **John H O'Haver** - DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION AND PROFESSOR OF CHEMICAL ENGINEER (2000)
- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (1999)
- **CHARLES E SMITH** - Professor Emeritus of Electrical Engineering (1993)
- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (1991)
- **James G Vaughan** - DIRECTOR OF THE CENTER FOR MANUFACTURING EXCELLENCE AND FAP BARNARD

DISTINGUISHED PROFESSOR OF MECHANICAL ENGINEERING (1989)

Frist Service Award

- **TERRY L PANHORST** - ASSISTANT PROFESSOR OF GEOLOGY AND GEOLOGICAL ENGINEERING (2002)
- **PAMELA B LAWHEAD** - Associate Professor Emerita of Computer and Information Science (1995)

Elsie M. Hood Outstanding Teacher Award

The Elsie M. Hood Outstanding Teacher of the Year for the University is selected from nominations submitted by students, alumni and faculty.

- **John H O'Haver** - DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION AND PROFESSOR OF CHEMICAL ENGINEER (2012)
- **James G Vaughan** - DIRECTOR OF THE CENTER FOR MANUFACTURING EXCELLENCE AND FAP BARNARD DISTINGUISHED PROFESSOR OF MECHANICAL ENGINEERING (1991)

SEC Faculty Achievement Awards Program UM Nominee

The SEC Faculty Achievement Awards program recognizes extraordinary faculty accomplishments at SEC universities. This award honors those with outstanding records in both teaching and scholarship who serve as role models for junior faculty and students.

- **John H O'Haver** - DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION AND PROFESSOR OF CHEMICAL ENGINEER (2012)

School of Engineering, Faculty Service Award

- **Richard K Gordon** - ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING (2012)
- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2011)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2010)
- **Elizabeth Kaye Ervin** - ASSOCIATE PROFESSOR OF CIVIL ENGINEERING (2009)
- **Dawn E Wilkins** - ACTING CHAIR & PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2008)
- **Prabhakar R Mantena** - PROFESSOR OF MECHANICAL ENGINEERING (2007)
- **Tyrus A McCarty** - ASSISTANT DEAN FOR SPECIAL INITIATIVES, SCHOOL OF ENGINEERING AND ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING (2006)
- **ATEF Z ELSHERBENI** - ASSOCIATE DEAN FOR RESEARCH & GRADUATE PROGRAMS, DIRECTOR OF MICRO SYSTEMS LABORATORY, DIRECTOR OF CAD LABORATORY AND PROFESSOR OF ELECTRICAL ENGINEERING (2005)
- **Alexander H D Cheng** - DEAN OF THE SCHOOL OF ENGINEERING AND PROFESSOR OF CIVIL ENGINEERING (2004)
- **PAMELA B LAWHEAD** - Associate Professor Emerita of Computer and Information Science (2003)
- **ALLEN W GLISSON** - Chair Emeritus and Professor Emeritus of Electrical Engineering (2002)
- **Waheed Uddin** - PROFESSOR OF CIVIL ENGINEERING AND DIRECTOR OF THE CENTER FOR ADVANCED INFRASTRUCTURE TECHNOLOGY (2001)

School of Engineering, Faculty Teaching Award

- **Dawn E Wilkins** - ACTING CHAIR & PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2012)
- **A M Rajendran** - CHAIR AND PROFESSOR OF MECHANICAL ENGINEERING (2011)
- **Cristiane Januzzi Queiroz Surbeck** - ASSISTANT PROFESSOR OF CIVIL ENGINEERING (2010)
- **Chung Rak Song** - ASSOCIATE PROFESSOR OF CIVIL ENGINEERING (2009)
- **Peter C Sukanek** - PROFESSOR OF CHEMICAL ENGINEERING (2008)
- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (2007)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2006)

- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (2004)

School of Engineering Outstanding Teacher of the Year

- **Yixin Chen** - ASSOCIATE PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2012)
- **Chung Rak Song** - ASSOCIATE PROFESSOR OF CIVIL ENGINEERING (2011)
- **John H O'Haver** - DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION AND PROFESSOR OF CHEMICAL ENGINEER (2010)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (2009)
- **James G Vaughan** - DIRECTOR OF THE CENTER FOR MANUFACTURING EXCELLENCE AND FAP BARNARD DISTINGUISHED PROFESSOR OF MECHANICAL ENGINEERING (2008)
- **Alexander H D Cheng** - DEAN OF THE SCHOOL OF ENGINEERING AND PROFESSOR OF CIVIL ENGINEERING (2007)
- **Ahmed Hajmohammad-Khalil Al-Ostaz** - PROFESSOR OF CIVIL ENGINEERING (2006)
- **Paul Scovazzo** - ASSOCIATE PROFESSOR OF CHEMICAL ENGINEERING (2005)
- **ALLEN W GLISSON** - Chair Emeritus and Professor Emeritus of Electrical Engineering (2004)
- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (2003)
- **ATEF Z ELSHERBENI** - ASSOCIATE DEAN FOR RESEARCH & GRADUATE PROGRAMS, DIRECTOR OF MICRO SYSTEMS LABORATORY, DIRECTOR OF CAD LABORATORY AND PROFESSOR OF ELECTRICAL ENGINEERING (2002)
- **John H O'Haver** - DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION AND PROFESSOR OF CHEMICAL ENGINEER (2001)
- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (1999)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (1998)
- **SAM SHU-YI WANG** - DIRECTOR EMERITUS, NATIONAL CENTER FOR COMPUTATIONAL HYDROSCIENCE AND ENGINEERING AND F.A.P.BARNARD DISTINGUISHED PROFESSOR EMERITUS OF MECHANICAL ENGINEERING (1985)
- **SAM SHU-YI WANG** - DIRECTOR EMERITUS, NATIONAL CENTER FOR COMPUTATIONAL HYDROSCIENCE AND ENGINEERING AND F.A.P.BARNARD DISTINGUISHED PROFESSOR EMERITUS OF MECHANICAL ENGINEERING (1977)

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Engr 297: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 297

Subject Areas

- [Engineering Science](#)
- [Engineering, General](#)

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Manf 460: Introduction to Project Management

School of Engineering

This course introduces the field of project management and familiarizes students with management concepts/processes/terminology they will encounter in their careers in manufacturing. Topics covered will include the 10 knowledge areas commonly identified in PM, problem analysis and correction, understanding cost/schedule relationship, and ethics.

3 Credits

Prerequisites

- Junior Standing Required

Instruction Type(s)

- Lecture: Lecture for Manf 460

Subject Areas

- [Project Management](#)

Related Areas

- [Business Administration and Management, General](#)
- [Business/Managerial Operations, Other](#)
- [Logistics, Materials, and Supply Chain Management](#)
- [Operations Management and Supervision](#)

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Engs 501: Geospatial Primer

School of Engineering

This is a course in analysis of spatial measurement systems. Emphasis is placed upon analysis of measurement systems required to produce geodetic reference frameworks (e.g., baseline networks) and map products (e.g., orthophotos, feature databases, and surface models).

1 Credit

Instruction Type(s)

- Indep Study: Independent Study for Engs 501

Subject Areas

- [Engineering Technologies and Engineering-Related Fields, Other](#)

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School of Engineering

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Minors

[School of Engineering](#)

- [Minor - Engineering](#)
- [Minor - Manufacturing](#)

[Computer & Information Science](#)

- [Minor - Computer Science](#)
- [Minor - Data Science](#)

[Electrical and Computer Engineering](#)

- [Minor - Electrical Engineering](#)

[Geology & Geological Engineering](#)

- [Minor - Geology](#)

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Engr 629: Televisions Systems II

School of Engineering

Current practice and future development in TV, especially High Definition TV. Techniques of scanning, resolution, waveform design, and modulation, as well as regulatory aspects of television will be covered. Prospects of commercialization of HDTV will be discussed.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 629

Subject Areas

- [Laser and Optical Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Telecommunications Engineering](#)

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Engr 711: Turbulence

School of Engineering

Introduction to probability theory; stochastic processes and statistical continuum theory; kinematics and dynamics of homogeneous turbulence; isotropic turbulence; turbulent shear flows.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 711

Subject Areas

- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 102: Principles of Engineering

School of Engineering

The purpose of this course is to provide students with an introduction to the problem-solving methods required to create realistic solutions to everyday technical problems.

3 Credits

Prerequisites

- Pre-requisite: ACT Math 25 (SAT 580 or SATR 590)
- Enrollment limited to students having earned fewer than 45 credit hours.

Instruction Type(s)

- Lecture: Lecture for Engr 102

Subject Areas

- [Engineering, General](#)

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Manf 455: Lean III: Practical Problem Solving

School of Engineering

Experiential learning of problem solving and process improvement methodologies.

3 Credits

Prerequisites

- [Manf 351: Manufacturing Product/Process Design](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Manf 455

Subject Areas

- [Mechanical Engineering](#)

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Engs 675: Microwave Data

School of Engineering

In this course the student is introduced to the basic concepts, theory and applications of microwave remote sensing. The course begins with an explanation of why microwave remote sensing is utilized. Its advantages over visible and infrared remote sensing are described and typical applications are presented. Passive microwave remote sensing is then described beginning with the theory of natural microwave emissions from the Earth's surface and atmosphere. Some of the more widely used sensors are discussed, and many remote sensing applications are presented. The remainder of the course focuses on the other type of microwave remote sensing, active or radar remote sensing. The fundamental principles of radar and the concepts and vocabulary necessary to understand a radar image are presented. The most commonly used type of imaging radar, the Synthetic Aperture Radar (SAR), is described in detail from the principles of operation, interpretation of images, current SAR sensors, to science applications. A recent application of SAR that can measure topography and surface displacement at fine spatial resolution, Interferometric Synthetic Aperture Radar (InSAR), is presented in the following section. The last section is dedicated to the combination and integration, fusion, of microwave remote sensing.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 675
- Indiv Based: Online Program for Engs 675

Subject Areas

- [Engineering, Other](#)

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Engr 410: Engineering Analysis II

School of Engineering

Review of vector algebra; functions of several variables; multiple integrals; line integrals, and vector integral calculus; complex numbers, limits, analytical functions, and derivatives; line integrals; Cauchy's theorem and formula; Taylor and Laurent series; residue theory.

4 Credits

Prerequisites

- [Math 264: Unified Calculus & Analytic Geometry IV](#)
- [Math 353: Elementary Differential Equations](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Engr 410

Subject Areas

- [Engineering, General](#)

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Engr 579: Geophysics II

School of Engineering

Seismic and electrical theory and methods of subsurface investigation.

3 Credits

Cross-listed Courses

- [G E 579: Geophysics II](#)

Instruction Type(s)

- Lecture: Lecture for Engr 579

Subject Areas

- [Engineering, General](#)
- [Geological/Geophysical Engineering](#)

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Engr 314: Materials Science Laboratory

School of Engineering

Laboratory investigation of crystal structure, defects, and diffraction theory; solidification of solids; microstructurally controlled physical and mechanical properties.

1 Credit

Prerequisites

- Engr 314 Requires: One Way-Co-Requisite Engr 313
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Lab for Engr 314

Subject Areas

- [Engineering, General](#)

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Engr 677: Plates and Shells

School of Engineering

Classical plate history; variational methods; thick plates; large deflections; membrane theory of shells.

3 Credits

Prerequisites

- [Engr 671: Elasticity](#)

Instruction Type(s)

- Lecture: Lecture for Engr 677

Subject Areas

- [Engineering, General](#)
- [Structural Engineering](#)
- [Civil Engineering, General](#)

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Engr 617: Continuum Mechanics

School of Engineering

Continuum hypothesis, forces and stress fields, displacement and strain fields, governing field laws, applications to fluid, solid and magnetofluid mechanics, electrodynamics, electro- and thermoviscoelasticity.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 617

Subject Areas

- [Engineering, General](#)
- [Engineering Mechanics](#)
- [Civil Engineering, General](#)

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Engs 613: Introduction to Remote Sensing Systems

School of Engineering

This course is an introduction to electro-optical, microwave, and lidar remote sensing systems. Introduction to Remote Sensing Systems is focused on understanding the basic principles, characteristics, and applications of electro-optical, microwave (radar), and lidar remote sensing systems. Included is treatment of: airborne multispectral, thermal, and hyperspectral sensing; earth resource satellites operating in the optical portion of the spectrum (including moderate resolution systems, high resolution systems, and the Earth Observing System); airborne and satellite radar systems, image characteristics, and basic interferometric radar principles; lidar system operation and sample applications.

1 Credit

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indep Study: Independent Study for Engs 613
- Indep Study: Online Program for Engs 613

Subject Areas

- [Engineering, Other](#)

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Engr 719: Advanced Microwave Measurements

School of Engineering

Modern microwave measurement techniques for passive and active microwave circuits, materials scatters and antennas.

3 Credits

Prerequisites

- [Engr 721: Advanced Electrodynamics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 719

Subject Areas

- [Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Engr 603: Fluid Mechanics I

School of Engineering

Equations of motion, potential and stream function; complex variable application, conformal transformation; flow-past cylinders, Schwartz-Christofel transform, vortex motion.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Engr 603

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Engr 558: Vibration Analysis

School of Engineering

This course is intended to establish a systematic treatment of problems in the vibration of linear systems. Topics covered include systems with multiple degrees of freedom, properties of vibrating systems, vibration of continuous systems, and approximate numerical methods for finding natural frequencies.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Engr 558

Subject Areas

- [Engineering, General](#)
- [Mechanical Engineering](#)

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Manf 350: Standardized Work/Takt Time

School of Engineering

Intensive training on a manufacturing factory floor. This course will help students to improve how to observe, grasp current condition, and document. This course will introduce standardized work and takt time with focus on human movement.

3 Credits

Prerequisites

- [Manf 254: Continuous Flow/Layout](#)
- Students must be enrolled Center of Manufacturing Excellence (CME)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Manf 350

Subject Areas

- [Mechanical Engineering](#)

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Engr 397: Special Topics in Engineering Science

School of Engineering

Special Topics Course taught by Engineering Faculty or Staff Member.

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Instructor Approval Required

Instruction Type(s)

- Lecture: Lecture for Engr 397
- Lecture: Web-based Lecture for Engr 397

Subject Areas

- [Engineering, General](#)

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Manf 353: Accounting & Financial Mgmt for Manf

School of Engineering

This course explores accounting and financial management concepts important to a manufacturing setting. The course is designed to help students become more sophisticated users of strategic cost/managerial and financial accounting information for decision making. The course demonstrates how accounting information adds value to manufacturing organizations by providing recommendations to improve profitability of products, services, and customers. The course also focuses on measuring causes or drivers of costs, and making managerial recommendations about design, capacity, quality, and processes.

3 Credits

Prerequisites

- [Manf 150: Intro to Engineering / Manufacturing](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Manf 353

Subject Areas

- [Engineering/Industrial Management](#)

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Engs 684: Agricultural Applications Remote Sensing

School of Engineering

This course discusses the application of remote sensing to agricultural production and the supporting technologies that provide for an information-based decision-making process. With the help of this new technology, some producers have adopted precision agriculture and changed field size into smaller, more precise management zones. This course covers the role of remote sensing in crop production, along with the methods it helps create to manage and conserve the natural resources of vegetation, soil, and water. While specific examples of agricultural applications are identified in various types of production, the actual use of precision agriculture technologies is only limited by the imagination of the enduser. What works in one setting for monitoring on a local basis may be utilized in a different manner for inventorying crop production on a regional or global basis. It is under varying conditions of spatial, spectral, radiometric, and temporal resolutions that new technologies are being used. Examples illustrate possibilities for use and adoption by others. These new technologies are being used under varying spatial, spectral, radiometric and temporal resolutions. Throughout the course, examples will illustrate the current uses of these tools and other areas in which they could be adopted.

3 Credits

Prerequisites

- Student must be admitted to Certificate in Geographic Info Systems program.

Instruction Type(s)

- Indiv Based: Individual Based for Engs 684
- Indiv Based: Online Program for Engs 684

Subject Areas

- [Engineering, Other](#)

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Engr 554: Computational Heat Transfer

Mechanical Engineering

Analytical and computational solution methods on various conduction and convection heat transfer problems, including 1D steady and transient conduction heat transfer with and without heat generation, external forced convection heat transfer over a plane surface, laminar and turbulent internal convection heat transfer, natural convection over a rotating cylinder, convection heat transfer from a bank of tube arrays.

3 Credits

Prerequisites

- [Engr 321: Thermodynamics](#)
- [Engr 323: Fluid Mechanics](#)

Instruction Type(s)

- Lecture: Lecture for Engr 554

Subject Areas

- [Mechanical Engineering](#)

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M E 201: Engineering Graphics Fundamentals

Mechanical Engineering

Introduction to 2-D and 3-D computer-aided design and drafting in mechanical engineering using CAD software. Topics include geometric constructions, multiview sketching, drawing constraints, dimensioning, drafting.

2 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for M E 201
- Lecture/Lab: Web-based Lecture/Lab for M E 201

Course Fee(s)

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Mechanical Engineering](#)

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M E 541: Theory and Use of CAD and Solid Modeling

Mechanical Engineering

This course will introduce students to the theory and utilization of modern CAD/CAM/CAE systems. Students will learn techniques and methods of solid modeling, will apply these tools to the design process, and will develop the ability to utilize solid models for communication, analysis, and manufacturing.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for M E 541

Subject Areas

- [Mechanical Engineering](#)

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M E 326: Machine Learning for Engineers

Mechanical Engineering

This course covers an introduction to python programming followed by an overview of machine-learning tools used for real-world applications. The course also teaches how to implement machine-learning tools for a wide range of engineering data sets.

4 Credits

Prerequisites

- Junior Standing Required

Instruction Type(s)

- Lecture: Lecture for M E 326

Subject Areas

- [Mechanical Engineering](#)

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M E 534: Properties and Selection of Materials

Mechanical Engineering

Fundamental relationships that govern the properties of materials will be examined and used to optimize the selection of engineering materials. Materials covered will include metals, plastics, ceramics, and composites.

3 Credits

Instruction Type(s)

- Lecture: Lecture for M E 534

Subject Areas

- [Mechanical Engineering](#)
- [Materials Science](#)

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M E 521: Projects

Mechanical Engineering

Approved investigation of problem under direction of a staff member.

3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for M E 521

Subject Areas

- [Mechanical Engineering](#)

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M E 529: Aerodynamics

Mechanical Engineering

Application of fluid mechanics concepts to describe the flow field and to calculate lift and drag forces as well as moments around wings and bodies at both subsonic and supersonic speeds. This is accomplished via the following methods: application of ideal flows and superposition to aerodynamic situations; introduction to conformal mapping, thin-wing and slender body theories; application of linearized potential flow for compressible flow in both subsonic and supersonic aircraft; shock-expansion theory.

3 Credits

Prerequisites

- [Engr 323: Fluid Mechanics](#)

One-way corequisites

- [M E 401: Thermo-fluid Dynamics](#)

Instruction Type(s)

- Lecture: Lecture for M E 529

Subject Areas

- [Mechanical Engineering](#)

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Engr 523: Engineering Thermal Management

Mechanical Engineering

Review of thermodynamics and fluid mechanics, steady-state conduction and convection heat transfer, transient conduction heat transfer - lumped capacitance and semi-infinite methods, boiling and condensation heat transfer, fin and heat sink analysis and optimization, heat pipe and heat exchanger analyses, and advanced thermal management techniques.

3 Credits

Prerequisites

- Prerequisite: Engr 321 and Engr 323 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Engr 523

Subject Areas

- [Mechanical Engineering](#)

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Mechanical Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)

Undergraduate Studies

Academic Regulations

Students admitted to the university and the School of Engineering in accordance with stated admission policies may then declare their chosen degree program.

See the degree requirements under Programs.

Graduate Studies

M.S. and Ph.D. entrance requirements are those of the Graduate School. M.S. applicants are expected to possess or be in the process of completing an undergraduate degree in engineering or closely related field from an accredited institution. In general, Ph.D. applicants are expected to possess or be in the process of completing a master's degree. In certain cases, applicants completing an undergraduate degree in engineering or closely related field from an accredited institution may be considered.

See the degree requirements under Programs.

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M E 324: Introduction to Mechanical Design

Mechanical Engineering

The design process and methodology, analysis, synthesis, application of fundamentals to specific machine components, feasibility including economic and human factors, social significance, creativity, communication, ethics, and professionalism. (2 lecture, 1 practicum hour).

3 Credits

Prerequisites

- [Engr 312: Mechanics of Materials](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for M E 324

Subject Areas

- [Mechanical Engineering](#)

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M E 401: Thermo-fluid Dynamics

Mechanical Engineering

The conservation equations and laws of thermodynamics are used in formulating and solving problems in compressible gas dynamics, reacting flows, boundary layers, heat transfer, and plasma dynamics.

3 Credits

Prerequisites

- [Engr 321: Thermodynamics](#)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Engr 323: Fluid Mechanics](#)

Instruction Type(s)

- Lecture: Lecture for M E 401

Subject Areas

- [Engineering Physics/Applied Physics](#)
- [Aerospace, Aeronautical and Astronautical/Space Engineering](#)

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M E 531: Mechanical Behavior of Engr Materials

Mechanical Engineering

The dislocation concept of plastic deformation is introduced and used to explain the relationships between microstructure and mechanical properties. The phenomena of strain hardening, creep, fatigue, and fracture are discussed in detail.

3 Credits

Prerequisites

- Pre-requisite: Engr 313 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for M E 531

Subject Areas

- [Mechanical Engineering](#)
- [Materials Science](#)

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Mechanical Engineering

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Faculty in Mechanical Engineering

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- [C](#)
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- [P](#)
- [R](#)
- [S](#)
- [T](#)
- [W](#)
- [Y](#)

[Jump to Emeritus faculty](#)

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[Jump to index](#)

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Emeritus Faculty

- [L](#)
- [M](#)
- [R](#)
- [S](#)
- [Y](#)

[Jump to current faculty](#)

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M E 325: Intermediate Dynamics

Mechanical Engineering

Continuation of Engr 309. Rigid body dynamics, vibrations, Lagrangian formulations; application to mechanical engineering problems.

3 Credits

Prerequisites

- [Engr 309: Statics](#)
- Pre-Requisite: 24 Earned Hours

Cross-listed Courses

- [C E 325: Intermediate Dynamics](#)

Instruction Type(s)

- Lecture: Lecture for M E 325
- Lecture: Web-based Lecture for M E 325

Subject Areas

- [Physics, General](#)
- [Engineering, General](#)

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M E 418: Projects

Mechanical Engineering

Approved investigation of original problem under direction of a staff member.

1 - 3 Credits

Prerequisites

- M E 418 Requires: One Way-Co-Req Engr 309 and Engr 321
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Indiv Based: Individual Based Study for M E 418

Subject Areas

- [Mechanical Engineering](#)

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M E 530: Physical Metallurgy

Mechanical Engineering

Application of chemical and microstructural control for understanding material behavior. Topics include a survey of relevant areas of thermodynamics and kinetics, phase diagrams, diffusions, solidifications, solid state transformations, recovery, recrystallization, and grain growth.

3 Credits

Prerequisites

- Pre-requisite: Engr 313 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for M E 530

Subject Areas

- [Mechanical Engineering](#)
- [Metallurgical Engineering](#)
- [Materials Science](#)

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M E 525: Advanced Dynamics

Mechanical Engineering

Rigid body dynamics, vibrations, LaGrangian and Hamiltonian formulations; application to mechanical engineering problems.

3 Credits

Prerequisites

- Pre-requisite: M E 325 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for M E 525

Subject Areas

- [Mechanical Engineering](#)
- [Engineering, General](#)
- [Engineering Mechanics](#)

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M E 426: Kinematics: Analysis and Synthesis

Mechanical Engineering

Introduction to the kinematic design of mechanisms, such as linkages, cams, gears and gear trains. Motion of such mechanisms; analysis of their velocities and accelerations by graphical, analytical, and computer-aided design methods of synthesis and optimization.

3 Credits

Prerequisites

- [M E 324: Introduction to Mechanical Design](#)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Engr 330: Engineering Systems Analysis and Design](#)

Instruction Type(s)

- Lecture: Lecture for M E 426

Subject Areas

- [Mechanical Engineering](#)

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M E 527: Materials Processing

Mechanical Engineering

Metal processing, including casting, forging, press operation machining; plastic fabrication, including casting, molding, press forming; tool and die designs; coatings.

3 Credits

Prerequisites

- Pre-req: Engr 313 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for M E 527

Subject Areas

- [Mechanical Engineering](#)
- [Manufacturing Engineering](#)
- [Materials Science](#)

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Mechanical Engineering

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Leadership

- Arunachalam Raj Rajendran - Chair and Distinguished Professor of Mechanical Engineering

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Overview

The Department of Mechanical Engineering offers the Bachelor of Science in Mechanical Engineering (B.S.M.E.) degree. Mechanical engineering is a fundamental discipline that emphasizes problem solving related to mechanical, materials, fluid, thermal, and environmental systems. An emphasis in manufacturing is also available under the B.S.M.E. degree in cooperation with the Center for Manufacturing Excellence.

At the graduate level, the department has offerings for the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in engineering science with an emphasis in mechanical engineering. The latter graduate degrees are listed under the School of Engineering.

Accreditation

The following undergraduate engineering programs are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, and Bachelor of Science in Mechanical Engineering. The Bachelor of Science in Computer Science (BSCS) program of the Department of Computer and Information Science is accredited as a Computer Science program by the Computing Accreditation Commission (CAC) of ABET, <https://www.abet.org>.

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Engr 546: Micro/Nanoscale Fabrication

Mechanical Engineering

Introductory course on the physical theory, design, analysis, fabrication, and characterization of micro/nanoscale fabrication and manufacturing.

3 Credits

Prerequisites

- Senior standing required.

Instruction Type(s)

- Lecture: Lecture for Engr 546

Subject Areas

- [Manufacturing Engineering](#)
- [Materials Engineering](#)
- [Mechanical Engineering](#)

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M E 402: Elements of Propulsion

Mechanical Engineering

An application of the principles of gas dynamics and physical laws to the analysis, performance estimation, and design of air-breathing propulsion devices including the ramjet, turbojet, turbofan, and turboprop engines.

3 Credits

Prerequisites

- [M E 401: Thermo-fluid Dynamics](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for M E 402

Subject Areas

- [Engineering Physics/Applied Physics](#)
- [Aerospace, Aeronautical and Astronautical/Space Engineering](#)

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M E 406: Alternative Energy Systems

Mechanical Engineering

This course does a qualitative and quantitative survey of various alternate energy methods for power generation. It contains first-order analysis of some of the systems such as alternatives to harness wind power through wind turbines, solar-based systems - active and passive solar, flat-plate solar collectors, photovoltaic systems, biofuels, and energy from organic waste such as biomass, landfills and municipal solid waste, geothermal systems, and hydro-power. A project based on a renewable energy system is part of this course.

3 Credits

Prerequisites

- [Engr 321: Thermodynamics](#)
- [Engr 323: Fluid Mechanics](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for M E 406

Subject Areas

- [Mechanical Engineering](#)

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Degrees Offered

- [B.S.M.E. in Mechanical Engineering](#)
 - [Emphasis - Manufacturing](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr.](#)
 - [Emphasis - Mechanical Engineering](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr.](#)
 - [Emphasis - Mechanical Engineering](#)

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M E 535: Experimental Stress Analysis

Mechanical Engineering

The theories of experimental stress analysis techniques are examined in detail with special emphasis on the application of strain measurement methods, brittle coatings, transmission, and reflection photoelasticity.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for M E 535

Subject Areas

- [Mechanical Engineering](#)
- [Engineering Mechanics](#)

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M E 543: Linear Systems and Controls

Mechanical Engineering

Investigating how to model, analyze, and control linear dynamical systems such as a robotic arm or an inverted pendulum. Topics include state-space systems, dynamical systems, matrix exponential, eigenvalue tests, Lyapunov functions, controllability and observability.

3 Credits

Prerequisites

- Pre-requisite: Engr 330 or El E 351 or El E 431 or Graduate Standing.
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for M E 543

Subject Areas

- [Mechanical Engineering](#)

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M E 537: Mechatronic Systems Engineering

Mechanical Engineering

Concepts, elements, and practice for integrating hardware and software to create intelligent mechatronic systems.

3 Credits

Prerequisites

- Pre-requisite: Engr 330 or El E 351 or El E 431 or Graduate Standing.

Instruction Type(s)

- Lecture: Lecture for M E 537

Subject Areas

- [Mechanical Engineering](#)

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M E 523: Special Topics in Mechanical Engineering

Mechanical Engineering

Supervised reading of specialized topics beyond those available in existing courses.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for M E 523

Subject Areas

- [Mechanical Engineering](#)

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M E 438: Mechanical Engineering Design

Mechanical Engineering

Design projects involving the fabrication and testing of a prototype; and/or selection of new design projects addressing realistic constraints such as safety, cost, reliability, aesthetics, ergonomics, ethics, and social impact.

3 Credits

Prerequisites

- M E 438 Requires: One Way-Co-Requisite M E 428
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for M E 438

Subject Areas

- [Mechanical Engineering](#)

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M E 533: Electronic Properties of Materials

Mechanical Engineering

Theories of electron/atom interactions and electron transport are examined to explain the electronic properties of solids. Junctions, magnetic and optical properties are also discussed with special emphasis on semiconducting materials.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Cross-listed Courses

- [EIE 533: Electronic Properties of Materials](#)

Subject Areas

- [Mechanical Engineering](#)
- [Electrical and Electronics Engineering](#)
- [Materials Science](#)

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M E 522: Projects

Mechanical Engineering

Approved investigation of problem under direction of a staff member.

3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for M E 522

Subject Areas

- [Mechanical Engineering](#)

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M E 428: Dynamics of Machinery

Mechanical Engineering

Force analysis of machinery; engine dynamics and flywheel design; balancing of rotors and reciprocating masses; single and multicylinder engine design; shafts and cam dynamics.

3 Credits

Prerequisites

- [M E 426: Kinematics: Analysis and Synthesis](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for M E 428

Subject Areas

- [Mechanical Engineering](#)

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M E 437: Mechanical Engineering Design I

Mechanical Engineering

This is a practical design project based course that acts as a precursor to M E 438. As a team, students are to initiate engagement with an appropriate organization/industry and identify a suitable engineering problem that needs a design solution and broadly meets the capstone parameters.

Z grade.

2 Credits

One-way corequisites

- [M E 426: Kinematics: Analysis and Synthesis](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for M E 437

Subject Areas

- [Mechanical Engineering](#)

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Mechanical Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)

Courses

- [Engr 312: Mechanics of Materials](#)
- [Engr 313: Introduction to Materials Science](#)
- [Engr 314: Materials Science Laboratory](#)
- [Engr 323: Fluid Mechanics](#)
- [Engr 330: Engineering Systems Analysis and Design](#)
- [Engr 420: Engineering Analysis III](#)
- [Engr 553: Heat Transfer](#)
- [Engr 559: Elements of Robotics](#)
- [Engr 523: Engineering Thermal Management](#)
- [Engr 546: Micro/Nanoscale Fabrication](#)
- [Engr 554: Computational Heat Transfer](#)
- [M E 101: Introduction to Mechanical Engineering](#)
- [M E 201: Engineering Graphics Fundamentals](#)
- [M E 324: Introduction to Mechanical Design](#)
- [M E 325: Intermediate Dynamics](#)
- [M E 326: Machine Learning for Engineers](#)
- [M E 401: Thermo-fluid Dynamics](#)
- [M E 402: Elements of Propulsion](#)
- [M E 406: Alternative Energy Systems](#)
- [M E 416: Structures and Dynamics Laboratory](#)
- [M E 417: Projects](#)
- [M E 418: Projects](#)
- [M E 419: Energy and Fluids Laboratory](#)
- [M E 426: Kinematics: Analysis and Synthesis](#)
- [M E 428: Dynamics of Machinery](#)
- [M E 437: Mechanical Engineering Design I](#)
- [M E 438: Mechanical Engineering Design](#)
- [M E 521: Projects](#)
- [M E 522: Projects](#)
- [M E 523: Special Topics in Mechanical Engineering](#)
- [M E 524: Special Topics in Mechanical Engineering](#)
- [M E 525: Advanced Dynamics](#)
- [M E 527: Materials Processing](#)
- [M E 529: Aerodynamics](#)
- [M E 530: Physical Metallurgy](#)
- [M E 531: Mechanical Behavior of Engr Materials](#)
- [M E 533: Electronic Properties of Materials](#)
- [M E 534: Properties and Selection of Materials](#)
- [M E 535: Experimental Stress Analysis](#)
- [M E 537: Mechatronic Systems Engineering](#)
- [M E 541: Theory and Use of CAD and Solid Modeling](#)
- [M E 543: Linear Systems and Controls](#)

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properly its educational responsibility.

M E 417: Projects

Mechanical Engineering

Approved investigation of original problem under direction of a staff member.

1 - 3 Credits

Prerequisites

- M E 417 Requires: One Way-Co-Req Engr 309 and Engr 321
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Indiv Based: Individual Based Study for M E 417

Subject Areas

- [Mechanical Engineering](#)

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Mechanical Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Distinguished Faculty and Staff Awards

School of Engineering, Junior Faculty Research Award

- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (2009)

School of Engineering, Senior Faculty Research Award

- **Prabhakar R Mantena** - PROFESSOR OF MECHANICAL ENGINEERING (2008)

Faculty Achievement Award

The Faculty Achievement Award is given annually to recognize unusual effort in the classroom, involvement with students, and active scholarship.

- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (1999)
- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (1991)

School of Engineering, Faculty Service Award

- **Prabhakar R Mantena** - PROFESSOR OF MECHANICAL ENGINEERING (2007)
- **Tyrus A McCarty** - ASSISTANT DEAN FOR SPECIAL INITIATIVES IN THE SCHOOL OF ENGINEERING AND ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING (2006)

School of Engineering, Faculty Teaching Award

- **Erik Curtis Hurlen** - INSTRUCTOR IN MECHANICAL ENGINEERING (2016)
- **A M Rajendran** - CHAIR AND PROFESSOR OF MECHANICAL ENGINEERING (2011)
- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (2007)
- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (2004)

School of Engineering Outstanding Teacher of the Year

- **A M Rajendran** - CHAIR AND PROFESSOR OF MECHANICAL ENGINEERING (2016)
- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (2015)
- **Ellen Lackey** - PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR OF COMPOSITE MATERIALS RESEARCH GROUP TEST FACILITIES (2003)
- **Jeffrey A Roux** - PROFESSOR OF MECHANICAL ENGINEERING (1999)

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M E 419: Energy and Fluids Laboratory

Mechanical Engineering

Laboratory experiments demonstrating fundamental laws and use of scientific instruments in thermodynamics, heat transfer, and fluid flow.

1 Credit

Prerequisites

- [Engr 321: Thermodynamics](#)
- [Engr 323: Fluid Mechanics](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Laboratory for M E 419

Subject Areas

- [Mechanical Engineering](#)

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M E 101: Introduction to Mechanical Engineering

Mechanical Engineering

Introduction to mechanical engineering professional focus areas including structural, material, fluids, thermal, and manufacturing, hands on experiments in mechanical engineering laboratories, as well as lectures on leadership and industry related engineering topics.

1 Credit

Instruction Type(s)

- Lecture: Lecture for M E 101

Subject Areas

- [Mechanical Engineering](#)

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M E 524: Special Topics in Mechanical Engineering

Mechanical Engineering

Supervised reading of specialized topics beyond those available in existing courses.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for M E 524

Subject Areas

- [Mechanical Engineering](#)

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M E 416: Structures and Dynamics Laboratory

Mechanical Engineering

Introduction to the basic and latest instrumentation related to static and dynamic measurements and methods of collecting and analyzing experimental data; experiments chosen to reinforce basic static and dynamic theories.

1 Credit

Prerequisites

- [Engr 312: Mechanics of Materials](#)
- [M E 325: Intermediate Dynamics](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Laboratory for M E 416

Subject Areas

- [Mechanical Engineering](#)

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Emphasis - Aeroacoustics

- [M.S. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Aeroacoustics

Description

A degree of M.S. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

For the emphasis in aeroacoustics, thesis and nonthesis options are available. Both options require as a minimum 30 semester hours of graduate credit (to include 6 hours of math-related courses) in which the student's adviser must approve all course selections. Under the thesis option, the minimum of 30 graduate credits shall consist of 24 hours of graded course work and 6 thesis hours. The nonthesis option requires as a minimum 30 hours of graded course work.

Other Academic Requirements

For both the thesis and nonthesis options, a candidate must pass a final oral examination.

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Emphasis - Mechanical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Mechanical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Mechanical Engineering

Description

A M.S. in engineering science with emphasis in mechanical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in mechanical engineering can be completed as a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work plus 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work. A third, nonthesis option includes 30 hours of approved course work and a comprehensive oral exam.

Other Academic Requirements

For each option, a candidate must pass a final oral examination.

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Emphasis - Hydrology & Comp Hydroscience

- [M.S. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Hydrology & Comp Hydroscience

Description

An M.S. in engineering science with an emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. It covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the M.S. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete 24 credit hours of coursework (plus at least 6 thesis hours). Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I|
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment

- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation
- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Materials Science and Engr.

- [M.S. in Engineering Science](#)
- [Emphasis - Materials Science and Engr.](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Materials Science and Engr.

Description

A M.S. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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B.S.M.E. in Mechanical Engineering

- [Overview](#)
- [Degree Requirements](#)

Description

The B.S.M.E. provides students with fundamentals in the field and a specialization in the following disciplines: mechanics, thermodynamics, fluid mechanics, materials, design, and laboratory diagnostics. The preparation fosters an inquisitiveness and understanding that will preclude future obsolescence of the mechanical engineering graduate.

Minimum Total Credit Hours: 128

Goals/Mission Statement

The program educational objectives of the Department of Mechanical Engineering derive their foundation from the statement of purpose for The University of Mississippi's statement of purpose and vision statement. The academic mission of the Department of Mechanical Engineering (ME) is focused on broad, overarching goals that reflect both the academic purpose of the School of Engineering and the university. The stated university goals have been used to refine the goals and objectives of the department. The goals and objectives have been established from input by the faculty, students, and the Ole Miss Engineering School Advisory Board as constituency groups. These goals and objectives are listed as follows.

- Educate students in the broad scope of the mechanical engineering discipline so as to be successful in applying and advancing knowledge in industry, academia, and related fields;
- Conduct basic and applied research in fields related to mechanical engineering to maintain and enhance the quality and reputation of the faculty and the School of Engineering;
- Serve industry, the engineering community, and the community at large in the State of Mississippi, the nation, and the world;
- Teach students the influence of issues related to health, safety, economy, environment, and society while seeking engineering solutions.

Program Educational Objectives

This process and these goals have resulted in the development of the Department of Mechanical Engineering curriculum consisting of lecture, design, and laboratory courses that stress the departmental goals. The mechanical engineering faculty, advisory board, and students, as constituency groups, have established the following undergraduate program educational objectives:

1. Graduates will meet or exceed the expectations of employers of mechanical engineers;
2. Qualified graduates will continue their professional development by pursuing advanced study if they so desire;
3. Graduates will continue their professional development by pursuing leadership positions in their profession and/or communities.

Student Outcomes

Students of the Bachelor of Science in Mechanical Engineering program will demonstrate achievement of the following student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment

- to draw conclusions
- 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts, 3 hours in humanities, languages (modern, Greek, or Latin), or fine arts, 6 hours in social science (including Econ 310), and the remaining 3 hours can be in any of the humanities, languages (modern, Greek, or Latin), fine arts, social science, or general education courses as specified by the School of Engineering.

Course Requirements

Specific requirements for the B.S.M.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102 or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116; Phys 211, 212, 221, 222; Csci 251; Econ 310; Engr 309, 310 or Math 375, 312, 313, 314, 321, 323, 330, 360, 361, 420, 553; M E 101, 201, 324, 325, 401, 402, 416, 419, 426, 428, 438.

One technical elective must be chosen from Thermal/Fluid Elective including M E 406, 529 or Engr 551.

A second technical elective must be chosen from Design Elective (includes 1 hour of design): M E 406, 417, 418, 422, 523, 524, 526, 527, 531, 534, 535, 538, 540, 541, 555 or Engr 559.

A third technical elective must be chosen from any of the Thermal/Fluid Elective courses, Design Elective courses or Other Electives including M E 417, 418, 421, 521, 522, 523, 524, 529, 530, 532, 533, 537, 543, Engr 410, 515, 523, 546, 554, 558, 559, 585, 590, 593.

Specializations

- [Emphasis - Manufacturing](#)

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Emphasis - Manufacturing

- [B.S.M.E. in Mechanical Engineering](#)
- [Emphasis - Manufacturing](#)
- [Degree Requirements](#)

B.S.M.E. in Mechanical Engineering

Description

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Minimum Total Credit Hours: 128

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- Serve industry, the engineering community, and the community at large in the State of Mississippi, the nation, and the world;
- Teach students the influence of issues related to health, safety, economy, environment, and society while seeking engineering solutions.

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2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments,

- which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts, 3 hours in humanities, languages (modern, Greek, or Latin), or fine arts, 6 hours in social science (including Econ 310), and the remaining 3 hours can be in any of the humanities, languages (modern, Greek, or Latin), fine arts, social science, or general education courses as specified by the School of Engineering.

Course Requirements

Specific requirements for the B.S.M.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102 or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116; Phys 211, 212, 221, 222; Csci 251; Econ 310; Engr 309, 310 or Math 375, 312, 313, 314, 321, 323, 330, 360, 361, 420, 553; M E 101, 201, 324, 325, 401, 402, 416, 419, 426, 428, 438.

One technical elective must be chosen from Thermal/Fluid Elective including M E 406, 529 or Engr 551.

A second technical elective must be chosen from Design Elective (includes 1 hour of design): M E 406, 417, 418, 422, 523, 524, 526, 527, 531, 534, 535, 538, 540, 541, 555 or Engr 559.

A third technical elective must be chosen from any of the Thermal/Fluid Elective courses, Design Elective courses or Other Electives including M E 417, 418, 421, 521, 522, 523, 524, 529, 530, 532, 533, 537, 543, Engr 410, 515, 523, 546, 554, 558, 559, 585, 590, 593.

Emphasis - Manufacturing

Description

The B.S.M.E. provides students with fundamentals in the field and a specialization in the following disciplines: mechanics, materials, thermodynamics, fluid mechanics, design, and laboratory diagnostics. The preparation fosters an inquisitiveness and understanding that will preclude future obsolescence of the mechanical engineering graduate. An emphasis in manufacturing is also available under the B.S.M.E. degree in cooperation with the Center for Manufacturing Excellence. The B.S.M.E. with emphasis in manufacturing provides broad training in the basic and engineering sciences along with a cross-disciplinary account and business focus on manufacturing.

General Education Requirements

In addition to the courses specified by the School of Engineering general education requirements, the following are required: Math 263- 264 and Math 353; laboratory science to be fulfilled by Chem 105, 115 and Phys 211, 212, 221, 222. The required 18 hours of humanities/behavioral and social science/fine arts are as specified by the School of Engineering general education requirements but must include Bus 250 and Econ 310.

Course Requirements

Specific requirements for the B.S.M.E. with an emphasis in manufacturing include Csci 251; Engr 309, 310 or Math 375, 312, 313, 314, 321, 323, 330, 360, 420, 553; M E 201, 324, 325, 401, 416, 419, 426, 428, 438; Manf 150, 152, 251, 252, 253, 255, 351, 353, 355, 455. Two electives are required and may be chosen from the following courses: M E 402, 406, 417, 418, 421, 422, 521, 522, 523, 524, 526, 527, 529, 530, 531, 532, 533, 534, 535, 537, 538, 540, 541, 543, 555; Engr 410, 496, 515, 558, 559, 585, 590, 593; Fin 331; Mgmt 371, 372, 383, 466, 476; Bus 322; Mktg 351; GB 350, 370; or Manf 460, 465, 470.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.M.E. in Mechanical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Complete Econ 310 with a passing grade.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

General Education (non-emphasis)

Requirement	Hours	Description
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
3 add'l hrs social science	3	Complete 3 additional hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.

Requirement	Hours	Description
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Major Requirements

Requirement	Hours	Description
ME 201	2	Complete ME 201 with a passing grade.
ME 324	3	Complete ME 324 with a passing grade.
ME 325	3	Complete ME 325 with a passing grade.
ME 401	3	Complete ME 401 with a passing grade.
ME 416	1	Complete ME 416 with a passing grade.
ME 419	1	Complete ME 419 with a passing grade.
ME 426	3	Complete ME 426 with a passing grade.
ME 428	3	Complete ME 428 with a passing grade.
ME 438	3	Complete ME 438 with a passing grade.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Csci 251	3	Complete Csci 251 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310 or Math 375	3	Complete Engr 310 or Math 375 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 330	3	Complete Engr 330 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 420	3	Complete Engr 420 with a passing grade.
Engr 553	3	Complete Engr 553 with passing grade

Non-specialization Requirements

Requirement	Hours	Description
Engr 361	1	Complete Engr 361 with a passing grade.
ME 101	1	Complete ME 101 with a passing grade.
ME 402	3	Complete ME 402 with a passing grade.
Thermal/Fluid tech elective	3	Complete either ME 406 , ME 529 , or Engr 551 with a passing grade.
Design tech elective	3	Complete one of the following electives with a passing grade: ME 406 , ME 417 , ME 418 , ME 422 , ME 523 , ME 524 , ME 526 , ME 527 , ME 531 , ME 534 , ME 535 , ME 538 , ME 540 , ME 541 , ME 555 or Engr 559 .
Tech elective	3	Choose a third technical elective from any of the Thermal/Fluid Elective courses, Design Elective courses or Other Electives including ME 417 , 418 , 421 , 521 , 522 , 523 , 524 , 529 , 530 , 532 , 533 , 537 , 543 , Engr 410 , 515 , 523 , 546 , 554 , 558 , 559 , 585 , 590 , 593 .

Emphasis - Manufacturing

Requirement Hours		Description
Bus 250	3	Complete Bus 250 with a passing grade.
Manf 150	1	Complete Manf 150 with a passing grade.
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.
Manf 351	1	Complete Manf 351 with a passing grade.
Manf 353	3	Complete Manf 353 with a passing grade.
Manf 355	1	Complete Manf 355 with a passing grade.
Manf 455	3	Complete Manf 455 with a passing grade.
2 Manf Technical electives	6	Choose two electives from the following courses: M E 402 , 406 , 417 , 418 , 421 , 422 , 521 , 522 , 523 , 524 , 526 , 527 , 529 , 530 , 531 , 532 , 533 , 534 , 535 , 537 , 538 , 540 , 541 , 543 , 555 ; Engr 410 , 496 , 515 , 558 , 559 , 585 , 590 , 593 ; Fin 331 ; Mgmt 371 , 372 , 383 , 466 , 476 ; Bus 322 ; Mktg 351 ; GB 350 , 370 ; or Manf 460 , 465 , 470

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B.S.M.E. in Mechanical Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.M.E. in Mechanical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Complete Econ 310 with a passing grade.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

General Education (non-emphasis)

Requirement	Hours	Description
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
3 add'l hrs social science	3	Complete 3 additional hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Major Requirements

Requirement	Hours	Description
ME 201	2	Complete ME 201 with a passing grade.
ME 324	3	Complete ME 324 with a passing grade.
ME 325	3	Complete ME 325 with a passing grade.
ME 401	3	Complete ME 401 with a passing grade.
ME 416	1	Complete ME 416 with a passing grade.
ME 419	1	Complete ME 419 with a passing grade.
ME 426	3	Complete ME 426 with a passing grade.
ME 428	3	Complete ME 428 with a passing grade.
ME 438	3	Complete ME 438 with a passing grade.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Csci 251	3	Complete Csci 251 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310 or Math 375	3	Complete Engr 310 or Math 375 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 330	3	Complete Engr 330 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 420	3	Complete Engr 420 with a passing grade.
Engr 553	3	Complete Engr 553 with passing grade

Non-specialization Requirements

Requirement	Hours	Description
Engr 361	1	Complete Engr 361 with a passing grade.
ME 101	1	Complete ME 101 with a passing grade.
ME 402	3	Complete ME 402 with a passing grade.
Thermal/Fluid tech elective	3	Complete either ME 406 , ME 529 , or Engr 551 with a passing grade.

Requirement Hours	Description
Design tech elective 3	Complete one of the following electives with a passing grade: ME 406 , ME 417 , ME 418 , ME 422 , ME 523 , ME 524 , ME 526 , ME 527 , ME 531 , ME 534 , ME 535 , ME 538 , ME 540 , ME 541 , ME 555 or Engr 559 .
Tech elective 3	Choose a third technical elective from any of the Thermal/Fluid Elective courses, Design Elective courses or Other Electives including ME 417 , 418 , 421 , 521 , 522 , 523 , 524 , 529 , 530 , 532 , 533 , 537 , 543 , Engr 410 , 515 , 523 , 546 , 554 , 558 , 559 , 585 , 590 , 593 .

Emphasis - Manufacturing

Requirement Hours	Description
Bus 250 3	Complete Bus 250 with a passing grade.
Manf 150 1	Complete Manf 150 with a passing grade.
Manf 152 1	Complete Manf 152 with a passing grade.
Manf 251 3	Complete Manf 251 with a passing grade.
Manf 252 1	Complete Manf 252 with a passing grade.
Manf 253 3	Complete Manf 253 with a passing grade.
Manf 255 1	Complete Manf 255 with a passing grade.
Manf 351 1	Complete Manf 351 with a passing grade.
Manf 353 3	Complete Manf 353 with a passing grade.
Manf 355 1	Complete Manf 355 with a passing grade.
Manf 455 3	Complete Manf 455 with a passing grade.
2 Manf Technical electives 6	Choose two electives from the following courses: ME 402 , 406 , 417 , 418 , 421 , 422 , 521 , 522 , 523 , 524 , 526 , 527 , 529 , 530 , 531 , 532 , 533 , 534 , 535 , 537 , 538 , 540 , 541 , 543 , 555 ; Engr 410 , 496 , 515 , 558 , 559 , 585 , 590 , 593 ; Fin 331 ; Mgmt 371 , 372 , 383 , 466 , 476 ; Bus 322 ; Mktg 351 ; GB 350 , 370 ; or Manf 460 , 465 , 470

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Emphasis - Materials Science and Engr.

- [Ph.D. in Engineering Science](#)
- [Emphasis - Materials Science and Engr.](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Materials Science and Engr.

Description

A Ph.D. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.

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Emphasis - Aeroacoustics

- [Ph.D. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Aeroacoustics

Description

A Ph.D. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics.

Course Requirements

The Ph.D. with emphasis in aeroacoustics requires a minimum 66 semester hours of graduate credit beyond the baccalaureate degree. The student's adviser must approve all course selections.

Other Academic Requirements

At the adviser's discretion, a preliminary examination may be required at or near the beginning of the student's work beyond the master's degree. A comprehensive written examination must be passed before entering the dissertation process.

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Emphasis - Hydrology & Comp Hydroscience

- [Ph.D. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Hydrology & Comp Hydroscience

Description

A Ph.D. in engineering science with emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. This degree covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the Ph.D. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete a minimum of 36 hours beyond the B.S. degree and 18 hours of dissertation credit. Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment
- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation

- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

Other academic requirements include passing written and oral comprehensive exams including dissertation prospectus and dissertation defense. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Mechanical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Mechanical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Mechanical Engineering

Description

A Ph.D. in engineering science with emphasis in mechanical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as civil engineering and physics.

Course Requirements

The Ph.D. with an emphasis in mechanical engineering requires 30 semester hours of course work as specified by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Comprehensive exams must be passed before entering the dissertation process.

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Csci 427: Network Security

Computer & Information Science

This course explores the concepts and methods of computer security with an emphasis on network security and the appropriate tools to identify and remedy vulnerabilities across leading network platforms. It emphasizes both offensive and defensive analysis tools, including scanners, sniffers, intrusion detection systems, and firewalls.

3 Credits

Prerequisites

- [Csci 325: Foundations of Computer Security](#) (Minimum grade: C-)
- [Csci 361: Introduction to Computer Networks](#) (Minimum grade: C-)
- Engineering students only.
- Pre-Requisite: 24 Earned Hours

Cross-listed Courses

- [CIS 427: Network Security](#)

Instruction Type(s)

- Lecture: Lecture for Csci 427

Subject Areas

- [Computer Science](#)

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Csci 520: Formal Theory of Computer Languages

Computer & Information Science

A detailed study of mathematical models of regular and context-free languages, nondeterministic and deterministic models; closure properties, design algorithms, simplification of grammars.

3 Credits

Prerequisites

- Pre-requisite: CSCI 311 or CSCI 500 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 520

Subject Areas

- [Computer Science](#)

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Csci 556: Multiparadigm Programming

Computer & Information Science

Principles and practices of software design and programming using languages that feature explicit and convenient support for multiple programming paradigms (e.g., imperative, object-oriented, and functional).

3 Credits

Prerequisites

- Prerequisite: (Csci 211 or CIS 211) and Csci 223 or graduate standing

Instruction Type(s)

- Lecture: Lecture for Csci 556

Subject Areas

- [Computer Science](#)

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Csci 557: GPU Computing

Computer & Information Science

This course examines the use of GPU for general-purpose high performance parallel computing. It covers the key principles, practices, and hardware/software architectures for design of general-purpose, parallel programs using GPUs. The course surveys and analyzes real-world applications that benefit from GPUs, and involves hands-on programming as well as performance profiling and analysis. The fundamentals of concurrent programming and its challenges at algorithm and coding levels are also discussed.

3 Credits

Prerequisites

- Pre-requisite (Csci 211 and Csci 223) OR (EI E 385 and Csci 356) OR Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 557

Subject Areas

- [Computer Science](#)

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Csci 433: Algorithm and Data Structure Analysis

Computer & Information Science

Study of the design and analysis of algorithms and data structures. The topics include analysis techniques, sorting, searching, advanced data structures, graphs, string matching, and NP-completeness.

3 Credits

Prerequisites

- [Math 301: Discrete Mathematics](#)
- Prerequisite: Csci 211 (minimum grade C-) OR CIS 211 (minimum grade C-) OR Csci 356 (minimum grade C-).
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Csci 433

Subject Areas

- [Computer Science](#)

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Csci 521: Computer Systems Engineering

Computer & Information Science

Analysis of computer system components and manufacturing economics, and how they influence design goals, direct architectural development, create hardware/software issues and modify implementation concepts, as well as system and circuit packaging.

3 Credits

Prerequisites

- Pre-requisite: CSCI 423 or CSCI 501 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 521

Subject Areas

- [Computer Science](#)

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Csci 663: Software Families

Computer & Information Science

Study of concepts, methods, patterns, and tools for the analysis, design, and implementation of software families (e.g., software frameworks and software product lines) and other reusable, generic, and flexible programming artifacts.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Csci 663

Subject Areas

- [Computer Science](#)

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Csci 550: Program Semantics and Derivation

Computer & Information Science

A study of formal methods for the specification, derivation, and verification of computer programs. Predicate logic; notations for specification of programs; programming language semantics; calculational techniques for derivation of programs; case studies.

3 Credits

Prerequisites

- Prerequisite: Csci 211 OR CIS 211 or graduate standing.
- Prerequisite: Math 301 or graduate standing

Instruction Type(s)

- Lecture: Lecture for Csci 550

Subject Areas

- [Computer Science](#)

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Csci 475: Introduction to Database Systems

Computer & Information Science

This course introduces database systems covering basic concepts and best practices. Topics include data models (e.g., relational, object-oriented, NoSQL), normalization, SQL, security and privacy, current trends in data management, and web-to-database application programming.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 or CIS 211 or Csci 343 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 475

Subject Areas

- [Computer Science](#)

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CIS 112: Computer Science II

Computer & Information Science

Continuation of Csci 111 with emphasis on computer programming as a systematic discipline. The topics include data structures, abstract data types, algorithm design and analysis, and programming methods and standards.

3 Credits

Prerequisites

- Prerequisite: Csci 111 or CIS 111 or Csci 113 or CIS 113 (Minimum grade C-).

Cross-listed Courses

- [Csci 112: Computer Science II](#)

Course Fee(s)

Computer Science 5

- \$75.00

Subject Areas

- [Computer Science](#)

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Csci 503: Fundamental Concepts in Languages

Computer & Information Science

An intensive study of the fundamental concepts of programming languages and the associated software system structures.

3 Credits

Prerequisites

- Graduate Program Level Only

Instruction Type(s)

- Lecture: Lecture for Csci 503
- Lecture: Web-based Lecture for Csci 503

Subject Areas

- [Computer Science](#)

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Csci 256: Programming in Python

Computer & Information Science

Problem solving, algorithm development, and programming techniques, including applications from a range of disciplines.

3 Credits

Prerequisites

- Prerequisite: Minimum ACT mathematics score of 22; or minimum SAT mathematics score of 540; or Math 121 or above; or ALEKS PPL score of 61.

Cross-listed Courses

- [CIS 256: Programming in Python](#)

Instruction Type(s)

- Lecture: Lecture for Csci 256
- Lecture: Web-based Lecture for Csci 256

Subject Areas

- [Computer Science](#)

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Csci 333: Digital Design and 3D Printing

Computer & Information Science

This course introduces the principles and methods for computer-aided design of objects that can be rendered effectively on 3D printers. It surveys the design techniques and the hardware and software technologies in 3D printing workflows. Students create designs and render them on 3D printers.

3 Credits

Prerequisites

- Prerequisite: Csci 211 or CIS 211 or Csci 251 or CIS 251 or Csci 256.
- Pre-Requisite: Engineering Majors Only

Cross-listed Courses

- [CIS 333: Digital Design and 3D Printing](#)

Instruction Type(s)

- Lecture: Lecture for Csci 333

Subject Areas

- [Computer Science](#)

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Csci 423: Introduction to Operating Systems

Computer & Information Science

Study of the basic concepts of operating systems, including user interfaces, process management, state saving, interprocess communication, input/output, device drivers, timing services, memory management, file management, and system abstractions.

3 Credits

Prerequisites

- Prerequisite: Csci 211 (minimum grade C-) OR CIS 211 (minimum grade C-) OR Csci 356 (minimum grade C-).
- Pre-Requisite: 24 Earned Hours
- Prerequisite Csci 223 C- OR EI E 385 C-

Instruction Type(s)

- Lecture: Lecture for Csci 423

Subject Areas

- [Computer Science](#)

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CIS 256: Programming in Python

Computer & Information Science

Problem solving, algorithm development, and programming techniques, including applications from a range of disciplines.

3 Credits

Prerequisites

- Prerequisite: Minimum ACT mathematics score of 22; or minimum SAT mathematics score of 540; or Math 121 or above; or ALEKS PPL score of 61.

Cross-listed Courses

- [Csci 256: Programming in Python](#)

Subject Areas

- [Computer Science](#)

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Csci 426: System Security

Computer & Information Science

This course covers the fundamentals of computer security with an emphasis on computer systems security. Areas covered include operating system security mechanisms, access control models, and other relevant topics.

3 Credits

Prerequisites

- [Csci 325: Foundations of Computer Security](#) (Minimum grade: C-)
- [Csci 423: Introduction to Operating Systems](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Csci 426

Subject Areas

- [Computer Science](#)

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Csci 323: Systems of Programming

Computer & Information Science

Study of a contemporary operating system and its set of tools from the perspective of software professionals and system administrators. The course analyzes the system components and their interactions, the tool environment, and system administration issues such as configuration, installation, networking, security, and performance tuning.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 112 or CIS 112 (Minimum grade: C-); or Csci 113 or CIS 113 (Minimum grade: B-)

Instruction Type(s)

- Lecture: Lecture for Csci 323

Subject Areas

- [Computer Science](#)

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CIS 211: Computer Science III

Computer & Information Science

Continuation of Csci 112 with emphasis on advanced data structures, algorithm design analysis, advanced programming techniques, and user interfaces.

3 Credits

Prerequisites

- Prerequisite: Csci 112 (minimum C-) or CIS 112 (minimum C-) or Csci 113 (minimum B-) or CIS 113 (minimum B-)

Cross-listed Courses

- [Csci 211: Computer Science III](#)

Course Fee(s)

Computer Science 5

- \$75.00

Subject Areas

- [Computer Science](#)

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CIS 111: Computer Science I

Computer & Information Science

Introduction to computer science with emphasis on problem solving and algorithm development. Using high-level, block-structured programming language, students design, implement, debug, test, and document computer programs for various applications.

3 Credits

Prerequisites

- Pre-requisite: Minimum ACT mathematics score of 22; or minimum SAT mathematics score of 540; or Math 121 or above; or ALEKS PPL score of 61
- Pre-requisite: Non-engineering Majors Only

Cross-listed Courses

- [Csci 111: Computer Science I](#)

Course Fee(s)

Computer Science 5

- \$75.00

Subject Areas

- [Computer Science](#)

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Csci 490: Special Topics

Computer & Information Science

Study of topics in computer science according to the interests of the instructor and students. May be repeated for credit when the topic varies.

3 Credits

Prerequisites

- [Csci 223: Computer Org. & Assembly Language](#)
- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 OR CIS 211

Instruction Type(s)

- Indiv Based: Individual Based Study for Csci 490
- Indiv Based: Web based Indiv Based Study for Csci 490

Subject Areas

- [Computer Science](#)

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Minor - Data Science

- [Minor - Data Science](#)

Minor - Data Science

Description

A minor in data science will provide students with practical knowledge of methods and techniques used for data collection, storage, and analysis. Students will gain essential programming skills to support a wide range of data science applications.

Course Requirements

A minor in data science consists of Csci 256, 343, 443, 475 and six additional hours selected from Csci 345, 356, 444, 492, 517, and 543.

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Csci 562: Software Engineering I

Computer & Information Science

Software engineering paradigms, requirement analysis and specification, design of reliable software; data flow, data structure, and object-oriented design methodologies.

3 Credits

Prerequisites

- Pre-requisite: CSCI 387 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 562
- Lecture: Compressed Video for Csci 562

Subject Areas

- [Computer Science](#)

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Csci 487: Senior Project

Computer & Information Science

Each student conducts an in-depth study of a current problem in computer science or related area. Upon completion, the student presents the results in both oral and written form.

3 Credits

Prerequisites

- Pre-requisite: 6 Hours of CSCI 300 or above (C- minimum grade)

Instruction Type(s)

- Lecture: Lecture for Csci 487

Subject Areas

- [Computer Science](#)

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CIS 427: Network Security

Computer & Information Science

This course explores the concepts and methods of computer security with an emphasis on network security and the appropriate tools to identify and remedy vulnerabilities across leading network platforms. It emphasizes both offensive and defensive analysis tools, including scanners, sniffers, intrusion detection systems, and firewalls.

3 Credits

Prerequisites

- [Csci 325: Foundations of Computer Security](#) (Minimum grade: C-)
- [Csci 361: Introduction to Computer Networks](#) (Minimum grade: C-)
- Pre-requisite: 24 or more earned hours.

Cross-listed Courses

- [Csci 427: Network Security](#)

Course Fee(s)

Computer Science 4

- \$100.00

Subject Areas

- [Computer Science](#)

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Computer & Information Science

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)

Undergraduate Studies

Academic Regulations

CSci 111 is the typical first computer science course for those studying in the B.S.C.S. program, the B.A. computer science major, the computer science minor, the computer engineering emphasis in electrical engineering, and the management information systems program in the School of Business Administration. Typical first courses for other students would include CSci 103, 191, and 251.

Students admitted to the university in accordance with stated admission policies may then declare their chosen degree program.

See the degree requirements under Programs.

Graduate Studies

M.S. and Ph.D. entrance requirements are those of the Graduate School. M.S. applicants are expected to possess or be in the process of completing an undergraduate degree in engineering or closely related field from an accredited institution. In general, Ph.D. applicants are expected to possess or be in the process of completing a master's degree. In certain cases, applicants completing an undergraduate degree in engineering or closely related field from an accredited institution may be considered.

See the degree requirements under Programs.

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Csci 211: Computer Science III

Computer & Information Science

Continuation of Csci 112 with emphasis on advanced data structures, algorithm design analysis, advanced programming techniques, and user interfaces.

3 Credits

Prerequisites

- Engineering students only.
- Prerequisite: Csci 112 (minimum C-) or CIS 112 (minimum C-) or Csci 113 (minimum B-) or CIS 113 (minimum B-)

Cross-listed Courses

- [CIS 211: Computer Science III](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Csci 211

Subject Areas

- [Computer Science](#)

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Csci 502: Fundamental Concepts in Algorithms

Computer & Information Science

An intensive study of the fundamental concepts of algorithms and data structures and the associated programming techniques.

3 Credits

Prerequisites

- Graduate Program Level Only

Instruction Type(s)

- Lecture: Lecture for Csci 502

Subject Areas

- [Computer Science](#)

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Csci 575: Database Systems

Computer & Information Science

Review of database systems with special emphasis on data description and manipulation languages; data normalization; functional dependencies; database design; data integrity and security; distributed data processing; design and implementation of a comprehensive project.

3 Credits

Prerequisites

- Pre-requisite: CSCI 423 or CSCI 475 or CSCI 501 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 575

Subject Areas

- [Computer Science](#)

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Csci 543: Data Mining

Computer & Information Science

This course focuses on techniques for analyzing large datasets to identify patterns of information and organize them for use in decision making. The topics include exploratory data analysis, classification, clustering, text mining, web mining, recommender systems, and neural networks as well as advanced topics covering the applications of data mining in cross-cutting domains.

3 Credits

Prerequisites

- Prerequisite: Csci 211 or CIS 211 or Csci 343 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 543

Subject Areas

- [Computer Science](#)

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Csci 444: Information Visualization

Computer & Information Science

This course introduces the principles and methods for data and information visualization. It emphasizes the evaluation of alternative visualizations and the design of presentations that enable people to understand and analyze the information effectively. It addresses a variety of data types, such as quantitative, categorical, topological, geospatial, temporal, and unstructured data, and practical tools for rendering the visualizations.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 or CIS 211 or Csci 343 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 444

Subject Areas

- [Computer Science](#)

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Csci 447: Immersive Media

Computer & Information Science

This course explores the applications, methods, and technologies for the realization of immersive virtual environments. Students will develop virtual reality applications, immersive virtual worlds, and interactive media. Topics include virtual reality, augmented reality, 3D content authoring, motion tracking, and current trends in immersive media.

3 Credits

Prerequisites

- Engineering students only.
- Pre-Requisite: 24 Earned Hours
- Pre-requisite Csci 211 or CIS 211 or Csci 343

Cross-listed Courses

- [CIS 447: Immersive Media](#)

Instruction Type(s)

- Lecture: Lecture for Csci 447

Subject Areas

- [Computer Science](#)

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CIS 356: Data Structures in Python

Computer & Information Science

This course will introduce data structures and their application using the Python programming language. Abstract data types for stack, queue, various lists, trees and graphs will be studied. Built-in data structures such as lists, dictionaries, and tuples will be used extensively.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Pre-requisite Csci 256 (C-) OR Csci 112 OR CIS 112 (C-) OR Csci 113 OR CIS 113 B-.

Cross-listed Courses

- [Csci 356: Data Structures in Python](#)

Subject Areas

- [Computer Science](#)

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CIS 333: Digital Design and 3D Printing

Computer & Information Science

This course introduces the principles and methods for computer-aided design of objects that can be rendered effectively on 3D printers. It surveys the design techniques and the hardware and software technologies in 3D printing workflows. Students create designs and render them on 3D printers.

3 Credits

Prerequisites

- Prerequisite: Csci 211 or CIS 211 or Csci 251 or CIS 251 or Csci 256.
- Pre-requisite: Non-engineering Majors Only

Cross-listed Courses

- [Csci 333: Digital Design and 3D Printing](#)

Course Fee(s)

Computer Science

- \$50.00

Subject Areas

- [Computer Science](#)

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Csci 390: Special Topics in Programming

Computer & Information Science

Study of topics in programming according to the interests of the instructor and students. May be repeated for credit when the topic varies.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 OR CIS 211 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 390

Subject Areas

- [Computer Science](#)

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Csci 300: Social Responsibility in Comp. Science

Computer & Information Science

Study of the nature of and need for social responsibility and ethical behavior in computing and the computer professions.

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 OR CIS 211 OR Csci 223.

Instruction Type(s)

- Lecture: Lecture for Csci 300

Subject Areas

- [Computer Science](#)
- [Computer and Information Sciences, General](#)

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CIS 251: Programming for Engineering and Sciences

Computer & Information Science

Algorithm development and structured programming techniques; numerical and graphical applications related to engineering and scientific problem solving. Co-requisite for this course may also be satisfied by consent of instructor.

3 Credits

One-way corequisites

- [Math 261: Unified Calculus & Analytic Geometry I](#)

Cross-listed Courses

- [Csci 251: Programming for Engineering and Sciences](#)

Course Fee(s)

Computer Science 5

- \$75.00

Subject Areas

- [Computer Science](#)

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Csci 387: Software Design and Development

Computer & Information Science

Study of techniques for the construction of large, complex software systems, including project management, requirements analysis, specification, design, development, testing, documentation, deployment, and maintenance. Students develop software systems in a group structure that simulates an industrial setting.

3 Credits

Prerequisites

- [Csci 223: Computer Org. & Assembly Language](#) (Minimum grade: C-)
- Prerequisite: Csci 211 (C-) OR CIS 211 (C-) OR Csci 356 (C-) OR CIS 356 (C-).

Instruction Type(s)

- Lecture: Lecture for Csci 387

Subject Areas

- [Computer Science](#)

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Computer & Information Science

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)

Faculty in Computer & Information Science

- [B](#)
- [C](#)
- [D](#)
- [H](#)
- [J](#)
- [L](#)
- [T](#)
- [W](#)
- [X](#)

[Jump to Emeritus faculty](#)

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Emeritus Faculty

- [C](#)

- [L](#)
- [W](#)

[Jump to current faculty](#)

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Csci 541: Expert Systems and Logic Programming

Computer & Information Science

Expert systems and knowledge engineering. Computer systems to emulate human expertise. Rule-based and other knowledge representation techniques. Knowledge engineering as a model for expert systems development; logic programming for expert systems implementation.

3 Credits

Prerequisites

- Prerequisite: Csci 211 OR CIS 211 or graduate standing.
- Prerequisite: Math 301 or graduate standing

Instruction Type(s)

- Lecture: Lecture for Csci 541

Subject Areas

- [Computer Science](#)

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Csci 305: Software for Global Use

Computer & Information Science

Study of the principles and practice of software internationalization with emphasis on the design and customization of software to accommodate linguistic and cultural diversity.

3 Credits

Prerequisites

- Prerequisite: Csci 211 OR CIS 211

Instruction Type(s)

- Lecture: Lecture for Csci 305

Subject Areas

- [Computer Science](#)

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Csci 531: Artificial Intelligence

Computer & Information Science

Use of the computer in human problem solving. Game theory, decision trees, Markov decision problems, selected topics.

3 Credits

Prerequisites

- Pre-requisite: CSCI 433 or CSCI 502 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 531

Subject Areas

- [Computer Science](#)
- [Artificial Intelligence](#)

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Csci 191: Office Applications

Computer & Information Science

Introduction to the use of computers with emphasis on the Windows platform and the Microsoft Office suite of application tools. (Not to be used to satisfy computer science major requirements).

3 Credits

Prerequisites

- Course cannot be booked if completed Csci 112/CIS 112 with a grade of C- or better OR Csci 113/CIS 113 with a grade of B- or better.

Instruction Type(s)

- Lecture: Lecture for Csci 191
- Lecture: Web Based Lecture for Csci 191
- Lecture: iStudy for Csci 191
- Lecture: WEB Washington Internship for Csci 191

Course Fee(s)

Computer Science 4

- \$100.00 per 3 Semester Credit Hours

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Computer Science](#)
- [Computer and Information Sciences, General](#)

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Csci 581: Special Topics in Computer Science I

Computer & Information Science

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).
- Prerequisite: Csci 211 OR CIS 211 OR graduate standing
- Prerequisite: Csci 223 OR graduate standing

Instruction Type(s)

- Lecture: Lecture for Csci 581

Subject Areas

- [Computer Science](#)

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Csci 526: Parallel Computing

Computer & Information Science

This course explores the conceptual, theoretical, and practical issues raised by developing software for parallel environments and architectures. Students will write several programs using different languages and platforms.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).
- Prerequisite: Csci 211 or CIS 211 or graduate standing.
- Prerequisite: Csci 223 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 526

Subject Areas

- [Computer and Information Sciences, General](#)

Related Areas

- [Artificial Intelligence](#)
- [Information Technology](#)

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Csci 632: Machine Learning

Computer & Information Science

Presents the theory of and algorithms for constructing computer programs that automatically learn from experience. Introduces key concepts from statistics, artificial intelligence, and computational complexity to the design of practical machine learning systems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Csci 632

Subject Areas

- [Computer and Information Sciences, General](#)

Related Areas

- [Artificial Intelligence](#)
- [Information Technology](#)

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Csci 501: Fundamental Concepts in Systems

Computer & Information Science

An intensive study of the fundamental concepts of operating system and machine structures and the associated programming techniques.

3 Credits

Prerequisites

- Graduate Program Level Only

Instruction Type(s)

- Lecture: Lecture for Csci 501

Subject Areas

- [Computer Science](#)

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Csci 311: Models of Computation

Computer & Information Science

Introduction to the theoretical foundations of computer science, including automata and formal languages.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 112 or CIS 112 (Minimum grade: C-); or Csci 113 or CIS 113 (Minimum grade: B-)

One-way corequisites

- [Math 301: Discrete Mathematics](#)

Instruction Type(s)

- Lecture: Lecture for Csci 311
- Lecture: Hybrid Lecture for Csci 311

Subject Areas

- [Computer Science](#)

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Csci 517: Natural Language Processing

Computer & Information Science

Computer processing of natural language text at morphological, lexical, syntactic, and semantic levels; algorithms and procedures for sentence parsing and analysis; applications of natural language processing techniques.

3 Credits

Prerequisites

- Prerequisite: Csci 211 or Csci 343

Instruction Type(s)

- Lecture: Lecture for Csci 517

Subject Areas

- [Computer Science](#)

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Csci 524: Distributed Operating System Design

Computer & Information Science

Analysis of operating system design principles for multiple computers; a distributed operating system model is presented and compared to selected network and distributed operating system examples.

3 Credits

Prerequisites

- Pre-requisite: CSCI 423 or CSCI 501 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 524

Subject Areas

- [Computer Science](#)

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Csci 193: Personal Computer Systems

Computer & Information Science

Study of the hardware and software components of personal computer systems for experienced computer users. (Not to be used to satisfy computer science major requirements).

3 Credits

Instruction Type(s)

- Lecture: Lecture for Csci 193

Subject Areas

- [Computer Science](#)
- [Computer and Information Sciences, General](#)

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Csci 192: Computing Applications

Computer & Information Science

Introduction to the use of computers with emphasis on the Windows platform and the WordPerfect suite of application tools.
(Not to be used to satisfy computer science major requirements).

3 Credits

Instruction Type(s)

- Lecture: Lecture for Csci 192

Subject Areas

- [Computer Science](#)
- [Computer and Information Sciences, General](#)

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CIS 447: Immersive Media

Computer & Information Science

This course explores the applications, methods, and technologies for the realization of immersive virtual environments. Students will develop virtual reality applications, immersive virtual worlds, and interactive media. Topics include virtual reality, augmented reality, 3D content authoring, motion tracking, and current trends in immersive media.

3 Credits

Prerequisites

- Pre-requisite: 24 or more earned hours.
- Pre-requisite Csci 211 or CIS 211 or Csci 343

Cross-listed Courses

- [Csci 447: Immersive Media](#)

Course Fee(s)

Computer Science

- \$50.00

Subject Areas

- [Computer Science](#)

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CIS 113: Honors Computer Science I

Computer & Information Science

Introduction to computer science with an emphasis on problem solving and algorithm development. Using high-level, block-structured programming language, students will design, implement, debug, test, and document computer programs. In addition, topics related to data structures, abstract data types, algorithm design and analysis will also be emphasized.

3 Credits

Prerequisites

- Limited to students in the Sally McDonnell Barksdale Honors College
- Pre-requisite: Math ACT 22 or Math 121 (or above)

Cross-listed Courses

- [Csci 113: Honors Computer Science I](#)

Course Fee(s)

Computer Science 5

- \$75.00

Subject Areas

- [Computer Science](#)

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Csci 554: Web Architecture and Programming

Computer & Information Science

Study of web architecture and programming tools. Analysis of public-port protocols such as HTTP, embedded browser languages, browser extensions and interoperability. Server-side web components, design, tuning, and security. Server components include HTTP, Common Gateway Interface, database engine, and extensions.

3 Credits

Prerequisites

- Prerequisite: Csci 211 or CIS 211 or graduate standing.
- Prerequisite: Csci 223 or graduate standing.
- Csci 211 or Csci 223

Instruction Type(s)

- Lecture: Lecture for Csci 554

Subject Areas

- [Computer Science](#)

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Csci 353: Introduction to Numerical Methods

Computer & Information Science

This course provides an overview of numerical methods and optimization techniques, laying the foundation for advanced studies in machine learning, data science, and related engineering disciplines. It covers fundamental concepts like numerical errors and algorithm efficiency, delves into topics like interpolation, integration techniques, and matrix factorization, and explores various computational topics essential for data science and engineering.

3 Credits

Prerequisites

- Prerequisite: Csci 111 or CIS 111 or Csci 251 or CIS 251 or Csci 113 or CIS 113 or Csci 256 or CIS 256 or Csci 259.
(Minimum grade: C-)
- Prerequisites: Math 263 or Math 319
- Csci 111 or Csci 251

Instruction Type(s)

- Lecture: Lecture for CSCI 353

Subject Areas

- [Computer Science](#)

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Csci 500: Fundamental Concepts in Computing

Computer & Information Science

An intensive study of the formal concepts needed for graduate study in computer science.

3 Credits

Prerequisites

- Graduate Program Level Only

Instruction Type(s)

- Lecture: Lecture for Csci 500

Subject Areas

- [Computer Science](#)

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Csci 533: Analysis of Algorithms

Computer & Information Science

Introduction to the analysis of the efficiency of computer algorithms and concepts of computational complexity; sorting, matrix multiplication, others.

3 Credits

Prerequisites

- Pre-requisite: CSCI 433 or CSCI 502 or Graduate Standing
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Csci 533

Subject Areas

- [Computer Science](#)

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Csci 103: Survey of Computing

Computer & Information Science

Introduction to computers and computing for students with no prior computer experience.

(Not to be used to satisfy computer science major requirements).

3 Credits

Prerequisites

- Course cannot be booked if completed Csci 112/CIS 112 with a grade of C- or better OR Csci 113/CIS 113 with a grade of B- or better.

Instruction Type(s)

- Lecture: Lecture for Csci 103
- Lecture: Web based lecture for Csci 103
- Lecture: iStudy for Csci 103
- Lecture: Independent Study for Csci 103
- Lecture: WEB Washington Internship for Csci 103

Course Fee(s)

Computer Science 4

- \$100.00 per 3 Semester Credit Hours

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Computer Science](#)
- [Computer and Information Sciences, General](#)

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Csci 113: Honors Computer Science I

Computer & Information Science

Introduction to computer science with an emphasis on problem solving and algorithm development. Using high-level, block-structured programming language, students will design, implement, debug, test, and document computer programs. In addition, topics related to data structures, abstract data types, algorithm design and analysis will also be emphasized.

3 Credits

Prerequisites

- Limited to students in the Sally McDonnell Barksdale Honors College
- Pre-requisite: Math ACT 22 or Math 121 (or above)
- Engineering students only.

Cross-listed Courses

- [CIS 113: Honors Computer Science I](#)

Instruction Type(s)

- Lecture: Lecture for Csci 113

Subject Areas

- [Computer Science](#)

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Csci 251: Programming for Engineering and Sciences

Computer & Information Science

Algorithm development and structured programming techniques; numerical and graphical applications related to engineering and scientific problem solving.

Corequisite for this course may also be satisfied by consent of instructor.

3 Credits

Prerequisites

- Engineering students only.
- Csci 251 Requires: One Way-Co-Requisite Math 261

Cross-listed Courses

- [CIS 251: Programming for Engineering and Sciences](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Csci 251
- Lecture/Lab: Hybrid Lecture/Lab for Csci 251
- Lecture/Lab: Web-based Lecture/Lab for Csci 251

Course Fee(s)

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Computer Science](#)

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Csci 325: Foundations of Computer Security

Computer & Information Science

This course covers fundamental tools and concepts of computer security. Topics include symmetric and asymmetric cryptography, cryptographic hashing, basic security principles, and legal and ethical issues.

3 Credits

Prerequisites

- [Csci 223: Computer Org. & Assembly Language](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Csci 325

Subject Areas

- [Computer Science](#)

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Csci 111: Computer Science I

Computer & Information Science

Introduction to computer science with emphasis on problem solving and algorithm development. Using high-level, block-structured programming language, students design, implement, debug, test, and document computer programs for various applications.

3 Credits

Prerequisites

- Pre-requisite: Minimum ACT mathematics score of 22; or minimum SAT mathematics score of 540; or Math 121 or above; or ALEKS PPL score of 61
- Pre-Requisite: Engineering Majors Only

Cross-listed Courses

- [CIS 111: Computer Science I](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Csci 111

Subject Areas

- [Computer Science](#)

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Csci 555: Functional Programming

Computer & Information Science

The principles and techniques of programming with functions. Purely functional programming languages; recursion; higher-order functions; reduction models; strictness; type systems; list operations; infinite data structures; program synthesis and transformation.

3 Credits

Prerequisites

- Prerequisite: Csci 211 OR CIS 211 OR graduate standing
- Prerequisite: Math 301 OR graduate standing

Instruction Type(s)

- Lecture: Lecture for Csci 555

Subject Areas

- [Computer Science](#)

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Csci 523: Operating Systems

Computer & Information Science

Design and construction of operating systems for shared program computers; various contemporary operating systems.

3 Credits

Prerequisites

- Pre-requisite: CSCI 423 or CSCI 501 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 523

Subject Areas

- [Computer Science](#)

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Computer & Information Science

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- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)

Degrees Offered

- [B.A. in Computer Science](#)
- [B.S.C.S. in Computer Science](#)
 - [Emphasis - Computer Security](#)
 - [Emphasis - Data Science](#)
- [B.S.D.S. in Data Science](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Computer Science](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Computer Science](#)

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Csci 458: Mobile Application Development

Computer & Information Science

This course introduces the design and development of cross-platform mobile applications, focusing on effective design for mobile and desktop browsers and conversion to native applications for common mobile devices, such as Android and iOS. Topics include user interface design, event handling, application programming interfaces (APIs) for accessing hardware components (e.g., GPS, camera, accelerometer), and developing for restricted resources, such as power, memory, and network speed.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 or CIS 211 or Csci 343 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 458

Subject Areas

- [Computer Science](#)

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Csci 443: Advanced Data Science

Computer & Information Science

This course extends the study in Csci 343 to processing and analysis of big data. Topics include machine learning, natural language processing, and data intensive processing techniques such as MapReduce, NoSQL, and other state-of-the-art frameworks.

3 Credits

Prerequisites

- [Csci 343: Fundamentals of Data Science](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Csci 443

Subject Areas

- [Computer Science](#)

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Csci 259: Programming in C++

Computer & Information Science

Study of programming in the language C++, covering character processing; use of pointers with strings, arrays and functions; data structures; bitwise operators.

3 Credits

Prerequisites

- Pre-requisite: Minimum ACT mathematics score of 22; or minimum SAT mathematics score of 540; or Math 121 or above; or ALEKS PPL score of 61
- Csci 111 or Csci 251

Instruction Type(s)

- Lecture: Lecture for Csci 259
- Lecture: Hybrid Lecture for Csci 259

Subject Areas

- [Computer Science](#)

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Csci 525: Compiler Construction

Computer & Information Science

Introduction to techniques used in current compilers for computer languages; the syntactic specification of programming languages and an introduction to syntax-directed compiling.

3 Credits

Prerequisites

- Pre-requisite: CSCI 311 or CSCI 450 or CSCI 500 or CSCI 503 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 525

Subject Areas

- [Computer Science](#)

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Csci 658: Software Language Engineering

Computer & Information Science

Study of topics on the design, implementation, use, and evolution of artificial languages for the engineering of software. Languages of interest include general-purpose programming languages, domain-specific languages, and modeling languages as well as application programming interfaces and collections of design patterns that implicitly define languages.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Csci 658

Subject Areas

- [Computer Science](#)

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Csci 223: Computer Org. & Assembly Language

Computer & Information Science

Introduction to the architecture of computer systems. The topics include processor and external device structures and operation, machine operation, machine operations and instructions, assembly language concepts, and assembly language programming.

3 Credits

Prerequisites

- Pre-requisite: Csci 112 or CIS 112 (Minimum grade: C-); or Csci 113 or CIS 113 (Minimum grade: B-).

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Csci 223

Subject Areas

- [Computer Science](#)

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Csci 354: Web Programming

Computer & Information Science

This course introduces programming for the World Wide Web. Topics include development principles and practice with current Web development tools such as HTML5, CSS, JavaScript, jQuery, Ajax, JSON, and PHP.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Pre-requisite Csci 211 or CIS 211 or Csci 343

Instruction Type(s)

- Lecture: Lecture for Csci 354
- Lecture: Web-based Lecture for Csci 354

Subject Areas

- [Computer Science](#)

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Minor - Computer Science

- [Minor - Computer Science](#)

Minor - Computer Science

Description

The minor in computer science enables students to develop an understanding of the fundamental concepts and techniques of computing science. Students thus can enhance their studies in other disciplines by adding a dimension of algorithmic thinking and developing practical computational skills useful in many areas of contemporary society.

Course Requirements

A minor in computer science consists of 18 hours of computer science courses including CSci 111, 112, 211, 3 additional credit hours at the 200 level or above, and 6 additional hours at the 300 level or above.

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Csci 547: Digital Image Processing

Computer & Information Science

Present mathematical models for image formation. Introduce statistical, geometric, and inferential methods to extract information from single and multiple images. Discuss applications of computer vision.

3 Credits

Prerequisites

- Prerequisite: Math 262 or graduate standing.
- Prerequisite: Csci 211 or CIS 211 or Csci 251 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 547

Subject Areas

- [Web Page, Digital/Multimedia and Information Resources Design](#)
- [Computer and Information Sciences, General](#)

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Csci 530: Computer Architecture and Design

Computer & Information Science

This course studies the past evolution and current trends in computer architecture and the factors influencing the design of hardware and software components of computer systems. Topics include processor micro-architecture, instruction set architecture, hardware parallelism, memory subsystems, various processor design paradigms (superscalar, VLIW, multicore, and GPU), and performance analysis.

3 Credits

Prerequisites

- [Csci 223: Computer Org. & Assembly Language](#)

Instruction Type(s)

- Lecture: Lecture for Csci 530

Subject Areas

- [Computer Science](#)

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Csci 561: Computer Networks

Computer & Information Science

Analysis of loosely coupled computer communication, communication protocols, and network services; an open systems interconnection model is presented and compared to selected examples of computer networks.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).
- Prerequisite: Csci 423 or Csci 501 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 561

Subject Areas

- [Computer Science](#)

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Csci 345: Information Storage and Retrieval

Computer & Information Science

Examination of systems for storage and retrieval of information in textual and other formats. The topics include query processing, matching and ranking algorithms, text analysis, user interfaces, and evaluation of retrieval effectiveness.

3 Credits

Prerequisites

- Prerequisite: Csci 211 or CIS 211 or Csci 343 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 345

Subject Areas

- [Computer Science](#)

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Csci 343: Fundamentals of Data Science

Computer & Information Science

Data science is the study of discovering knowledge from data. This course explores the field using a broad perspective. Topics include data collection and integration, exploratory data analysis, descriptive statistics, prediction, and regression, and evaluating and communicating results. Significant programming is required.

3 Credits

Prerequisites

- Prerequisite: Csci 112 or CIS 112 or Csci 251 or CIS 251 or Csci 256; or Csci 113 or CIS 113 (Minimum grade: B-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Csci 343

Subject Areas

- [Computer Science](#)

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Computer & Information Science

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Courses

- [Engr 654: Information Systems Principles](#)
- [Engr 660: Software Engineering II](#)
- [Engr 661: Computer Networks II](#)
- [CIS 111: Computer Science I](#)
- [CIS 112: Computer Science II](#)
- [CIS 113: Honors Computer Science I](#)
- [CIS 211: Computer Science III](#)
- [CIS 251: Programming for Engineering and Sciences](#)
- [CIS 256: Programming in Python](#)
- [CIS 333: Digital Design and 3D Printing](#)
- [CIS 356: Data Structures in Python](#)
- [CIS 427: Network Security](#)
- [CIS 447: Immersive Media](#)
- [Csci 103: Survey of Computing](#)
- [Csci 111: Computer Science I](#)
- [Csci 112: Computer Science II](#)
- [Csci 113: Honors Computer Science I](#)
- [Csci 191: Office Applications](#)
- [Csci 192: Computing Applications](#)
- [Csci 193: Personal Computer Systems](#)
- [Csci 203: Introduction to Computational Media](#)
- [Csci 211: Computer Science III](#)
- [Csci 223: Computer Org. & Assembly Language](#)
- [Csci 251: Programming for Engineering and Sciences](#)
- [Csci 256: Programming in Python](#)
- [Csci 259: Programming in C++](#)
- [Csci 300: Social Responsibility in Comp. Science](#)
- [Csci 305: Software for Global Use](#)
- [Csci 311: Models of Computation](#)
- [Csci 323: Systems of Programming](#)
- [Csci 325: Foundations of Computer Security](#)
- [Csci 333: Digital Design and 3D Printing](#)
- [Csci 343: Fundamentals of Data Science](#)
- [Csci 345: Information Storage and Retrieval](#)
- [Csci 353: Introduction to Numerical Methods](#)
- [Csci 354: Web Programming](#)
- [Csci 356: Data Structures in Python](#)
- [Csci 361: Introduction to Computer Networks](#)
- [Csci 387: Software Design and Development](#)
- [Csci 390: Special Topics in Programming](#)
- [Csci 391: Computer Graphics](#)
- [Csci 405: Computer Simulation](#)
- [Csci 423: Introduction to Operating Systems](#)
- [Csci 425: Code Generation and Optimization](#)
- [Csci 426: System Security](#)
- [Csci 427: Network Security](#)
- [Csci 431: Robotics Programming](#)

- [Csci 433: Algorithm and Data Structure Analysis](#)
- [Csci 443: Advanced Data Science](#)
- [Csci 444: Information Visualization](#)
- [Csci 447: Immersive Media](#)
- [Csci 450: Organization of Programming Languages](#)
- [Csci 458: Mobile Application Development](#)
- [Csci 475: Introduction to Database Systems](#)
- [Csci 487: Senior Project](#)
- [Csci 490: Special Topics](#)
- [Csci 491: Special Topics in Computer Security](#)
- [Csci 492: Special Topics in Data Science](#)
- [Csci 500: Fundamental Concepts in Computing](#)
- [Csci 501: Fundamental Concepts in Systems](#)
- [Csci 502: Fundamental Concepts in Algorithms](#)
- [Csci 503: Fundamental Concepts in Languages](#)
- [Csci 517: Natural Language Processing](#)
- [Csci 520: Formal Theory of Computer Languages](#)
- [Csci 521: Computer Systems Engineering](#)
- [Csci 523: Operating Systems](#)
- [Csci 524: Distributed Operating System Design](#)
- [Csci 525: Compiler Construction](#)
- [Csci 526: Parallel Computing](#)
- [Csci 530: Computer Architecture and Design](#)
- [Csci 531: Artificial Intelligence](#)
- [Csci 533: Analysis of Algorithms](#)
- [Csci 541: Expert Systems and Logic Programming](#)
- [Csci 543: Data Mining](#)
- [Csci 547: Digital Image Processing](#)
- [Csci 550: Program Semantics and Derivation](#)
- [Csci 551: Computer System Performance Analysis](#)
- [Csci 554: Web Architecture and Programming](#)
- [Csci 555: Functional Programming](#)
- [Csci 556: Multiparadigm Programming](#)
- [Csci 557: GPU Computing](#)
- [Csci 561: Computer Networks](#)
- [Csci 562: Software Engineering I](#)
- [Csci 575: Database Systems](#)
- [Csci 581: Special Topics in Computer Science I](#)
- [Csci 582: Special Topics in Computer Science II](#)
- [Csci 632: Machine Learning](#)
- [Csci 658: Software Language Engineering](#)
- [Csci 663: Software Families](#)
- [Csci 665: Wireless and Sensor Networks](#)

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Csci 582: Special Topics in Computer Science II

Computer & Information Science

May be repeated for credit.

1 - 3 Credits

Prerequisites

- Prerequisite: (Csci 211 or CIS 211) and Csci 223 or graduate standing

Instruction Type(s)

- Lecture: Lecture for Csci 582

Subject Areas

- [Computer Science](#)

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Csci 431: Robotics Programming

Computer & Information Science

The goal of this course is to provide students hands-on experience in the design, construction, and programming of robots that are driven by micro-controllers (e.g., LEGO EV3 mobile robots). Upon completion of this course, students should be able to develop a robotic system from available modular units; to understand the role of knowledge representation, problem solving, and learning in intelligent-system engineering; and to explain the basic concepts of robotics systems.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 OR CIS 211 OR Csci 223.

Instruction Type(s)

- Lecture: Lecture for Csci 431

Subject Areas

- [Computer Science](#)

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Computer & Information Science

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Distinguished Faculty and Staff Awards

School of Engineering, Junior Faculty Research Award

- **Yixin Chen** - ASSOCIATE PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2011)

Outstanding Staff Award

A staff member of the School of Engineering who has demonstrated exemplary service, leadership, and commitment.

- **Carrie Dawn Long** - ADMINISTRATIVE SECRETARY (2011)
- **Aubrey D Bolen** - ADMINISTRATIVE COORDINATOR I (2010)

Frist Service Award

- **PAMELA B LAWHEAD** - Associate Professor Emerita of Computer and Information Science (1995)

School of Engineering, Faculty Service Award

- **Dawn E Wilkins** - PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2008)
- **PAMELA B LAWHEAD** - Associate Professor Emerita of Computer and Information Science (2003)

School of Engineering, Faculty Teaching Award

- **Dawn E Wilkins** - PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2012)

School of Engineering Outstanding Teacher of the Year

- **Yixin Chen** - ASSOCIATE PROFESSOR OF COMPUTER AND INFORMATION SCIENCE (2012)

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Csci 450: Organization of Programming Languages

Computer & Information Science

History and concepts of programming languages; run-time behavior; formal aspects; language definition; data types and structures; control; and data flow, compilation, and interpretation.

3 Credits

Prerequisites

- [Csci 223: Computer Org. & Assembly Language](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 or CIS 211 (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Csci 450
- Lecture: Web-based Lecture for Csci 450

Subject Areas

- [Computer Science](#)

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Computer & Information Science

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)

Minors

- [Minor - Computer Science](#)
- [Minor - Data Science](#)

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Csci 405: Computer Simulation

Computer & Information Science

Introduction to computer-based simulation and its applications to engineering, the sciences, and management.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 OR CIS 211 or graduate standing.

Instruction Type(s)

- Lecture: Lecture for Csci 405

Subject Areas

- [Computer Science](#)

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Csci 551: Computer System Performance Analysis

Computer & Information Science

Defining, parameterizing, and evaluating models of computer systems. The emphasis is on applying queuing network models and simulation techniques as tools to evaluate the performance of centralized and distributed computer systems.

3 Credits

Prerequisites

- Pre-requisite: (CSCI 423 and Math 375) or CSCI 501 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Csci 551

Subject Areas

- [Computer Science](#)

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Csci 112: Computer Science II

Computer & Information Science

Continuation of CSCI 111 with emphasis on computer programming as a systematic discipline. The topics include data structures, abstract data types, algorithm design and analysis, and programming methods and standards.

3 Credits

Prerequisites

- Engineering students only.
- Prerequisite: Csci 111 or CIS 111 or Csci 113 or CIS 113 (Minimum grade C-).

Cross-listed Courses

- [CIS 112: Computer Science II](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Csci 112

Subject Areas

- [Computer Science](#)

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Csci 356: Data Structures in Python

Computer & Information Science

This course will introduce data structures and their application using the Python programming language. Abstract data types for stack, queue, various lists, trees and graphs will be studied. Built-in data structures such as lists, dictionaries, and tuples will be used extensively.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours
- Pre-requisite Csci 256 (C-) OR Csci 112 OR CIS 112 (C-) OR Csci 113 OR CIS 113 B-.

Cross-listed Courses

- [CIS 356: Data Structures in Python](#)

Instruction Type(s)

- Lecture: Lecture for Csci 356
- Lecture: Web-based Lecture for Csci 356

Subject Areas

- [Computer Science](#)

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Csci 361: Introduction to Computer Networks

Computer & Information Science

Analysis of loosely coupled computer communication protocols and network services. A generic network model is presented and compared to selected examples of computer networks including the Internet TCP/IP and Internet-based applications.

3 Credits

Prerequisites

- Prerequisite Csci 223 OR EI E 235

Instruction Type(s)

- Lecture: Lecture for Csci 361

Subject Areas

- [Computer Science](#)

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Csci 391: Computer Graphics

Computer & Information Science

Introduction to the fundamentals of computer graphics, including elementary figures, shading, geometric transformations, graphics program design, and interactive techniques.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- [Csci 223: Computer Org. & Assembly Language](#)
- Prerequisite: Csci 211 OR CIS 211

Instruction Type(s)

- Lecture: Lecture for Csci 391

Subject Areas

- [Computer Science](#)
- [Computer Graphics](#)

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Csci 203: Introduction to Computational Media

Computer & Information Science

This course introduces computing and programming with emphasis on interactive media, including graphics, images, animation, and sound. It explores core computing concepts such as variables, conditionals, loops, functions, objects, arrays, and algorithms

3 Credits

Prerequisites

- Pre-requisite: Math ACT 22 or Math 121 (or above)

Instruction Type(s)

- Lecture: Lecture for Csci 203
- Lecture: Web-based Lecture for Csci 203

Course Fee(s)

Computers and Info Science 4

- \$125.00

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Computer Science](#)
- [Computer and Information Sciences, General](#)

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Csci 492: Special Topics in Data Science

Computer & Information Science

Study of topics in data science according to the interests of the instructor and students. May be repeated for credit when the topic varies.

3 Credits

Prerequisites

- Prerequisite Csci 211 C- min OR CIS 211 C- min OR Csci 343 C- min.

Instruction Type(s)

- Lecture: Lecture for Csci 492

Subject Areas

- [Computer Science](#)

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Csci 425: Code Generation and Optimization

Computer & Information Science

This course examines how machine code is generated and optimized to harness the computing power of modern processors. The course surveys a range of topics including the compilation process and techniques, interface between software and hardware, and program optimizations at different levels (e.g., algorithm, high-level, and assembly level).

3 Credits

Prerequisites

- [Csci 223: Computer Org. & Assembly Language](#)
- Pre-Requisite: 24 Earned Hours
- Prerequisite: Csci 211 OR CIS 211

Instruction Type(s)

- Lecture: Lecture for Csci 425

Subject Areas

- [Computer Science](#)

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Csci 665: Wireless and Sensor Networks

Computer & Information Science

This course uses wireless and sensor networks as case studies to enable students to understand and analyze loosely coupled computer networks, network protocols, and network services. Building on basic knowledge about wireless and sensor networks, the course explores recent research on related topics. Students learn to use appropriate embedded programming languages (e.g., nesC) and operating system platforms (e.g., TinyOS) to develop embedded and network programs. Students also learn to design and implement mote-based wireless and sensor network systems by completing a series of programming projects (e.g., multiple access control, multi-hop routing, and data collection from sensors).

3 Credits

Prerequisites

- [Csci 561: Computer Networks](#)

Instruction Type(s)

- Lecture: Lecture for Csci 665

Subject Areas

- [Computer Science](#)

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Csci 491: Special Topics in Computer Security

Computer & Information Science

Study of topics in computer security according to the interests of the instructor and students. May be repeated for credit when the topic varies.

3 Credits

Prerequisites

- [Csci 325: Foundations of Computer Security](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Csci 491

Subject Areas

- [Computer Science](#)

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B.S.D.S. in Data Science

- [Overview](#)
- [Degree Requirements](#)

Description

The Bachelor of Science in Data Science (B.S.D.S.) program is an interdisciplinary program with computer science, mathematics and statistics at its core.

Minimum Total Credit Hours: 126

General Education Requirements

For detailed information see the [General Education/Core Curriculum](#) for the School of Engineering.

Candidates for the B.S.D.S. degree must successfully complete the following general education requirements:

- 6 hours from Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102;
- 3 hours of literature chosen from Engl 220-226;
- 8 hours of laboratory science chosen from Chem 105, 106, 115, 116 or Phys 211, 212, 221, 222 or Bisc 160, 161, 162, 163;
- 6 hours from Math 261 and 262;
- 3 hours from Spch 102 or Spch 105;
- 6 hours of social science chosen from anthropology, economics, political science, psychology, and sociology;
- 3 hours of humanities chosen from classics, English, history, modern languages, philosophy, religion, and African American studies, gender studies, or southern studies;
- 3 hours of fine arts chosen from courses in the history, appreciation, and criticism of art, dance, music, and theatre arts (Courses emphasizing the enhancement of skills and performance are not acceptable.);
- 3 additional hours of fine arts, languages (modern, Greek, or Latin), or humanities.

Course Requirements

Candidates for the B.S.D.S. degree must successfully complete the following requirements in addition to the general education requirements:

- 12 hours from Math 301, 319, 375 and 380
- 6 additional hours of science electives chosen from the laboratory science courses listed above or from Astr 103, 104, Chem 221, 222, Geol 101, 102, 103, 104, 105, 107, 120 (except not both Geol 101 and 104), and biology, chemistry, physics, and geology courses at the 300-level and above (If a science course has a separate, but coordinated laboratory course, the student is strongly encouraged to enroll for the laboratory section as well as the lecture section.)
- 34 hours from Csci 111, 223, 256, 300, 325, 343, 356, 433, 443, 444, 475, 487
- 15 hours of computer science electives at the 300+ level with at least two selected from the courses Csci 345, 492, 517, 531, 547 (may take up to two Csci 492 courses of different topics)
- 18 hours for a minor with the exception of data science, computer science, the computing emphasis on Digital Media Studies, general engineering, and math for School of Engineering

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B.S.D.S. in Data Science

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs literature survey	3	Complete 3 hours of literature survey chosen from Eng 220 , Eng 221 , Eng 222 , Eng 223 , Eng 224 , Eng 225 , or Eng 226 .
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.
6 hrs social science	6	Complete 6 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in Ancient Greek (Gr), Arabic (Arab) and Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish

General Education II

Requirement	Hours	Description
8 hrs lab science	8	Complete 8 hours of laboratory science chosen from the following: CHEM 105 , 106 , 115 , 116 ; PHYS 211 , 212 , 221 , 222 ; or BISC 160 , 161 , 162 , 163 .
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.

Major Requirements

Requirement	Hours	Description
CSci 111	3	Complete Csci 111 with a passing grade.
CSci 223	3	Complete CSci 223 with a passing grade.
CSci 256	3	Complete CSci 256 with a passing grade.
CSci 300	1	Complete CSci 300 with a passing grade.

Requirement	Hours	Description
CSci 325	3	Complete CSci 325 with a passing grade.
CSci 343	3	Complete CSci 343 with a passing grade.
CSci 356	3	Complete CSci 356 with a passing grade.
CSci 433	3	Complete CSci 433 with a passing grade.
CSci 443	3	Complete CSci 443 with a passing grade.
CSci 444	3	Complete CSci 444 with a passing grade.
CSci 475	3	Complete CSci 475 with a passing grade.
CSci 487	3	Complete CSci 487 with a passing grade.
6 hrs CS electives	6	Complete 6 hrs of electives with a passing grade chosen from CSci 345 , 492 , 517 , or CSci 547 . (may take up to two CSci 492 courses of different topics)
9 add'l hours CS elect 300+	9	Complete an additional 9 hrs of CSci electives at the 300+ level with a passing grade.
School of Engineering GPA		GPA must be a 2.0

Major Requirements II

Requirement	Hours	Description
6 hrs Add'l science elective	6	Complete 6 credit hours of additional science electives chosen from the following Astro 103, 104- Chem 221 , 222 - Geol 101 , 102 , 103 , 104 , 105 , 107 and 120 (not both 101 and 104)- Bio, Chem, Phys & Geo 300 + and any of our Lab Science not already taken.
MATH 301	3	Complete Math 301 with a passing grade.
Math 319	3	Complete Math 319 with a passing grade.
Math 375	3	Complete Math 375 with a passing grade.
Math 380	3	Complete Math 380 with a passing grade.

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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Emphasis - Computer Science

- [M.S. in Engineering Science](#)
- [Emphasis - Computer Science](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Computer Science

Description

A M.S. in engineering science with emphasis in computer science prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

Students must choose one of the following options and complete the stated degree requirements.

Thesis option

- 24 semester credit hours of approved graduate coursework plus 6 hours of thesis research (by enrolling in Engr 697)
- A written thesis
- A final public oral examination over the work in the thesis area the student must register for the Engr 697 section assigned to the student's research adviser for 6 hours during the program; Engr 697 is an ungraded, variable credit course for which the student may register repeatedly until the thesis is complete. The student must prepare the thesis according to the Graduate School requirements and schedule.

Project option

- 27 semester credit hours of approved graduate coursework plus 3 hours of an independent study research project (by enrolling in Engr 693)
- A written project paper
- A final public oral examination over the work in the research project's area. The M.S. project can be a survey of results in a particular research area, a design and implementation of a known idea, or a thorough study of a research problem.

The student must register for 3 hours in the Engr 693 section assigned to the student's research adviser during the final semester

of the program; Engr 693 is a graded course that should only be taken once. The student must prepare the research paper according to department requirements.

Coursework option

- 30 semester credit hours of approved graduate coursework
- A final oral examination in front of a committee, but no written report. The topics of the final oral examination are selected by the graduate committee.

Coursework Requirements

The following coursework requirements apply to the coursework, research project, and thesis options.

Each student must complete the M.S. core coursework requirement; that is, the student must successfully complete the following courses with a grade of B or better:

- Csci 533 Analysis of Algorithms
- Csci 523 Operating Systems or Csci 561 Computer Networks or Csci 530 Computer Architecture and Design
- Csci 525 Compiler Construction or Csci 555 Functional Programming or Csci 556 Multiparadigm Programming or Csci 526 Parallel Computing or Csci 531 Artificial Intelligence or Csci 658 Software Language Engineering or another programming-intensive course approved by the department's Graduate Committee

The department's graduate faculty encourages students to take Engr 694 Research Methods if they plan to choose the thesis option or to continue their studies toward the Ph.D. degree.

The following coursework requirements apply to both research project and thesis options.

In addition to the thesis or M.S. project courses, each student must complete at least 9 semester credit hours of regular computer science courses at the 600 level or above. A regular computer science course is a course that (a) is taught by a computer science faculty member on a computer science topic, (b) is publicized and offered to all graduate students who meet the prerequisites, and (c) has a regular weekly meeting time with organized lectures or activities.

These courses typically have Csci, Engr, or EngS prefixes.

In addition to the thesis or M.S. project courses, a student may count up to two nonregular courses (6 hours) toward his or her degree. A nonregular course is an independent study course or any other course that does not meet the requirements stated above for regular courses (i.e., it does not count at the 600 level or above).

Coursework Option

The following coursework requirements apply to the coursework option.

Each student must complete at least 12 semester credit hours of regular computer science courses at the 600 level or above. A regular computer science course is a course that (a) is taught by a computer science faculty member on a computer science topic, (b) is publicized and offered to all graduate students who meet the prerequisites, and (c) has a regular weekly meeting time with organized lectures or activities. These courses typically have Csci, Engr, or EngS prefixes.

A student may count up to two nonregular courses (6 hours) toward his or her degree. A nonregular course is an independent study course or any other course that does not meet the requirements stated above for regular courses (i.e., it does not count at the 600 level or above).

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Emphasis - Computer Science

- [Ph.D. in Engineering Science](#)
- [Emphasis - Computer Science](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Computer Science

Description

A Ph.D. in engineering science with emphasis in computer science prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as electrical engineering, physics, biology, and the liberal arts.

Course Requirements

For the Ph.D. in engineering science with an emphasis in computer science, the student must present a bachelor's or master's degree in the field or the equivalent and take additional classes adding up to 48 hours of approved graduate-level course work (excluding the 18+ semester hours of dissertation research). This may include no course numbered lower than Csci 510, and a minimum of 18 hours must be in computer science courses at the 600 level. The student may count up to 9 credit hours of independent study taught by Department of Computer and Information Science faculty members toward the degree.

Other Academic Requirements

The student must pass the comprehensive examination and the preliminary oral examination (dissertation prospectus).

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Emphasis - Data Science

- [B.S.C.S. in Computer Science](#)
- [Emphasis - Data Science](#)
- [Degree Requirements](#)

B.S.C.S. in Computer Science

Description

The goal of the B.S.C.S. program is to give each student a thorough professional education in contemporary computer science while allowing sufficient flexibility for the student to pursue individual interests in related technical fields.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Mission Statement

The Department of Computer and Information Science at the University of Mississippi seeks to provide high-quality programs of instruction, research, and service and to refine them continuously to meet the evolving needs of its students and society. Toward this end, the Department shall: * enable its undergraduate students to master the fundamental principles of computing and to develop the skills needed to solve practical problems using contemporary computer-based technologies and practices; * empower its graduate students to understand advanced concepts, develop new technologies and methods, and expand the base of fundamental knowledge; * cultivate a community of professionals that encourages scholarship and facilitates both applied and theoretical research; * serve its constituents in government, industry, and the public as a resource on state-of-the-art computing science and information technology.

BSCS Program Educational Objectives

As effective members of the Computer Science profession:

1. Graduates demonstrate the ability to solve computing problems commensurate with their levels of professional experience
2. Graduates demonstrate the ability to contribute effectively to the benefit of teams
3. Graduates continue to update their professional knowledge and skills to adapt to changes in technology and the evolving needs of society and the workplace

BSCS Student Outcomes

In keeping with the accreditation of the BSCS program by ABET, Inc., the Department helps students have the ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

General Education Requirements

Candidates for the B.S.C.S. degree must successfully complete the following general education requirements:

- 6 hours from Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102;

- 3 hours of literature chosen from Engl 221-226;
- 8 hours of laboratory science chosen from Chem 105, 106, 115, 116 or Phys 211, 212, 221, 222 or Bisc 160, 161, 162, 163;
- 6 hours from Math 261 and 262;
- 3 hours from Spch 102 or Spch 105;
- 6 hours of social science chosen from anthropology, economics, political science, psychology, and sociology;
- 3 hours of humanities chosen from classics, English, history, modern languages, philosophy, religion, and African American studies, gender studies, or southern studies;
- 3 hours of fine arts chosen from courses in the history, appreciation, and criticism of art, dance, music, and theatre arts (Courses emphasizing the enhancement of skills and performance are not acceptable.);
- 3 additional hours of fine arts, languages (modern, Greek, or Latin), or humanities.

Course Requirements

Candidates for the B.S.C.S. degree must successfully complete the following requirements in addition to the general education requirements:

- 12 hours from Math 301, 302 or 401, 375, and either 263 or 319;
- 6 additional hours of science electives chosen from the laboratory science courses listed above or from Astr 103, 104, Chem 221, 222, Geol 101, 102, 103, 104, 105, 107, and 120 (except not both Geol 101 and 104), and biology, chemistry, physics, and geology courses at the 300-level and above; (If a science course has a separate, but coordinated laboratory course, the student is strongly encouraged to enroll for the laboratory section as well as the lecture section.)
- 4 hours from EI E 235, 236;
- 31 hours from Csci 111, 112, 211, 223, 300, 311, 387, 423, 433, 450, and 487;
- 15 hours of computer science electives chosen from 300 level and above or other approved electives;
- 18 hours of course work for an approved minor or other technical electives chosen in consultation with the academic advisor.

Emphases:

Students can earn an emphasis in either computer security or data science by completing the 15 hours of required Csci 300+ electives as follows:

Computer Security Emphasis:

- Csci 325 Foundations of Computer Security
- Csci 361 Introduction to Computer Networks
- Csci 426 System Security
- Csci 427 Network Security
- One of: CSci 323-Systems of Programming, CSci 475-Introduction to Database Systems, CSci 491-Special Topics in Computer Security, CSci 523-Operating Systems, or CSci 561-Computer Networks

Data Science Emphasis:

- Csci 343 Fundamentals of Data Science
- Csci 443 Advanced Data Science
- Csci 475 Introduction to Database Systems
- Two of: CSci 345-Information Storage and Retrieval, CSci 444-Information Visualization, CSci 492-Special Topics in Data Science, CSci 517-Natural Language Processing, or CSci 543-Data Mining.

*Note that a student may earn at most ONE emphasis on the B.S.C.S. degree.

Emphasis - Data Science

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw

courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.C.S. in Computer Science

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs literature survey	3	Complete 3 hours of literature survey chosen from Eng 220 , Eng 221 , Eng 222 , Eng 223 , Eng 224 , Eng 225 , or Eng 226 .
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.
6 hrs social science	6	Complete 6 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) and Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish

General Education II

Requirement	Hours	Description
8 hrs lab science	8	Complete 8 hours of laboratory science chosen from the following: CHEM 105 , 106 , 115 , 116 ; PHYS 211 , 212 , 221 , 222 ; or BISC 160 , 161 , 162 , 163 .
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.

Major Requirements

Requirement	Hours	Description
Csci 111	3	Complete Csci 111 with a passing grade.
Csci 112	3	Complete Csci 112 with a passing grade.
Csci 211	3	Complete Csci 211 with a passing grade.
Csci 300	1	Complete Csci 300 with a passing grade.
Csci 223	3	Complete Csci 223 with a passing grade.
Csci 311	3	Complete Csci 311 with a passing grade.
Csci 387	3	Complete Csci 387 with a passing grade.
Csci 423	3	Complete Csci 423 with a passing grade.
Csci 433	3	Complete Csci 433 with a passing grade.
Csci 450	3	Complete Csci 450 with a passing grade.

Requirement	Hours	Description
Csci 487	3	Complete Csci 487 with a passing grade.
15 hrs 300+ level CSci electives	15	Complete 15 hours of computer science electives chosen from computer science courses at the 300 level and above.
School of Engineering GPA		Must be at least a 2.0.

Major Requirements II

Requirement Hours	Description
6 hrs Add'l science elective	Complete 6 credit hours of additional science electives chosen from the following Astro 103, 104- Chem 221 , 222 - Geol 101 , 102 , 103 , 104 , 105 , 107 and 120 (not both 101 and 104)- Bio, Chem, Phys & Geo 300+ and any of our Lab Science not already taken.
El E 235	3 Complete El E 235 with a passing grade.
El E 236	1 Complete El E 236 with a passing grade.
Math 263 or 319	3 Complete either Math 263 or Math 319 .
Math 301	3 Complete Math 301 with a passing grade.
Math 302 or 401	3 Complete Math 302 or Math 401 with a passing grade.
Math 375	3 Complete Math 375 with a passing grade.

Non-minor requirements

Requirement	Hours	Description
18 hrs tech elective or minor	18	Complete either 18 hours of course work for an approved minor or other technical electives chosen in consultation with the academic advisor.

[Emphasis - Data Science](#)

Requirement	Hours	Description
CSci 343	3	Complete CSci 343 with a grade of C- or better.
CSci 443	3	Complete CSci 443 with a grade of C- or better.
CSci 475	3	Complete CSci 475 with a grade of C- or better.
6 add'l hrs of Data Science	6	Complete 6 add'l hours of data science courses chosen from: CSci 345 , 444 , 492 , 517 , or CSci 543 with a grade of C- or better.

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Emphasis - Computer Security

- [B.S.C.S. in Computer Science](#)
- [Emphasis - Computer Security](#)
- [Degree Requirements](#)

B.S.C.S. in Computer Science

Description

The goal of the B.S.C.S. program is to give each student a thorough professional education in contemporary computer science while allowing sufficient flexibility for the student to pursue individual interests in related technical fields.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Mission Statement

The Department of Computer and Information Science at the University of Mississippi seeks to provide high-quality programs of instruction, research, and service and to refine them continuously to meet the evolving needs of its students and society. Toward this end, the Department shall: * enable its undergraduate students to master the fundamental principles of computing and to develop the skills needed to solve practical problems using contemporary computer-based technologies and practices; * empower its graduate students to understand advanced concepts, develop new technologies and methods, and expand the base of fundamental knowledge; * cultivate a community of professionals that encourages scholarship and facilitates both applied and theoretical research; * serve its constituents in government, industry, and the public as a resource on state-of-the-art computing science and information technology.

BSCS Program Educational Objectives

As effective members of the Computer Science profession:

1. Graduates demonstrate the ability to solve computing problems commensurate with their levels of professional experience
2. Graduates demonstrate the ability to contribute effectively to the benefit of teams
3. Graduates continue to update their professional knowledge and skills to adapt to changes in technology and the evolving needs of society and the workplace

BSCS Student Outcomes

In keeping with the accreditation of the BSCS program by ABET, Inc., the Department helps students have the ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

General Education Requirements

Candidates for the B.S.C.S. degree must successfully complete the following general education requirements:

- 6 hours from Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102;

- 3 hours of literature chosen from Engl 221-226;
- 8 hours of laboratory science chosen from Chem 105, 106, 115, 116 or Phys 211, 212, 221, 222 or Bisc 160, 161, 162, 163;
- 6 hours from Math 261 and 262;
- 3 hours from Spch 102 or Spch 105;
- 6 hours of social science chosen from anthropology, economics, political science, psychology, and sociology;
- 3 hours of humanities chosen from classics, English, history, modern languages, philosophy, religion, and African American studies, gender studies, or southern studies;
- 3 hours of fine arts chosen from courses in the history, appreciation, and criticism of art, dance, music, and theatre arts (Courses emphasizing the enhancement of skills and performance are not acceptable.);
- 3 additional hours of fine arts, languages (modern, Greek, or Latin), or humanities.

Course Requirements

Candidates for the B.S.C.S. degree must successfully complete the following requirements in addition to the general education requirements:

- 12 hours from Math 301, 302 or 401, 375, and either 263 or 319;
- 6 additional hours of science electives chosen from the laboratory science courses listed above or from Astr 103, 104, Chem 221, 222, Geol 101, 102, 103, 104, 105, 107, and 120 (except not both Geol 101 and 104), and biology, chemistry, physics, and geology courses at the 300-level and above; (If a science course has a separate, but coordinated laboratory course, the student is strongly encouraged to enroll for the laboratory section as well as the lecture section.)
- 4 hours from EI E 235, 236;
- 31 hours from Csci 111, 112, 211, 223, 300, 311, 387, 423, 433, 450, and 487;
- 15 hours of computer science electives chosen from 300 level and above or other approved electives;
- 18 hours of course work for an approved minor or other technical electives chosen in consultation with the academic advisor.

Emphases:

Students can earn an emphasis in either computer security or data science by completing the 15 hours of required Csci 300+ electives as follows:

Computer Security Emphasis:

- Csci 325 Foundations of Computer Security
- Csci 361 Introduction to Computer Networks
- Csci 426 System Security
- Csci 427 Network Security
- One of: CSci 323-Systems of Programming, CSci 475-Introduction to Database Systems, CSci 491-Special Topics in Computer Security, CSci 523-Operating Systems, or CSci 561-Computer Networks

Data Science Emphasis:

- Csci 343 Fundamentals of Data Science
- Csci 443 Advanced Data Science
- Csci 475 Introduction to Database Systems
- Two of: CSci 345-Information Storage and Retrieval, CSci 444-Information Visualization, CSci 492-Special Topics in Data Science, CSci 517-Natural Language Processing, or CSci 543-Data Mining.

*Note that a student may earn at most ONE emphasis on the B.S.C.S. degree.

Emphasis - Computer Security

Degree Requirements

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courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.C.S. in Computer Science

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs literature survey	3	Complete 3 hours of literature survey chosen from Eng 220 , Eng 221 , Eng 222 , Eng 223 , Eng 224 , Eng 225 , or Eng 226 .
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.
6 hrs social science	6	Complete 6 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) and Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish

General Education II

Requirement	Hours	Description
8 hrs lab science	8	Complete 8 hours of laboratory science chosen from the following: CHEM 105 , 106 , 115 , 116 ; PHYS 211 , 212 , 221 , 222 ; or BISC 160 , 161 , 162 , 163 .
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.

Major Requirements

Requirement	Hours	Description
Csci 111	3	Complete Csci 111 with a passing grade.
Csci 112	3	Complete Csci 112 with a passing grade.
Csci 211	3	Complete Csci 211 with a passing grade.
Csci 300	1	Complete Csci 300 with a passing grade.
Csci 223	3	Complete Csci 223 with a passing grade.
Csci 311	3	Complete Csci 311 with a passing grade.
Csci 387	3	Complete Csci 387 with a passing grade.
Csci 423	3	Complete Csci 423 with a passing grade.
Csci 433	3	Complete Csci 433 with a passing grade.
Csci 450	3	Complete Csci 450 with a passing grade.

Requirement	Hours	Description
Csci 487	3	Complete Csci 487 with a passing grade.
15 hrs 300+ level CSci electives	15	Complete 15 hours of computer science electives chosen from computer science courses at the 300 level and above.
School of Engineering GPA		Must be at least a 2.0.

Major Requirements II

Requirement Hours	Description
6 hrs Add'l science elective	Complete 6 credit hours of additional science electives chosen from the following Astro 103, 104- Chem 221 , 222 - Geol 101 , 102 , 103 , 104 , 105 , 107 and 120 (not both 101 and 104)- Bio, Chem, Phys & Geo 300+ and any of our Lab Science not already taken.
El E 235	3 Complete El E 235 with a passing grade.
El E 236	1 Complete El E 236 with a passing grade.
Math 263 or 319	3 Complete either Math 263 or Math 319 .
Math 301	3 Complete Math 301 with a passing grade.
Math 302 or 401	3 Complete Math 302 or Math 401 with a passing grade.
Math 375	3 Complete Math 375 with a passing grade.

Non-minor requirements

Requirement	Hours	Description
18 hrs tech elective or minor	18	Complete either 18 hours of course work for an approved minor or other technical electives chosen in consultation with the academic advisor.

Emphasis - Computer Security

Requirement	Hours	Description
CSci 325	3	Complete CSci 325 with a grade of C- or better.
CSci 361	3	Complete CSci 361 with a grade of C- or better.
CSci 426	3	Complete CSci 426 with a grade of C- or better.
CSci 427	3	Complete CSci 427 with a grade of C- or better.
3 add'l hrs of Computer Security	3	Complete 3 add'l hours of computer security courses with a grade of C- or better chosen from: CSci 323 , 475 , 491 , 523 or CSci 561 .

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B.S.C.S. in Computer Science

- [Overview](#)
- [Degree Requirements](#)

Description

The goal of the B.S.C.S. program is to give each student a thorough professional education in contemporary computer science while allowing sufficient flexibility for the student to pursue individual interests in related technical fields.

Minimum Total Credit Hours: 127

Goals/Mission Statement

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General Education Requirements

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- 3 hours of literature chosen from Engl 221-226;
- 8 hours of laboratory science chosen from Chem 105, 106, 115, 116 or Phys 211, 212, 221, 222 or Bisc 160, 161, 162, 163;
- 6 hours from Math 261 and 262;

- 3 hours from Spch 102 or Spch 105;
- 6 hours of social science chosen from anthropology, economics, political science, psychology, and sociology;
- 3 hours of humanities chosen from classics, English, history, modern languages, philosophy, religion, and African American studies, gender studies, or southern studies;
- 3 hours of fine arts chosen from courses in the history, appreciation, and criticism of art, dance, music, and theatre arts (Courses emphasizing the enhancement of skills and performance are not acceptable.);
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- 6 additional hours of science electives chosen from the laboratory science courses listed above or from Astr 103, 104, Chem 221, 222, Geol 101, 102, 103, 104, 105, 107, and 120 (except not both Geol 101 and 104), and biology, chemistry, physics, and geology courses at the 300-level and above; (If a science course has a separate, but coordinated laboratory course, the student is strongly encouraged to enroll for the laboratory section as well as the lecture section.)
- 4 hours from El E 235, 236;
- 31 hours from Csci 111, 112, 211, 223, 300, 311, 387, 423, 433, 450, and 487;
- 15 hours of computer science electives chosen from 300 level and above or other approved electives;
- 18 hours of course work for an approved minor or other technical electives chosen in consultation with the academic advisor.

Emphases:

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Data Science Emphasis:

- Csci 343 Fundamentals of Data Science
- Csci 443 Advanced Data Science
- Csci 475 Introduction to Database Systems
- Two of: CSci 345-Information Storage and Retrieval, CSci 444-Information Visualization, CSci 492-Special Topics in Data Science, CSci 517-Natural Language Processing, or CSci 543-Data Mining.

*Note that a student may earn at most ONE emphasis on the B.S.C.S. degree.

Specializations

- [Emphasis - Computer Security](#)
- [Emphasis - Data Science](#)

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B.S.C.S. in Computer Science

- [Overview](#)
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Degree Requirements

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B.S.C.S. in Computer Science

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs literature survey	3	Complete 3 hours of literature survey chosen from Eng 220 , Eng 221 , Eng 222 , Eng 223 , Eng 224 , Eng 225 , or Eng 226 .
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.
6 hrs social science	6	Complete 6 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish

General Education II

Requirement	Hours	Description
8 hrs lab science	8	Complete 8 hours of laboratory science chosen from the following: CHEM 105 , 106 , 115 , 116 ; PHYS 211 , 212 , 221 , 222 ; or BISC 160 , 161 , 162 , 163 .
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.

Major Requirements

Requirement	Hours	Description
Csci 111	3	Complete Csci 111 with a passing grade.
Csci 112	3	Complete Csci 112 with a passing grade.

Requirement	Hours	Description
Csci 211	3	Complete Csci 211 with a passing grade.
Csci 300	1	Complete Csci 300 with a passing grade.
Csci 223	3	Complete Csci 223 with a passing grade.
Csci 311	3	Complete Csci 311 with a passing grade.
Csci 387	3	Complete Csci 387 with passing grade
Csci 423	3	Complete Csci 423 with a passing grade.
Csci 433	3	Complete Csci 433 with a passing grade.
Csci 450	3	Complete Csci 450 with a passing grade.
Csci 487	3	Complete Csci 487 with a passing grade.
15 hrs 300+ level CSci electives	15	Complete 15 hours of computer science electives chosen from computer science courses at the 300 level and above.
School of Engineering GPA		Must be at least a 2.0.

Major Requirements II

Requirement Hours	Description
6 hrs Add'l science elective	Complete 6 credit hours of additional science electives chosen from the following Astro 103, 104- Chem 221 , 222 - Geol 101 , 102 , 103 , 104 , 105 , 107 and 120 (not both 101 and 104)- Bio, Chem, Phys & Geo 300 + and any of our Lab Science not already taken.
ELE 235	3 Complete ELE 235 with a passing grade.
ELE 236	1 Complete ELE 236 with a passing grade.
Math 263 or 319	3 Complete either Math 263 or Math 319 .
Math 301	3 Complete Math 301 with a passing grade.
Math 302 or 401	3 Complete Math 302 or Math 401 with a passing grade.
Math 375	3 Complete Math 375 with a passing grade.

Non-minor requirements

Requirement	Hours	Description
18 hrs tech elective or minor	18	Complete either 18 hours of course work for an approved minor or other technical electives chosen in consultation with the academic advisor.

[Emphasis - Data Science](#)

Requirement	Hours	Description
CSci 343	3	Complete CSci 343 with a a grade of C- or better.
CSci 443	3	Complete CSci 443 with a grade of C- or better.
CSci 475	3	Complete CSci 475 with a grade of C- or better.
6 add'l hrs of Data Science	6	Complete 6 add'l hours of data science courses chosen from: CSci 345 , 444 , 492 , 517 , or CSci 543 with a grade of C- or better.

[Emphasis - Computer Security](#)

Requirement	Hours	Description
CSci 325	3	Complete CSci 325 with a grade of C- or better.

Requirement	Hours	Description
CSci 361	3	Complete CSci 361 with a grade of C- or better.
CSci 426	3	Complete CSci 426 with a grade of C- or better.
CSci 427	3	Complete CSci 427 with a grade of C- or better.
3 add'l hrs of Computer Security	3	Complete 3 add'l hours of computer security courses with a grade of C- or better chosen from: CSci 323 , 475 , 491 , 523 or CSci 561 .

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Telecommunications

- [Overview](#)
- [Faculty](#)

Faculty in Telecommunications

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Telecommunications

- [Overview](#)
- [Faculty](#)

Contact

20 Anderson Hall
University, MS 38677

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Emphasis - Manufacturing

- [B.S. in Engineering](#)
- [Emphasis - Manufacturing](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Manufacturing

Description

Manufacturing Emphasis - This emphasis stresses manufacturing science and technology, while providing a cross-disciplinary foundation in business and accountancy to meet the need for qualified managerial and technical professionals in the rapidly expanding field of manufacturing. The curriculum provides core knowledge in engineering and manufacturing fundamentals with electives in accountancy, business, management information systems, and management and marketing. The student should consult with and obtain the approval of his/her academic adviser for the selection of the desired option courses.

Course Requirements

For an emphasis in manufacturing, students must complete the following 21 hours:

- Manf 150, 152, 252, 253, 255, 351, 353, 355, 455
- Accy 201, 202

Additionally, students must take Econ 202 and Econ 203 as part of the SS/Hum/FA courses.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .

Requirement Hours	Description
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.
Engr 361 1	Complete Engr 361 with a passing grade.
Engr 400 1	Complete Engr 400 with a passing grade.
Engr 431 3	Complete Engr 431 with a passing grade.
Engr 451 2	Complete Engr 451 with a passing grade.

Requirement Hours		Description
<u>Engr 452</u>	1	Complete Engr 452 with a passing grade.
<u>Manf 460</u>	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Manufacturing

Requirement Hours		Description
<u>Manf 150</u>	1	Complete Manf 150 with a passing grade.
<u>Manf 152</u>	1	Complete Manf 152 with a passing grade.
<u>Manf 251</u>	3	Complete Manf 251 with a passing grade.
<u>Manf 252</u>	1	Complete Manf 252 with a passing grade.
<u>Manf 253</u>	3	Complete Manf 253 with a passing grade.
<u>Manf 255</u>	1	Complete Manf 255 with a passing grade.
<u>Manf 351</u>	1	Complete Manf 351 with a passing grade.
<u>Manf 353</u>	3	Complete Manf 353 with a passing grade.
<u>Manf 355</u>	1	Complete Manf 355 with a passing grade.
<u>Manf 455</u>	3	Complete Manf 455 with a passing grade.
<u>Econ 202</u>	3	Complete Econ 202 with a passing grade.
<u>Econ 203</u>	3	Complete Econ 203 with a passing grade.

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Emphasis - Global Security Studies

- [B.S. in Engineering](#)
- [Emphasis - Global Security Studies](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Global Security Studies

Description

The Global Security Studies (GSS) emphasis is designed to familiarize students with the skills and background necessary for entry-level employment in the national security and defense sector. Students must complete each course in the emphasis with a grade of “C-” or better.

Course Requirements

Emphasis Courses (18 hours)

- ISS 135 – Intro to Global & National Security Studies (3 hr)
- ISS 301 – Survey of U.S. National Security Policy (3 hr)
- ISS 351 – Advanced Analytics I (3 hr)
- Three electives chosen from:
 - ISS 125 – Introduction to Intelligence Studies (3 hr)
 - ISS 360 – Overview of Cybersecurity and Policy (3 hr)
 - ISS 420 – Special Topics (3 hr)
 - ISS 480 – National Security Issues for the 21st Century (3 hr)
 - ISS 490 – Internship (3 hr)
 - POL 335 – International Politics of Nuclear Weapons (3 hr) Other courses as approved by the Center for Intelligence and Security Studies

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement Hours	Description
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Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 .

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Engr 100 or Engr 102	3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251	3	Complete CSci 251 with a passing grade.
Engr 201	3	Complete Engr 201 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.

Requirement Hours		Description
Engr 400	1	Complete Engr 400 with a passing grade.
Engr 431	3	Complete Engr 431 with a passing grade.
Engr 451	2	Complete Engr 451 with a passing grade.
Engr 452	1	Complete Engr 452 with a passing grade.
Manf 460	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Global Security Studies

Requirement	Hours	Description
ISS 135 C- min (BS ENGR (gss))	3	Complete ISS 135 with a grade of C- or better.
ISS 301 C- min (BS ENGR (gss))	3	Complete ISS 301 with a grade of C- or better.
ISS 351 C- min (BS ENGR (gss))	3	Complete ISS 351 with a grade of C- or better.
9 hrs elect C- min (BS ENGR (gss))	9	Complete 9 hrs of electives with a grade of C- or better chosen from the following: ISS 125 , 360 , 420 , 480 , 490 , & Pol 335 .
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Intelligent Security Studies

- [B.S. in Engineering](#)
- [Emphasis - Intelligent Security Studies](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Intelligent Security Studies

Description

The Intelligence and Security Studies (ISS) emphasis is designed to prepare outstanding students at the University of Mississippi for entry-level positions in the U.S. Intelligence Community. Admission to the ISS emphasis is available to U.S. citizens after a rigorous selection process after completion of ISS 125. Additionally, the completion of an internship is required. Staff in the Center for Intelligence and Security Studies will work with the intelligence community to place students in internships that complement their academic experience. Internships may be in intelligence community agencies, other governmental organizations, and the private sector. Students must complete each course in the emphasis with a grade of “B” or better and must maintain an overall GPA of 3.0.

Course Requirements

Emphasis Courses (18 hours)

- ISS 125 – Introduction to Intelligence Studies (3 hr)
- ISS 351 – Advanced Analytics I (3 hr)
- ISS 352 – Advanced Analytics II (3 hr)
- ISS 490 – Internship (3 hr)
- ISS 499 – Capstone (3 hr)
- One elective chosen from:
 - ISS 301 – Survey of U.S. National Security Policy (3 hr)
 - ISS 360 – Overview of Cybersecurity and Policy (3 hr)
 - ISS 420 – Special Topics (3 hr)
 - ISS 480 – National Security Issues for the 21st Century (3 hr)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Sucessfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 .

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Engr 100 or Engr 102	3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251	3	Complete CSci 251 with a passing grade.
Engr 201	3	Complete Engr 201 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.

Requirement	Hours	Description
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.
Engr 431	3	Complete Engr 431 with a passing grade.
Engr 451	2	Complete Engr 451 with a passing grade.
Engr 452	1	Complete Engr 452 with a passing grade.
Manf 460	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Intelligent Security Studies

Requirement	Hours	Description
ISS 125 B min (BS ENGR (iss))	3	Complete ISS 125 with a grade of B or better.
ISS 351 B min (BS ENGR (iss))	3	Complete ISS 351 with a grade of B or better.
ISS 352 B min (BS ENGR (iss))	3	Complete ISS 352 with a grade of B or better.
ISS 490 B min (BS ENGR (iss))	3	Complete ISS 490 with a grade of B or better.
ISS 499 B min (BS ENGR (iss))	3	Complete ISS 499 with a grade of B or better.
3 hrs elect - B min (BS ENGR (iss))	3	Complete 3 hrs of electives with a grade of B or better chosen from: ISS 301 , 360 , 420 , & ISS 480 .
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Pre-Med Studies

- [B.S. in Engineering](#)
- [Emphasis - Pre-Med Studies](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Pre-Med Studies

Description

An emphasis in pre-med studies is intended to prepare students for further study in medical school.

Course Requirements

For an emphasis in pre-med studies, students must complete the following 21 hours:

- Bisc 160 (3)
- Bisc 161 (1)
- Bisc 162 (3)
- Bisc 163 (1)
- Chem 221 (3)
- Chem 225 (1)
- Chem 222 (3)
- Chem 226 (1)
- 5 hours of 300+ level Chem or Bisc (Psy courses can be taken as SS)

Additionally, students must take Psy 201 (3), which may count as a social science elective.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement Hours	Description
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Requirement Hours	Description
First Year Writing I 3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II 3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.

Requirement	Hours	Description
Engr 361	1	Complete Engr 361 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.
Engr 431	3	Complete Engr 431 with a passing grade.
Engr 451	2	Complete Engr 451 with a passing grade.
Engr 452	1	Complete Engr 452 with a passing grade.
Manf 460	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Pre-Med Studies

Requirement	Hours	Description
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Chem 222	3	Complete Chem 222 with a passing grade.
Chem 226	1	Complete Chem 226 with a passing grade.
2 hrs Chem/Bisc @ 300+	2	Complete 2 hrs of Chem or Bisc at the 300+ level with a passing grade.
Psy 201	3	Complete Psy 201 with a passing grade.
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Entrepreneurship

- [B.S. in Engineering](#)
- [Emphasis - Entrepreneurship](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Entrepreneurship

Description

The Entrepreneurship emphasis is designed to prepare outstanding students at the University of Mississippi to pursue the process of starting and running their own business. The entrepreneurship major is designed to teach and promote: opportunity recognition, opportunity assessment, risk management & mitigation, conveying a compelling vision, tenacity & perseverance, creative problem solving, resource leveraging, guerrilla skills, value creation, maintain focus yet adapt, resilience, self-efficacy, and building networks.

Course Requirements

Emphasis Courses (18 hours) * Accy 201 – Introduction to Intelligence Studies (3 hr) * Accy 202 – Advanced Analytics I (3 hr)

Additionally, students must take Econ 202 and Econ 203 as part of the SS/Hum/FA courses.

*Four electives chosen from: * ENT 321 – Entrepreneurial Pitching * *ENT 331 – Social Influencing in Sports * *ENT 351 – Design Thinking * *ENT 352 – Entrepreneurial Law (New Fall 2023) * *ENT 356 – Quickbooks -- Get QuickBooks User Certified! * *ENT 381 – Arts Entrepreneurship * *ENT 382 – Franchising * *ENT 386 – Digital Marketing 1 Get Google Garage Certified! * *ENT 387 – Digital Marketing 2 (Requires Digital Marketing 1) * *ENT 388 – e-Commerce Strategy for Entrepreneurship * ENT 396 – Business Venturing * *ENT 411 – Project Management for PMI Certification Get PMP or CAPM Certified! * *ENT 412 – Basics of Applied International Trade Get Nasbte CGBP Certified! * *ENT 422 – Blockchain and the Modern Economy * ENT 426 – Venture Ideas (Requires MGMT 371) * ENT 436 – Business Modeling and Strategy (Requires MGMT 371) * ENT 446 – Corporate Innovation (Requires MGMT 371) * ENT 456 – Venture Finance (Requires MGMT 371) * *ENT 466 – Regulating Small Business and New Ventures (Requires MGMT 371 or GB 370) * *ENT 476 – Entrepreneurial Leadership (Requires MGMT 371 or GB 370) * *ENT 486 – Family Business Management (Requires MGMT 371 or GB 370) * *GB 350 – Essentials of Marketing * *GB 370 – Entrepreneurship and Management * Any other ENT prefix course will count for the emphasis as well as approved BUS 380 & BUS 400 courses (study abroad and internships) at management department discretion *Available Online

Degree Requirements

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B.S. in Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 .

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Engr 100 or Engr 102	3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251	3	Complete CSci 251 with a passing grade.
Engr 201	3	Complete Engr 201 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.

Requirement Hours		Description
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.
Engr 431	3	Complete Engr 431 with a passing grade.
Engr 451	2	Complete Engr 451 with a passing grade.
Engr 452	1	Complete Engr 452 with a passing grade.
Manf 460	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Entrepreneurship

Requirement Hours		Description
Accy 201 (BS Engr (entr))	3	Complete Accy 201 with a passing grade.
Accy 202 (BS Engr (entr))	3	Complete Accy 202 with a passing grade.
12 hrs elect (BS Engr (entr))	12	Complete 4 courses chosen from the following: ENT 321 , 331 , 351 , 352 , 356 , 381 , 382 , 386 , 387 , 388 , 396 , 411 , 412 , 422 , 426 , 436 , 446 , 456 , 466 , 476 , 486 , GB 350 , 370 . Any other ENT prefix course will count for the emphasis as well as approved BUS 380 & BUS 400 courses (study abroad and internships) at management department discretion.
Econ 202	3	Complete Econ 202 with a passing grade.
Econ 203	3	Complete Econ 203 with a passing grade.

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Emphasis - Military Science

- [B.S. in Engineering](#)
- [Emphasis - Military Science](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Military Science

Description

Students seeking an emphasis in military science will be assigned an adviser in both the Department of Military Science and School of Engineering.

Course Requirements

For an emphasis in military science, students must complete 21 credit hours chosen from the following:

- MSL 201, 202, 203, 301, 302, 340, 399, 401, 402, or
- ISS 125

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

	Requirement Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Requirement Hours	Description
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.
Engr 361 1	Complete Engr 361 with a passing grade.
Engr 400 1	Complete Engr 400 with a passing grade.
Engr 431 3	Complete Engr 431 with a passing grade.
Engr 451 2	Complete Engr 451 with a passing grade.
Engr 452 1	Complete Engr 452 with a passing grade.
Manf 460 3	Complete Manf 460 with a passing grade.

Requirement Hours	Description
12 hrs approved engr electives 12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Military Science

Requirement Hours	Description
18 hrs from selected courses 18	Complete 18 hrs chosen from the following courses: MSL 201 , 202 , 203 , 301 , 302 , 340 , 399 , 401 , 402 , and ISS 125 with a passing grade.
3 hrs social sciences 3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Aerospace Studies

- [B.S. in Engineering](#)
- [Emphasis - Aerospace Studies](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Aerospace Studies

Description

Students seeking an emphasis in aerospace studies will be assigned an adviser in both the Department of Aerospace Studies and School of Engineering.

Course Requirements

For an emphasis in aerospace studies students must complete 21 hrs from the following:

- AS 101, AS 102, AS 105, AS 111, AS 112, AS 201, AS 202, AS 211, AS 212, AS 301, AS 302, AS 311, AS 312, AS 401, AS 402, AS 411, and AS 412

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

	Requirement Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Requirement Hours	Description
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.
Engr 361 1	Complete Engr 361 with a passing grade.
Engr 400 1	Complete Engr 400 with a passing grade.
Engr 431 3	Complete Engr 431 with a passing grade.
Engr 451 2	Complete Engr 451 with a passing grade.
Engr 452 1	Complete Engr 452 with a passing grade.
Manf 460 3	Complete Manf 460 with a passing grade.

Requirement Hours	Description
12 hrs approved engr electives 12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Aerospace Studies

Requirement Hours	Description
18 hrs of AS courses 18	For an emphasis in aerospace studies students must complete 18 hrs from the following: AS 101 , AS 102 , AS 105 , AS 111 , AS 112 , AS 201 , AS 202 , AS 211 , AS 212 , AS 301 , AS 302 , AS 311 , AS 312 , AS 401 , AS 402 , AS 411 , and AS 412
3 hrs social sciences 3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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B.S. in Engineering

- [Overview](#)
- [Degree Requirements](#)

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116
- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Specializations

- [Emphasis - Aerospace Engineering](#)
- [Emphasis - Aerospace Studies](#)
- [Emphasis - Business Administration](#)
- [Emphasis - Entrepreneurship](#)
- [Emphasis - Global Security Studies](#)
- [Emphasis - Intelligent Security Studies](#)
- [Emphasis - Manufacturing](#)
- [Emphasis - Military Science](#)
- [Emphasis - Naval Science](#)
- [Emphasis - Pre-Med Studies](#)
- [Standard Option](#)

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Standard Option

- [B.S. in Engineering](#)
- [Standard Option](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Standard Option

Description

This emphasis is based on individually designed curricula that permit the student to obtain a strong background in engineering while simultaneously giving the student a broad education outside these areas of study. The 21 hours of emphasis courses must be organized around a coherent theme and must be pre-approved by the director of general engineering.

Course Requirements

- 21 hours of an approved emphasis area

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

	Requirement Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Requirement Hours	Description
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.
Engr 361 1	Complete Engr 361 with a passing grade.
Engr 400 1	Complete Engr 400 with a passing grade.
Engr 431 3	Complete Engr 431 with a passing grade.
Engr 451 2	Complete Engr 451 with a passing grade.
Engr 452 1	Complete Engr 452 with a passing grade.
Manf 460 3	Complete Manf 460 with a passing grade.

Requirement Hours	Description
12 hrs approved engr electives 12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Standard Option

Requirement	Hours	Description
18 hrs approved by Dir of Gen Engr	18	The 18 hours of emphasis courses must be organized around a coherent theme and must be pre-approved by the director of general engineering.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Business Administration

- [B.S. in Engineering](#)
- [Emphasis - Business Administration](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Business Administration

Description

For students earning an emphasis in business administration, coursework is designed to prepare them for an MBA graduate program.

Course Requirements

For an emphasis in business administration, students must complete the following 21 hours:

- Accy 201 and Accy 202
- Mktg 351
- Fin 331
- Mgmt 371
- Bus 230 and 250

Additionally, students must take Econ 202 and Econ 203 as part of the SS/Hum/FA courses.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .

Requirement Hours	Description
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.
Engr 361 1	Complete Engr 361 with a passing grade.
Engr 400 1	Complete Engr 400 with a passing grade.
Engr 431 3	Complete Engr 431 with a passing grade.
Engr 451 2	Complete Engr 451 with a passing grade.

Requirement Hours		Description
<u>Engr 452</u>	1	Complete Engr 452 with a passing grade.
<u>Manf 460</u>	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Business Administration

Requirement	Hours	Description
Accy 201	3	Complete Accy 201 with a passing grade.
Accy 202	3	Complete Accy 202 with a passing grade.
Mktg 351 or Mgmt 371	3	Complete Mktg 351 or Mgmt 371 with a passing grade.
Bus 230 or Econ 230	3	Complete Bus 230 or Econ 230 with a passing grade.
Bus 250	3	Complete Bus 250 with a passing grade.
Fin 331	3	Complete Fin 331 with a passing grade.
Econ 202	3	Complete Econ 202 with a passing grade.
Econ 203	3	Complete Econ 203 with a passing grade.

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Emphasis - Naval Science

- [B.S. in Engineering](#)
- [Emphasis - Naval Science](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Naval Science

Description

Students seeking an emphasis in naval science will be assigned an adviser in both the Department of Naval Science and School of Engineering.

Course Requirements

For an emphasis in naval science, students must complete 21 credit hours chosen from the following:

- NSC 211, 212, 213, 215, 216, 310, 312, 313, 315, 316, 317, 318, 320, 410, 412, 413, 415, 416, 417, or 418,

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

	Requirement Hours	Description
First Year Writing I	3	Sucessfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Requirement Hours	Description
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310 3	Successfully complete Econ 310 .

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.
Chem 105 3	Complete Chem 105 with a passing grade.
Chem 115 1	Complete Chem 115 with a passing grade.
Chem 106 3	Complete Chem 106 with a passing grade.
Chem 116 1	Complete Chem 116 with a passing grade.
Phys 211 3	Complete Phys 211 with a passing grade.
Phys 221 1	Complete Phys 221 with a passing grade.
Phys 212 3	Complete Phys 212 with a passing grade.
Phys 222 1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours	Description
Engr 100 or Engr 102 3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251 3	Complete CSci 251 with a passing grade.
Engr 201 3	Complete Engr 201 with a passing grade.
Engr 309 3	Complete Engr 309 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 312 3	Complete Engr 312 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 314 1	Complete Engr 314 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.
Engr 323 3	Complete Engr 323 with a passing grade.
Engr 360 3	Complete Engr 360 with a passing grade.
Engr 361 1	Complete Engr 361 with a passing grade.
Engr 400 1	Complete Engr 400 with a passing grade.
Engr 431 3	Complete Engr 431 with a passing grade.
Engr 451 2	Complete Engr 451 with a passing grade.
Engr 452 1	Complete Engr 452 with a passing grade.
Manf 460 3	Complete Manf 460 with a passing grade.

Requirement Hours	Description
12 hrs approved engr electives 12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Naval Science

Requirement Hours	Description
18 hrs from selected courses 18	Complete 18 hrs chosen from the following courses: NSC 211 , 212 , 213 , 215 , 216 , 310 , 312 , 313 , 315 , 316 , 317 , 318 , 320 , 410 , 412 , 413 , 415 , 416 , 417 , or NSC 418 with a passing grade.
3 hrs social sciences 3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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B.S. in Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Sucessfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 .

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Engr 100 or Engr 102	3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251	3	Complete CSci 251 with a passing grade.
Engr 201	3	Complete Engr 201 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.
Engr 431	3	Complete Engr 431 with a passing grade.
Engr 451	2	Complete Engr 451 with a passing grade.
Engr 452	1	Complete Engr 452 with a passing grade.
Manf 460	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , CE 207 , CE 208 , CE 210 , CE 325 , CE 471 , CE 472 , Csci 111 , Csci 112 , Csci 343 , EI E 235 , EI E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Aerospace Studies

Requirement	Hours	Description
18 hrs of AS courses	18	For an emphasis in aerospace studies students must complete 18 hrs from the following: AS 101 , AS 102 , AS 105 , AS 111 , AS 112 , AS 201 , AS 202 , AS 211 , AS 212 , AS 301 , AS 302 , AS 311 , AS 312 , AS 401 , AS 402 , AS 411 , and AS 412
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Business Administration

Requirement	Hours	Description
Accy 201	3	Complete Accy 201 with a passing grade.
Accy 202	3	Complete Accy 202 with a passing grade.
Mktg 351 or Mgmt 371	3	Complete Mktg 351 or Mgmt 371 with a passing grade.
Bus 230 or Econ 230	3	Complete Bus 230 or Econ 230 with a passing grade.
Bus 250	3	Complete Bus 250 with a passing grade.
Fin 331	3	Complete Fin 331 with a passing grade.
Econ 202	3	Complete Econ 202 with a passing grade.

Requirement	Hours	Description
Econ 203	3	Complete Econ 203 with a passing grade.

Emphasis - Manufacturing

Requirement	Hours	Description
Manf 150	1	Complete Manf 150 with a passing grade.
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.
Manf 351	1	Complete Manf 351 with a passing grade.
Manf 353	3	Complete Manf 353 with a passing grade.
Manf 355	1	Complete Manf 355 with a passing grade.
Manf 455	3	Complete Manf 455 with a passing grade.
Econ 202	3	Complete Econ 202 with a passing grade.
Econ 203	3	Complete Econ 203 with a passing grade.

Emphasis - Military Science

Requirement	Hours	Description
18 hrs from selected courses	18	Complete 18 hrs chosen from the following courses: MSL 201 , 202 , 203 , 301 , 302 , 340 , 399 , 401 , 402 , and ISS 125 with a passing grade.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Naval Science

Requirement	Hours	Description
18 hrs from selected courses	18	Complete 18 hrs chosen from the following courses: NSC 211 , 212 , 213 , 215 , 216 , 310 , 312 , 313 , 315 , 316 , 317 , 318 , 320 , 410 , 412 , 413 , 415 , 416 , 417 , or NSC 418 with a passing grade.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Pre-Med Studies

Requirement	Hours	Description
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.

Requirement	Hours	Description
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Chem 222	3	Complete Chem 222 with a passing grade.
Chem 226	1	Complete Chem 226 with a passing grade.
2 hrs Chem/Bisc @ 300+	2	Complete 2 hrs of Chem or Bisc at the 300+ level with a passing grade.
Psy 201	3	Complete Psy 201 with a passing grade.
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Standard Option

Requirement	Hours	Description
18 hrs approved by Dir of Gen Engr	18	The 18 hours of emphasis courses must be organized around a coherent theme and must be pre-approved by the director of general engineering.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Intelligent Security Studies

Requirement	Hours	Description
ISS 125 B min (BS ENGR (iss))	3	Complete ISS 125 with a grade of B or better.
ISS 351 B min (BS ENGR (iss))	3	Complete ISS 351 with a grade of B or better.
ISS 352 B min (BS ENGR (iss))	3	Complete ISS 352 with a grade of B or better.
ISS 490 B min (BS ENGR (iss))	3	Complete ISS 490 with a grade of B or better.
ISS 499 B min (BS ENGR (iss))	3	Complete ISS 499 with a grade of B or better.
3 hrs elect - B min (BS ENGR (iss))	3	Complete 3 hrs of electives with a grade of B or better chosen from: ISS 301 , 360 , 420 , & ISS 480 .
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Global Security Studies

Requirement	Hours	Description
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Requirement	Hours	Description
<u>ISS 135</u> C- min (BS ENGR (gss))	3	Complete <u>ISS 135</u> with a grade of C- or better.
<u>ISS 301</u> C- min (BS ENGR (gss))	3	Complete <u>ISS 301</u> with a grade of C- or better.
<u>ISS 351</u> C- min (BS ENGR (gss))	3	Complete <u>ISS 351</u> with a grade of C- or better.
9 hrs elect C- min (BS ENGR (gss))	9	Complete 9 hrs of electives with a grade of C- or better chosen from the following: <u>ISS 125</u> , <u>360</u> , <u>420</u> , <u>480</u> , <u>490</u> , & <u>Pol 335</u> .
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), <u>Liba 203</u> , <u>313</u> , or <u>Hon 101</u> , <u>102</u>
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Aerospace Engineering

Requirement	Hours	Description
<u>Phys 308</u>	3	Complete <u>Phys 308</u> with a passing grade.
9 hrs ae electives (BS Engr (ae))	9	Complete 9 hrs of electives with a passing grade chosen from the following: <u>CSci 111</u> , <u>112</u> , <u>325</u> , <u>356</u> , <u>ISS 125</u> , <u>EL E 235</u> , <u>236</u> , <u>Phys 310</u> , <u>C E 310</u> , and <u>ME 527</u> .
6 hrs general electives	6	Complete 6 hrs of electives of your choice.
<u>Ch E 316</u>	3	Complete <u>Ch E 316</u> with a passing grade. This course is meant to share with Engineering electives.
<u>ME 401</u>	3	Complete <u>ME 401</u> with a passing grade. This course is intended to share with Engineering Electives.
<u>ME 402</u>	3	Complete <u>ME 402</u> with a passing grade. This course is intended to share with Engineering electives.
<u>ME 529</u>	3	Complete <u>ME 529</u> with a passing grade. This course is intended to share with Engineering Electives.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), <u>Liba 203</u> , <u>313</u> , or <u>Hon 101</u> , <u>102</u>
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Entrepreneurship

Requirement	Hours	Description
<u>Accy 201</u> (BS Engr (entr))	3	Complete <u>Accy 201</u> with a passing grade.
<u>Accy 202</u> (BS Engr (entr))	3	Complete <u>Accy 202</u> with a passing grade.
12 hrs elect (BS Engr (entr))	12	Complete 4 courses chosen from the following: <u>ENT 321</u> , <u>331</u> , <u>351</u> , <u>352</u> , <u>356</u> , <u>381</u> , <u>382</u> , <u>386</u> , <u>387</u> , <u>388</u> , <u>396</u> , <u>411</u> , <u>412</u> , <u>422</u> , <u>426</u> , <u>436</u> , <u>446</u> , <u>456</u> , <u>466</u> , <u>476</u> , <u>486</u> , <u>GB 350</u> , <u>370</u> . Any other ENT prefix course will count for the emphasis as well as approved <u>BUS 380</u> & <u>BUS 400</u> courses (study abroad and internships) at management department discretion.
<u>Econ 202</u>	3	Complete <u>Econ 202</u> with a passing grade.
<u>Econ 203</u>	3	Complete <u>Econ 203</u> with a passing grade.

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Emphasis - Aerospace Engineering

- [B.S. in Engineering](#)
- [Emphasis - Aerospace Engineering](#)
- [Degree Requirements](#)

B.S. in Engineering

Description

The B.S. in engineering provides the student with a fundamental knowledge of engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 127

Goals/Mission Statement

Program Educational Objectives

Graduates from the program, within 3-5 years after graduation, will:

- Meet or exceed the expectations of employers of general engineers;
- Continue their professional development by pursuing advanced study, including licensure and certifications if they so desire; and
- Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

BSE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

- Writ 101 and 102
- 3 hours of fine arts
- 3 hours of humanities
- 3 hours of fine arts, languages (modern, Greek, or Latin), or humanities
- 3 hours of social science
- 3 additional hours of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering
- Econ 310
- Math 261, 262, 263, 264, and 353
- Chem 105, 106, 115, 116

- Phys 211, 212, 221, 222

Course Requirements

- Engr 100 or Engr 102,
- Csci 251
- Engr 309, 310, 312, 313, 314, 321, 323, 330, 360, 361, 400, and Engr 450
- Manf 460
- 12 hours of approved engineering electives
 - 3 hours of which must be above the 200 level and
 - 9 hours of which must be above the 300 level
- The pre-approved engineering electives are Engr 340, BME 200, BME 222, BME 301, BME 311, BME 313, BME 314, BME 333, BME 350, BME 370, BME 510, BME 523, BME 524, Ch E 307, Ch E 308, Ch E 413, Ch E 520, Ch E 521, Ch E 522, Ch E 523, Ch E 524, C E 207, C E 208, C E 210, C E 325, C E 471, C E 472, Csci 111, Csci 112, Csci 343, El E 235, El E 331, G E 305, G E 405, M E 324, M E 325, M E 401, M E 406, and M E 421. Engineering courses not included in this list must be pre-approved by the director of general engineering

Emphasis - Aerospace Engineering

Description

“The emphasis in aerospace engineering provides a cross-disciplinary foundation in topics critical to the modern aerospace industry. The curriculum provides core knowledge in typical aerospace topics such as fluid mechanics and structures while also providing a foundation in digital architectures and programming, materials, and electrical systems. The curriculum appropriately prepares the student for either entry into the aerospace industry or to graduate education in aerospace-related fields. Electives can be selected under approval of the student’s academic adviser to further a knowledge base in relevant aerospace areas such as flight mechanics, controls, and digital systems, and communications.”

Course Requirements

Engineering Electives (12 hours) * Ch E 316: Chemical Engineering Fluid Mechanics (3) * M E 401: Thermo-Fluid Dynamics (3) * M E 402: Elements of Propulsion (3) * M E 529: Aerodynamics (3)

Emphasis Courses (3 hours) * PHYS 308: Mathematical Physics (3)

Emphasis Courses (select 9 hours from suggested or other by approval) Csci 111, Csci 112, ISS 125, El E 235, El E 236, PHYS 310, Csci 325, Csci 356, C E 310, M E 527

Open Emphasis Hours (6 hours open for student selection based on interest)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S. in Engineering

General Education

Requirement Hours	Description
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Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 .
First Year Writing II	3	Successfully complete one of the following courses: Liba 1 Writ 102 or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 .

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Engr 100 or Engr 102	3	Complete Engr 100 or Engr 102 with a passing grade.
CSci 251	3	Complete CSci 251 with a passing grade.
Engr 201	3	Complete Engr 201 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 314	1	Complete Engr 314 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.

Requirement	Hours	Description
Engr 400	1	Complete Engr 400 with a passing grade.
Engr 431	3	Complete Engr 431 with a passing grade.
Engr 451	2	Complete Engr 451 with a passing grade.
Engr 452	1	Complete Engr 452 with a passing grade.
Manf 460	3	Complete Manf 460 with a passing grade.
12 hrs approved engr electives	12	Complete 12 hours of approved engineering electives with 9 hrs at the 300+ level chosen from: Engr 340 , BME 200 , BME 222 , BME 301 , BME 311 , BME 313 , BME 314 , BME 333 , BME 350 , BME 370 , BME 510 , BME 523 , BME 524 , Ch E 307 , Ch E 308 , Ch E 413 , Ch E 520 , Ch E 521 , Ch E 522 , Ch E 523 , Ch E 524 , C E 207 , C E 208 , C E 210 , C E 325 , C E 471 , C E 472 , Csci 111 , Csci 112 , Csci 343 , El E 235 , El E 331 , G E 305 , G E 405 , M E 324 , M E 325 , M E 401 , M E 406 , and M E 421

Emphasis - Aerospace Engineering

Requirement	Hours	Description
Phys 308	3	Complete Phys 308 with a passing grade.
9 hrs ae electives (BS Engr (ae))	9	Complete 9 hrs of electives with a passing grade chosen from the following: CSci 111 , 112 , 325 , 356 , ISS 125 , El E 235 , 236 , Phys 310 , C E 310 , and M E 527 .
6 hrs general electives	6	Complete 6 hrs of electives of your choice.
Ch E 316	3	Complete Ch E 316 with a passing grade. This course is meant to share with Engineering electives.
M E 401	3	Complete M E 401 with a passing grade. This course is intended to share with Engineering Electives.
M E 402	3	Complete M E 402 with a passing grade. This course is intended to share with Engineering electives.
M E 529	3	Complete M E 529 with a passing grade. This course is intended to share with Engineering Electives.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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El E 536: Introduction to Quantum Computing

Electrical and Computer Engineering

Introduction to quantum computing; single-qubit systems; multiple qubit systems; measurement; entanglement; simple quantum gates; quantum versions of classical computations; quantum algorithms; running simple codes on a quantum computer or simulator.

3 Credits

Prerequisites

- Prerequisite: Engr 310 OR Graduate Standing

Instruction Type(s)

- Lecture: Lecture for El E 536

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Computer Engineering, General](#)

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El E 367: Computer-Aided Design in Electrical Engr

Electrical and Computer Engineering

Computer-aided Design (CAD) and analytical procedures in electrical engineering.

3 Credits

Prerequisites

- El E 367 Requires: One Way-Co-Requisites El E 351 and Engr 361

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for El E 367

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Cp E 431: Computer Architecture

Electrical and Computer Engineering

Computer Architecture: instruction set architecture; single-cycle, FSM, and pipelined processor microarchitecture; hazards; memory technology; caches; memory protection, translation, and virtualization; FSM and pipelined cache microarchitecture; integration of processors and memories; performance analysis; superscalar execution; multiprocessors.

3 Credits

Prerequisites

- [El E 385: Advanced Digital Systems](#)

Instruction Type(s)

- Lecture: Lecture for Cp E 431

Subject Areas

- [Computer Engineering, General](#)

Related Areas

- [Computer Hardware Engineering](#)

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El E 431: Theory of Control Systems

Electrical and Computer Engineering

Analysis and design of servo-mechanisms, control systems; stability analysis; complex plane, root locus, attenuation-phase, and compensation; multiple-loop, multiple-input systems; analog simulation.

3 Credits

Prerequisites

- [El E 331: Signals and Systems](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 431

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 340: Electrical Engineering Analysis I

Electrical and Computer Engineering

Vector differential calculus; line, surface, and volume integrals of vector functions; complex numbers, limits, analytical functions, and derivatives; line integrals; Cauchy's theorem and formula; Taylor and Laurent series; residue theory.

3 Credits

Prerequisites

- [Math 264: Unified Calculus & Analytic Geometry IV](#)
- [Math 353: Elementary Differential Equations](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 340

Subject Areas

- [Electrical, Electronics and Communications Engineering, Other](#)

Related Areas

- [Electrical and Electronics Engineering](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Cp E 421: Embedded Systems Design

Electrical and Computer Engineering

Characteristics of embedded computing applications; performance metrics in embedded systems; embedded system design process; microcontroller/CPU/SoC/DSP ISAs; processes and operating systems; RTOSes; peripheral busses; networking and distributed embedded architectures; interfacing with memory; analog I/O.

3 Credits

Prerequisites

- [El E 351: Electronics Circuits I](#)
- [El E 485: Microprocessor Systems Engineering](#)
- [El E 486: Microprocessor Systems Engr Lab](#)

Instruction Type(s)

- Lecture: Lecture for Cp E 421

Subject Areas

- [Computer Engineering, General](#)

Related Areas

- [Computer Hardware Engineering](#)

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Cp E 462: Senior Design in Computer Engineering II

Electrical and Computer Engineering

Second-semester senior design project formulation, report preparation, implementation, and presentation.

3 Credits

Prerequisites

- [Cp E 461: Senior Design in Computer Engineering I](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Cp E 462

Subject Areas

- [Computer Engineering, General](#)

Related Areas

- [Computer Hardware Engineering](#)

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El E 485: Microprocessor Systems Engineering

Electrical and Computer Engineering

Microcomputer systems. Programming, software aids, and principles of microprocessor interfacing.

2 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Corequisites

- [El E 486: Microprocessor Systems Engr Lab](#)

One-way corequisites

- [El E 385: Advanced Digital Systems](#)

Instruction Type(s)

- Lecture: Lecture for El E 485

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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El E 433: High Frequency and Microwave Laboratory

Electrical and Computer Engineering

High frequency measurements of transmission line and load characteristics, two port network analysis of passive microwave devices, network analyzer theory and use, measurements of input impedance and return loss of antennas, and time domain reflectometry measurements.

1 Credit

Prerequisites

- [El E 441: Electromagnetic Theory I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Laboratory for El E 433
- Lecture: Lecture for El E 433
- Lecture: Lecture for El E 433

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 522: Electrical Engineering Projects II

Electrical and Computer Engineering

Approved investigation of problem under direction of a member of the staff. May be repeated for credit.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for El E 522

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 523: Microwave Engineering

Electrical and Computer Engineering

Microwave integrated circuits, scattering matrix description of microwave circuit elements, computer analysis of cascade two-ports, microwave semiconductor devices.

3 Credits

Prerequisites

- Pre-requisite: El E 341 or Graduate Standing.

Instruction Type(s)

- Lecture: Lecture for El E 523

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 534: Wireless Mobile Communications

Electrical and Computer Engineering

Focuses on today's modern cellular and personal communications systems, satellite-based systems, and their technical and regulatory aspects. The technical aspects include modulation techniques, propagation characteristics, bit error rate, and multipath.

3 Credits

Prerequisites

- Prerequisite: El E 331 and El E 391 or graduate standing and consent of instructor

Instruction Type(s)

- Lecture: Lecture for El E 534

Subject Areas

- [Telecommunications Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)

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El E 351: Electronics Circuits I

Electrical and Computer Engineering

Terminal characteristics of devices, graphical analysis, linear piece-wise analysis, two-port parameters, equivalent models, and circuits.

3 Credits

Prerequisites

- [Engr 360: Electric Circuit Theory](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for El E 351

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 442: Electromagnetic Theory II

Electrical and Computer Engineering

Transmission-line theory, electric and magnetic properties of matter, plane waves, guided waves; wave propagation in anisotropic media, microwave networks, radiation, antennas.

3 Credits

Prerequisites

- [El E 341: Theory of Fields](#)
- [El E 441: Electromagnetic Theory I](#)
- Pre-Requisite: 24 Earned Hours

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 337: Digital Systems Laboratory II

Electrical and Computer Engineering

Self-paced laboratory. (3 lab hours).

1 Credit

Prerequisites

- [El E 235: Principles of Digital Systems](#)
- [El E 236: Digital Systems Laboratory I](#)

Instruction Type(s)

- Lab: Laboratory for El E 337

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Electrical and Computer Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Minors](#)
- [Courses](#)
- [Faculty](#)

Undergraduate Studies

Students admitted to the university and the School of Engineering in accordance with stated admission policies may then declare their chosen degree program.

See the degree requirements under Programs.

Graduate Studies

M.S. and Ph.D. entrance requirements are those of the Graduate School. M.S. applicants are expected to possess or be in the process of completing an undergraduate degree in engineering or closely related field from an accredited institution. In general, Ph.D. applicants are expected to possess or be in the process of completing a master's degree. In certain cases, applicants completing an undergraduate degree in engineering or closely related field from an accredited institution may be considered.

See the degree requirements under Programs.

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El E 425: Local Area Networks

Electrical and Computer Engineering

Study of the architecture and operation of computer communication networks with emphasis on how distributed applications are realized over networks. Overview of computer networks, distributed applications, such as email and file transfer, mechanisms for transferring content among the end systems of the network, and mechanism for transferring data over physical facilities. Practical experimentation is a significant component.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 425

Subject Areas

- [Telecommunications Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)

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El E 237: Electrical Engineering Tools and Toys

Electrical and Computer Engineering

Analysis and design of simple hardware project(s) using Raspberry Pi hardware and an operating system. Learn to prepare technical reports summarizing the project purpose, design, and conclusion.

1 Credit

Prerequisites

- [El E 235: Principles of Digital Systems](#)

Instruction Type(s)

- Lab: Laboratory for El E 237

Subject Areas

- [Computer Hardware Engineering](#)
- [Electrical and Electronics Engineering](#)

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El E 386: Advanced Digital Systems Laboratory

Electrical and Computer Engineering

Advanced digital systems. MSI circuits, PLD devices, VHDL design and synthesis, computer architecture. (3 lab hours).

1 Credit

Prerequisites

- [El E 236: Digital Systems Laboratory I](#)
- [El E 235: Principles of Digital Systems](#) (Minimum grade: C-)

Corequisites

- [El E 385: Advanced Digital Systems](#)

One-way corequisites

- [El E 236: Digital Systems Laboratory I](#)

Instruction Type(s)

- Lab: Laboratory for El E 386
- Lab: Lab for El E 386
- Lab: Lab for El E 386

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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El E 441: Electromagnetic Theory I

Electrical and Computer Engineering

Maxwell's equations, the wave equation and its solution, plane waves in free space and conducting media, reflection and transmission at interfaces, transmission line theory, introduction to waveguides and cavity resonators.

3 Credits

Prerequisites

- [El E 341: Theory of Fields](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 441

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 235: Principles of Digital Systems

Electrical and Computer Engineering

Binary numbers, number system conversion, coding schemes; Boolean algebra, axioms, theorems, Karnaugh map; logic design, Boolean functions, minimization; implementation of transform methods; asynchronous systems.

3 Credits

Instruction Type(s)

- Lecture: Lecture for El E 235

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Cp E 461: Senior Design in Computer Engineering I

Electrical and Computer Engineering

Senior design project formulation, report preparation, and presentation.

1 Credit

Prerequisites

- [El E 386: Advanced Digital Systems Laboratory](#)
- [El E 353: Electronics Laboratory](#)
- [ECE 361: Design and Design Tools in ECE](#)

One-way corequisites

- [El E 486: Microprocessor Systems Engr Lab](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Cp E 461

Subject Areas

- [Computer Engineering, General](#)

Related Areas

- [Computer Hardware Engineering](#)

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El E 481: Fund. Low Power Dig. VLSI Design

Electrical and Computer Engineering

Techniques to constrain designs, run static timing analysis, evaluate datapath logic, run physical synthesis, optimize for low-power structures, analyze DFT (design for testability) constraints, and interface with other tools. Exploration and implementation of several low-power techniques to reduce both dynamic and leakage power during synthesis, including multiple supply voltage (MSV) design, power shutoff (PSO) synthesis and dynamic voltage frequency scaling (DVFS) synthesis, low-power flow using CPF and IEEE 1801 and troubleshoot a low-power design, and formal verification of power constraints and ensure the functionality of a low-power design.

3 Credits

Prerequisites

- [El E 385: Advanced Digital Systems](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 481

Subject Areas

- [Computer Hardware Engineering](#)

Related Areas

- [Computer Engineering, General](#)

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El E 443: Network Analysis and Synthesis

Electrical and Computer Engineering

Properties of network functions, synthesis of passive and active RC networks.

3 Credits

Prerequisites

- [El E 351: Electronics Circuits I](#)
- [Engr 410: Engineering Analysis II](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 443

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 432: Robotics Laboratory

Electrical and Computer Engineering

Self-paced experiments in the study of robot technology, including programming, control, and applications. (3 lab hours).

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Laboratory for El E 432

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 482: Digital CMOS VLSI Design

Electrical and Computer Engineering

Design, layout, simulation, and test of design custom digital CMOS/VLSI chips, using a CMOS cell library and state-of-the-art CAD tools. Digital CMOS static and dynamic gates, flip flops, CMOS array structures commonly used in digital systems.

3 Credits

Prerequisites

- [El E 385: Advanced Digital Systems](#)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [El E 351: Electronics Circuits I](#)

Instruction Type(s)

- Lecture: Lecture for El E 482

Subject Areas

- [Computer Hardware Engineering](#)
- [Electrical and Electronics Engineering](#)

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ECE 361: Design and Design Tools in ECE

Electrical and Computer Engineering

Command line SPICE; drawings for laser cutters and NC milling machines; specifying real resistors, capacitors, and inductors; understanding ground concepts; designing DC power supplies: PCB layout using KiCad or similar; numerical optimization for design; research and the creative process in design.

1 Credit

Prerequisites

- [ELE 351: Electronics Circuits I](#)
- [Engr 361: Electric Circuit Laboratory](#)

Instruction Type(s)

- Lab: Laboratory for ECE 361

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Computer Engineering, General](#)

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El E 447: Modulation, Noise, and Communications

Electrical and Computer Engineering

Spectral analysis, sampling theory, analog and digital modulation techniques, information, communication systems, and noise.

3 Credits

Prerequisites

- [El E 331: Signals and Systems](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 447

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Telecommunications Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)

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El E 462: Sr. Design in Electrical Engineering II

Electrical and Computer Engineering

Second-semester senior design project formulation, report preparation, implementation, and presentation.

3 Credits

Prerequisites

- [El E 461: Sr. Design in Electrical Engineering I](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for El E 462

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Faculty in Electrical and Computer Engineering

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[Jump to Emeritus faculty](#)

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Emeritus Faculty

- [D](#)
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- [L](#)
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[Jump to current faculty](#)

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El E 535: Digital Communications

Electrical and Computer Engineering

Random processes, digital communication fundamentals including sampling, baseband and bandpass modulation, performance of digital communication systems in the presence of noise, and optimal signal detection.

3 Credits

Prerequisites

- [El E 391: Probability and Random Signals](#)
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for El E 535

Subject Areas

- [Telecommunications Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)

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Minor - Electrical Engineering

- [Minor - Electrical Engineering](#)

Minor - Electrical Engineering

Description

The Department of Electrical Engineering offers a minor in electrical engineering.

Course Requirements

The minor in electrical engineering requires a minimum of 18 hours of course work. Included in the 18 hours are the following required courses, totaling 14 hours: El E 235, 236, 331, 351, Engr 360, 361. Two El E elective courses, 300 or 400 level, totaling 4 hours or more complete the requirement for the minor.

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El E 100: Introduction to Electrical Engineering

Electrical and Computer Engineering

Relevant perspective on the entire electrical field with review of professional careers.

1 Credit

Instruction Type(s)

- Lecture: Lecture for El E 100

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 352: Electronics Circuits II

Electrical and Computer Engineering

Terminal characteristics of devices, graphical analysis, linear piece- wise analysis, two-port parameters, equivalent models, and circuits.

3 Credits

Prerequisites

- [El E 351: Electronics Circuits I](#)

Instruction Type(s)

- Lecture: Lecture for El E 352

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Cp E 432: Testing of Computing Systems

Electrical and Computer Engineering

Physical defects from semiconductor manufacture, fault modeling and simulation, fault activation and detection in digital systems, digital test pattern synthesis, test coverage, test compaction, online/offline/BIST testing concepts, design-for-test, design-for-manufacture, system testability and diagnosability.

3 Credits

Prerequisites

- [El E 351: Electronics Circuits I](#)
- [El E 385: Advanced Digital Systems](#)
- [El E 386: Advanced Digital Systems Laboratory](#)

Instruction Type(s)

- Lecture: Lecture for Cp E 432

Subject Areas

- [Computer Engineering, General](#)

Related Areas

- [Computer Hardware Engineering](#)

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El E 533: Electronic Properties of Materials

Electrical and Computer Engineering

Theories of electron/atom interactions and electron transport are examined to explain the electronic properties of solids. Junctions, magnetic, and optical properties are also discussed with special emphasis on semiconducting materials.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Cross-listed Courses

- [M E 533: Electronic Properties of Materials](#)

Instruction Type(s)

- Lecture: Lecture for El E 533

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 461: Sr. Design in Electrical Engineering I

Electrical and Computer Engineering

Senior design project formulation, report preparation, and presentation.

1 Credit

Prerequisites

- [El E 353: Electronics Laboratory](#)
- [ECE 361: Design and Design Tools in ECE](#)
- [El E 386: Advanced Digital Systems Laboratory](#)

One-way corequisites

- [El E 486: Microprocessor Systems Engr Lab](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for El E 461

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 331: Signals and Systems

Electrical and Computer Engineering

General concepts and descriptions of linear systems, signal flow graphs and block diagrams, Fourier and Laplace transforms, state-variable methods, transfer functions, and impulse response.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- [Engr 360: Electric Circuit Theory](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 331

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 385: Advanced Digital Systems

Electrical and Computer Engineering

Advanced Digital Systems: RTL hardware design using VHDL; coding, simulation, synthesis, and implementation of digital system in FPGA; combinational and sequential building blocks; timing analysis; trade-offs in design metrics; overview of transistor-level design; arithmetic circuits; number system; memory arrays; logic arrays; temporal and spatial parallelism.

3 Credits

Prerequisites

- [El E 235: Principles of Digital Systems](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Corequisites

- [El E 386: Advanced Digital Systems Laboratory](#)

Instruction Type(s)

- Lecture: Lecture for El E 385

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Electrical and Computer Engineering

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Leadership

- Hamid Bahrami - Chair and Professor of Electrical and Computer Engineering

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Overview

The Department of Electrical and Computer Engineering offers a Bachelor of Science in Electrical Engineering (B.S.E.E.) and a Bachelor of Science in Computer Engineering (B.S.Cp.E.). Students in either program, who are selected for the manufacturing emphasis, would follow the curriculum designed for the respective Bachelor's degree with manufacturing emphasis. Other students would follow the respective Bachelor's degree program with general (standard) emphasis curriculum.

The department also offers a Master of Science (M.S.) in engineering science with emphasis areas in computer engineering, electrical engineering, electromagnetics, and telecommunications, and a Doctor of Philosophy (Ph.D.) in engineering science with emphasis areas in computer engineering, electrical engineering or electromagnetics.

Accreditation

The following undergraduate engineering programs are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, and Bachelor of Science in Mechanical Engineering. The Bachelor of Science in Computer Science (BSCS) program of the Department of Computer and Information Science is accredited as a Computer Science program by the Computing Accreditation Commission (CAC) of ABET <https://www.abet.org>.

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El E 322: Electric Circuit II

Electrical and Computer Engineering

Transient analysis of RL, RC, and RLC circuits, two-port networks.

1 Credit

Prerequisites

- [Engr 360: Electric Circuit Theory](#)

One-way corequisites

- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for El E 322

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 586: Digital Signal Processing

Electrical and Computer Engineering

Representation of signals and systems, Z-transform and applications, DFT (FFT), FIR and IIR digital filters design and implementation.

3 Credits

Prerequisites

- [El E 331: Signals and Systems](#)

Instruction Type(s)

- Lecture: Lecture for El E 586

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 236: Digital Systems Laboratory I

Electrical and Computer Engineering

Experiments with digital logic gates. Implementation of combinational and sequential logic circuits, programmable logic devices, flip-flops, and simulation software. (3 lab hours).

1 Credit

Prerequisites

- Co-requisite: El E 235 (may be taken as a pre-requisite).

Instruction Type(s)

- Lab: Laboratory for El E 236
- Lecture: Lecture for El E 236

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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El E 487: Digital Signal Processing Laboratory

Electrical and Computer Engineering

Self-paced laboratory on the fundamentals of data acquisition and digital signal processing. (3 lab hours).

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Laboratory for El E 487

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Computer Engineering, General](#)

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El E 451: Electrical Energy Conversion

Electrical and Computer Engineering

Basic principles of electrical energy conversion; fundamentals of electromechanical devices and applications. DC and AC motors and generators. Transformers and electric power transmission.

3 Credits

Prerequisites

- [El E 331: Signals and Systems](#)
- [Engr 360: Electric Circuit Theory](#)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [El E 341: Theory of Fields](#)

Instruction Type(s)

- Lecture: Lecture for El E 451

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Degrees Offered

- [B.S.Cp.E. in Computer Engineering](#)
 - [Emphasis - Manufacturing](#)
 - [Standard Option](#)
- [B.S.E.E. in Electrical Engineering](#)
 - [Emphasis - General Program](#)
 - [Emphasis - Manufacturing](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Computer Engineering](#)
 - [Emphasis - EE \(Electromagnetics\)](#)
 - [Emphasis - Electrical Engineering](#)
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- [Ph.D. in Engineering Science](#)
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El E 391: Probability and Random Signals

Electrical and Computer Engineering

Probability and random variables, operations on single and multiple random variables, temporal and special characteristics of random processes, linear systems with random inputs.

3 Credits

Prerequisites

- [El E 331: Signals and Systems](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 391

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 357: Electrical Engineering Problems I

Electrical and Computer Engineering

Analytical procedures and numerical techniques in basic electrical engineering.

1 Credit

One-way corequisites

- [El E 351: Electronics Circuits I](#)
- [Engr 361: Electric Circuit Laboratory](#)
- [Engr 310: Engineering Analysis I](#)

Instruction Type(s)

- Lecture: Lecture for El E 357

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 453: Solid State Devices

Electrical and Computer Engineering

Crystals, conduction, semiconductors, dielectric and magnetic materials, energy band theory applied to junction devices, transistors.

3 Credits

Prerequisites

- [El E 351: Electronics Circuits I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for El E 453

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 353: Electronics Laboratory

Electrical and Computer Engineering

Circuit elements and instruments; experiments dealing with the characteristics and applications of diodes, transistors, and op-amps. (3 lab hours).

1 Credit

Prerequisites

- [Engr 361: Electric Circuit Laboratory](#)
- El E 353 Requires: One Way-Co-Requisite El E 352

Instruction Type(s)

- Lab: Laboratory for El E 353
- Lecture: Lecture for El E 353
- Lecture: Lecture for El E 353

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 525: Introduction to Antennas

Electrical and Computer Engineering

Linear antennas and use of computer programs for antenna analysis and design. Arrays of antennas, beam shaping methods, and mathematical techniques.

3 Credits

Prerequisites

- Pre-requisite: El E 341 or Graduate Standing.
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for El E 525

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 521: Electrical Engineering Projects I

Electrical and Computer Engineering

Approved investigation of problem under direction of a member of the staff. May be repeated for credit.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Indiv Based: Individual Based Study for El E 521

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Courses

- [Engr 360: Electric Circuit Theory](#)
- [Engr 361: Electric Circuit Laboratory](#)
- [Engr 363: Introductory Electric Circuit Laboratory](#)
- [Engr 410: Engineering Analysis II](#)
- [Cp E 421: Embedded Systems Design](#)
- [Cp E 431: Computer Architecture](#)
- [Cp E 432: Testing of Computing Systems](#)
- [Cp E 461: Senior Design in Computer Engineering I](#)
- [Cp E 462: Senior Design in Computer Engineering II](#)
- [ECE 361: Design and Design Tools in ECE](#)
- [El E 100: Introduction to Electrical Engineering](#)
- [El E 235: Principles of Digital Systems](#)
- [El E 236: Digital Systems Laboratory I](#)
- [El E 237: Electrical Engineering Tools and Toys](#)
- [El E 322: Electric Circuit II](#)
- [El E 331: Signals and Systems](#)
- [El E 337: Digital Systems Laboratory II](#)
- [El E 340: Electrical Engineering Analysis I](#)
- [El E 341: Theory of Fields](#)
- [El E 351: Electronics Circuits I](#)
- [El E 352: Electronics Circuits II](#)
- [El E 353: Electronics Laboratory](#)
- [El E 357: Electrical Engineering Problems I](#)
- [El E 367: Computer-Aided Design in Electrical Engr](#)
- [El E 385: Advanced Digital Systems](#)
- [El E 386: Advanced Digital Systems Laboratory](#)
- [El E 391: Probability and Random Signals](#)
- [El E 415: Telecommunications Laboratory](#)
- [El E 425: Local Area Networks](#)
- [El E 431: Theory of Control Systems](#)
- [El E 432: Robotics Laboratory](#)
- [El E 433: High Frequency and Microwave Laboratory](#)
- [El E 441: Electromagnetic Theory I](#)
- [El E 442: Electromagnetic Theory II](#)
- [El E 443: Network Analysis and Synthesis](#)
- [El E 447: Modulation, Noise, and Communications](#)
- [El E 451: Electrical Energy Conversion](#)
- [El E 453: Solid State Devices](#)
- [El E 461: Sr. Design in Electrical Engineering I](#)
- [El E 462: Sr. Design in Electrical Engineering II](#)
- [El E 481: Fund. Low Power Dig. VLSI Design](#)
- [El E 482: Digital CMOS VLSI Design](#)
- [El E 485: Microprocessor Systems Engineering](#)
- [El E 486: Microprocessor Systems Engr Lab](#)
- [El E 487: Digital Signal Processing Laboratory](#)
- [El E 521: Electrical Engineering Projects I](#)
- [El E 522: Electrical Engineering Projects II](#)

- [El E 523: Microwave Engineering](#)
- [El E 525: Introduction to Antennas](#)
- [El E 533: Electronic Properties of Materials](#)
- [El E 534: Wireless Mobile Communications](#)
- [El E 535: Digital Communications](#)
- [El E 536: Introduction to Quantum Computing](#)
- [El E 561: Microwave Circuit Design](#)
- [El E 586: Digital Signal Processing](#)

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El E 486: Microprocessor Systems Engr Lab

Electrical and Computer Engineering

Design and application of digital integrated circuits; digital system realization; programming and interfacing microprocessors and electric systems. (3 lab hours).

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Corequisites

- [El E 485: Microprocessor Systems Engineering](#)

Instruction Type(s)

- Lab: Laboratory for El E 486

Subject Areas

- [Computer Engineering, General](#)
- [Electrical and Electronics Engineering](#)

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Electrical and Computer Engineering

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Distinguished Faculty and Staff Awards

Distinguished Research and Creative Achievement Award

- **ATEF Z ELSHERBENI** - Associate Dean Emeritus for Research and Graduate Programs and Professor of Electrical Engineering (2012)

Staff Council Award - EEO1

- **BRADFORD BAKER** - (2014)

School of Engineering, Junior Faculty Research Award

- **Fan Yang** - ADJUNCT RESEARCH PROFESSOR OF ELECTRICAL ENGINEERING (2008)
- **Mustafa Muhammad Matalgah** - PROFESSOR OF ELECTRICAL ENGINEERING (2006)
- **Alexander Borisovitch Yakovlev** - PROFESSOR OF ELECTRICAL ENGINEERING (2003)

Outstanding Staff Award

A staff member of the School of Engineering who has demonstrated exemplary service, leadership, and commitment.

- **MARTYE F HICKMAN** - SUPERVISOR, ELECTRICAL ENGINEERING SHOPS (2008)

School of Engineering, Senior Faculty Research Award

- **Lei Cao** - PROFESSOR OF ELECTRICAL ENGINEERING (2016)
- **ATEF Z ELSHERBENI** - Associate Dean Emeritus for Research and Graduate Programs and Professor of Electrical Engineering (2011)
- **ATEF Z ELSHERBENI** - Associate Dean Emeritus for Research and Graduate Programs and Professor of Electrical Engineering (2006)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (2005)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (2001)

Faculty Achievement Award

The Faculty Achievement Award is given annually to recognize unusual effort in the classroom, involvement with students, and active scholarship.

- **CHARLES E SMITH** - Professor Emeritus of Electrical Engineering (1993)

School of Engineering, Faculty Service Award

- **Richard K Gordon** - ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING (2012)
- **ATEF Z ELSHERBENI** - Associate Dean Emeritus for Research and Graduate Programs and Professor of Electrical

Engineering (2005)

- **ALLEN W GLISSON** - Chair Emeritus and Professor Emeritus of Electrical Engineering (2002)

School of Engineering Outstanding Teacher of the Year

- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (2009)
- **ALLEN W GLISSON** - Chair Emeritus and Professor Emeritus of Electrical Engineering (2004)
- **ATEF Z ELSHERBENI** - Associate Dean Emeritus for Research and Graduate Programs and Professor of Electrical Engineering (2002)
- **AHMED KISHK** - Dir of Antenna Sytms Lab & Prof Emeritus of Electrical Engin (1998)

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Electrical and Computer Engineering

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Minors

- [Minor - Electrical Engineering](#)

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El E 561: Microwave Circuit Design

Electrical and Computer Engineering

Design projects on passive and active microwave circuits (self-paced). (6 lab hours).

2 Credits

Prerequisites

- Pre-requisite: El E 433 and El E 523 or Graduate Standing

Instruction Type(s)

- Indiv Based: Individual Based Study for El E 561

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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El E 415: Telecommunications Laboratory

Electrical and Computer Engineering

Multiplexing techniques; modulation methods; sampling; electronic switching.

1 Credit

Prerequisites

- [Engr 360: Electric Circuit Theory](#)
- [Engr 361: Electric Circuit Laboratory](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lab: Laboratory for El E 415
- Lecture: Lecture for El E 415

Subject Areas

- [Telecommunications Engineering](#)
- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)

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El E 341: Theory of Fields

Electrical and Computer Engineering

Field concepts, vector algebra and calculus, Laplace's equations, wave equation, diffusion equation and their solutions; electric and magnetic fields, Maxwell's equations.

3 Credits

Prerequisites

- Prerequisite: Engr 410 or El E 340

Instruction Type(s)

- Lecture: Lecture for El E 341

Subject Areas

- [Electrical and Electronics Engineering](#)

Related Areas

- [Electrical, Electronics and Communications Engineering, Other](#)
- [Laser and Optical Engineering](#)
- [Telecommunications Engineering](#)

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Emphasis - Telecommunications

- [M.S. in Engineering Science](#)
- [Emphasis - Telecommunications](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Telecommunications

Description

An M.S. in engineering science with emphasis in telecommunications prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in telecommunications must be completed as a thesis option only. In addition to 6 hours of thesis, 24 hours of course work is required. This typically will include courses in wireless communications, digital communications, communications networking, probabilistic modeling, telecommunications policy, and management information systems. Coursework must be approved by the program director.

Other Academic Requirements

A candidate must prepare and orally defend a thesis.

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Emphasis - Computer Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Computer Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Computer Engineering

Description

An M.S. in engineering science with emphasis in computer engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

General Education Requirements

The M.S. with emphasis in computer engineering can be completed as either a thesis or nonthesis option.

The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit. Of the 24 hours of course work, 3 to 6 hours can be in an approved minor area, at least 1 hour must be in seminar, and no more than 3 hours can come from research credit outside the thesis.

The nonthesis option requires 27 hours of course work and a 3-hour project or research course with a written report, final oral presentation, and final oral exam. Course work for either option must be approved by the student's advisory committee.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - EE (Electromagnetics)

- [M.S. in Engineering Science](#)
- [Emphasis - EE \(Electromagnetics\)](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - EE (Electromagnetics)

Description

An M.S. in engineering science with emphasis in electromagnetics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in electromagnetics can be taken as a thesis or nonthesis option. Either option requires 10 semester hours of core courses in electromagnetics theory and applications: Numerical Methods in Electromagnetics (Engr 626); Advanced Electrodynamics (Engr 721); Passive Microwave Circuits (Engr 723); and Seminar (Engr 695).

Also required are 8 semester hours in specific areas of electromagnetics, including microwave circuits, antennas, electromagnetics, and computational electromagnetics courses (from among Engr 590, Engr 593, Engr 622, Engr 624, Engr 627, Engr 687, Engr 691, Engr 693 (no more than 2 semester hours), Engr 719, Engr 725, Engr 728, and Engr 699).

For the thesis option, the student must complete 6 hours of electives, including 3 to 6 hours in a minor field. The thesis candidate must take at least 6 hours of thesis.

For the nonthesis option, the student also must complete 9 hours of electives, including 3 to 6 hours as a minor from mathematics, physics, or another area with approval, and technical electives from the areas listed above. The nonthesis candidate also must complete a 3-hour project or research course with written report and oral presentations, and a final oral exam.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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Emphasis - Electrical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Electrical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Electrical Engineering

Description

An M.S. in engineering science with emphasis in electrical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in electrical engineering can be completed as either a thesis or nonthesis option.

The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit. Of the 24 hours of course work, 3 to 6 hours can be in an approved minor area, at least 1 hour must be in seminar, and no more than 3 hours can come from research credit outside the thesis.

The nonthesis option requires 27 hours of course work and a 3-hour project or research course with a written report, final oral presentation, and final oral exam. Course work for either option must be approved by the student's advisory committee.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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B.S.E.E. in Electrical Engineering

- [Overview](#)
- [Degree Requirements](#)

Description

The Bachelor of Science in Electrical Engineering program provides broad knowledge in basic and engineering sciences. The curriculum provides thorough knowledge of the field of electrical engineering. A manufacturing emphasis within B.S.E.E. is available to students admitted to the Center for Manufacturing Excellence (CME) Program. All other B.S.E.E. students follow the general program.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Mission Statement

The mission of the electrical and computer engineering department is to provide quality education to the students of the department.

Statement of Goals

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

Undergraduate Program Philosophy

The electrical engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The electrical engineering program is a broad-based program with an emphasis on the fundamentals of electrical engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi-course sequences in engineering. Multi-course sequence areas are:

1. Core topics common to many areas of engineering
2. Circuits, electronics, and systems
3. Digital Logic, computer architecture
4. Technical elective courses
5. Engineering design

The BSEE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required. For general, a broad choice of technical elective courses is available.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the

following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Electrical Engineering (BSEE) undergraduate program. The graduates of the program, within 3-5 years after graduation, will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry and/or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, continuing education credits and pursuit of professional certificates;
- Attain advanced degrees and work in academia, government agencies or high-tech companies;
- Generate professional publications, develop patents and foster entrepreneurship.

Student Outcomes

Students of the Bachelor of Science in Electrical Engineering program will demonstrate achievement of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts, 3 hours in humanities, languages (modern, Greek, or Latin), or fine arts, 6 hours in social science (including the required Econ 310), and the remaining 3 hours can be in any of the humanities, languages (modern, Greek, or Latin), fine arts, social science, or general education courses as specified by the School of Engineering.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.E.E. include: Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 115; Phys 211, 212, 221, 222; two Csci programming courses Csci 256, 356; ECE 361, Engr 309, 310, 360, 361; El E 235, 236, 237, 322, 331, 340, 341, 351, 352, 353, 385, 386, 391, 431, 447, 461, 462, 485, 486.

Coursework for General Emphasis:

Specific requirements for the General Emphasis include El E 100; ENGR 321; 14 credit hours of Technical Electives (BME 313, 314, 413; EL E 415, 425, 433, 441, 443, 451, 453, 482, 487, 523, 525, 533, 534, 535, 536, 586; CSci 361, 423, 521, 530, 551, 561) for a total of 18 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the Manufacturing Emphasis include MANF 150, 152, 251, 252, 253, 255, 351, 353, 355, 455; 6 credit hours of Technical Electives (BME 313, 314, 413; EL E 415, 425, 433, 441, 443, 451, 453, 482, 487, 523, 525, 533, 534, 535, 536, 586; CSci 361, 423, 521, 530, 551, 561) for a total of 24 credit hours.

Specializations

- [Emphasis - General Program](#)

- [Emphasis - Manufacturing](#)

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Emphasis - General Program

- [B.S.E.E. in Electrical Engineering](#)
- [Emphasis - General Program](#)
- [Degree Requirements](#)

B.S.E.E. in Electrical Engineering

Description

The Bachelor of Science in Electrical Engineering program provides broad knowledge in basic and engineering sciences. The curriculum provides thorough knowledge of the field of electrical engineering. A manufacturing emphasis within B.S.E.E. is available to students admitted to the Center for Manufacturing Excellence (CME) Program. All other B.S.E.E. students follow the general program.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Mission Statement

The mission of the electrical and computer engineering department is to provide quality education to the students of the department.

Statement of Goals

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

Undergraduate Program Philosophy

The electrical engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The electrical engineering program is a broad-based program with an emphasis on the fundamentals of electrical engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi-course sequences in engineering. Multi-course sequence areas are:

1. Core topics common to many areas of engineering
2. Circuits, electronics, and systems
3. Digital Logic, computer architecture
4. Technical elective courses
5. Engineering design

The BSEE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required. For general, a broad choice of technical elective courses is available.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Electrical Engineering (BSEE) undergraduate program. The graduates of the program, within 3-5 years after graduation, will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry and/or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, continuing education credits and pursuit of professional certificates;
- Attain advanced degrees and work in academia, government agencies or high-tech companies;
- Generate professional publications, develop patents and foster entrepreneurship.

Student Outcomes

Students of the Bachelor of Science in Electrical Engineering program will demonstrate achievement of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts, 3 hours in humanities, languages (modern, Greek, or Latin), or fine arts, 6 hours in social science (including the required Econ 310), and the remaining 3 hours can be in any of the humanities, languages (modern, Greek, or Latin), fine arts, social science, or general education courses as specified by the School of Engineering.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.E.E. include: Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 115; Phys 211, 212, 221, 222; two Csci programming courses Csci 256, 356; ECE 361, Engr 309, 310, 360, 361; El E 235, 236, 237, 322, 331, 340, 341, 351, 352, 353, 385, 386, 391, 431, 447, 461, 462, 485, 486.

Coursework for General Emphasis:

Specific requirements for the General Emphasis include El E 100; ENGR 321; 14 credit hours of Technical Electives (BME 313, 314, 413; EL E 415, 425, 433, 441, 443, 451, 453, 482, 487, 523, 525, 533, 534, 535, 536, 586; CSci 361, 423, 521, 530, 551, 561) for a total of 18 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the Manufacturing Emphasis include MANF 150, 152, 251, 252, 253, 255, 351, 353, 355, 455; 6 credit hours of Technical Electives (BME 313, 314, 413; EL E 415, 425, 433, 441, 443, 451, 453, 482, 487, 523, 525, 533, 534, 535, 536, 586; CSci 361, 423, 521, 530, 551, 561) for a total of 24 credit hours.

Emphasis - General Program

Description

The B.S.E.E. with general emphasis provides broad training in basic and engineering sciences and fundamental knowledge of electrical engineering. The general emphasis provides greater flexibility for a student to choose 14 credit hours of technical elective courses from a breadth of electrical engineering topical areas.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.E.E. in Electrical Engineering

General Education

Requirement Hours	Description
First Year Writing I 3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II 3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences 3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310 3	Complete Econ 310 with a passing grade.
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.
Math 264 3	Complete Math 264 with a passing grade.
Math 353 3	Complete Math 353 with a passing grade.

Requirement	Hours	Description
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
ECE 361	1	Complete ECE 361 with a passing grade.
El E 235	3	Complete El E 235 with a passing grade.
El E 236	1	Complete El E 236 with a passing grade.
El E 237	1	Complete EE 237 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
El E 322	1	Complete El E 322 with a passing grade.
El E 340	3	Complete El E 340 with a passing grade.
El E 341	3	Complete El E 341 with a passing grade.
El E 351	3	Complete El E 351 with a passing grade.
El E 352	3	Complete El E 352 with a passing grade.
El E 353	1	Complete El E 353 with a passing grade.
El E 385	3	Complete El E 385 with a passing grade.
El E 386	1	Complete El E 386 with a passing grade.
El E 391	3	Complete El E 391 with a passing grade.
El E 431	3	Complete El E 431 with a passing grade.
El E 447	3	Complete El E 447 with a passing grade.
El E 461	1	Complete El E 461 with a passing grade.
El E 462	3	Complete El E 462 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
School of Engineering GPA		Must be at least a 2.0
Enroll in a BSEE emphasis		Enroll in an emphasis within the BSEE program.

Emphasis - General Program

Requirement	Hours	Description
El E 100 or Engr 100	3	Complete El E 100 or Engr 100 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Csci 256	3	Complete Csci 256 with a passing grade.
Csci 356	3	Complete Csci 356 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.

Requirement Hours	Description
14 hrs technical electives 14	Complete 14 hours of technical elective courses. Technical elective courses may be chosen from BME 301 , 313 , 314 , 413 ; EL E 415 , 425 , 433 , 441 , 443 , 451 , 453 , 482 , 487 , 523 , 525 , 533 , 534 , 535 , 536 , 586 ; Cp E 421 , 431 , 432 ; CSci 361 , 423 , 521 , 530 , 551 , 561) for a total of 18 credit hours. A maximum of 6 hrs. of 300+ level courses from CSCI, Math, Phys can be counted as technical electives, subject to approval by the Chair of ECE.

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Emphasis - Manufacturing

- [B.S.E.E. in Electrical Engineering](#)
- [Emphasis - Manufacturing](#)
- [Degree Requirements](#)

B.S.E.E. in Electrical Engineering

Description

The Bachelor of Science in Electrical Engineering program provides broad knowledge in basic and engineering sciences. The curriculum provides thorough knowledge of the field of electrical engineering. A manufacturing emphasis within B.S.E.E. is available to students admitted to the Center for Manufacturing Excellence (CME) Program. All other B.S.E.E. students follow the general program.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Mission Statement

The mission of the electrical and computer engineering department is to provide quality education to the students of the department.

Statement of Goals

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

Undergraduate Program Philosophy

The electrical engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The electrical engineering program is a broad-based program with an emphasis on the fundamentals of electrical engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi-course sequences in engineering. Multi-course sequence areas are:

1. Core topics common to many areas of engineering
2. Circuits, electronics, and systems
3. Digital Logic, computer architecture
4. Technical elective courses
5. Engineering design

The BSEE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required. For general, a broad choice of technical elective courses is available.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Electrical Engineering (BSEE) undergraduate program. The graduates of the program, within 3-5 years after graduation, will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry and/or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, continuing education credits and pursuit of professional certificates;
- Attain advanced degrees and work in academia, government agencies or high-tech companies;
- Generate professional publications, develop patents and foster entrepreneurship.

Student Outcomes

Students of the Bachelor of Science in Electrical Engineering program will demonstrate achievement of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts, 3 hours in humanities, languages (modern, Greek, or Latin), or fine arts, 6 hours in social science (including the required Econ 310), and the remaining 3 hours can be in any of the humanities, languages (modern, Greek, or Latin), fine arts, social science, or general education courses as specified by the School of Engineering.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.E.E. include: Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 115; Phys 211, 212, 221, 222; two Csci programming courses Csci 256, 356; ECE 361, Engr 309, 310, 360, 361; El E 235, 236, 237, 322, 331, 340, 341, 351, 352, 353, 385, 386, 391, 431, 447, 461, 462, 485, 486.

Coursework for General Emphasis:

Specific requirements for the General Emphasis include El E 100; ENGR 321; 14 credit hours of Technical Electives (BME 313, 314, 413; EL E 415, 425, 433, 441, 443, 451, 453, 482, 487, 523, 525, 533, 534, 535, 536, 586; CSci 361, 423, 521, 530, 551, 561) for a total of 18 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the Manufacturing Emphasis include MANF 150, 152, 251, 252, 253, 255, 351, 353, 355, 455; 6 credit hours of Technical Electives (BME 313, 314, 413; EL E 415, 425, 433, 441, 443, 451, 453, 482, 487, 523, 525, 533, 534, 535, 536, 586; CSci 361, 423, 521, 530, 551, 561) for a total of 24 credit hours.

Emphasis - Manufacturing

Description

The B.S.E.E. with emphasis in manufacturing provides broad training in basic and engineering sciences and fundamental knowledge of electrical engineering, with a focus on manufacturing.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.E.E. in Electrical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 with a passing grade.
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.

Requirement	Hours	Description
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
ECE 361	1	Complete ECE 361 with a passing grade.
El E 235	3	Complete El E 235 with a passing grade.
El E 236	1	Complete El E 236 with a passing grade.
El E 237	1	Complete EE 237 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
El E 322	1	Complete El E 322 with a passing grade.
El E 340	3	Complete El E 340 with a passing grade.
El E 341	3	Complete El E 341 with a passing grade.
El E 351	3	Complete El E 351 with a passing grade.
El E 352	3	Complete El E 352 with a passing grade.
El E 353	1	Complete El E 353 with a passing grade.
El E 385	3	Complete El E 385 with a passing grade.
El E 386	1	Complete El E 386 with a passing grade.
El E 391	3	Complete El E 391 with a passing grade.
El E 431	3	Complete El E 431 with a passing grade.
El E 447	3	Complete El E 447 with a passing grade.
El E 461	1	Complete El E 461 with a passing grade.
El E 462	3	Complete El E 462 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
School of Engineering GPA		Must be at least a 2.0
Enroll in a BSEE emphasis		Enroll in an emphasis within the BSEE program.

Emphasis - Manufacturing

Requirement	Hours	Description
Csci 256	3	Complete Csci 256 with a passing grade.
Csci 356	3	Complete Csci 356 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.
Manf 150	1	Complete Manf 150 with a passing grade.
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.
Manf 351	1	Complete Manf 351 with a passing grade.
Manf 353	3	Complete Manf 353 with a passing grade.

Requirement	Hours	Description
Manf 355	1	Complete Manf 355 with a passing grade.
Manf 455	3	Complete Manf 455 with a passing grade.
6 hrs of tech elective courses	6	Complete 6 hours of technical elective courses, with a passing grade, to be chosen from EI E 415 , 425 , 433 , 441 , 443 , 451 , 453 , 481 , 482 , 487 , 523 , 525 , 533 , 534 , 535 , 536 , 586 .

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B.S.E.E. in Electrical Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.E.E. in Electrical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 with a passing grade.
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.

Requirement Hours		Description
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
ECE 361	1	Complete ECE 361 with a passing grade.
El E 235	3	Complete El E 235 with a passing grade.
El E 236	1	Complete El E 236 with a passing grade.
El E 237	1	Complete EE 237 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
El E 322	1	Complete El E 322 with a passing grade.
El E 340	3	Complete El E 340 with a passing grade.
El E 341	3	Complete El E 341 with a passing grade.
El E 351	3	Complete El E 351 with a passing grade.
El E 352	3	Complete El E 352 with a passing grade.
El E 353	1	Complete El E 353 with a passing grade.
El E 385	3	Complete El E 385 with a passing grade.
El E 386	1	Complete El E 386 with a passing grade.
El E 391	3	Complete El E 391 with a passing grade.
El E 431	3	Complete El E 431 with a passing grade.
El E 447	3	Complete El E 447 with a passing grade.
El E 461	1	Complete El E 461 with a passing grade.
El E 462	3	Complete El E 462 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
School of Engineering GPA		Must be at least a 2.0
Enroll in a BSEE emphasis		Enroll in an emphasis within the BSEE program.

Emphasis - General Program

Requirement Hours		Description
El E 100 or Engr 100	3	Complete El E 100 or Engr 100 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Csci 256	3	Complete Csci 256 with a passing grade.
Csci 356	3	Complete Csci 356 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.
14 hrs technical electives	14	Complete 14 hours of technical elective courses. Technical elective courses may be chosen from BME 301 , 313 , 314 , 413 ; El E 415 , 425 , 433 , 441 , 443 , 451 , 453 , 482 , 487 , 523 , 525 , 533 , 534 , 535 , 536 , 586 ; Cp E 421 , 431 , 432 ; CSci 361 , 423 , 521 , 530 , 551 , 561) for a total of 18 credit hours. A maximum of 6 hrs. of 300+ level courses from CSCI, Math, Phys can be counted as technical electives, subject to approval by the Chair of ECE.

Emphasis - Manufacturing

Requirement	Hours	Description
Csci 256	3	Complete Csci 256 with a passing grade.
Csci 356	3	Complete Csci 356 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.
Manf 150	1	Complete Manf 150 with a passing grade.
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.
Manf 351	1	Complete Manf 351 with a passing grade.
Manf 353	3	Complete Manf 353 with a passing grade.
Manf 355	1	Complete Manf 355 with a passing grade.
Manf 455	3	Complete Manf 455 with a passing grade.
6 hrs of tech elective courses	6	Complete 6 hours of technical elective courses, with a passing grade, to be chosen from El E 415 , 425 , 433 , 441 , 443 , 451 , 453 , 481 , 482 , 487 , 523 , 525 , 533 , 534 , 535 , 536 , 586 .

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Emphasis - Computer Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Computer Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Computer Engineering

Description

A Ph.D. in engineering science with emphasis in computer engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics and computer science.

Course Requirements

The Ph.D. with an emphasis in computer engineering requires at least 48 hours of course work and at least 18 hours of dissertation credit. Of the 48 hours of course work, 12 hours must be in an approved minor area, at least 2 hours must be in seminar, and no more than 6 hours can come from research credit outside the dissertation. Course work must be approved by the student's advisory committee.

Other Academic Requirements

A written comprehensive exam is taken during the first year of residency.

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Emphasis - EE (Electromagnetics)

- [Ph.D. in Engineering Science](#)
- [Emphasis - EE \(Electromagnetics\)](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - EE (Electromagnetics)

Description

A Ph.D. in engineering science with emphasis in electromagnetics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics and mathematics.

Course Requirements

The Ph.D. with an emphasis in electromagnetics requires 36 semester hours in the major field out of a required total of 48 semester hours of graded course work beyond the bachelor's degree. Included in these requirements are the following core courses: Advanced Electrodynamics (Engr 721); Numerical Methods in Electromagnetics (Engr 626); Passive Microwave Circuits (Engr 723); and Seminar (Engr 695, two semester hours). Other courses are to be taken in specific areas of electromagnetics, including microwave circuits, antennas, electromagnetics, and computational electromagnetics. These related courses include Engr 590, Engr 593, Engr 622, Engr 624, Engr 627, Engr 655, Engr 687, Engr 691, Engr 693 (no more than 2 semester hours), Engr 699, Engr 719, Engr 725, Engr 728, Engr 729, or other courses with approval. The candidate must take 12 semester hours of graded courses in a minor area (mathematics, physics, or another appropriate field with approval).

Other Academic Requirements

A written comprehensive exam is taken during the first year of residency.

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Emphasis - Electrical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Electrical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Electrical Engineering

Description

A Ph.D. in engineering science with emphasis in electrical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics and computer science.

Course Requirements

The Ph.D. with an emphasis in electrical engineering requires at least 48 hours of course work and at least 18 hours of dissertation credit. Of the 48 hours of course work, 12 hours must be in an approved minor area, at least 2 hours must be in seminar, and no more than 6 hours can come from research credit outside the dissertation. Course work must be approved by the student's advisory committee.

Other Academic Requirements

A written comprehensive exam is taken during the first year of residency.

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B.S.Cp.E. in Computer Engineering

- [Overview](#)
- [Degree Requirements](#)

Description

The Bachelor of Science in Computer Engineering program prepares students to have an understanding of computer hardware, software, and electrical engineering fundamentals, thereby acquiring knowledge to develop and/or apply many kinds of computing systems, such as microprocessors, computers, smart phones, and Internet of Things (IoT) devices. Students in the program will have knowledge of computer programming languages, hardware description languages, digital logic design, computer organization, electrical and electronics circuit design, and processing of electrical signals. They will have the ability to apply mathematical and statistical methods for understanding, development, and applications of computing devices.

The graduates of the program will be able to pursue (i) employment in electronic chip design/production companies, hardware/software services companies, and all industries requiring electrical and computer engineers, such as automotive, aerospace, defense, utilities and heavy-machinery; and (ii) advanced study in computer engineering or a related field.

Minimum Total Credit Hours: 126

Goals/Mission Statement

Mission Statement

The mission of the electrical and computer engineering department is to provide quality education to the students of the department.

Statement of Goals

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

Undergraduate Program Philosophy

The computer engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The computer engineering program is a broad-based program with an emphasis on the fundamentals of computer engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi-course sequences in engineering. Multi-course sequence areas are:

- Core topics common to electrical and computer engineering, such as circuits, electronics, signals and systems analysis, and digital systems
- Programming languages, computer operating systems, and algorithms and data structures computer architecture and microprocessors
- Technical elective courses such as embedded systems, VLSI design and testing of computing systems
- Engineering design

The BSCpE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Computer Engineering (BSCpE) undergraduate program. The graduates of the program within 3-5 years after graduation will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, continuing education credits and pursuit of professional certificates;
- Attain advanced degrees and work in academia, government agencies or high-tech companies;
- Generate professional publications, develop patents and foster entrepreneurship.

Student Outcomes

Students of the Bachelor of Science in Computer Engineering program will demonstrate achievement of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

The following courses are required: Math 261-264 and Math 353; laboratory sciences to be fulfilled by Chem 105, 115 and Phys 211, 212, 221, 222; Writ 100/101 and Writ 102/Liba 102. Students must also complete at least 18 semester hours of 3 hours in humanities chosen from classics, English, history, philosophy, religion, African American studies, gender studies, and Southern studies; 3 hours in fine arts chosen from art history, dance, music, and theatre arts (courses emphasizing the enhancement of skills and performance are not acceptable); 3 hours in social science chosen from anthropology, economics, political science, psychology, and sociology; Econ 310; 3 additional hours of humanities or fine arts or languages (modern, Greek, or Latin); and 3 additional hours of humanities, languages (modern, Greek, or Latin), fine arts, or general education courses as specified by the School of Engineering.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.Cp.E. program include Math 301; Csci 256, 356, 423, 433; Engr 310, 360, 361; El E 235, 236, 237, 322, 331, 351, 352, 353, 385, 386, 425, 485, 486; ECE 361, Cp E 431, 461, 462.

Coursework for Standard Emphasis:

Specific requirements for the Standard Emphasis include El E 100; 3 hours selected from Technical Elective I (El E 391, El E 431, or El E 586); 9 hours selected from Technical Elective II (El E 482, 536 CpE 421, or CpE 432); 6 hours of Technical Elective III (El E 343, 447, 453, 533, 534, 535, or other courses from Technical Elective I, II not already completed or a maximum of 3 hours of CSci at 300 level or above) for a total of 19 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the manufacturing emphasis include Manf 150, 152, 251, 252, 253, 255, 351, 353, 355, 455 and 9 hours of technical elective courses to be chosen from El E 482, 536, CpE 421, or CpE 432 for a total of 27 credit hours.

Specializations

- [Emphasis - Manufacturing](#)
- [Standard Option](#)

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Standard Option

- [B.S.Cp.E. in Computer Engineering](#)
- [Standard Option](#)
- [Degree Requirements](#)

B.S.Cp.E. in Computer Engineering

Description

The Bachelor of Science in Computer Engineering program prepares students to have an understanding of computer hardware, software, and electrical engineering fundamentals, thereby acquiring knowledge to develop and/or apply many kinds of computing systems, such as microprocessors, computers, smart phones, and Internet of Things (IoT) devices. Students in the program will have knowledge of computer programming languages, hardware description languages, digital logic design, computer organization, electrical and electronics circuit design, and processing of electrical signals. They will have the ability to apply mathematical and statistical methods for understanding, development, and applications of computing devices.

The graduates of the program will be able to pursue (i) employment in electronic chip design/production companies, hardware/software services companies, and all industries requiring electrical and computer engineers, such as automotive, aerospace, defense, utilities and heavy-machinery; and (ii) advanced study in computer engineering or a related field.

Minimum Total Credit Hours: 126

Goals/Mission Statement

Mission Statement

The mission of the electrical and computer engineering department is to provide quality education to the students of the department.

Statement of Goals

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

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The computer engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The computer engineering program is a broad-based program with an emphasis on the fundamentals of computer engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi-course sequences in engineering. Multi-course sequence areas are:

- Core topics common to electrical and computer engineering, such as circuits, electronics, signals and systems analysis, and digital systems

- Programming languages, computer operating systems, and algorithms and data structures computer architecture and microprocessors
- Technical elective courses such as embedded systems, VLSI design and testing of computing systems
- Engineering design

The BSCpE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Computer Engineering (BSCpE) undergraduate program. The graduates of the program within 3-5 years after graduation will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, continuing education credits and pursuit of professional certificates;
- Attain advanced degrees and work in academia, government agencies or high-tech companies;
- Generate professional publications, develop patents and foster entrepreneurship.

Student Outcomes

Students of the Bachelor of Science in Computer Engineering program will demonstrate achievement of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

The following courses are required: Math 261-264 and Math 353; laboratory sciences to be fulfilled by Chem 105, 115 and Phys 211, 212, 221, 222; Writ 100/101 and Writ 102/Liba 102. Students must also complete at least 18 semester hours of 3 hours in humanities chosen from classics, English, history, philosophy, religion, African American studies, gender studies, and Southern studies; 3 hours in fine arts chosen from art history, dance, music, and theatre arts (courses emphasizing the enhancement of skills and performance are not acceptable); 3 hours in social science chosen from anthropology, economics, political science, psychology, and sociology; Econ 310; 3 additional hours of humanities or fine arts or languages (modern, Greek, or Latin); and 3 additional hours of humanities, languages (modern, Greek, or Latin), fine arts, or general education courses as specified by the School of Engineering.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.Cp.E. program include Math 301; Csci 256, 356, 423, 433; Engr 310, 360, 361; El E 235, 236, 237, 322, 331, 351, 352, 353, 385, 386, 425, 485, 486; ECE 361, Cp E 431, 461, 462.

Coursework for Standard Emphasis:

Specific requirements for the Standard Emphasis include El E 100; 3 hours selected from Technical Elective I (El E 391, El E 431, or El E 586); 9 hours selected from Technical Elective II (El E 482, 536 CpE 421, or CpE 432); 6 hours of Technical Elective III (El E 343, 447, 453, 533, 534, 535, or other courses from Technical Elective I, II not already completed or a maximum of 3 hours of CSci at 300 level or above) for a total of 19 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the manufacturing emphasis include Manf 150, 152, 251, 252, 253, 255, 351, 353, 355, 455 and 9 hours of technical elective courses to be chosen from El E 482, 536, CpE 421, or CpE 432 for a total of 27 credit hours.

Standard Option

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.Cp.E. in Computer Engineering

General Education

Requirement Hours	Description
First Year Writing I 3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II 3	Complete Writ 102 , Liba 102 , or Hon 102 with a passing grade:
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences 3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310 3	Complete Econ 310 with a passing grade.
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.

Requirement Hours		Description
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours		Description
Cp E 431	3	Complete Cp E 431 with a passing grade.
Cp E 461	1	Complete Cp E 461 with a passing grade.
Cp E 462	3	Complete Cp E 462 with a passing grade.
CSci 256	3	Complete CSci 256 with a passing grade.
CSci 356	3	Complete CSci 356 with a passing grade.
CSci 423	3	Complete CSci 423 with a passing grade.
CSci 433	3	Complete CSci 433 with a passing grade.
ECE 361	1	Complete ECE 361 with a passing grade.
El E 235	3	Complete El E 235 with a passing grade.
El E 236	1	Complete El E 236 with a passing grade.
El E 237	1	Complete El E 237 with a passing grade.
El E 322	1	Complete El E 322 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
El E 351	3	Complete El E 351 with a passing grade.
El E 352	3	Complete El E 352 with a passing grade.
El E 353	1	Complete El E 353 with a passing grade.
El E 385	3	Complete El E 385 with a passing grade.
El E 386	1	Complete El E 386 with a passing grade.
El E 425	3	Complete El E 425 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
Math 301	3	Complete Math 301 with a passing grade.

Standard Option

Requirement Hours		Description
El E 100	1	Complete El E 100 with a passing grade.
3 hrs Tech Elective I	3	Complete El E 391 , 431 , or 586 with a passing grade.
9 hrs Tech Elect II	9	Complete 9 hours chosen from El E 482 , El E 536 Cp E 421 , or Cp E 432 .
6 hrs Tech Electives III	6	Complete 6 hrs chosen from El E 341 , 447 , 453 , 533 , 534 , 535 , or other courses from Technical Elective I, II not already completed or a maximum of 3 hours of CSci at 300 level or above.

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Emphasis - Manufacturing

- [B.S.Cp.E. in Computer Engineering](#)
- [Emphasis - Manufacturing](#)
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B.S.Cp.E. in Computer Engineering

Description

The Bachelor of Science in Computer Engineering program prepares students to have an understanding of computer hardware, software, and electrical engineering fundamentals, thereby acquiring knowledge to develop and/or apply many kinds of computing systems, such as microprocessors, computers, smart phones, and Internet of Things (IoT) devices. Students in the program will have knowledge of computer programming languages, hardware description languages, digital logic design, computer organization, electrical and electronics circuit design, and processing of electrical signals. They will have the ability to apply mathematical and statistical methods for understanding, development, and applications of computing devices.

The graduates of the program will be able to pursue (i) employment in electronic chip design/production companies, hardware/software services companies, and all industries requiring electrical and computer engineers, such as automotive, aerospace, defense, utilities and heavy-machinery; and (ii) advanced study in computer engineering or a related field.

Minimum Total Credit Hours: 126

Goals/Mission Statement

Mission Statement

The mission of the electrical and computer engineering department is to provide quality education to the students of the department.

Statement of Goals

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

Undergraduate Program Philosophy

The computer engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The computer engineering program is a broad-based program with an emphasis on the fundamentals of computer engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi-course sequences in engineering. Multi-course sequence areas are:

- Core topics common to electrical and computer engineering, such as circuits, electronics, signals and systems analysis, and digital systems

- Programming languages, computer operating systems, and algorithms and data structures computer architecture and microprocessors
- Technical elective courses such as embedded systems, VLSI design and testing of computing systems
- Engineering design

The BSCpE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Computer Engineering (BSCpE) undergraduate program. The graduates of the program within 3-5 years after graduation will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, continuing education credits and pursuit of professional certificates;
- Attain advanced degrees and work in academia, government agencies or high-tech companies;
- Generate professional publications, develop patents and foster entrepreneurship.

Student Outcomes

Students of the Bachelor of Science in Computer Engineering program will demonstrate achievement of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

The following courses are required: Math 261-264 and Math 353; laboratory sciences to be fulfilled by Chem 105, 115 and Phys 211, 212, 221, 222; Writ 100/101 and Writ 102/Liba 102. Students must also complete at least 18 semester hours of 3 hours in humanities chosen from classics, English, history, philosophy, religion, African American studies, gender studies, and Southern studies; 3 hours in fine arts chosen from art history, dance, music, and theatre arts (courses emphasizing the enhancement of skills and performance are not acceptable); 3 hours in social science chosen from anthropology, economics, political science, psychology, and sociology; Econ 310; 3 additional hours of humanities or fine arts or languages (modern, Greek, or Latin); and 3 additional hours of humanities, languages (modern, Greek, or Latin), fine arts, or general education courses as specified by the School of Engineering.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.Cp.E. program include Math 301; Csci 256, 356, 423, 433; Engr 310, 360, 361; El E 235, 236, 237, 322, 331, 351, 352, 353, 385, 386, 425, 485, 486; ECE 361, Cp E 431, 461, 462.

Coursework for Standard Emphasis:

Specific requirements for the Standard Emphasis include El E 100; 3 hours selected from Technical Elective I (El E 391, El E 431, or El E 586); 9 hours selected from Technical Elective II (El E 482, 536 CpE 421, or CpE 432); 6 hours of Technical Elective III (El E 343, 447, 453, 533, 534, 535, or other courses from Technical Elective I, II not already completed or a maximum of 3 hours of CSci at 300 level or above) for a total of 19 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the manufacturing emphasis include Manf 150, 152, 251, 252, 253, 255, 351, 353, 355, 455 and 9 hours of technical elective courses to be chosen from El E 482, 536, CpE 421, or CpE 432 for a total of 27 credit hours.

Emphasis - Manufacturing

Degree Requirements

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B.S.Cp.E. in Computer Engineering

General Education

Requirement Hours	Description
First Year Writing I 3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II 3	Complete Writ 102 , Liba 102 , or Hon 102 with a passing grade:
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences 3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310 3	Complete Econ 310 with a passing grade.
3 hrs FA/Lang/Hum 3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement Hours	Description
Math 261 3	Complete Math 261 with a passing grade.
Math 262 3	Complete Math 262 with a passing grade.
Math 263 3	Complete Math 263 with a passing grade.

Requirement	Hours	Description
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Cp E 431	3	Complete Cp E 431 with a passing grade.
Cp E 461	1	Complete Cp E 461 with a passing grade.
Cp E 462	3	Complete Cp E 462 with a passing grade.
CSci 256	3	Complete CSci 256 with a passing grade.
CSci 356	3	Complete CSci 356 with a passing grade.
CSci 423	3	Complete CSci 423 with a passing grade.
CSci 433	3	Complete CSci 433 with a passing grade.
ECE 361	1	Complete ECE 361 with a passing grade.
El E 235	3	Complete El E 235 with a passing grade.
El E 236	1	Complete El E 236 with a passing grade.
El E 237	1	Complete El E 237 with a passing grade.
El E 322	1	Complete El E 322 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
El E 351	3	Complete El E 351 with a passing grade.
El E 352	3	Complete El E 352 with a passing grade.
El E 353	1	Complete El E 353 with a passing grade.
El E 385	3	Complete El E 385 with a passing grade.
El E 386	1	Complete El E 386 with a passing grade.
El E 425	3	Complete El E 425 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
Math 301	3	Complete Math 301 with a passing grade.

Emphasis - Manufacturing

Requirement	Hours	Description
Manf 150	1	Complete Manf 150 with a passing grade.
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.

Requirement	Hours	Description
<u>Manf 351</u>	1	Complete <u>Manf 351</u> with a passing grade.
<u>Manf 353</u>	3	Complete <u>Manf 353</u> with a passing grade.
<u>Manf 355</u>	1	Complete <u>Manf 355</u> with a passing grade.
<u>Manf 455</u>	3	Complete <u>Manf 455</u> with a passing grade.
9 hrs tech electives II	9	Complete 9 hrs of technical electives chosen from <u>EI E 482</u> , <u>Cp E 421</u> , and <u>Cp E 432</u> with a passing grade.

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B.S.Cp.E. in Computer Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

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B.S.Cp.E. in Computer Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Writ 102 , Liba 102 , or Hon 102 with a passing grade:
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 with a passing grade.
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.

Requirement	Hours	Description
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
Cp E 431	3	Complete Cp E 431 with a passing grade.
Cp E 461	1	Complete Cp E 461 with a passing grade.
Cp E 462	3	Complete Cp E 462 with a passing grade.
CSci 256	3	Complete CSci 256 with a passing grade.
CSci 356	3	Complete CSci 356 with a passing grade.
CSci 423	3	Complete CSci 423 with a passing grade.
CSci 433	3	Complete CSci 433 with a passing grade.
ECE 361	1	Complete ECE 361 with a passing grade.
El E 235	3	Complete El E 235 with a passing grade.
El E 236	1	Complete El E 236 with a passing grade.
El E 237	1	Complete El E 237 with a passing grade.
El E 322	1	Complete El E 322 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
El E 351	3	Complete El E 351 with a passing grade.
El E 352	3	Complete El E 352 with a passing grade.
El E 353	1	Complete El E 353 with a passing grade.
El E 385	3	Complete El E 385 with a passing grade.
El E 386	1	Complete El E 386 with a passing grade.
El E 425	3	Complete El E 425 with a passing grade.
El E 485	2	Complete El E 485 with a passing grade.
El E 486	1	Complete El E 486 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 361	1	Complete Engr 361 with a passing grade.
Math 301	3	Complete Math 301 with a passing grade.

Standard Option

Requirement	Hours	Description
El E 100	1	Complete El E 100 with a passing grade.
3 hrs Tech Elective I	3	Complete El E 391 , 431 , or 586 with a passing grade.
9 hrs Tech Elect II	9	Complete 9 hours chosen from El E 482 , El E 536 Cp E 421 , or Cp E 432 .
6 hrs Tech Electives III	6	Complete 6 hrs chosen from El E 341 , 447 , 453 , 533 , 534 , 535 , or other courses from Technical Elective I, II not already completed or a maximum of 3 hours of CSci at 300 level or above.

Emphasis - Manufacturing

Requirement	Hours	Description
Manf 150	1	Complete Manf 150 with a passing grade.

Requirement	Hours	Description
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.
Manf 351	1	Complete Manf 351 with a passing grade.
Manf 353	3	Complete Manf 353 with a passing grade.
Manf 355	1	Complete Manf 355 with a passing grade.
Manf 455	3	Complete Manf 455 with a passing grade.
9 hrs tech electives II	9	Complete 9 hrs of technical electives chosen from ELE 482 , Cp E 421 , and Cp E 432 with a passing grade.

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Geol 120: Dinosaurs

Geology & Geological Engineering

Introduction to natural history for non-science majors, as exemplified by the origin, diversification, and extinction of dinosaurs.

May be used to satisfy natural science requirement of core curriculum. Geol 112 (laboratory) may be taken with Geol 120 to satisfy laboratory- science requirement.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 120
- Lecture: Web-based Lecture for Geol 120

Subject Areas

- [Paleontology](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Geology/Earth Science, General](#)
- [Hydrology and Water Resources Science](#)

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G E 635: Advanced Rock Mechanics

Geology & Geological Engineering

The application of mechanics to solving problems in rock engineering for both surface and underground conditions.

3 Credits

Prerequisites

- [G E 540: Rock Mechanics](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 635

Subject Areas

- [Geology/Earth Science, General](#)
- [Geological Engineering](#)

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Geol 610: Earth Science Projects

Geology & Geological Engineering

(May be repeated for credit).

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Geol 610
- Indiv Based: In-Country Program for Geol 610

Subject Areas

- [Geology/Earth Science, General](#)
- [Earth and Planetary Sciences](#)

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Geol 645: Advanced Sedimentation

Geology & Geological Engineering

Analysis of sedimentation process and response patterns as indicators of depositional environment, dispersal, and basin evolution.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 645

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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G E 401: Geological Eng. Design Field Camp 2

Geology & Geological Engineering

Advanced application of geological engineering field instruments and field techniques; geologic engineering mapping exercises as individual and group projects drawn from selected geological engineering topics, including hydrology, environmental applications, geotechnical engineering, hazards engineering, and resource assessment; preparation of geologic and engineering reports, maps, and figures; analysis of observed conditions to make engineering judgments.

3 Credits

Prerequisites

- [Geol 305: Geomorphology](#)
- [G E 301: Geological Eng. Design Field Camp 1](#)
- [Geol 303: Structural and Tectonic Geology](#) (Minimum grade: C)
- [Engr 340: Engineering Geology](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for G E 401
- Lecture: Lecture for G E 401
- Lecture: In-Country Program for G E 401
- Lecture: Study USA for G E 401

Subject Areas

- [Geological/Geophysical Engineering](#)

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G E 513: Economic Geology

Geology & Geological Engineering

Study of the formation and classification of ore deposits; exploration techniques; evaluation of reserves; and extraction techniques.

3 Credits

Prerequisites

- Pre-requisite: Minimum grade of C in Geol 303 or Graduate Standing.

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 513

Subject Areas

- [Geological Engineering](#)
- [Geology/Earth Science, General](#)

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G E 450: Hydrogeology

Geology & Geological Engineering

The theory and geology of the flow of ground water. Engineering principles and the design of wells for production or injection of fluids from or into subsurface aquifers. (3 lecture, 2 lab hours).

4 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 450

Subject Areas

- [Hydrology and Water Resources Science](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Geology/Earth Science, General](#)
- [Paleontology](#)

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Geol 420: Optical Mineralogy

Geology & Geological Engineering

Use of the petrographic microscope to study the optical properties of rock-forming minerals. (2 lecture, 2 lab hours).

3 Credits

Prerequisites

- Pre-requisite: Minimum grade of C in Geol 222 or Geol 225.
- Pre-Requisite: 24 Earned Hours
- Geol 222 or Geol 225

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 420

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 500: Intro. to Geographic Information Systems

Geology & Geological Engineering

Introduces the use of a geographic information system. Topics include applications of geographic information; spatial data collection; data accuracy and uncertainty; data visualization of cartographic principles; spatial analysis; GPS/GNSS; and legal, economic, and ethical issues associated with the use of a geographic information system.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Geol 500

Subject Areas

- [Geology/Earth Science, General](#)
- [Geographic Information Science and Cartography](#)

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Geol 647: Sedimentary Petrology

Geology & Geological Engineering

Advanced treatment of the principals and recent advances in sedimentary petrology with particular emphasis on textural and geochemical aspects of diagnosis.

4 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 647

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 530: Geology Field Studies

Geology & Geological Engineering

Field projects for graduate students.

3 Credits

Prerequisites

- Geol 221 or Geol 222 or Geol 303 or Geol 314 or Graduate Standing.

Instruction Type(s)

- Lab: Laboratory for Geol 530
- Lab: In-Country Program for Geol 530

Subject Areas

- [Geological/Geophysical Engineering](#)
- [Geology/Earth Science, General](#)

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G E 591: Special Topics

Geology & Geological Engineering

Lecture or lecture/lab courses on specific topics and on a one-time basis.

1 - 3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 591
- Lecture/Lab: Teacher Workshop for G E 591

Subject Areas

- [Geology/Earth Science, General](#)
- [Geological/Geophysical Engineering](#)

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G E 490: Directed Studies and Projects

Geology & Geological Engineering

Individual studies and/or projects for undergraduates on specific topics.

1 - 3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Indiv Based: Individual Based Study for G E 490
- Indiv Based: Washington Internship Experience Program

Subject Areas

- [Geological/Geophysical Engineering](#)

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G E 421: Geological Engineering Design

Geology & Geological Engineering

Geological engineering design by the application of rock mechanics, soil mechanics, geology, geophysics, remote sensing, and hydrology to geological and engineering problems. The taking of the national Fundamentals of Engineering (FE) examination is a requirement of this course.

4 Credits

Prerequisites

- [G E 420: Subsurface Site Characterization](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours
- Co-requisites: G E 305 or G E 540 or CE 431

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 421

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geol 517: Global Tectonics

Geology & Geological Engineering

This 3-credit course is designed to introduce students to the fundamental principles of plate tectonics, the driving forces and evolution of plate tectonics on Earth, and examine the magmatic, sedimentary metamorphic and geophysical characteristics of tectonic settings. Course material will focus on synthesis of data and concepts to understand theoretical and applied aspects of global tectonics and application of tectonic principles to addressing regional geological problems.

3 Credits

Prerequisites

- Pre-requisite: Geol 303 or Graduate Standing.

Instruction Type(s)

- Lecture: Lecture for Geol 517

Subject Areas

- [Geological and Earth Sciences/Geosciences, Other](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geology/Earth Science, General](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 203: Earth Dynamics Laboratory Content

Geology & Geological Engineering

This is the laboratory component of Geol 103. This course is designed for students transferring into the program after completing Geol 101 and 102. Students cannot receive credit from both Geology 103 and 203. This course when combined with introductory geology courses can be used by students seeking a waiver of the requirement to complete Geology 103, with permission of the department.

2 Credits

One-way corequisites

- [Geol 101: Physical Geology](#)
- [Geol 102: Historical Geology](#)

Instruction Type(s)

- Lecture: Lecture for Geol 203

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geol 518: Quantitative Methods in Geo. & Geo Eng

Geology & Geological Engineering

Quantitative methods in geology and geological engineering.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 518

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geol 102: Historical Geology

Geology & Geological Engineering

Classical introduction to Earth science and the historical development of the Earth and its life. Satisfies science requirement of core curriculum when taken in conjunction with Geol 112.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 102
- Lecture: Web-based Lecture for Geol 102
- Lecture: WEB Washington Internship for Geol 102

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geol 111: Physical Geology Laboratory

Geology & Geological Engineering

Laboratory exercises that introduce earth science and the physical and chemical processes that affect the Earth.

1 Credit

One-way corequisites

- [Geol 101: Physical Geology](#)

Instruction Type(s)

- Lab: Laboratory for Geol 111
- Lab: Web-based Laboratory for Geol 111

Course Fee(s)

Geology 2

- \$195.00

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 104: Environmental Geology - Hazards

Geology & Geological Engineering

An introduction to the relationship between humans and the geological environment with a focus on natural and human induced hazards, including landslides, volcanic eruptions, earthquakes, tsunamis, subsidence, sea-level rise, and pollution. Satisfies laboratory-science requirements of core curriculum when taken in conjunction with Geol 114. Will not count for credit if Geol 101 is counted.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 104
- Lecture/Lab: Web-based Lecture/Lab for Geol 104

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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G E 507: Regional Geological Engineering

Geology & Geological Engineering

Geological engineering problems associated with each area of the United States.

3 Credits

Instruction Type(s)

- Lecture: Lecture for G E 507

Subject Areas

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Related Areas

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- [Geological Engineering](#)

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G E 555: Introduction to Mining Engineering

Geology & Geological Engineering

Introduction of theories and fundamentals of mining engineering, including the identification and evaluation of mineral deposits, the design and implementation of efficient mining operations, and innovations in mining technology.

3 Credits

Prerequisites

- Junior Standing Required

Instruction Type(s)

- Lecture: Lecture for G E 555
- Lecture: Web-based Lecture for G E 555

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geol 410: Coastal and Reef Dynamics

Geology & Geological Engineering

Taught as study abroad only. An intermediate-level course designed to acquaint the student with the dynamics of the physical and biological systems that have formed and are forming the coastal, caye, and reef areas of Belize, Central America.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 410

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geology & Geological Engineering

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Undergraduate Studies

Academic Regulations

Students admitted to the University and the School of Engineering in accordance with stated admission policies may then declare their chosen degree program.

Graduate Studies

M.S. and Ph.D. entrance requirements are those of the Graduate School. M.S. applicants are expected to possess or be in the process of completing an undergraduate degree in engineering or closely related field from an accredited institution. In general, Ph.D. applicants are expected to possess or be in the process of completing a master's degree. In certain cases, applicants completing an undergraduate degree in engineering or closely related field from an accredited institution may be considered.

See the degree requirements under Programs.

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Geol 225: Mineralogy & Elementary Petrology

Geology & Geological Engineering

Hand specimen identification of minerals and rocks; determination of physical and chemical properties; mineralogic and lithologic classifications; lithification processes; mineral resources.

5 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- Pre-requisites: Geol 103 OR (Geol 101 and Geol 111 and Geol 102 and Geol 112) OR Geol 203 in place of Geol 111 and Geol 112 with a grade of C in each prerequisite course.

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 225

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 305: Geomorphology

Geology & Geological Engineering

Introduction to concepts of landform genesis. (2 lecture, 2 lab hours).

3 Credits

Prerequisites

- Pre-Requisites: Minimum grade of C in Geol (103) OR (Geol 101 and Geol 111 and Geol 102 and Geol 112) OR (Geol 203).
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 305

Subject Areas

- [Geology/Earth Science, General](#)
- [Geological Engineering](#)

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Geol 107: Introduction to Oceanography

Geology & Geological Engineering

Qualitative introduction to ocean circulation, properties of seawater, waves, tides, and shoreline evolution.

May be used to satisfy natural science requirement of core curriculum.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 107
- Lecture: Web-based Lecture for Geol 107

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geol 648: Metamorphic Petrology

Geology & Geological Engineering

Metamorphic rock chemistry and mineralogy; time and space relationships of metamorphic rocks in consideration of global tectonics.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 648

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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G E 530: Advanced Geomechanics

Geology & Geological Engineering

Applications of the principles of geomechanics to engineering problems dealing with earth materials.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 530
- Lecture/Lab: In-Country Program for G E 530

Subject Areas

- [Geological Engineering](#)

Related Areas

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Geol 520: Advanced Igneous and Metamorphic Petrology

Geology & Geological Engineering

The course is designed to present the principles of igneous and metamorphic petrology and petrography, rock classification based on composition and textures, tectonic associations of rock types, and magma petrogenesis and tectonic associations.

3 Credits

Prerequisites

- Pre-requisite: Geol 225 or Geology/Geological Engineering Graduate Standing

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 520

Subject Areas

- [Geochemistry and Petrology](#)

Related Areas

- [Geochemistry](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Geology/Earth Science, General](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 643: Advanced Geomorphology

Geology & Geological Engineering

Surface processes associated with specific physiographic districts.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 643

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geol 690: Scientific Writing

Geology & Geological Engineering

Exercises in scientific writing format and style, with particular emphasis on writing abstracts and manuscripts for publication in refereed archival journals.

3 Credits

Instruction Type(s)

- Seminar: Seminar for Geol 690

Subject Areas

- [Geological/Geophysical Engineering](#)
- [Geology/Earth Science, General](#)

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G E 577: Geophysics I

Geology & Geological Engineering

The application of geophysical methods and techniques to shallow subsurface investigations. Not intended for students in the B.S.G.E. program.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- Phys 212 or Phys 214

One-way corequisites

- [Engr 340: Engineering Geology](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 577

Subject Areas

- [Geology/Earth Science, General](#)
- [Geological/Geophysical Engineering](#)

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G E 510: Remote Sensing

Geology & Geological Engineering

Interdisciplinary course designed to introduce theory and principles of remote sensing technology. Topics covered will include digital image processing and classification, rectification and projections, interpolation, sensors and platforms, history and theory, as well as other related topics. The course is designed to cover the subject material to allow for multidisciplinary participants.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 510

Subject Areas

-
- [Geology/Earth Science, General](#)

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Geol 115: Environmental Geology - Resources Lab

Geology & Geological Engineering

Additional laboratory exercises that introduce the relationship between humans and the geologic environment with a focus on natural resources.

1 Credit

Prerequisites

- Geol 115 Requires: One Way-Co-Requisite Geol 105

Instruction Type(s)

- Lab: Laboratory for Geol 115
- Lab: Web-based Laboratory for Geol 115

Course Fee(s)

Geology 2

- \$195.00

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geology & Geological Engineering

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Faculty in Geology & Geological Engineering

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- [B](#)
- [C](#)
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- [O](#)
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- [R](#)
- [W](#)
- [Y](#)

[Jump to Emeritus faculty](#)

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Emeritus Faculty

- [A](#)

- [E](#)
- [M](#)
- [P](#)
- [Z](#)

[Jump to current faculty](#)

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G E 430: Geological Field Studies I

Geology & Geological Engineering

Application of geological engineering and geology to special study field problems.

4 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 430
- Lecture/Lab: In-Country Program for G E 430

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geol 101: Physical Geology

Geology & Geological Engineering

Classical introduction to Earth science and the physical and chemical processes that affect the Earth. Satisfies science requirement of core curriculum when taken in conjunction with Geol 111. Will not count for credit if Geol 104 is counted.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 101
- Lecture: Web-based Lecture for Geol 101
- Lecture: iStudy for Geol 101
- Lecture: WEB Washington Internship for Geol 101
- Lecture: WEB New York Internship Experience

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Minor - Geology

- [Minor - Geology](#)

Minor - Geology

Course Requirements

A minor in geology consists of 18 hours of geology courses, including 12 hours at the 200-level or above.

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Geol 649: Pedology

Geology & Geological Engineering

The objective of the course is to provide students with an understanding of the fundamental physical and chemical properties of soils and the formative processes responsible for those properties. The course will also cover the description and interpretation of soils preserved in the geological record as paleosols.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 649

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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G E 305: Geomechanics

Geology & Geological Engineering

Properties and behavior of earth materials and their geological engineering applications to problems and design in geotechnics, mining, and petroleum. (2 lecture, 2 lab hours).

3 Credits

Prerequisites

- [Engr 312: Mechanics of Materials](#)

Instruction Type(s)

- Lecture: Lecture for G E 305

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geol 646: Advanced Stratigraphy

Geology & Geological Engineering

Analysis of components of recent depositional systems and case studies of ancient analogues.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 646

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geology & Geological Engineering

- [Overview](#)
- [Academics & Admissions](#)
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- [Minors](#)
- [Courses](#)
- [Faculty](#)

Leadership

- Thomas Oommen - Chair and Professor of Geology and Geological Engineering

Contact

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Overview

The Department of Geology and Geological Engineering offers the Bachelor of Science in Geological Engineering (B.S.G.E.) degree and the Bachelor of Science (B.S.) in geology degree. At the graduate level, the department has offerings for the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in engineering science. The latter graduate degrees are listed under the School of Engineering.

Accreditation

The following undergraduate engineering programs are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, and Bachelor of Science in Mechanical Engineering. The Bachelor of Science in Computer Science (BSCS) program of the Department of Computer and Information Science is accredited as a Computer Science program by the Computing Accreditation Commission (CAC) of ABET <https://www.abet.org>.

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Geol 615: Geostatistics

Geology & Geological Engineering

Operational aspects and interpretation of geological data using statistics and data analysis.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 615

Subject Areas

- [Geological/Geophysical Engineering](#)

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G E 470: Intro. to Geographic Information System

Geology & Geological Engineering

Introduces the use of a geographic information system. Topics include applications of geographic information; spatial data collection; data accuracy and uncertainty; data visualization of cartographic principles; spatial analysis; GPS/GNSS; and legal, economic, and ethical issues associated with the use of a geographic information system.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Cross-listed Courses

- [C E 500: Geographic Information Systems Engr Sci](#)

Instruction Type(s)

- Lecture: Lecture for G E 470

Subject Areas

- [Geographic Information Science and Cartography](#)

Related Areas

- [Geography](#)

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G E 511: Spatial Analysis

Geology & Geological Engineering

GIS analysis of the relationships of mapped features. Course will include application and integration of GIS, image processing, and mathematical modes.

3 Credits

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 511

Subject Areas

-
- [Geology/Earth Science, General](#)

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Geol 106: Earth History

Geology & Geological Engineering

Survey of the history of geologic processes and life forms on Earth.

Will not count for credit if Geol 102 is counted.

Restricted to students majoring in geology or geological engineering.

2 Credits

Prerequisites

- Co-Requisites: Geol 101 or Geol 103.

Instruction Type(s)

- Lecture: Lecture for Geol 106

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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G E 415: Petroleum Geology

Geology & Geological Engineering

Development of petroleum exploration programs based on stratigraphic, structural, and/or geochemical data.

3 Credits

Prerequisites

- [Geol 314: Sedimentology and Stratigraphy](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 415

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geol 222: Elementary Petrology

Geology & Geological Engineering

Hand-specimen identification and lithologic classification, the role of plate tectonics in petrogenesis. (3 lecture, 2 lab hours).

4 Credits

Prerequisites

- [Geol 221: Mineralogy](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 222

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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G E 540: Rock Mechanics

Geology & Geological Engineering

Survey of engineering properties and behaviors of rock mass system components. Reconstruction and visualization of internal structure of system domains. Classifications of rock masses. Role of environmental variables in system behavior. Modeling system behavior as equivalent continuum and simplified discontinuum.

4 Credits

Prerequisites

- Pre-Requisite Engr 309 and Engr 340 (minimum grade: C) or Graduate Standing.

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 540

Subject Areas

- [Geological/Geophysical Engineering](#)

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G E 413: Prob. & Stat. Analyses in Eng. Design

Geology & Geological Engineering

Introduction to probability, statistics, uncertainty, and reliability. Application of common continuous and discrete probability distributions. Design under uncertainty and elementary decision analysis. Simulation of random variables. Applications in natural and man-made materials, hydrologic and geological conditions and other natural processes, and engineering design.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for G E 413

Subject Areas

- [Geological/Geophysical Engineering](#)

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G E 301: Geological Eng. Design Field Camp 1

Geology & Geological Engineering

Introduction to the use of geological engineering field instruments and field techniques; measuring and describing stratigraphic sections; creation of stratigraphic columns and correlation diagrams; geologic mapping.

3 Credits

Prerequisites

- [Geol 314: Sedimentology and Stratigraphy](#)
- Pre-requisite: Minimum grade of C in Geol 222 or Geol 225.
- Pre-Requisite: 24 Earned Hours
- Geol 222 or Geol 225

Instruction Type(s)

- Laboratory: Laboratory for G E 301
- Laboratory: In-Country Program for G E 301
- Laboratory: Web-based Laboratory for G E 301
- Laboratory: Study USA for G E 301

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geology & Geological Engineering

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Degrees Offered

- [B.S.G. in Geology](#)
- [B.S.G.E. in Geological Engineering](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Geological Engineering](#)
 - [Emphasis - Geology](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Geological Engineering](#)
 - [Emphasis - Geology](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)

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G E 503: Environmental Geochemistry

Geology & Geological Engineering

Chemical interaction between water and aquifer minerals, organic minerals, and contaminants.

3 Credits

Prerequisites

- Pre-requisite: Chem 106 or Graduate Standing
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for G E 503

Subject Areas

- [Geochemistry](#)
- [Geological/Geophysical Engineering](#)

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G E 525: Engineering Seismology

Geology & Geological Engineering

Origin of earthquakes, their effects on structures and the selection of ground-motion parameters for earthquake-resistant design.

3 Credits

Instruction Type(s)

- Lecture: Lecture for G E 525

Subject Areas

- [Geological/Geophysical Engineering](#)
- [Geology/Earth Science, General](#)

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Geol 535: Geochemistry

Geology & Geological Engineering

Application of chemical principles to geologic problems; crystal chemistry.

3 Credits

Prerequisites

- Pre-requisite: Chem 106 and Geol 221 (or Graduate Standing)

Instruction Type(s)

- Lecture: Lecture for Geol 535

Subject Areas

- [Geochemistry](#)

Related Areas

- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Geology/Earth Science, General](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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G E 405: Engineering Geophysics

Geology & Geological Engineering

The application of geophysical methods and techniques to subsurface engineering investigations.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- [Engr 340: Engineering Geology](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours
- Phys 212 or Phys 214

Instruction Type(s)

- Lecture: Lecture for G E 405

Subject Areas

- [Geological/Geophysical Engineering](#)

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Geol 314: Sedimentology and Stratigraphy

Geology & Geological Engineering

Study of principles of sediment and sedimentary rock formation, transport, classification, and depositional environments, as well as the development of stratigraphic sequences and modern and traditional methods of stratigraphic correlation. (3 lecture, 2 lab hours).

4 Credits

Prerequisites

- [Geol 103: Earth Dynamics](#) (Minimum grade: C)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 314

Subject Areas

- [Geological/Geophysical Engineering](#)
- [Geology/Earth Science, General](#)

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Geol 630: Coastal Plain Geology

Geology & Geological Engineering

Stratigraphy, depositional patterns, and dominant process; emphasis on Gulf Coastal Plain; field studies.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 630

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geol 303: Structural and Tectonic Geology

Geology & Geological Engineering

Geometric and genetic classification of both macro- and micro-structural types and their interrelations with crustal tectonics. (3 lecture, 2 lab hours).

4 Credits

Prerequisites

- Pre-Requisite: Minimum grade of C in Geol 225 or (Geol 221 and Geol 222).

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 303

Subject Areas

- [Geological/Geophysical Engineering](#)
- [Geology/Earth Science, General](#)

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Geol 105: Environmental Geology - Resources

Geology & Geological Engineering

An introduction to the relationship between humans and the geological environment with a focus on natural resources, waste disposal, and climate change. Satisfies laboratory-science requirements of core curriculum when taken in conjunction with Geol 115.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Geol 105
- Lecture: Web-based Lecture for Geol 105
- Lecture: iStudy Lecture for Geol 105

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 309: Invertebrate Paleontology

Geology & Geological Engineering

The classification, morphology, and paleoecology of invertebrate fossils. (3 lecture, 2 lab hours).

4 Credits

Prerequisites

- Pre-Requisites: Minimum grade of C in Geol (103) OR (Geol 101 and Geol 111 and Geol 102 and Geol 112) OR (Geol 203).
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 309

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 221: Mineralogy

Geology & Geological Engineering

Crystallography, crystal chemistry and minerals; determination by physical and chemical properties. (3 lecture, 2 lab hours).

4 Credits

Prerequisites

- [Geol 103: Earth Dynamics](#) (Minimum grade: C)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 221

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 505: Hydrogeology

Geology & Geological Engineering

Groundwater hydrology for geologists.

4 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#)
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Geol 505

Subject Areas

- [Hydrology and Water Resources Science](#)
- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Paleontology](#)

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G E 436: Field Camp G E Design

Geology & Geological Engineering

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Subject Areas

- [Geology/Earth Science, General](#)
- [Geological/Geophysical Engineering](#)

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Geol 697: Thesis

Geology & Geological Engineering

Research and writing in preparation of a thesis for the M.S. in engineering science-geology degree.

May be repeated for credit.

No grade

1 - 12 Credits

Instruction Type(s)

- Thesis: Thesis for Geol 697

Subject Areas

- [Geological/Geophysical Engineering](#)
- [Geology/Earth Science, General](#)

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Geology & Geological Engineering

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Courses

- [Engr 310: Engineering Analysis I](#)
- [Engr 340: Engineering Geology](#)
- [G E 301: Geological Eng. Design Field Camp 1](#)
- [G E 305: Geomechanics](#)
- [G E 401: Geological Eng. Design Field Camp 2](#)
- [G E 405: Engineering Geophysics](#)
- [G E 413: Prob. & Stat. Analyses in Eng. Design](#)
- [G E 415: Petroleum Geology](#)
- [G E 420: Subsurface Site Characterization](#)
- [G E 421: Geological Engineering Design](#)
- [G E 430: Geological Field Studies I](#)
- [G E 436: Field Camp G E Design](#)
- [G E 450: Hydrogeology](#)
- [G E 470: Intro. to Geographic Information System](#)
- [G E 490: Directed Studies and Projects](#)
- [G E 503: Environmental Geochemistry](#)
- [G E 507: Regional Geological Engineering](#)
- [G E 510: Remote Sensing](#)
- [G E 511: Spatial Analysis](#)
- [G E 513: Economic Geology](#)
- [G E 525: Engineering Seismology](#)
- [G E 530: Advanced Geomechanics](#)
- [G E 540: Rock Mechanics](#)
- [G E 555: Introduction to Mining Engineering](#)
- [G E 577: Geophysics I](#)
- [G E 591: Special Topics](#)
- [G E 635: Advanced Rock Mechanics](#)
- [Geol 101: Physical Geology](#)
- [Geol 102: Historical Geology](#)
- [Geol 103: Earth Dynamics](#)
- [Geol 104: Environmental Geology - Hazards](#)
- [Geol 105: Environmental Geology - Resources](#)
- [Geol 106: Earth History](#)
- [Geol 107: Introduction to Oceanography](#)
- [Geol 111: Physical Geology Laboratory](#)
- [Geol 112: Historical Geology Laboratory](#)
- [Geol 114: Environmental Geology-Hazards Laboratory](#)
- [Geol 115: Environmental Geology - Resources Lab](#)
- [Geol 120: Dinosaurs](#)
- [Geol 203: Earth Dynamics Laboratory Content](#)
- [Geol 221: Mineralogy](#)
- [Geol 222: Elementary Petrology](#)
- [Geol 225: Mineralogy & Elementary Petrology](#)
- [Geol 303: Structural and Tectonic Geology](#)
- [Geol 305: Geomorphology](#)
- [Geol 309: Invertebrate Paleontology](#)
- [Geol 314: Sedimentology and Stratigraphy](#)

- [Geol 410: Coastal and Reef Dynamics](#)
- [Geol 420: Optical Mineralogy](#)
- [Geol 500: Intro. to Geographic Information Systems](#)
- [Geol 505: Hydrogeology](#)
- [Geol 517: Global Tectonics](#)
- [Geol 518: Quantitative Methods in Geo. & Geo Eng](#)
- [Geol 520: Advanced Igneous and Metamorphic Petrology](#)
- [Geol 530: Geology Field Studies](#)
- [Geol 535: Geochemistry](#)
- [Geol 610: Earth Science Projects](#)
- [Geol 614: Advanced Geographic Information Systems](#)
- [Geol 615: Geostatistics](#)
- [Geol 630: Coastal Plain Geology](#)
- [Geol 643: Advanced Geomorphology](#)
- [Geol 645: Advanced Sedimentation](#)
- [Geol 646: Advanced Stratigraphy](#)
- [Geol 647: Sedimentary Petrology](#)
- [Geol 648: Metamorphic Petrology](#)
- [Geol 649: Pedology](#)
- [Geol 690: Scientific Writing](#)
- [Geol 697: Thesis](#)

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Geol 112: Historical Geology Laboratory

Geology & Geological Engineering

Laboratory exercises that introduce earth science and the historical development of the Earth and its life.

1 Credit

Prerequisites

- Geol 112 Requires: One Way-Co-Requisite Geol 102 or Geol 120

Instruction Type(s)

- Lab: Laboratory for Geol 112
- Lab: Web-based Laboratory for Geol 112

Course Fee(s)

Geology 2

- \$195.00

Online, Internet, or Web-based

Students may be required to pay additional fees to an outside vendor for identity verification prior to a proctored assessment.

- \$100.00 per 3 Semester Credit Hours

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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Geology & Geological Engineering

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Distinguished Faculty and Staff Awards

Excellence in Advising Award - Office of the Provost

To recognize outstanding academic advising by a faculty member and to demonstrate the University of Mississippi's commitment to excellent advising.

- **Cathy A Grace** - LECTURER IN GEOLOGY AND GEOLOGICAL ENGINEERING (2014)

School of Engineering, Junior Faculty Research Award

- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2007)
- **Robert M Holt** - PROFESSOR OF GEOLOGY AND GEOLOGICAL ENGINEERING (2004)
- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2002)

Outstanding Staff Award

A staff member of the School of Engineering who has demonstrated exemplary service, leadership, and commitment.

- **Aubrey D Bolen** - ADMINISTRATIVE COORDINATOR I (2010)
- **Cathy A Grace** - LECTURER IN GEOLOGY AND GEOLOGICAL ENGINEERING (2005)

School of Engineering, Senior Faculty Research Award

- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2010)

Frist Service Award

- **TERRY L PANHORST** - Assistant Professor Emeritus of Geology and Geological Engineering (2002)

School of Engineering, Faculty Service Award

- **Gregory L Easson** - DIRECTOR, MISSISSIPPI MINERAL RESOURCES INSTITUTE AND PROFESSOR OF GEOLOGY & GEOLOGICAL ENGINEERING (2011)

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Geology & Geological Engineering

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Minors

- [Minor - Geology](#)

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Geol 114: Environmental Geology-Hazards Laboratory

Geology & Geological Engineering

Laboratory exercises that introduce the relationship between humans and the geologic environment with a focus on natural hazards.

1 Credit

Prerequisites

- Geol 114 Requires: One Way-Co-Requisite Geol 104

Instruction Type(s)

- Lab: Laboratory for Geol 114

Course Fee(s)

Geology 2

- \$195.00

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
- [Paleontology](#)

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Geol 614: Advanced Geographic Information Systems

Geology & Geological Engineering

GIS&T project design and application; advanced analytical modeling using vector and raster-based data sets. Use of multivariate data and spatial process models. Use of spatial databases will be emphasized.

3 Credits

Prerequisites

- [G E 511: Spatial Analysis](#)

Cross-listed Courses

- [Engr 614: Geometrics](#)

Instruction Type(s)

- Lecture: Lecture for Geol 614

Subject Areas

- [Geographic Information Science and Cartography](#)

Related Areas

- [Geography](#)

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Geol 103: Earth Dynamics

Geology & Geological Engineering

An integrated study of the process-response relationships between plate tectonics and geological processes through time. 3 lecture / 2 lab hours.

Restricted to students majoring in geology or geological engineering.

4 Credits

Prerequisites

- Pre-requisite: Geology and Geological Engineering Majors Only

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for Geol 103

Subject Areas

- [Geology/Earth Science, General](#)

Related Areas

- [Geochemistry](#)
- [Geochemistry and Petrology](#)
- [Geological and Earth Sciences/Geosciences, Other](#)
- [Hydrology and Water Resources Science](#)
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G E 420: Subsurface Site Characterization

Geology & Geological Engineering

Coring, logging, introduction and application of geophysical methods, sampling, and penetrometer testing. Applications require preparation of quality assurance and control procedures, maps, cross sections, and oral and written reports.

4 Credits

Prerequisites

- [G E 301: Geological Eng. Design Field Camp 1](#)
- [Geol 303: Structural and Tectonic Geology](#) (Minimum grade: C)
- [Engr 340: Engineering Geology](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Geol 305: Geomorphology](#)
- [G E 450: Hydrogeology](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for G E 420

Subject Areas

- [Geological/Geophysical Engineering](#)

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B.S.G. in Geology

- [Overview](#)
- [Degree Requirements](#)

Description

The B.S. degree in geology prepares a student for a productive career as a professional geologist engaged in continuous professional growth along his or her chosen career path, or prepares a student for admission into a graduate degree program or professional school.

Minimum Total Credit Hours: 124

General Education Requirements

Writ 100, Writ 101 or Hon 101; Writ 102, Liba 102, or Hon 102; Writ 250; Spch 102 or 105, or Engr 390; Econ 310; 6 hours of social science; 3 hours of humanities; 3 hours of humanities or languages (modern or ancient); and 3 hours of fine arts. Social science, humanities, and fine arts are defined under [the General Education Requirements of the School of Engineering](#).

Course Requirements

A major in geology for the B.S. degree consists of at least 60 hours of geology, geological engineering, and engineering courses, including Geol 103, 105, 106, 225, 303, 305, 309, 314, and either 420 or 520; G E 301, 401, 420, 450, 470, and either 405 or 503; Engr 340 and 310 (or 453); and one additional Geol/G E or Engr class at the 300 level or above. An additional 4 hours are required for a minimum of 124 credits total. Required related subjects are three of the following four courses: Math 125, 261, 262, and 263 (a combination of Math 121 and 123 may be substituted for Math 125); Chem 105, 106, 115, 116; Phys 213, 214, 223, 224 (or Phys 211, 212, 221, 222); and Csci 111, 251, or 256.

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B.S.G. in Geology

- [Overview](#)
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Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

General Education

Requirement Hours	Description
First Year Writing I 3	Complete Writ 100 , Writ 101 , or Hon 101 .
First Year Writing II 3	Complete one of the following: Liba 102 , Writ 102 , or Hon 102 .
Writ 250 / Engl 250 3	Complete Writ 250 or Engl 250 .
Spch 102 , 105 , or Engr 390 3	Complete Spch 102 , Spch 105 , or Engr 390 .
Econ 310 3	Complete Econ 310 .
6 hrs social science 6	Complete 6 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
3 hrs humanities 3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Env 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts 3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs Hum/Lang 3	Complete 3 hours of humanities or languages (modern or ancient).

General Education II

Requirement Hours	Description
6 hrs calculus 6	Complete at least two of the following three math courses: Math 261 , Math 262 , or Math 263 .
3 add'l hrs of math 3	Complete an additional three hours of math chosen from Math 125 , Math 261 , Math 262 , or Math 263 . A combination of Math 121 and Math 123 may be substituted for Math 125 .

Major Requirements

Requirement	Hours	Description
Csci 111 , 251 , or 256	3	Complete Csci 111 , Csci 251 , or Csci 256 .
Engr 340	4	Complete Engr 340 (GEO).
Engr 453 or 310	3	Complete either Engr 453 or Engr 310 .
G E 301	3	Complete G E 301 .

Requirement	Hours	Description
GE 401	3	Complete GE 401 .
GE 420	4	Complete GE 420 .
GE 450	4	Complete GE 450 .
GE 470 or Geol 500	3	Complete GE 470 or Geol 500 .
GE 405 or GE 503	3	Complete GE 405 or GE 503 .
Geol 103	4	Complete Geol 103 .
Geol 105	3	Complete Geol 105 .
Geol 106	2	Complete Geol 106 .
Geol 225	5	Complete Geol 225 .
Geol 303	4	Complete Geol 303 .
Geol 305	3	Complete Geol 305 .
Geol 309	4	Complete Geol 309 .
Geol 314	4	Complete Geol 314 .
Geol 420 or 520	3	Complete Geol 420 or Geol 520 .
Add'l Geol/GE/Engr Course	6	Complete 1 additional Geology, Geological Engineering or Engineering course at the 300-level or above.
4 hrs general elective	4	Complete 4 hours of general electives to reach the required 124 credits.
Geology residency hrs	18	Student must earn at least 18 hours of their major courses in residence.
Resident Major GPA		Please contact your academic advisor for grade point requirements.
Overall Major GPA		Please contact your academic advisor for grade point requirements.

Major Requirements II

Requirement	Hours	Description
Chem 105	3	Complete Chem 105 .
Chem 106	3	Complete Chem 106 .
Chem 115	1	Complete Chem 115 .
Chem 116	1	Complete Chem 116 .
Physics sequence	8	Complete Phys 213, 214, 223 , and 224 (or Phys 211, 212, 221 , and 222).

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B.S.G.E. in Geological Engineering

- [Overview](#)
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Description

The B.S. degree in geological engineering prepares students for productive careers as professional geological engineers engaged in continuous professional growth along their chosen career paths or prepares students for admission into graduate degree programs or professional schools.

Minimum Total Credit Hours: 131

Goals/Mission Statement

The educational goals of the Bachelor of Science in Geological Engineering program are an outgrowth of and consistent with The University of Mississippi Mission. While recognizing that the primary intent is to prepare graduates whose careers will serve the state of Mississippi, it is our objective to prepare graduates who will also serve the needs of the nation and the world in geological engineering and related fields. Past graduates of the program have found professional positions in a range of industries including i) geotechnical, ii) geoenvironmental, iii) geospatial information science and technology, iv) graduate education, and v) earth resources extraction. Future graduates are expected to serve the same range of industries.

Geological Engineering Program Educational Objectives

The Geology & Geological Engineering Department at the University of Mississippi is dedicated to graduating geological engineers who within 3-5 years after graduation will be able to:

1. Practice geological engineering related to geotechnical, geoenvironmental, geospatial information science, or earth resources.
2. Pursue additional education, research and development, or other means of advancing their knowledge and mastery of subjects related to the discipline.
3. Conduct themselves in a responsible, professional and ethical manner.
4. Participate as leaders in activities that support service, stewardship, and economic development of the region, state and nation.

Student Outcomes

Students of the Bachelor of Science in Geological Engineering program will demonstrate achievement of the following student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts;

3 hours in humanities, languages (modern or ancient), or fine arts; 6 hours in social science (including Econ 310); and the remaining 3 hours can be in any of the humanities, fine arts, languages, social science, or [general education courses as specified by the School of Engineering](#).

Course Requirements

Specific requirements for the B.S.G.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264; Math 353; Chem 105, 106, 115, 116, and Phys 211, 212, 221, 222; Csci 251 or 256; Engr 309, 310, 312, 321, 323, 340, 321; Geol 103, 106, 225, 303, 305, 314; G E 301, 401, 405, 420, 421, 450, 470, 305 or 540. One engineering science elective must be selected from C E 431, 472, Engr 360. One geological engineering technical elective must be selected from G E 415, 460, 503, 507, 510, 511, 513; C E 471, 325; Engr 313, or an additional course from the Engineering Science Elective list; GE 490 or 591 may be applied with chair approval. Please see department for advice.

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B.S.G.E. in Geological Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

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General Education

Requirement	Hours	Description
First Year Writing I	3	Complete one of the following: Writ 100 , Writ 101 , or Hon 101 .
First Year Writing II	3	Complete one of the following: Writ 102 , Liba 102 , or Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) and Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 .
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 .
Math 262	3	Complete Math 262 .
Math 263	3	Complete Math 263 .
Math 264	3	Complete Math 264 .
Math 353	3	Complete Math 353 .
Chem 105	3	Complete Chem 105 .
Chem 106	3	Complete Chem 106 .
Chem 115	1	Complete Chem 115 .
Chem 116	1	Complete Chem 116 .
Phys 211	3	Complete Phys 211 .

Requirement	Hours	Description
Phys 212	3	Complete Phys 212 .
Phys 221	1	Complete Phys 221 .
Phys 222	1	Complete Phys 222 .

Major Requirements

Requirement	Hours	Description
Csci 251 or 256	3	Complete Csci 251 or CSci 256 .
Engr 309	3	Complete Engr 309 .
Engr 310	3	Complete Engr 310 .
Engr 312	3	Complete Engr 312 .
Engr 321	3	Complete Engr 321 .
Engr 323	3	Complete Engr 323 .
Engr 340	4	Complete Engr 340
Geol 103	4	Complete Geol 103 .
Geol 106	2	Complete Geol 106 .
Geol 225	5	Complete Geol 225 .
Geol 314	4	Complete Geol 314 .
Geol 303	4	Complete Geol 303
Geol 305	3	Complete Geol 305 .
G E 301	3	Complete G E 301 .
G E 401	3	Complete G E 401 .
G E 405	3	Complete GE 405 .
G E 420	4	Complete G E 420 .
G E 421	4	Complete G E 421 .
G E 450	4	Complete G E 450 .
G E 470	3	Complete G E 470 .
G E 305 or G E 540	3	Complete G E 305 or G E 540 .
1 Engr Sci Elective for GE	3	Complete one engineering science elective from C E 431 , 472 , or Engr 360 .
1 GE Engr Tech elect or Egr Sci El	3	Complete one geological engineering technical elective chosen from G E 415 , 460 , 503 , 507 , 510 , 511 , 513 ; C E 471 , 325 ; Engr 313 , or an additional course from the Engineering Science Elective list. Please see department for advice.
School of Engineering GPA		Must be at least a 2.0

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Emphasis - Hydrology & Comp Hydroscience

- [M.S. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Hydrology & Comp Hydroscience

Description

An M.S. in engineering science with an emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. It covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the M.S. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete 24 credit hours of coursework (plus at least 6 thesis hours). Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I|
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment

- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation
- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

or either option, a candidate must pass a final oral examination.

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Emphasis - Aeroacoustics

- [M.S. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Aeroacoustics

Description

A degree of M.S. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

For the emphasis in aeroacoustics, thesis and nonthesis options are available. Both options require as a minimum 30 semester hours of graduate credit (to include 6 hours of math-related courses) in which the student's adviser must approve all course selections. Under the thesis option, the minimum of 30 graduate credits shall consist of 24 hours of graded course work and 6 thesis hours. The nonthesis option requires as a minimum 30 hours of graded course work.

Other Academic Requirements

For both the thesis and nonthesis options, a candidate must pass a final oral examination.

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Emphasis - Aeroacoustics

- [M.S. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Aeroacoustics

Description

A degree of M.S. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

For the emphasis in aeroacoustics, thesis and nonthesis options are available. Both options require as a minimum 30 semester hours of graduate credit (to include 6 hours of math-related courses) in which the student's adviser must approve all course selections. Under the thesis option, the minimum of 30 graduate credits shall consist of 24 hours of graded course work and 6 thesis hours. The nonthesis option requires as a minimum 30 hours of graded course work.

Other Academic Requirements

For both the thesis and nonthesis options, a candidate must pass a final oral examination.

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Emphasis - Mechanical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Mechanical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Mechanical Engineering

Description

A M.S. in engineering science with emphasis in mechanical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in mechanical engineering can be completed as a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work plus 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work. A third, nonthesis option includes 30 hours of approved course work and a comprehensive oral exam.

Other Academic Requirements

For each option, a candidate must pass a final oral examination.

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Emphasis - Telecommunications

- [M.S. in Engineering Science](#)
- [Emphasis - Telecommunications](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Telecommunications

Description

An M.S. in engineering science with emphasis in telecommunications prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in telecommunications must be completed as a thesis option only. In addition to 6 hours of thesis, 24 hours of course work is required. This typically will include courses in wireless communications, digital communications, communications networking, probabilistic modeling, telecommunications policy, and management information systems. Coursework must be approved by the program director.

Other Academic Requirements

A candidate must prepare and orally defend a thesis.

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Emphasis - Environmental Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Environmental Engineering

Description

A M.S. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. Students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Goals/Mission Statement

The program will provide high quality graduate education in a range of environmental disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The M.S. with emphasis in environmental engineering can be completed as either a thesis or nonthesis option. The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697- Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation. The graduate course work for either option must include at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I), one course in numerical method (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

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graduation; and 3) change other regulations affecting the student body at any time. Implicit in each student's enrollment with the university is an agreement to comply with university rules and regulations, which the university may modify to exercise properly its educational responsibility.

Emphasis - Materials Science and Engr

- [M.S. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Materials Science and Engr

Description

A M.S. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Hydrology & Comp Hydroscience

- [M.S. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Hydrology & Comp Hydroscience

Description

An M.S. in engineering science with an emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. It covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the M.S. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete 24 credit hours of coursework (plus at least 6 thesis hours). Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I|
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment

- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation
- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Civil Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Civil Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Civil Engineering

Description

A degree of M.S. in engineering science with emphasis in civil engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. The program offers a choice of several concentration areas: structures, geotechnical engineering, construction materials, water resource engineering, environmental engineering, transportation systems, infrastructure asset management, and earthquake and disaster response management.

Goals/Mission Statement

The program will provide high quality graduate education in a range of civil engineering disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The thesis option for the M.S. with emphasis in civil engineering requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697-Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation.

Required graduate course work for either option includes at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I); one course in numerical method (e.g., Engr 590-Finite Element Analysis); and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Chemical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Chemical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Chemical Engineering

Description

A degree of M.S. in engineering science with an emphasis in chemical engineering prepares graduates to apply chemical engineering science (transport phenomena, thermodynamics, chemical reaction engineering, and applied mathematics. It enables them to independently execute complex projects and pursue successful careers in engineering, medicine, law, professional education, public policy, the military, management, and sales.

Course Requirements

The M.S. in engineering science with an emphasis in chemical engineering requires a minimum of 30 hours of graduate credit. The specific coursework depends on the M.S. option pursued by the student. All M.S. students should be able to demonstrate proficiency in transport phenomena, thermodynamics, and chemical reaction analysis. This is accomplished by completion and approval of the chemical engineering proficiency form prior to graduation.

Coursework Option

All 30 hours come from graded 500-/600- level coursework agreed upon by the student and his or her committee, but must include at least two Ch E 510+ courses (6 credit hours).

Students whose undergraduate degree is not in chemical engineering may be required to take additional coursework beyond the 30-hour requirement at the discretion of his or her committee.

Nonthesis Option

This option requires at least 27 hours of graded 500-/600-level coursework agreed upon by the student and his or her committee including at least two Ch E 510+ courses (6 credit hours). In addition, students must complete no less than 3 hours of project (Engr 693 and Engr 694) credit.

Thesis Option

Students must take 21 hours of graded 500-/600- level coursework, plus 3 hours of Research Seminar (Ch E 515). The coursework must include no less than 6 hours selected by the student's committee from any Ch E course 510 or higher. The remaining 15 hours of coursework are agreed upon by the student and his or her committee. All students in the M.S. thesis option must take or have taken at least one course in each of the following topics: reactors design, thermodynamics and transport as graduate or undergraduate students. In addition, students must complete no less than 6 hours of thesis (Engr 697) credit.

Other Academic Requirements

Every candidate for a master's degree must pass a final written or oral examination.

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Emphasis - Computer Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Computer Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Computer Engineering

Description

An M.S. in engineering science with emphasis in computer engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

General Education Requirements

The M.S. with emphasis in computer engineering can be completed as either a thesis or nonthesis option.

The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit. Of the 24 hours of course work, 3 to 6 hours can be in an approved minor area, at least 1 hour must be in seminar, and no more than 3 hours can come from research credit outside the thesis.

The nonthesis option requires 27 hours of course work and a 3-hour project or research course with a written report, final oral presentation, and final oral exam. Course work for either option must be approved by the student's advisory committee.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Materials Science and Engr.

- [M.S. in Engineering Science](#)
- [Emphasis - Materials Science and Engr.](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Materials Science and Engr.

Description

A M.S. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - EE (Electromagnetics)

- [M.S. in Engineering Science](#)
- [Emphasis - EE \(Electromagnetics\)](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - EE (Electromagnetics)

Description

An M.S. in engineering science with emphasis in electromagnetics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in electromagnetics can be taken as a thesis or nonthesis option. Either option requires 10 semester hours of core courses in electromagnetics theory and applications: Numerical Methods in Electromagnetics (Engr 626); Advanced Electrodynamics (Engr 721); Passive Microwave Circuits (Engr 723); and Seminar (Engr 695).

Also required are 8 semester hours in specific areas of electromagnetics, including microwave circuits, antennas, electromagnetics, and computational electromagnetics courses (from among Engr 590, Engr 593, Engr 622, Engr 624, Engr 627, Engr 687, Engr 691, Engr 693 (no more than 2 semester hours), Engr 719, Engr 725, Engr 728, and Engr 699).

For the thesis option, the student must complete 6 hours of electives, including 3 to 6 hours in a minor field. The thesis candidate must take at least 6 hours of thesis.

For the nonthesis option, the student also must complete 9 hours of electives, including 3 to 6 hours as a minor from mathematics, physics, or another area with approval, and technical electives from the areas listed above. The nonthesis candidate also must complete a 3-hour project or research course with written report and oral presentations, and a final oral exam.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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Emphasis - Materials Science and Engr

- [M.S. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Materials Science and Engr

Description

A M.S. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Geological Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Geological Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Geological Engineering

Description

A M.S. in engineering science with emphasis in geological engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in geological engineering can be completed as either a thesis or nonthesis option. All course selections for both the thesis and nonthesis options must be approved by the student's advisory committee. The thesis option requires a minimum of 6 semester hours of thesis credit. The nonthesis option requires the successful completion of an applied project approved by the student's committee.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Biomedical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Biomedical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Biomedical Engineering

Description

A degree of M.S. in engineering science with an emphasis in biomedical engineering prepares graduates to apply interdisciplinary science and engineering tools to advance biology and medicine. Graduates will be able to independently solve problems, execute complex projects, and pursue successful careers in research, development, or management within engineering or biomedical science fields, as well as professional degrees such as medicine or law.

Course Requirements

The M.S. in engineering science with an emphasis in biomedical engineering requires a minimum of 30 hours of graduate credit with an overall GPA of 3.0. The specific coursework requirements depend on the M.S. option pursued by the student.

Students whose undergraduate degree is not in biomedical engineering or a closely related field may be required to take additional coursework beyond the 30-hour requirement at the discretion of the student's committee. The committee should be formed before the end of the first semester.

Coursework Option

All 30 credit hours come from graded 500+ level coursework agreed upon by the students and their committee. These courses must include at least two BME 500+ level courses (6 credit hours) and BME 600 (3 credit hours). Students must successfully pass a comprehensive final exam before graduation. Parameters for the exam will be agreed upon by the students and their committee, with final approval by the graduate program coordinator. Students must orally defend the comprehensive exam material to their committee.

Nonthesis Option

This option requires at least 27 credit hours of graded 500+ level coursework agreed upon by the students and their committee. These courses must include at least two BME 500+ courses (6 credit hours) and BME 600 (3 credit hours). In addition, students

must complete no less than 3 hours of project credit (Engr 693, Engr 694) and successfully defend their project to their committee before graduation.

Thesis Option

Students must take BME 600 (3 credit hours) and 3 hours of BME 601 (1 credit hour). In addition, students must take 18 credit hours of graded 500+ level coursework agreed upon by them and their committee. The coursework must include at least two BME 500+ courses, not including BME 600 or BME 601. In addition, students must complete no less than 6 credit hours of thesis (Engr 697). Students must successfully write and defend a thesis to their committee before graduation.

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Emphasis - Environmental Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Environmental Engineering

Description

A M.S. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. Students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Goals/Mission Statement

The program will provide high quality graduate education in a range of environmental disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The M.S. with emphasis in environmental engineering can be completed as either a thesis or nonthesis option. The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697- Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation.

The graduate course work for either option must include at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I), one course in numerical method (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

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Emphasis - Hydrology & Comp Hydroscience

- [M.S. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Hydrology & Comp Hydroscience

Description

An M.S. in engineering science with an emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. It covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the M.S. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete 24 credit hours of coursework (plus at least 6 thesis hours). Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I|
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment

- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation
- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Geology

- [M.S. in Engineering Science](#)
- [Emphasis - Geology](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Geology

Description

A M.S. in engineering science with emphasis in geology prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in geology can be completed as either a thesis or nonthesis option. All course selections for both the thesis and nonthesis options must be approved by the student's advisory committee. The thesis option requires a minimum of 6 semester hours of thesis credit. The nonthesis option requires the successful completion of an applied project approved by the student's committee.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Electrical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Electrical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Electrical Engineering

Description

An M.S. in engineering science with emphasis in electrical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in electrical engineering can be completed as either a thesis or nonthesis option.

The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit. Of the 24 hours of course work, 3 to 6 hours can be in an approved minor area, at least 1 hour must be in seminar, and no more than 3 hours can come from research credit outside the thesis.

The nonthesis option requires 27 hours of course work and a 3-hour project or research course with a written report, final oral presentation, and final oral exam. Course work for either option must be approved by the student's advisory committee.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Environmental Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Environmental Engineering

Description

A M.S. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. Students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Goals/Mission Statement

The program will provide high quality graduate education in a range of environmental disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The M.S. with emphasis in environmental engineering can be completed as either a thesis or nonthesis option. The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697- Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation. The graduate course work for either option must include at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I), one course in numerical method (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

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graduation; and 3) change other regulations affecting the student body at any time. Implicit in each student's enrollment with the university is an agreement to comply with university rules and regulations, which the university may modify to exercise properly its educational responsibility.

Emphasis - Computer Science

- [M.S. in Engineering Science](#)
- [Emphasis - Computer Science](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Computer Science

Description

A M.S. in engineering science with emphasis in computer science prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

Students must choose one of the following options and complete the stated degree requirements.

Thesis option

- 24 semester credit hours of approved graduate coursework plus 6 hours of thesis research (by enrolling in Engr 697)
- A written thesis
- A final public oral examination over the work in the thesis area the student must register for the Engr 697 section assigned to the student's research adviser for 6 hours during the program; Engr 697 is an ungraded, variable credit course for which the student may register repeatedly until the thesis is complete. The student must prepare the thesis according to the Graduate School requirements and schedule.

Project option

- 27 semester credit hours of approved graduate coursework plus 3 hours of an independent study research project (by enrolling in Engr 693)
- A written project paper
- A final public oral examination over the work in the research project's area. The M.S. project can be a survey of results in a particular research area, a design and implementation of a known idea, or a thorough study of a research problem.

The student must register for 3 hours in the Engr 693 section assigned to the student's research adviser during the final semester

of the program; Engr 693 is a graded course that should only be taken once. The student must prepare the research paper according to department requirements.

Coursework option

- 30 semester credit hours of approved graduate coursework
- A final oral examination in front of a committee, but no written report. The topics of the final oral examination are selected by the graduate committee.

Coursework Requirements

The following coursework requirements apply to the coursework, research project, and thesis options.

Each student must complete the M.S. core coursework requirement; that is, the student must successfully complete the following courses with a grade of B or better:

- Csci 533 Analysis of Algorithms
- Csci 523 Operating Systems or Csci 561 Computer Networks or Csci 530 Computer Architecture and Design
- Csci 525 Compiler Construction or Csci 555 Functional Programming or Csci 556 Multiparadigm Programming or Csci 526 Parallel Computing or Csci 531 Artificial Intelligence or Csci 658 Software Language Engineering or another programming-intensive course approved by the department's Graduate Committee

The department's graduate faculty encourages students to take Engr 694 Research Methods if they plan to choose the thesis option or to continue their studies toward the Ph.D. degree.

The following coursework requirements apply to both research project and thesis options.

In addition to the thesis or M.S. project courses, each student must complete at least 9 semester credit hours of regular computer science courses at the 600 level or above. A regular computer science course is a course that (a) is taught by a computer science faculty member on a computer science topic, (b) is publicized and offered to all graduate students who meet the prerequisites, and (c) has a regular weekly meeting time with organized lectures or activities.

These courses typically have Csci, Engr, or EngS prefixes.

In addition to the thesis or M.S. project courses, a student may count up to two nonregular courses (6 hours) toward his or her degree. A nonregular course is an independent study course or any other course that does not meet the requirements stated above for regular courses (i.e., it does not count at the 600 level or above).

Coursework Option

The following coursework requirements apply to the coursework option.

Each student must complete at least 12 semester credit hours of regular computer science courses at the 600 level or above. A regular computer science course is a course that (a) is taught by a computer science faculty member on a computer science topic, (b) is publicized and offered to all graduate students who meet the prerequisites, and (c) has a regular weekly meeting time with organized lectures or activities. These courses typically have Csci, Engr, or EngS prefixes.

A student may count up to two nonregular courses (6 hours) toward his or her degree. A nonregular course is an independent study course or any other course that does not meet the requirements stated above for regular courses (i.e., it does not count at the 600 level or above).

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Emphasis - Materials Science and Engr

- [Ph.D. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Materials Science and Engr

Description

A Ph.D. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.

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Emphasis - Civil Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Civil Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Civil Engineering

Description

A Ph.D. in engineering science with emphasis in civil engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in engineering research and development, education, industry, or public service. The program offers a choice of several concentration areas: structures, geotechnical engineering, construction materials, water resource engineering, environmental engineering, transportation systems, infrastructure asset management, and earthquake and disaster response management.

Goals/Mission Statement

The program will provide high quality graduate education in a range of civil engineering disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The Ph.D. degree with emphasis in civil engineering requires the following coursework:

- For students entering the Ph.D. directly from a B.S.: 36 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S.: 24 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S. at the University of Mississippi: 12 hours of coursework and 18 hours of dissertation.

Combining the student's M.S. and Ph.D. programs, at least two courses need to be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592-Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course in numerical methods (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Additional hours of Graduate Seminar may be required. Other graduate coursework must be approved by the student's advisory committee.

Other Academic Requirements

A qualifying examination, comprehensive examination, dissertation prospectus, and dissertation defense are needed. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Environmental Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Environmental Engineering

Description

A Ph.D. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public service. Depending on their career focus, students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Course Requirements

The Ph.D. with emphasis in environmental engineering requires 24 hours of course work beyond a master's degree or 48 hours beyond a bachelor's degree, and 18 hours of dissertation credit. At least two courses must be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592- Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course must be in numerical method (e.g., Engr 590-Finite Element Analysis), and one course must be in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's advisory committee.

Other Academic Requirements

Completion of a qualifying examination, a comprehensive examination, a dissertation prospectus, and a dissertation defense is required. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Computer Science

- [Ph.D. in Engineering Science](#)
- [Emphasis - Computer Science](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Computer Science

Description

A Ph.D. in engineering science with emphasis in computer science prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as electrical engineering, physics, biology, and the liberal arts.

Course Requirements

For the Ph.D. in engineering science with an emphasis in computer science, the student must present a bachelor's or master's degree in the field or the equivalent and take additional classes adding up to 48 hours of approved graduate-level course work (excluding the 18+ semester hours of dissertation research). This may include no course numbered lower than Csci 510, and a minimum of 18 hours must be in computer science courses at the 600 level. The student may count up to 9 credit hours of independent study taught by Department of Computer and Information Science faculty members toward the degree.

Other Academic Requirements

The student must pass the comprehensive examination and the preliminary oral examination (dissertation prospectus).

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Emphasis - Materials Science and Engr.

- [Ph.D. in Engineering Science](#)
- [Emphasis - Materials Science and Engr.](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Materials Science and Engr.

Description

A Ph.D. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.

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Emphasis - Aeroacoustics

- [Ph.D. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Aeroacoustics

Description

A Ph.D. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics.

Course Requirements

The Ph.D. with emphasis in aeroacoustics requires a minimum 66 semester hours of graduate credit beyond the baccalaureate degree. The student's adviser must approve all course selections.

Other Academic Requirements

At the adviser's discretion, a preliminary examination may be required at or near the beginning of the student's work beyond the master's degree. A comprehensive written examination must be passed before entering the dissertation process.

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Emphasis - Chemical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Chemical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Chemical Engineering

Description

A Ph.D. in engineering science with emphasis in chemical engineering prepares graduates to apply chemical engineering science (transport phenomena, thermodynamics, chemical reaction engineering, and applied mathematics). It enables them to independently execute complex projects and pursue successful careers in engineering, medicine, law, professional education, public policy, the military, management, and sales. It further equips them with the experience to conduct research—generating and disseminating new knowledge.

Course Requirements

The Ph.D. with an emphasis in chemical engineering requires a minimum of 54 hours of graduate credit past the bachelor's degree. No specific courses are required beyond those specified for the M.S. thesis option. The remainder of the coursework is agreed upon by the student and his or her committee, 18 hours of which must be dissertation (Engr 797) credit. Students whose undergraduate degree is not in chemical engineering may need to take additional courses to satisfy prerequisites.

Other Academic Requirements

Students in the Ph.D. track must achieve a GPA of 3.25 or higher on 12 credit hours selected by the committee from Engr 665, Engr 669 or any Ch E 500-/600-level course. Selection must be done by the end of the first semester. To be admitted to candidacy, the student must successfully complete the preselected courses and pass a qualifying examination. The exam consists of writing and defending an Original Research Proposal (ORP). After the ORP, the Ph.D. candidate must successfully complete a dissertation prospectus, then write and defend a dissertation.

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Emphasis - Computer Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Computer Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Computer Engineering

Description

A Ph.D. in engineering science with emphasis in computer engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics and computer science.

Course Requirements

The Ph.D. with an emphasis in computer engineering requires at least 48 hours of course work and at least 18 hours of dissertation credit. Of the 48 hours of course work, 12 hours must be in an approved minor area, at least 2 hours must be in seminar, and no more than 6 hours can come from research credit outside the dissertation. Course work must be approved by the student's advisory committee.

Other Academic Requirements

A written comprehensive exam is taken during the first year of residency.

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Emphasis - Geological Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Geological Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Geological Engineering

Description

A Ph.D. in engineering science with emphasis in geological engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as geology and physics.

Course Requirements

The Ph.D. with an emphasis in geological engineering requires 54 semester hours of graduate credit beyond the bachelor's degree; selection of courses must be approved by the student's advisory committee.

Other Academic Requirements

Successful completion of both written and oral comprehensive exams is required before undertaking the dissertation.

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Emphasis - Aeroacoustics

- [Ph.D. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Aeroacoustics

Description

A Ph.D. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics.

Course Requirements

The Ph.D. with emphasis in aeroacoustics requires a minimum 66 semester hours of graduate credit beyond the baccalaureate degree. The student's adviser must approve all course selections.

Other Academic Requirements

At the adviser's discretion, a preliminary examination may be required at or near the beginning of the student's work beyond the master's degree. A comprehensive written examination must be passed before entering the dissertation process.

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Emphasis - Materials Science and Engr

- [Ph.D. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Materials Science and Engr

Description

A Ph.D. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.

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Emphasis - Hydrology & Comp Hydroscience

- [Ph.D. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Hydrology & Comp Hydroscience

Description

A Ph.D. in engineering science with emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. This degree covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the Ph.D. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete a minimum of 36 hours beyond the B.S. degree and 18 hours of dissertation credit. Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment
- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation

- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

Other academic requirements include passing written and oral comprehensive exams including dissertation prospectus and dissertation defense. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - EE (Electromagnetics)

- [Ph.D. in Engineering Science](#)
- [Emphasis - EE \(Electromagnetics\)](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - EE (Electromagnetics)

Description

A Ph.D. in engineering science with emphasis in electromagnetics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics and mathematics.

Course Requirements

The Ph.D. with an emphasis in electromagnetics requires 36 semester hours in the major field out of a required total of 48 semester hours of graded course work beyond the bachelor's degree. Included in these requirements are the following core courses: Advanced Electrodynamics (Engr 721); Numerical Methods in Electromagnetics (Engr 626); Passive Microwave Circuits (Engr 723); and Seminar (Engr 695, two semester hours). Other courses are to be taken in specific areas of electromagnetics, including microwave circuits, antennas, electromagnetics, and computational electromagnetics. These related courses include Engr 590, Engr 593, Engr 622, Engr 624, Engr 627, Engr 655, Engr 687, Engr 691, Engr 693 (no more than 2 semester hours), Engr 699, Engr 719, Engr 725, Engr 728, Engr 729, or other courses with approval. The candidate must take 12 semester hours of graded courses in a minor area (mathematics, physics, or another appropriate field with approval).

Other Academic Requirements

A written comprehensive exam is taken during the first year of residency.

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Emphasis - Mechanical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Mechanical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Mechanical Engineering

Description

A Ph.D. in engineering science with emphasis in mechanical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as civil engineering and physics.

Course Requirements

The Ph.D. with an emphasis in mechanical engineering requires 30 semester hours of course work as specified by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Comprehensive exams must be passed before entering the dissertation process.

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Emphasis - Hydrology & Comp Hydroscience

- [Ph.D. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Hydrology & Comp Hydroscience

Description

A Ph.D. in engineering science with emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. This degree covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the Ph.D. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete a minimum of 36 hours beyond the B.S. degree and 18 hours of dissertation credit. Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment
- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation

- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

Other academic requirements include passing written and oral comprehensive exams including dissertation prospectus and dissertation defense. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Electrical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Electrical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Electrical Engineering

Description

A Ph.D. in engineering science with emphasis in electrical engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics and computer science.

Course Requirements

The Ph.D. with an emphasis in electrical engineering requires at least 48 hours of course work and at least 18 hours of dissertation credit. Of the 48 hours of course work, 12 hours must be in an approved minor area, at least 2 hours must be in seminar, and no more than 6 hours can come from research credit outside the dissertation. Course work must be approved by the student's advisory committee.

Other Academic Requirements

A written comprehensive exam is taken during the first year of residency.

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Emphasis - Environmental Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Environmental Engineering

Description

A Ph.D. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public service. Depending on their career focus, students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Course Requirements

The Ph.D. with emphasis in environmental engineering requires 24 hours of course work beyond a master's degree or 48 hours beyond a bachelor's degree, and 18 hours of dissertation credit. At least two courses must be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592- Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course must be in numerical method (e.g., Engr 590-Finite Element Analysis), and one course must be in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's advisory committee.

Other Academic Requirements

Completion of a qualifying examination, a comprehensive examination, a dissertation prospectus, and a dissertation defense is required. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Hydrology & Comp Hydroscience

- [Ph.D. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Hydrology & Comp Hydroscience

Description

A Ph.D. in engineering science with emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. This degree covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the Ph.D. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete a minimum of 36 hours beyond the B.S. degree and 18 hours of dissertation credit. Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment
- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation

- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

Other academic requirements include passing written and oral comprehensive exams including dissertation prospectus and dissertation defense. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Biomedical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Biomedical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Biomedical Engineering

Description

A degree of Ph.D. in engineering science with an emphasis in biomedical engineering prepares graduates to apply interdisciplinary science and engineering tools to advance biology and medicine. Graduates will be able to independently solve problems, execute complex projects, and pursue successful careers in research, development, or management within engineering or biomedical science fields, as well as professional degrees such as medicine or law. Graduates will be especially prepared to enter research positions in academia, industry, or government agencies.

Course Requirements

The Ph.D. with an emphasis in biomedical engineering requires a minimum of 54 hours of graduate credit past the bachelor's degree. The only required courses are BME 600 (Graduate Professional Development) and 3 hours of BME 601 (Biomedical Engineering seminar). The remainder of the coursework is agreed upon by the student and his or her committee, 18 hours of which must be dissertation (Engr 797) credit. Students whose undergraduate degree is not in biomedical engineering may need to take additional courses to satisfy prerequisites.

Other Academic Requirements

Students in the Ph.D. program must achieve a GPA of 3.25 or higher on 12 credit hours selected by the committee before being eligible to take the Ph.D. candidacy exam. Selection must be done by the end of the first semester.

To be admitted to candidacy, the student must successfully write and orally defend an Original Research Proposal (ORP). The BME department will allow the ORP to be in the domain of the student's main research thrust with an understanding that the committee's job will be to ensure (through questions at the oral exam) that the student has mastered the course materials identified by the committee as the 12 hours on which he or she must achieve a 3.25 GPA. If a student fails the candidacy exam, he or she may retake the exam one time and this second attempt must be within six months of the first failed attempt.

After successfully passing the candidacy exam, the Ph.D. candidate must successfully write and defend a dissertation prospectus to his or her committee. Two opportunities are given to successfully complete the prospectus. If a student does not pass the first attempt, the second attempt must be completed within six months of the first failed defense. After successfully defending the

dissertation prospectus, the Ph.D. candidate is eligible to write and defend his or her dissertation. The prospectus defense and dissertation defense cannot occur within the same academic term. A candidate may defend his or her prospectus no more than twice. If a defense is not successful after the second attempt, the candidate will have to leave the program.

Dissertation

The student will be eligible to defend his or her dissertation upon: * Completion of at least 18 hours of Engr 797 * Having anticipated completion of the minimum 54 total credit hours by the end of the term of graduation * Approval by the student's committee who will evaluate if the elements of the prospectus have been sufficiently addressed. This defense approval committee meeting cannot occur during the same full term (fall, spring, full summer) as the anticipated defense, and there must be a minimum of four calendar months between these events. The committee's approval or denial to proceed toward a goal dissertation date must be submitted to and acknowledged by the graduate program coordinator. If denied, there must be written justification.

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Emphasis - Geology

- [Ph.D. in Engineering Science](#)
- [Emphasis - Geology](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Geology

Description

A Ph.D. in engineering science with emphasis in geology prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as geological engineering and physics.

Course Requirements

The Ph.D. with an emphasis in geology requires 54 semester hours of graduate credit beyond the bachelor's degree; selection of courses must be approved by the student's advisory committee.

Other Academic Requirements

Successful completion of both written and oral comprehensive exams is required before undertaking the dissertation.

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Emphasis - Environmental Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Environmental Engineering

Description

A Ph.D. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public service. Depending on their career focus, students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Course Requirements

The Ph.D. degree with emphasis in environmental engineering requires the following coursework:

- For students entering the Ph.D. directly from a B.S.: 36 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S.: 24 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S. at the University of Mississippi: 12 hours of coursework and 18 hours of dissertation.

Combining the student's M.S. and Ph.D. programs, at least two courses need to be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592-Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course in numerical methods (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Additional hours of Graduate Seminar may be required. Other graduate coursework must be approved by the student's advisory committee.

Other Academic Requirements

Completion of a qualifying examination, a comprehensive examination, a dissertation prospectus, and a dissertation defense is required. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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C E 581: Transportation Engineering II

Civil Engineering

Advanced topics in transportation engineering and management with emphasis on intermodal facilities; physical design and traffic management; measures of system effectiveness and performance; environmental and social impacts; Intelligent Transportation System (ITS) technologies; applications of remote sensing and spatial technologies and GIS; economic evaluation of alternatives; computer modeling and simulation.

3 Credits

Prerequisites

- Pre-requisite: C E 481 (or Graduate Standing)
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for C E 581

Subject Areas

- [Civil Engineering, General](#)
- [Transportation and Highway Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Water Resources Engineering](#)

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C E 103: Introduction to Civil Engineering Lab

Civil Engineering

An introductory course into professional practice focus areas within civil engineering: structural, geotechnical, transportation and construction management, environmental and water resources with an emphasis on hands-on activities. Laboratory and field activities related to the four major areas of civil engineering. Mathematical, computer skills include algebra, geometry, trigonometry, vectors, unit conversion, and spreadsheets, and technical writing.

1 Credit

Instruction Type(s)

- Lab: Laboratory for C E 103

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 305: Civil Engineering Laboratory II

Civil Engineering

Selected experiments in soils, materials and concrete. Tests of identification and characterization of soils. Strength tests on other materials commonly used in civil engineering practice.

1 Credit

Prerequisites

- C E 305 Requires: One Way-Co-Requisite C E 431

Instruction Type(s)

- Laboratory: Laboratory for C E 305

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 302: Mechanics Laboratory

Civil Engineering

Experiments in mechanics of materials and fluids; evaluation, synthesis, and graphical presentation of results and report preparation; statistical analysis of experimental data.

1 Credit

One-way corequisites

- [Engr 312: Mechanics of Materials](#)
- [Engr 323: Fluid Mechanics](#)

Instruction Type(s)

- Lab: Laboratory for C E 302

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 570: Infrastructure Management

Civil Engineering

Overview of nation's infrastructure assets and rehabilitation/renovation needs; methodologies for development and implementation of performance monitoring and maintenance management systems for roadways, bridge structures, airports, and other infrastructure facilities; condition assessment and nondestructive evaluation; application of new materials and remote sensing and spatial technologies; Intelligent Transportation System (ITS) and computer applications for infrastructure asset management.

3 Credits

Instruction Type(s)

- Lecture: Lecture for C E 570

Subject Areas

- [Civil Engineering, General](#)
- [Construction Engineering Technology/Technician](#)

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C E 543: Sediment Transport

Civil Engineering

Fall velocity, particle size analysis, incipient motion, bed form mechanics, suspended loads; stream flows, natural river processes, transport of liquid-solid mixtures in pipelines.

3 Credits

Prerequisites

- Pre-requisite: Engr 323 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for C E 543

Subject Areas

- [Civil Engineering, General](#)
- [Water Resources Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)

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C E 497: Civil Engineering Projects

Civil Engineering

Special problems or independent study in civil engineering research and design.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Indiv Based: Individual Based Study for C E 497
- Indiv Based: In-Country Program for C E 497

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 471: Environmental Engineering I

Civil Engineering

An introduction to areas of environmental engineering including environmental chemistry, water and wastewater treatment, water quality management, air pollution, solid and hazardous waste, and noise pollution.

Students may take either C E 371 or C E 471, but not both for credit toward a degree.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- [Chem 115: General Chemistry Laboratory I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 471

Subject Areas

- [Civil Engineering, General](#)
- [Environmental/Environmental Health Engineering](#)

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C E 456: Civil Engineering Design II

Civil Engineering

Final course in capstone design sequence. Group experience in the design of a significant civil engineering project; data collection and quantitative analysis of economic and safety factors; qualitative evaluation based on reliability, aesthetics, ethics, social/environmental impact. Formal presentation and evaluation of projects to a jury of practicing professionals and electronic submission of a formal report.

3 Credits

Prerequisites

- [C E 455: Civil Engineering Design I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 456

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 101: Introduction to Civil Engineering I

Civil Engineering

An introductory course into professional practice focus areas within civil engineering: structural, geotechnical, transportation and construction management, environmental and water resources. Exposes students to industry professionals, civil engineering faculty, and representatives of the student chapters of professional engineering organizations. Mathematical and computer skills include algebra, geometry, trigonometry, vectors, unit conversion, and spreadsheets. Lab tours as available.

1 Credit

Instruction Type(s)

- Seminar: Seminar for C E 101

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 414: Advanced Concrete Design

Civil Engineering

Design of slender columns, two-way floor systems, beam-column joints. Introduction to prestressed concrete. Introduction to multi-story buildings.

3 Credits

Prerequisites

- [C E 412: Design of Concrete Structures](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 414

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
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C E 208: Civil Engineering Graphics I

Civil Engineering

Basic engineering drawings and computer-aided design for civil engineering applications. Topics include fundamentals of graphics and drafting principles, CAD fundamentals, architectural drawings, civil engineering drawings, and detailing.

1 Credit

Corequisites

- [C E 207: Surveying](#)

Instruction Type(s)

- Lecture: Lecture for C E 208

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
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C E 541: Flow in Open Channels

Civil Engineering

Uniform and nonuniform flow; gradually varying flow, rapidly varying flow controls; subcritical and supercritical transitions; unsteady flow; level-pool routing; flood waves.

3 Credits

Prerequisites

- Pre-requisite: Engr 323 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for C E 541

Subject Areas

- [Civil Engineering, General](#)
- [Water Resources Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)

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Engr 541: Foundations of Nano Engineering and Sci

Civil Engineering

Introduction to nanoscience and nanotechnology for nanoparticles' computational, characterization, and fabrication methods and applications.

3 Credits

Prerequisites

- [Chem 115: General Chemistry Laboratory I](#)
- [Phys 211: Physics for Science & Engineering I](#)
- [Phys 221: Lab Physics for Science & Engineering I](#)

Instruction Type(s)

- Lecture: Lecture for Engr 541

Subject Areas

- [Materials Engineering](#)

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C E 417: Construction Engineering and Management

Civil Engineering

Planning, estimating, and scheduling of civil engineering construction projects; procurement, specifications, bids, and contracts; construction cost control methods; program evaluation and review technique; scheduling techniques including critical path method (CPM) and line of balance (LOB); computer applications.

3 Credits

One-way corequisites

- [C E 315: Civil Engineering Materials](#)

Instruction Type(s)

- Lecture: Lecture for C E 417

Subject Areas

- [Civil Engineering, General](#)
- [Construction Engineering Technology/Technician](#)

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C E 521: Advanced Mechanics of Materials

Civil Engineering

Classical methods for second-order analysis of deformable bodies; failure criteria; torsion of thin walled sections; unsymmetrical bending of straight beams; curved beams; beam on elastic foundation; plates and shells; buckling.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- [Engr 312: Mechanics of Materials](#)
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for C E 521

Subject Areas

- [Civil Engineering, General](#)
- [Engineering Mechanics](#)

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C E 102: Introduction to Civil Engineering II

Civil Engineering

An introductory course into civil engineering with topical content including engineering ethics, current issues in civil engineering, historic civil engineering events, professional societies, bridge design software, architecture, drawing basics, resume preparation, technical writing, technical presentations, and Web authoring. Field trips as available.

1 Credit

Instruction Type(s)

- Lecture: Lecture for C E 102

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 207: Surveying

Civil Engineering

Traversing and computations, area calculations, topographic surveys, leveling, boundary surveys, circular and parabolic curves, volumes, photogrammetry, electronic distance measurement, computer applications. (2 lecture, 2 lab hours).

2 Credits

Corequisites

- [C E 208: Civil Engineering Graphics I](#)

Instruction Type(s)

- Lecture: Lecture for C E 207

Subject Areas

- [Civil Engineering, General](#)
- [Surveying Engineering](#)

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Civil Engineering

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Undergraduate Studies

Academic Regulations

Students admitted to the university and the School of Engineering in accordance with stated admission policies may then declare their chosen degree program.

Graduate Studies

M.S. and Ph.D. entrance requirements are those of the Graduate School. M.S. applicants are expected to possess or be in the process of completing an undergraduate degree in engineering or closely related field from an accredited institution. In general, Ph.D. applicants are expected to possess or be in the process of completing a master's degree. In certain cases, applicants completing an undergraduate degree in engineering or closely related field from an accredited institution may be considered.

See the degree requirements under Programs.

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C E 205: Civil Engineering Laboratory I

Civil Engineering

Statistical analysis of experimental data, experiments in mechanics of materials and fluids, transducer selection and calibration, and use of sophisticated data acquisition equipment and post-processing software; evaluation, synthesis, and graphical presentation of results and report preparation.

1 Credit

One-way corequisites

- [Engr 312: Mechanics of Materials](#)
- [Engr 323: Fluid Mechanics](#)

Instruction Type(s)

- Laboratory: Laboratory for C E 205

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 511: Structural Dynamics

Civil Engineering

Response of linear SDOF and MDOF systems. Application to frame vibration in complex structures; introduction to continuous systems; modal analysis for steady-state and transient response under dynamic loads in various applications; computer simulation.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- [C E 311: Structural Analysis](#)

Instruction Type(s)

- Lecture: Lecture for C E 511

Subject Areas

- [Civil Engineering, General](#)
- [Structural Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 575: Drinking Water Engineering

Civil Engineering

Design of drinking water facilities, including water supply design considerations, intake structures, wells, coagulation and flocculation, lime-softening, ion exchange, sedimentation, filtration, disinfection, and water plant residuals management.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- [Chem 115: General Chemistry Laboratory I](#)
- Prerequisite: Chem 105 and Chem 115, and either Engr 322 or 323 OR graduate standing

Instruction Type(s)

- Lecture: Lecture for C E 575

Subject Areas

- [Environmental/Environmental Health Engineering](#)

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C E 301: Environmental and Water Resources Lab

Civil Engineering

Experiments in environmental and water resources elements and systems; hands-on experience in experimental design and data acquisition and analysis; evaluation, synthesis, and graphical presentation of results and report preparation.

1 Credit

One-way corequisites

- [C E 371: Intro to Environmental Engineering](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for C E 301

Subject Areas

- [Water Resources Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)

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C E 572: Stormwater Engineering and Management

Civil Engineering

Quality and quantity of urban and rural stormwater. Runoff quality and quantity characteristics. Receiving water problems and sources of pollutants. Selection and design of stormwater quantity and quality controls. Stormwater computer models. Stormwater regulations.

3 Credits

Prerequisites

- Pre-Requisite C E 472 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for C E 572

Subject Areas

- [Water Resources Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)

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C E 311: Structural Analysis

Civil Engineering

Classification and analysis of structure systems: structural analysis of trusses, beams, and frames using classical geometry and energy methods. Influence lines and column buckling. Introduction to stiffness matrices for rods, beams, and frames. Computer applications.

3 Credits

Prerequisites

- [Engr 312: Mechanics of Materials](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 311

Subject Areas

- [Civil Engineering, General](#)
- [Structural Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 536: Designing with Geosynthetics

Civil Engineering

This course covers the history of geosynthetics; overview of geosynthetic functions, applications, and properties; relationship between testing and applications; designing with geotextiles, geogrids, geonets, geomembranes, and geosynthetic clay liners.

3 Credits

Prerequisites

- [C E 431: Soil Mechanics I](#)

Instruction Type(s)

- Lecture: Lecture for C E 536

Subject Areas

- [Geotechnical and Geoenvironmental Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 421: Matrix Analysis of Structures

Civil Engineering

Virtual work and virtual displacement methods; introduction to the flexibility and displacement matrix methods; stiffness matrices for rod, frame, and slab elements; introduction to structural dynamics and elastic stability; computational tools.

3 Credits

Prerequisites

- [C E 311: Structural Analysis](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 421

Subject Areas

- [Civil Engineering, General](#)
- [Structural Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 310: Introduction to Structural Mechanics

Civil Engineering

Dynamics of particles; introduction to rigid body mechanics in a plane; applications to civil engineering; introduction to structural systems and loads; analysis of statically determinate trusses, beams, and frames. Computer applications.

3 Credits

Prerequisites

- [Engr 309: Statics](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 310

Subject Areas

- [Structural Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 315: Civil Engineering Materials

Civil Engineering

Fundamental concepts of materials science including the structure and properties of materials and their relationship to material selection and system design; classification of materials; properties and behavior of construction materials including soils and aggregates, cement, concrete, metals, wood, asphalt, composites, and other new materials; mix design procedures and properties of Portland cement concrete and bituminous/asphalt mixtures; quality control and quality assurance.

3 Credits

Prerequisites

- C E 315 Requires: One Way-Co-Requisite C E 431

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for C E 315

Subject Areas

- [Civil Engineering, General](#)
- [Materials Engineering](#)

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C E 578: Agricultural Conservation for Eng & Sci

Civil Engineering

Topics in soil and water conservation for agricultural productivity and environmental protection. Interconnection of water, soil, food, and climate, such as erosion, cropping systems, pollution, and irrigation.

3 Credits

Prerequisites

- Senior standing required.

Instruction Type(s)

- Lecture: Lecture for C E 578

Subject Areas

- [Civil Engineering, Other](#)

Related Areas

- [Civil Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
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- [Water Resources Engineering](#)

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Civil Engineering

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Faculty in Civil Engineering

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- [B](#)
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- [C](#)
- [G](#)
- [M](#)

[Jump to current faculty](#)

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C E 542: Flow in Porous Media

Civil Engineering

Steady, homogenous flow; prediction of transport properties; wells, seepage, drainage, re-charge; nonhomogenous flow.

3 Credits

Prerequisites

- Pre-requisite: Engr 323 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for C E 542

Subject Areas

- [Civil Engineering, General](#)
- [Water Resources Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)

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C E 574: Wastewater Engineering

Civil Engineering

This course covers the design of municipal wastewater facilities. The flow of wastewater through preliminary, primary, secondary, and tertiary treatment(s) will be covered during the second half of the course.

C E 371 is required for civil engineering students. For non-civil engineering students, Chem 105, Chem 115, and senior standing are the prerequisites.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- [Chem 115: General Chemistry Laboratory I](#)
- Senior standing required.
- Prerequisite: Engr 322 OR Engr 323

Instruction Type(s)

- Lecture: Lecture for C E 574

Subject Areas

- [Environmental/Environmental Health Engineering](#)

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C E 206: Introduction to Surveying

Civil Engineering

Observation errors, leveling, distance measurement, traversing and computations, topographic surveys, boundary surveys, construction surveys, horizontal and vertical curves, areas, volumes, GNSS applications, computer applications.

3 Credits

One-way corequisites

- [C E 208: Civil Engineering Graphics I](#)

Instruction Type(s)

- Lecture/Lab: Lecture/Lab for C E 206

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
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C E 325: Intermediate Dynamics

Civil Engineering

Continuation of Engr 309. Rigid body dynamics, vibrations, Lagrangian formulations; applications to mechanical engineering problems.

3 Credits

Prerequisites

- [Engr 309: Statics](#)
- Pre-Requisite: 24 Earned Hours

Cross-listed Courses

- [M E 325: Intermediate Dynamics](#)

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
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C E 303: Materials Laboratory

Civil Engineering

Selected experiments in materials; evaluation, synthesis, and graphical presentation of results and report preparation.

1 Credit

One-way corequisites

- [C E 302: Mechanics Laboratory](#)
- [C E 315: Civil Engineering Materials](#)

Instruction Type(s)

- Lab: Laboratory for C E 303

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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Engr 547: Characterization Methods for Nanomaterials

Civil Engineering

Introduction to multiscale experimental mechanics, surface, physics, and chemical characterization of nanomaterials. Each module will contain a theoretical and a practical part.

3 Credits

Prerequisites

- [Engr 541: Foundations of Nano Engineering and Sci](#)

Instruction Type(s)

- Lecture: Lecture for Engr 547

Subject Areas

- [Materials Engineering](#)

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C E 435: Advanced Geotechnical Engineering

Civil Engineering

Linear and non linear geotechnical issues, advanced bearing capacity equations, propagation of body wave, dynamic pile driving equations. STATNAMIC, drilled piers, braced earth retaining structures, ground modifications, geotechnical instrumentation, Cam Clay model and other classical and modern topics.

3 Credits

Prerequisites

- [C E 431: Soil Mechanics I](#)
- [C E 433: Foundation Engineering](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 435

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 472: Water Resources Engineering

Civil Engineering

Water supply systems, open channel hydraulics, hydrologic cycle, surface water hydrology, run-off models, groundwater flow and contamination.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [Engr 323: Fluid Mechanics](#)

Instruction Type(s)

- Lecture: Lecture for CE 472

Subject Areas

- [Civil Engineering, General](#)
- [Water Resources Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)

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C E 500: Geographic Information Systems Engr Sci

Civil Engineering

Introduces the use of a geographic information system. Topics include applications of geographic information; spatial data collection; data accuracy and uncertainty; data visualization of cartographic principles; spatial analysis; and legal, economic, and ethical issues associated with the use of a geographic information system.

3 Credits

Prerequisites

- Junior Standing Required

Cross-listed Courses

- [G E 470: Intro. to Geographic Information System](#)

Subject Areas

- [Civil Engineering_ Other](#)

Related Areas

- [Civil Engineering_General](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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Civil Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)

Leadership

- Srinivas Pulugurtha - Chair and Professor of Civil Engineering

Contact

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Overview

The Department of Civil Engineering offers a Bachelor of Science in Civil Engineering (B.S.C.E.) degree. BSCE is the road map that leads to a professional engineering degree that emphasizes the engineering sciences and civil engineering design concepts needed to properly design, construct, and maintain naturally and/or physically built environmental systems such as roads, highways, bridges, dams, canals, water treatment plants, wastewater treatment plants, and buildings. The Civil Engineering curriculum prepares the student for both professional practice and graduate study.

At the graduate level, the department has offerings for the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in engineering science with an emphasis in civil engineering. The latter graduate degrees are listed under the School of Engineering.

Accreditation

The following undergraduate engineering programs are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, and Bachelor of Science in Mechanical Engineering. The Bachelor of Science in Computer Science (BSCS) program of the Department of Computer and Information Science is accredited as a Computer Science program by the Computing Accreditation Commission (CAC) of ABET <https://www.abet.org>.

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C E 516: Bridge Engineering

Civil Engineering

Bridge types, functions, construction features; AASHTO design vehicle loading; LRFD limit states design of superstructure elements; short span steel and pre-stressed concrete girder deck systems; introduction to design of substructure elements including bearings, piers, trestles

3 Credits

Prerequisites

- Prerequisites: either C_E 412 or C_E 413 OR Prerequisite: graduate standing

Instruction Type(s)

- Lecture: Lecture for C E 516

Subject Areas

- [Structural Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 514: Pre-Stressed Concrete Design

Civil Engineering

Pre- and post-tensioning technologies; material properties; ACI and AASHTO allowable stresses; response to and design for axial load, flexure, shear, and torsion; applications to buildings and bridges.

3 Credits

Prerequisites

- [C E 412: Design of Concrete Structures](#)

Instruction Type(s)

- Lecture: Lecture for C E 514

Subject Areas

- [Civil Engineering, General](#)
- [Structural Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
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C E 412: Design of Concrete Structures

Civil Engineering

Strength analysis and design of reinforced concrete structural elements using ACI requirements. Retangular and T sections in bending. Shear reinforcement in beams. Short columns. Footings and retaining walls. Introduction to analysis and design of steel structural elements.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [C E 311: Structural Analysis](#)

Instruction Type(s)

- Lecture: Lecture for C E 412

Subject Areas

- [Civil Engineering, General](#)
- [Structural Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 585: Highway Pavements

Civil Engineering

Stress analysis of pavements, traffic estimation, material characterization, condition monitoring and evaluation, current design schemes, computer applications.

3 Credits

One-way corequisites

- [C E 431: Soil Mechanics I](#)

Instruction Type(s)

- Lecture: Lecture for C E 585

Subject Areas

- [Civil Engineering, General](#)
- [Transportation and Highway Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
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C E 590: Airport Planning and Design

Civil Engineering

Impacts of national transportation policies with emphasis on ground, aviation, and intermodal facilities; financing resources; collection and use of traffic and passenger data for airport planning and design; travel demand forecasting; capacity analysis; visual aids and air traffic control; runway orientation and geometric design; design of terminal areas and ground access; basic pavement structural design and maintenance management; environmental impacts and economic assessment; airport applications of remote sensing and spatial technologies, GIS, and Intelligent Transportation System (ITS) technologies.

3 Credits

Instruction Type(s)

- Lecture: Lecture for C E 590

Subject Areas

- [Civil Engineering, General](#)
- [Transportation and Highway Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Water Resources Engineering](#)

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C E 495: Geospatial Analysis for Engr & Vis Apps

Civil Engineering

Working knowledge, application development, and operation issues related to geographical information system (GIS) tools using modern remote sensing raster imagery and vector mapping data; geospatial workflow implementation for engineering and visualization applications; geographic and non-geographic data processing to create spatial maps, inventory and attribute database, and data visualization; import and export of engineering graphics data; development of GIS based decision support systems.

3 Credits

Prerequisites

- Senior standing required.

Instruction Type(s)

- Lecture: Lecture for C E 495

Subject Areas

- [Civil Engineering, General](#)
- [Transportation and Highway Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
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C E 452: Civil Engineering Analysis

Civil Engineering

Development and analysis of conceptual models of contemporary civil engineering; applications in structures, geotechniques, hydraulics, hydrology, transportation, and environmental engineering.

3 Credits

Prerequisites

- [C E 311: Structures I](#)
- [C E 431: Soil Mechanics I](#)
- [Engr 310: Engineering Analysis I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 452

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 455: Civil Engineering Design I

Civil Engineering

Initial course in capstone design sequence. Individual and group experience in identifying objectives, major activities affecting cost/schedule, and roles of private and public organizations in civil engineering projects; introduction to regional and national building code provisions for access, egress, and structural safety; creativity in the design process and selection of competitive alternatives; preliminary site planning and facility design; preliminary group planning of a significant civil engineering project. Introduction to the use of computational tools for analysis, design, and visualization.

2 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [C E 412: Design of Concrete Structures](#)
- [C E 433: Foundation Engineering](#)
- [C E 481: Transportation Engineering I](#)
- [C E 472: Water Resources Engineering](#)

Instruction Type(s)

- Lecture: Lecture for C E 455

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 481: Transportation Engineering I

Civil Engineering

Major transportation modes and their characteristics; mechanics of motion; geometric and intersection design; traffic flow theory; probabilistic methods; capacity analysis; planning models; environmental impact analysis; economic evaluation; Intelligent Transportation System (ITS) and computer applications.

3 Credits

Prerequisites

- [C E 207: Surveying](#)
- [C E 208: Civil Engineering Graphics I](#)

Instruction Type(s)

- Lecture: Lecture for C E 481

Subject Areas

- [Civil Engineering, General](#)
- [Transportation and Highway Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Water Resources Engineering](#)

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C E 513: Advanced Steel Design

Civil Engineering

Advanced topics in design of structural steel members; Direct Analysis Method for steel frames; building connections; steel girder design; applications to buildings and bridges; seismically resistant steel frames.

3 Credits

Prerequisites

- Pre-requisite C E 413 OR Graduate Standing

Instruction Type(s)

- Lecture: Lecture for C E 513

Subject Areas

- [Structural Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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Civil Engineering

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Degrees Offered

- [B.S.C.E. in Civil Engineering](#)
 - [Emphasis - Environmental](#)
 - [Emphasis - Standard](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Civil Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Civil Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Hydrology & Comp Hydroscience](#)
 - [Emphasis - Materials Science and Engr](#)

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C E 401: Civil Engineering Fundamentals

Civil Engineering

Refresher of core undergraduate courses in the civil engineering curriculum.

1 Credit

Prerequisites

- Senior standing in Civil Engineering.

One-way corequisites

- [C E 455: Civil Engineering Design I](#)

Instruction Type(s)

- Recit/Disc: Recitation/Discussion for C E 401

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 405: Civil Engineering Laboratory III

Civil Engineering

Experiments in structural, hydraulic and environmental elements and systems; hands-on experience in experimental design, use of sophisticated data acquisition equipment and post-processing software.

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [C E 472: Water Resources Engineering](#)
- [C E 315: Civil Engineering Materials](#)
- [C E 471: Environmental Engineering I](#)
- [C E 205: Civil Engineering Laboratory I](#)

Instruction Type(s)

- Laboratory: Laboratory for C E 405

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
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C E 371: Intro to Environmental Engineering

Civil Engineering

An introduction to areas of environmental engineering including environmental chemistry, water and wastewater treatment, water quality management, air pollution, solid and hazardous waste, and noise pollution.

Students may take either C E 371 or C E 471, but not both for credit toward a degree.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- [Chem 115: General Chemistry Laboratory I](#)

Instruction Type(s)

- Lecture: Lecture for C E 371

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 433: Foundation Engineering

Civil Engineering

Soil investigation and bearing capacity. Factors to consider in foundation design, spread-footing design, combined footing design, mat foundations, retaining wall design, sheet-pile wall design, single pile foundation, and pile group foundation design. Caissons and cofferdams.

3 Credits

Prerequisites

- [C E 431: Soil Mechanics I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 433

Subject Areas

- [Civil Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 402: Soil Mechanics Laboratory

Civil Engineering

Selected experiments in soil mechanics; tests of identification and characterization of soils; evaluation, synthesis, and graphical presentation of results and report preparation.

1 Credit

One-way corequisites

- [C E 431: Soil Mechanics I](#)

Instruction Type(s)

- Lab: Laboratory for C E 402

Subject Areas

- [Geotechnical and Geoenvironmental Engineering](#)

Related Areas

- [Civil Engineering, General](#)
- [Civil Engineering, Other](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 413: Steel Design

Civil Engineering

LRFD and ASD design philosophy; AISC specifications for steel sections under tension, compression, bending, and combined axial load and bending; lateral load resisting systems; simple bolted and welded connections; composite beams.

3 Credits

Prerequisites

- [C E 311: Structural Analysis](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 413

Subject Areas

- [Civil Engineering, General](#)
- [Structural Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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Civil Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)

Courses

- [C E 101: Introduction to Civil Engineering I](#)
- [C E 102: Introduction to Civil Engineering II](#)
- [C E 103: Introduction to Civil Engineering Lab](#)
- [C E 205: Civil Engineering Laboratory I](#)
- [C E 206: Introduction to Surveying](#)
- [C E 207: Surveying](#)
- [C E 208: Civil Engineering Graphics I](#)
- [C E 301: Environmental and Water Resources Lab](#)
- [C E 302: Mechanics Laboratory](#)
- [C E 303: Materials Laboratory](#)
- [C E 305: Civil Engineering Laboratory II](#)
- [C E 310: Introduction to Structural Mechanics](#)
- [C E 311: Structural Analysis](#)
- [C E 315: Civil Engineering Materials](#)
- [C E 325: Intermediate Dynamics](#)
- [C E 371: Intro to Environmental Engineering](#)
- [C E 401: Civil Engineering Fundamentals](#)
- [C E 402: Soil Mechanics Laboratory](#)
- [C E 405: Civil Engineering Laboratory III](#)
- [C E 412: Design of Concrete Structures](#)
- [C E 413: Steel Design](#)
- [C E 414: Advanced Concrete Design](#)
- [C E 417: Construction Engineering and Management](#)
- [C E 421: Matrix Analysis of Structures](#)
- [C E 431: Soil Mechanics I](#)
- [C E 433: Foundation Engineering](#)
- [C E 435: Advanced Geotechnical Engineering](#)
- [C E 452: Civil Engineering Analysis](#)
- [C E 454: Engineering Design I](#)
- [C E 455: Civil Engineering Design I](#)
- [C E 456: Civil Engineering Design II](#)
- [C E 471: Environmental Engineering I](#)
- [C E 472: Water Resources Engineering](#)
- [C E 481: Transportation Engineering I](#)
- [C E 495: Geospatial Analysis for Engr & Vis Apps](#)
- [C E 497: Civil Engineering Projects](#)
- [C E 500: Geographic Information Systems Engr Sci](#)
- [C E 511: Structural Dynamics](#)
- [C E 513: Advanced Steel Design](#)
- [C E 514: Pre-Stressed Concrete Design](#)
- [C E 516: Bridge Engineering](#)
- [C E 521: Advanced Mechanics of Materials](#)
- [C E 531: Soil Mechanics II](#)
- [C E 536: Designing with Geosynthetics](#)
- [C E 541: Flow in Open Channels](#)
- [C E 542: Flow in Porous Media](#)
- [C E 543: Sediment Transport](#)
- [C E 561: Civil Engineering Systems](#)

- [C E 570: Infrastructure Management](#)
- [C E 572: Stormwater Engineering and Management](#)
- [C E 574: Wastewater Engineering](#)
- [C E 575: Drinking Water Engineering](#)
- [C E 578: Agricultural Conservation for Eng & Sci](#)
- [C E 581: Transportation Engineering II](#)
- [C E 585: Highway Pavements](#)
- [C E 590: Airport Planning and Design](#)
- [Engr 541: Foundations of Nano Engineering and Sci](#)
- [Engr 547: Characterization MethodsforNanomaterials](#)

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C E 431: Soil Mechanics I

Civil Engineering

Testing and identification of soils, saturated flow through earth structures, stress distribution in soils, consolidation, and settlement; shear strength of soils; earth pressure, slope stability, and shallow foundation problems.

3 Credits

Prerequisites

- [Engr 312: Mechanics of Materials](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for C E 431

Subject Areas

- [Civil Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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Civil Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Distinguished Faculty and Staff Awards

School of Engineering, Junior Faculty Research Award

- **Hakan Irfan Yasarer** - Associate Professor of Civil Engineering (2020)
- **Hunain Said Alkhateb** - Associate Professor of Civil Engineering and Associate Director of Graphene Core Testing Facility (2019)
- **Cristiane Januzzi Queiroz Surbeck** - Adjunct Professor of Civil Engineering (2014)
- **Elizabeth Kaye Ervin** - Adjunct Associate Professor of Civil Engineering (2012)
- **Ahmed Hajmohammad-Khalil Al-Ostaz** - Brevard Family Chair and Professor of Civil Engineering and Director of the Center for Graphene Research and Innovation (2010)
- **GAREY A FOX** - ASSISTANT PROFESSOR OF CIVIL ENGINEERING (2005)

Outstanding Staff Award

A staff member of the School of Engineering who has demonstrated exemplary service, leadership, and commitment.

- **Lynne McAlla Trusty** - Operations Coordinator II (2014)
- **DOROTHY ANNE LLOYD** - SENIOR SECRETARY (2009)
- **GENE LAMAR WALKER** - Instrument Technician (2006)
- **GENE LAMAR WALKER** - Instrument Technician (2003)

School of Engineering, Senior Faculty Research Award

- **Waheed Uddin** - PROFESSOR OF CIVIL ENGINEERING AND DIRECTOR OF THE CENTER FOR ADVANCED INFRASTRUCTURE TECHNOLOGY (2015)
- **Ahmed Hajmohammad-Khalil Al-Ostaz** - Brevard Family Chair and Professor of Civil Engineering and Director of the Center for Graphene Research and Innovation (2012)

School of Engineering, Faculty Service Award

- **Hunain Said Alkhateb** - Associate Professor of Civil Engineering and Associate Director of Graphene Core Testing Facility (2018)
- **Cristiane Januzzi Queiroz Surbeck** - Adjunct Professor of Civil Engineering (2015)
- **Elizabeth Kaye Ervin** - Adjunct Associate Professor of Civil Engineering (2009)
- **Alexander H D Cheng** - Dean Emeritus and Professor Emeritus of Civil Engineering (2004)
- **Waheed Uddin** - PROFESSOR OF CIVIL ENGINEERING AND DIRECTOR OF THE CENTER FOR ADVANCED INFRASTRUCTURE TECHNOLOGY (2001)

School of Engineering, Faculty Teaching Award

- **Hakan Irfan Yasarer** - Associate Professor of Civil Engineering (2021)
- **Grace McMahan Rushing** - Lecturer in Civil Engineering (2020)
- **Cristiane Januzzi Queiroz Surbeck** - Adjunct Professor of Civil Engineering (2010)
- **Chung Rak Song** - Adjunct Professor of Civil Engineering (2009)

School of Engineering Outstanding Teacher of the Year

- **Ahmed Hajmohammad-Khalil Al-Ostaz** - Brevard Family Chair and Professor of Civil Engineering and Director of the Center for Graphene Research and Innovation (2022)
- **Ahmed Hajmohammad-Khalil Al-Ostaz** - Brevard Family Chair and Professor of Civil Engineering and Director of the Center for Graphene Research and Innovation (2013)
- **Chung Rak Song** - Adjunct Professor of Civil Engineering (2011)
- **Alexander H D Cheng** - Dean Emeritus and Professor Emeritus of Civil Engineering (2007)
- **Ahmed Hajmohammad-Khalil Al-Ostaz** - Brevard Family Chair and Professor of Civil Engineering and Director of the Center for Graphene Research and Innovation (2006)

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C E 531: Soil Mechanics II

Civil Engineering

Soil variability, shear strength, and deformation of multilayered systems; critical state soil mechanics, Convection and Diffusion of ground water flow; settlement analysis; static and dynamic slope stability, dynamic behavior of soils, Computer applications.

3 Credits

Prerequisites

- [C E 431: Soil Mechanics I](#)

Instruction Type(s)

- Lecture: Lecture for C E 531

Subject Areas

- [Civil Engineering, General](#)
- [Geotechnical and Geoenvironmental Engineering](#)

Related Areas

- [Civil Engineering, Other](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 561: Civil Engineering Systems

Civil Engineering

Engineering applications of linear programming, dynamic programming, PERT-CPM, game theory; stochastic systems.

3 Credits

Prerequisites

- Pre-requisite: Math 264 (or Graduate Standing)

Instruction Type(s)

- Lecture: Lecture for C E 561

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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C E 454: Engineering Design I

Civil Engineering

Initial course in the capstone design sequence. Individual and group experience in identifying objectives, major activities affecting cost/schedule, and roles of private and public organizations in civil engineering projects; introduction to regional and national building code provisions for access, egress, and structural safety; creativity in the design process and selection of competitive alternatives; preliminary site planning and facility design; preliminary group planning of a significant civil engineering project. Introduction to using computational tools for analysis, design, and visualization. This course will also introduce students to leadership and communication skills necessary for today's civil engineering profession. The importance of career planning and building professional networks in civil engineering will be emphasized by inviting professionals as guest lecturers to share their experiences.

3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

One-way corequisites

- [C E 412: Design of Concrete Structures](#)
- [C E 433: Foundation Engineering](#)

Instruction Type(s)

- Lecture: Lecture for C E 454

Subject Areas

- [Civil Engineering, General](#)

Related Areas

- [Civil Engineering, Other](#)
- [Geotechnical and Geoenvironmental Engineering](#)
- [Structural Engineering](#)
- [Transportation and Highway Engineering](#)
- [Water Resources Engineering](#)

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Emphasis - Materials Science and Engr

- [M.S. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Materials Science and Engr

Description

A M.S. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Civil Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Civil Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Civil Engineering

Description

A degree of M.S. in engineering science with emphasis in civil engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. The program offers a choice of several concentration areas: structures, geotechnical engineering, construction materials, water resource engineering, environmental engineering, transportation systems, infrastructure asset management, and earthquake and disaster response management.

Goals/Mission Statement

The program will provide high quality graduate education in a range of civil engineering disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The thesis option for the M.S. with emphasis in civil engineering requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697-Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation.

Required graduate course work for either option includes at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I); one course in numerical method (e.g., Engr 590-Finite Element Analysis); and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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Emphasis - Environmental Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Environmental Engineering

Description

A M.S. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. Students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Goals/Mission Statement

The program will provide high quality graduate education in a range of environmental disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The M.S. with emphasis in environmental engineering can be completed as either a thesis or nonthesis option. The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697- Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation.

The graduate course work for either option must include at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I), one course in numerical method (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

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Emphasis - Hydrology & Comp Hydroscience

- [M.S. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Hydrology & Comp Hydroscience

Description

An M.S. in engineering science with an emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. It covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the M.S. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete 24 credit hours of coursework (plus at least 6 thesis hours). Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I|
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment

- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation
- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Standard

- [B.S.C.E. in Civil Engineering](#)
- [Emphasis - Standard](#)
- [Degree Requirements](#)

B.S.C.E. in Civil Engineering

Description

The B.S.C.E. degree emphasizes engineering sciences and civil engineering design with four proficiency areas: structural engineering, water resources and environmental engineering, transportation and construction management, and geotechnical engineering. The curriculum prepares the student for both professional practice and graduate study.

Minimum Total Credit Hours: 129

Goals/Mission Statement

Mission

The Department of Civil Engineering (CE) within the School of Engineering (SoE) at the University of Mississippi (UM) strives to continuously improve the quality of its three functions: teaching, research and service. In so doing, the Department shall:

- prepare students with a broad based education for entering the civil and other related engineering professions, for advanced studies, and for careers in research;
- provide a top quality research program and graduate education in selected areas of science and engineering technology with its impact extending to regional, national, and global communities; and
- provide service to citizens, industry, and government via technological and educational innovations.

Goals

- Improve and maintain effective state-of-the-art graduate and undergraduate programs
- Perform quality research in line with national trends and achieve national recognition in selected areas
- Become a locally and nationally visible department through professional service
- Build stronger ties with civil engineering alumni

Program Educational Objectives

BSCE Graduates of the Civil Engineering Program at the University of Mississippi, within 3-5 years after graduation, will:

- Practice in civil engineering, environmental engineering or a related area to serve society.
- Continue to develop professionally by obtaining advanced degrees, professional registration and/or certification as appropriate for their qualifications and careers.
- Assume leadership roles in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSCE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments,

- which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours must be in speech or oral communication (Spch 102 or 105), 3 hours in humanities, 6 hours in social science (including Econ 310), and 3 hours in fine arts. The remaining 3 hours can be in any of the humanities/fine arts categories.

Course Requirements

Specific requirements for the B.S.C.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 115; Phys 211, 212, 221, 222; Csci 251 or 256, Engr 309, 310, 312, 323, 400; C E 101, 102, 205, 207, 208, 305, 311, 315, 371, 401, 405, 412, 413, 417, 431, 433, 455, 456, 472, and 481; 3 hours of basic science elective; at least 6 hours from List A technical electives (C E 414, 435, 495, 500, 513, 514, 516, 536, 541, 572, 574, 575, 581, Engr 573); and no more than 9 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: C E 511, 521, 531, 570, 578, 585, 590, Engr 321, 360, 497, 541, 547, 555, 571, 591, 593, G E 440, 450; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401, C E 497, Engr 596, 597, 598; Category B.III: No more than one course from the approved list of the business minor.

Other Academic Requirements

Students in the Department of Civil Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Emphasis - Standard

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.C.E. in Civil Engineering

General Education

Requirement Hours		Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .

Requirement Hours		Description
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs Lang, Hum or FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), or Fine Art
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 with a passing grade.
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.

General Education II

Requirement	Hours	Description
Math 261 - C min 3		Complete Math 261 with a grade of C or better.
Math 262 - C min 3		Complete Math 262 with a C grade or better.
Math 263 - C min 3		Complete Math 263 with a C grade or better.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
C E 101 /102 or Engr 100	2	Complete C E 101 and C E 102 or complete Engr 100 . Coursework must be completed with a passing grade.
C E 205	1	Complete C E 205 with a passing grade.
C E 207	2	Complete C E 207 with a passing grade.
C E 208	1	Complete C E 208 with a passing grade.
C E 305	1	Complete C E 305 with a passing grade.
C E 311	3	Complete C E 311 with a passing grade.
C E 315	3	Complete C E 315 with a passing grade.
C E 371	3	Complete C E 371 with a passing grade.
C E 401	1	Complete CE 401 with a passing grade.
C E 405	1	Complete C E 405 with a passing grade.
C E 412	3	Complete C E 412 with a passing grade.
C E 417	3	Complete C E 417 with a passing grade.
C E 431	3	Complete C E 431 with a passing grade.
C E 433	3	Complete C E 433 with a passing grade.
C E 455	2	Complete C E 455 with a passing grade.
C E 456	3	Complete C E 456 with a passing grade.
C E 472	3	Complete C E 472 with a passing grade.

Requirement	Hours	Description
CE 481	3	Complete CE 481 with a passing grade.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Csci 251 or 256	3	Complete Csci 251 or CSci 256 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Standard

Requirement	Hours	Description
CE 413	3	Complete CE 413 with a passing grade.
3-4 hrs science elective	3	Complete at least 3-4 hours of basic science elective chosen from the following: Bisc 160 and Bisc 161 (must complete both to receive credit), Geol 101 , Geol 102 , Geol 103 , Geol 104 , Geol 105 , 106 , 107 , 120 , Bisc 102 , or Bisc 104 .
6 hrs Tech Elective A	6	Complete 6 hours of course work from List A technical electives: CE 414 , 435 , 495 , 500 , 513 , 514 , 516 , 536 , 541 , 547 , 572 , 574 , 575 , 581 , Engr 573 .
9 hrs Tech Elective B	9	Complete 9 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: CE 511 , 521 , 531 , 570 , 578 , 585 , 590 , Engr 321 , 360 , 497 , 541 , 547 , 555 , 571 , 591 , 593 , GE 440 , 450 ; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401 , CE 497 , Engr 596 , 597 , 598 ; Category B.III: No more than one course from the approved list of the business minor.

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B.S.C.E. in Civil Engineering

- [Overview](#)
- [Degree Requirements](#)

Description

The B.S.C.E. degree emphasizes engineering sciences and civil engineering design with four proficiency areas: structural engineering, water resources and environmental engineering, transportation and construction management, and geotechnical engineering. The curriculum prepares the student for both professional practice and graduate study.

Minimum Total Credit Hours: 129

Goals/Mission Statement

Mission

The Department of Civil Engineering (CE) within the School of Engineering (SoE) at the University of Mississippi (UM) strives to continuously improve the quality of its three functions: teaching, research and service. In so doing, the Department shall:

- prepare students with a broad based education for entering the civil and other related engineering professions, for advanced studies, and for careers in research;
- provide a top quality research program and graduate education in selected areas of science and engineering technology with its impact extending to regional, national, and global communities; and
- provide service to citizens, industry, and government via technological and educational innovations.

Goals

- Improve and maintain effective state-of-the-art graduate and undergraduate programs
- Perform quality research in line with national trends and achieve national recognition in selected areas
- Become a locally and nationally visible department through professional service
- Build stronger ties with civil engineering alumni

Program Educational Objectives

BSCE Graduates of the Civil Engineering Program at the University of Mississippi, within 3-5 years after graduation, will:

- Practice in civil engineering, environmental engineering or a related area to serve society.
- Continue to develop professionally by obtaining advanced degrees, professional registration and/or certification as appropriate for their qualifications and careers.
- Assume leadership roles in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSCE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment

- to draw conclusions
- 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours must be in speech or oral communication (Spch 102 or 105), 3 hours in humanities, 6 hours in social science (including Econ 310), and 3 hours in fine arts. The remaining 3 hours can be in any of the humanities/fine arts categories.

Course Requirements

Specific requirements for the B.S.C.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 115; Phys 211, 212, 221, 222; Csci 251 or 256, Engr 309, 310, 312, 323, 400; C E 101, 102, 205, 207, 208, 305, 311, 315, 371, 401, 405, 412, 413, 417, 431, 433, 455, 456, 472, and 481; 3 hours of basic science elective; at least 6 hours from List A technical electives (C E 414, 435, 495, 500, 513, 514, 516, 536, 541, 572, 574, 575, 581, Engr 573); and no more than 9 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: C E 511, 521, 531, 570, 578, 585, 590, Engr 321, 360, 497, 541, 547, 555, 571, 591, 593, G E 440, 450; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401, C E 497, Engr 596, 597, 598; Category B.III: No more than one course from the approved list of the business minor.

Other Academic Requirements

Students in the Department of Civil Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Specializations

- [Emphasis - Environmental](#)
- [Emphasis - Standard](#)

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Emphasis - Environmental

- [B.S.C.E. in Civil Engineering](#)
- [Emphasis - Environmental](#)
- [Degree Requirements](#)

B.S.C.E. in Civil Engineering

Description

The B.S.C.E. degree emphasizes engineering sciences and civil engineering design with four proficiency areas: structural engineering, water resources and environmental engineering, transportation and construction management, and geotechnical engineering. The curriculum prepares the student for both professional practice and graduate study.

Minimum Total Credit Hours: 129

Goals/Mission Statement

Mission

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Program Educational Objectives

BSCE Graduates of the Civil Engineering Program at the University of Mississippi, within 3-5 years after graduation, will:

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Student Outcomes

In accordance with ABET accreditation requirements, BSCE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments,

- which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours must be in speech or oral communication (Spch 102 or 105), 3 hours in humanities, 6 hours in social science (including Econ 310), and 3 hours in fine arts. The remaining 3 hours can be in any of the humanities/fine arts categories.

Course Requirements

Specific requirements for the B.S.C.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 115; Phys 211, 212, 221, 222; Csci 251 or 256, Engr 309, 310, 312, 323, 400; C E 101, 102, 205, 207, 208, 305, 311, 315, 371, 401, 405, 412, 413, 417, 431, 433, 455, 456, 472, and 481; 3 hours of basic science elective; at least 6 hours from List A technical electives (C E 414, 435, 495, 500, 513, 514, 516, 536, 541, 572, 574, 575, 581, Engr 573); and no more than 9 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: C E 511, 521, 531, 570, 578, 585, 590, Engr 321, 360, 497, 541, 547, 555, 571, 591, 593, G E 440, 450; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401, C E 497, Engr 596, 597, 598; Category B.III: No more than one course from the approved list of the business minor.

Other Academic Requirements

Students in the Department of Civil Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Emphasis - Environmental

Description

The B.S.C.E. degree with the Environmental Engineering emphasis stresses engineering sciences and civil and environmental engineering design with proficiency areas in: environmental and water resources engineering, structural engineering, transportation and construction management, and geotechnical engineering. The curriculum prepares the student for both professional practice and graduate study.

Course Requirements

COURSE REQUIREMENTS FOR ENVIRONMENTAL EMPHASIS Specific requirements for the B.S.C.E. with the Environmental Emphasis include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115; Phys 211, 212, 221, 222; Csci 251, Engr 309, 310, 312, 323, 400; C E 101, 102, 205, 207, 208, 305, 311, 315, 371, 401, 405, 412, 417, 431, 433, 455, 456, 472, and 481; 3 hours of basic environmental science elective (Bisc 104, Geol 104, or Geol 105); 12 hours from Environmental Technical Electives (C E 572, 574, 575, Engr 321, Engr 571, Engr 573, Ch E 545, G E 450, G E 503; only one of C E 495, G E 470, G E 510; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401, C E 497, Engr 596, 597, 598; no more than one course from the approved list of the business minor).

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.C.E. in Civil Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs Lang, Hum or FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), or Fine Art
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 with a passing grade.
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.

General Education II

Requirement	Hours	Description
Math 261 - C min	3	Complete Math 261 with a grade of C or better.
Math 262 - C min	3	Complete Math 262 with a C grade or better.
Math 263 - C min	3	Complete Math 263 with a C grade or better.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
CE 101 /102 or Engr 100	2	Complete CE 101 and CE 102 or complete Engr 100 . Coursework must be completed with a passing grade.
CE 205	1	Complete CE 205 with a passing grade.
CE 207	2	Complete CE 207 with a passing grade.
CE 208	1	Complete CE 208 with a passing grade.
CE 305	1	Complete CE 305 with a passing grade.

Requirement	Hours	Description
CE 311	3	Complete CE 311 with a passing grade.
CE 315	3	Complete CE 315 with a passing grade.
CE 371	3	Complete CE 371 with a passing grade.
CE 401	1	Complete CE 401 with a passing grade.
CE 405	1	Complete CE 405 with a passing grade.
CE 412	3	Complete CE 412 with a passing grade.
CE 417	3	Complete CE 417 with a passing grade.
CE 431	3	Complete CE 431 with a passing grade.
CE 433	3	Complete CE 433 with a passing grade.
CE 455	2	Complete CE 455 with a passing grade.
CE 456	3	Complete CE 456 with a passing grade.
CE 472	3	Complete CE 472 with a passing grade.
CE 481	3	Complete CE 481 with a passing grade.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Csci 251 or 256	3	Complete Csci 251 or CSci 256 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Environmental

Requirement	Hours	Description
Chem 106	3	Complete Chem 106 with a passing grade.
3 hrs envir sci electives	3	Complete 3 hrs of environmental science elective courses with a passing grade chosen from: Bisc 104 , 160 , Geol 104 , Geol 105
12 hrs envir tech elect	12	Complete 12 hrs of environmental technical electives with a passing grade chosen from: CE 572 , 574 , 575 , Engr 321 , 571 , 573 , Ch E 545 , G E 450 , 503 only one of CE 500 , G E 470 , G E 510 , other elective course with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401 , CE 497 , Engr 596 , 597 , 598 .
3 hrs Tech Elective B	3	Complete 3 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: CE 511 , 521 , 531 , 570 , 578 , 585 , 590 , Engr 321 , 360 , 497 , 541 , 547 , 555 , 571 , 591 , 593 , G E 440 , 450 ; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401 , CE 497 , Engr 596 , 597 , 598 ; Category B.III: No more than one course from the approved list of the business minor.

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B.S.C.E. in Civil Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

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B.S.C.E. in Civil Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: Liba 102 , Writ 102 or Hon 102 .
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs Lang, Hum or FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), or Fine Art
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102
Econ 310	3	Complete Econ 310 with a passing grade.
Spch 102 or 105	3	Complete Spch 102 or Spch 105 with a passing grade.

General Education II

Requirement	Hours	Description
Math 261 - C min	3	Complete Math 261 with a grade of C or better.
Math 262 - C min	3	Complete Math 262 with a C grade or better.
Math 263 - C min	3	Complete Math 263 with a C grade or better.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Requirement	Hours	Description
Major Requirements		
Requirement	Hours	Description
CE 101 /102 or Engr 100	2	Complete CE 101 and CE 102 or complete Engr 100 . Coursework must be completed with a passing grade.
CE 205	1	Complete CE 205 with a passing grade.
CE 207	2	Complete CE 207 with a passing grade.
CE 208	1	Complete CE 208 with a passing grade.
CE 305	1	Complete CE 305 with a passing grade.
CE 311	3	Complete CE 311 with a passing grade.
CE 315	3	Complete CE 315 with a passing grade.
CE 371	3	Complete CE 371 with a passing grade.
CE 401	1	Complete CE 401 with a passing grade.
CE 405	1	Complete CE 405 with a passing grade.
CE 412	3	Complete CE 412 with a passing grade.
CE 417	3	Complete CE 417 with a passing grade.
CE 431	3	Complete CE 431 with a passing grade.
CE 433	3	Complete CE 433 with a passing grade.
CE 455	2	Complete CE 455 with a passing grade.
CE 456	3	Complete CE 456 with a passing grade.
CE 472	3	Complete CE 472 with a passing grade.
CE 481	3	Complete CE 481 with a passing grade.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Csci 251 or 256	3	Complete Csci 251 or CSci 256 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 312	3	Complete Engr 312 with a passing grade.
Engr 323	3	Complete Engr 323 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Environmental

Requirement	Hours	Description
Chem 106	3	Complete Chem 106 with a passing grade.
3 hrs envir sci electives	3	Complete 3 hrs of environmental science elective courses with a passing grade chosen from: Bisc 104 , 160 , Geol 104 , Geol 105
12 hrs envir tech elect	12	Complete 12 hrs of environmental technical electives with a passing grade chosen from: CE 572 , 574 , 575 , Engr 321 , 571 , 573 , Ch E 545 , G E 450 , 503 only one of CE 500 , G E 470 , G E 510 , other elective course with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401 , CE 497 , Engr 596 , 597 , 598 .

Requirement Hours	Description
3 hrs Tech Elective B 3	Complete 3 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: CE 511 , 521 , 531 , 570 , 578 , 585 , 590 , Engr 321 , 360 , 497 , 541 , 547 , 555 , 571 , 591 , 593 , GE 440 , 450 ; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401 , CE 497 , Engr 596 , 597 , 598 ; Category B.III: No more than one course from the approved list of the business minor.

Emphasis - Standard

Requirement Hours	Description
CE 413 3	Complete CE 413 with a passing grade.
3-4 hrs science elective 3	Complete at least 3-4 hours of basic science elective chosen from the following: Bisc 160 and Bisc 161 (must complete both to receive credit), Geol 101 , Geol 102 , Geol 103 , Geol 104 , Geol 105 , 106 , 107 , 120 , Bisc 102 , or Bisc 104 .
6 hrs Tech Elective A 6	Complete 6 hours of course work from List A technical electives: CE 414 , 435 , 495 , 500 , 513 , 514 , 516 , 536 , 541 , 547 , 572 , 574 , 575 , 581 , Engr 573 .
9 hrs Tech Elective B 9	Complete 9 additional hours from List B technical electives (Category B.I: any course from List A; Category B.II: CE 511 , 521 , 531 , 570 , 578 , 585 , 590 , Engr 321 , 360 , 497 , 541 , 547 , 555 , 571 , 591 , 593 , GE 440 , 450 ; other courses with the approval of the student's adviser and department chair including any relevant independent study course, e.g., Hon 401 , CE 497 , Engr 596 , 597 , 598 ; Category B.III: No more than one course from the approved list of the business minor.

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Emphasis - Materials Science and Engr

- [Ph.D. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Materials Science and Engr

Description

A Ph.D. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.

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Emphasis - Civil Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Civil Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Civil Engineering

Description

A Ph.D. in engineering science with emphasis in civil engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in engineering research and development, education, industry, or public service. The program offers a choice of several concentration areas: structures, geotechnical engineering, construction materials, water resource engineering, environmental engineering, transportation systems, infrastructure asset management, and earthquake and disaster response management.

Goals/Mission Statement

The program will provide high quality graduate education in a range of civil engineering disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The Ph.D. degree with emphasis in civil engineering requires the following coursework:

- For students entering the Ph.D. directly from a B.S.: 36 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S.: 24 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S. at the University of Mississippi: 12 hours of coursework and 18 hours of dissertation.

Combining the student's M.S. and Ph.D. programs, at least two courses need to be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592-Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course in numerical methods (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Additional hours of Graduate Seminar may be required. Other graduate coursework must be approved by the student's advisory committee.

Other Academic Requirements

A qualifying examination, comprehensive examination, dissertation prospectus, and dissertation defense are needed. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Emphasis - Hydrology & Comp Hydroscience

- [Ph.D. in Engineering Science](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Hydrology & Comp Hydroscience

Description

A Ph.D. in engineering science with emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. This degree covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the Ph.D. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete a minimum of 36 hours beyond the B.S. degree and 18 hours of dissertation credit. Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

- Engr 591 - Engineering Analysis I
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment
- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation

- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

Other Academic Requirements

Other academic requirements include passing written and oral comprehensive exams including dissertation prospectus and dissertation defense. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Emphasis - Environmental Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Environmental Engineering

Description

A Ph.D. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public service. Depending on their career focus, students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Course Requirements

The Ph.D. degree with emphasis in environmental engineering requires the following coursework:

- For students entering the Ph.D. directly from a B.S.: 36 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S.: 24 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S. at the University of Mississippi: 12 hours of coursework and 18 hours of dissertation.

Combining the student's M.S. and Ph.D. programs, at least two courses need to be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592-Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course in numerical methods (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Additional hours of Graduate Seminar may be required. Other graduate coursework must be approved by the student's advisory committee.

Other Academic Requirements

Completion of a qualifying examination, a comprehensive examination, a dissertation prospectus, and a dissertation defense is required. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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Ch E 520: Biochemical Engineering

Chemical Engineering

An overview of microbiology and biochemistry. The development of models for microbial kinetics. The design of reactors and auxiliary equipment for microbial systems.

3 Credits

Prerequisites

- Junior Standing Required

Cross-listed Courses

- [BME 520: Biochemical Process Engineering](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 520

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 523: Molecular and Cellular Biophysics

Chemical Engineering

This course provides a molecular perspective on thermodynamics, transport phenomena, and reaction kinetics in a biological setting, critical for analyzing, understanding, and modeling life processes that initiate at the molecular level.

3 Credits

Prerequisites

- Pre-Requisite Phys 212 OR Graduate Standing

Cross-listed Courses

- [BME 523: Molecular and Cellular Biophysics](#)

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 528: Polymer Processing

Chemical Engineering

Analytical non-Newtonian fluid mechanical approach to polymer processing techniques; calendars, screw pumps, extruders, mixing, injection molding, and bonding operations.

3 Credits

Prerequisites

- Co-requisite: Engr 322 or Engr 323 or Graduate Standing.

Instruction Type(s)

- Lecture: Lecture for Ch E 528

Subject Areas

- [Polymer/Plastics Engineering](#)
- [Chemical Engineering](#)
- [Computer Engineering, General](#)

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Ch E 560: Advanced Transport Phenomena I

Chemical Engineering

Development and use of the equations of conservation of mass, energy, and momentum in continuous materials. The use of detailed and integral balances.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Ch E 560

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 450: Process Optimization

Chemical Engineering

Optimization of chemical processes.

1 Credit

Prerequisites

- [Ch E 449: Process Design](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Ch E 450

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 251: Programming for Chemical Engineering

Chemical Engineering

Algorithm development and structured programming techniques, including numerical and graphical applications related to engineering and scientific problem solving.

3 Credits

Prerequisites

- Ch E 251 Requires: One Way-Co-Requisite Math 261

Instruction Type(s)

- Lecture: Lecture for Ch E 251

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 307: Chemical Process Principles I

Chemical Engineering

Steady state material balances; stoichiometry; equations of state; solid-liquid phase equilibrium.

2 Credits

Prerequisites

- [Chem 106: General Chemistry II](#) (Minimum grade: C)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 307

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 524: Microscopy for Engineers

Chemical Engineering

Comprehensive study of the principles of optical microscopy and imaging techniques commonly used in engineering research, with an emphasis on biological, biomedical, and chemical engineering fields.

3 Credits

Prerequisites

- Pre-Requisite Phys 212 OR Graduate Standing

Cross-listed Courses

- [BME 524: Microscopy for Engineers](#)

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 545: Colloid and Surface Science

Chemical Engineering

Fundamental concepts of colloid and surface science.

3 Credits

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Ch E 545

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 417: Separation Processes

Chemical Engineering

Equilibrium-stage and mass transfer processes; distillation, adsorption, extraction, membrane separations.

3 Credits

Prerequisites

- [Ch E 308: Chemical Process Principles II](#) (Minimum grade: C-)
- [Ch E 421: Chemical Engineering Thermodynamics](#) (Minimum grade: C-)
- [Ch E 318: Chem Engineering Heat and Mass Transfer](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 417

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 452: Product and Process Development

Chemical Engineering

This course seeks to reinforce skills and experiences for chemical engineering students through the development and management of chemical- based products and processes.

3 Credits

Prerequisites

- [Ch E 449: Process Design](#) (Minimum grade: C-)
- [Ch E 318: Chem Engineering Heat and Mass Transfer](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 452

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Engr 540: Environmental Organic Transport Phenomen

Chemical Engineering

Using chemical equilibria and transport to predict the fate of chemicals in the natural environment. Course goal: a comprehension of the underlying engineering science principles; thereby, fostering greater problem solving creativity. The course shows that the same principles that govern transport are used in the design of environmental treatment processes.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#) (Minimum grade: C-)
- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Lecture: Lecture for Engr 540

Subject Areas

- [Chemical Engineering](#)
- [Engineering, General](#)
- [Civil Engineering, General](#)
- [Environmental/Environmental Health Engineering](#)

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Ch E 513: Special Topics in Chemical Engineering

Chemical Engineering

May be repeated for credit.

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Ch E 513

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 407: Chemical Engineering Projects I

Chemical Engineering

Specific topic investigated by each student; report due at the end of each semester.

1 - 3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Indiv Based: Individual Based Study for Ch E 407

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 449: Process Design

Chemical Engineering

Design, analysis, and simulation of chemical processes.

3 Credits

Prerequisites

- [Ch E 345: Engineering Economy](#) (Minimum grade: C-)
- [Ch E 417: Separation Processes](#) (Minimum grade: C-)
- [Ch E 423: Chemical Reactor Analysis and Design](#) (Minimum grade: C-)

Corequisites

- [Ch E 411: Chemical Engineering Seminar](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 449

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Engr 544: Synth and Fab of Nano Materials

Chemical Engineering

This course is designed as an introductory graduate-level course, detailing the synthesis and fabrication of nano materials. Additionally, the relevance of these topics to applications in energy, electronics, and medicine will be discussed.

3 Credits

Prerequisites

- [Chem 221: Elementary Organic Chemistry I](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Engr 544

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 252: Fundamentals of Chem Eng Problem Solving

Chemical Engineering

This course has three overall objectives: a) to introduce students to the core knowledge, skills, and abilities applied by chemical engineers to problems, b) to use spreadsheets such as Microsoft Excel to solve engineering calculations and present the results in a clear and professional manner; and c) to apply knowledge of algebraic methods and Python programming to solve mathematical problems typical of those needed to model chemical engineering applications.

2 Credits

One-way corequisites

- [Csci 256: Programming in Python](#)
- [Engr 101: Engineering Fundamentals](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 252

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Chemical Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)

Undergraduate Studies

Academic Regulations

Students admitted to the university and the School of Engineering in accordance with stated admission policies may then declare their chosen degree program.

See the degree requirements under Programs.

Graduate Studies

M.S. and Ph.D. entrance requirements are those of the Graduate School. M.S. applicants are expected to possess or be in the process of completing an undergraduate degree in engineering or closely related field from an accredited institution. In general, Ph.D. applicants are expected to possess or be in the process of completing a master's degree. In certain cases, applicants completing an undergraduate degree in engineering or closely related field from an accredited institution may be considered. See the degree requirements under Programs.

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Ch E 431: ChE Mass and Energy Balance Lab

Chemical Engineering

Hands-on examination of principles of material and energy balances and thermodynamics.

1 Credit

Prerequisites

- [Ch E 308: Chemical Process Principles II](#) (Minimum grade: C-)

One-way corequisites

- [Ch E 421: Chemical Engineering Thermodynamics](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 431

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 433: ChE Design Lab

Chemical Engineering

Provides students with experience at equipment scale-up, design/redesign, and construction.

2 Credits

Prerequisites

- [Ch E 318: Chem Engineering Heat and Mass Transfer](#) (Minimum grade: C-)
- Pre-Req: Ch E 431 min C- OR Ch E 432 min C-

Instruction Type(s)

- Lecture: Lecture for Ch E 433

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 101: Introduction to Chemical Engineering

Chemical Engineering

Careers in engineering; basic computer skills; simple graphical analysis; units and conversions.

2 Credits

Instruction Type(s)

- Lecture: Lecture for Ch E 101

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 432: ChE Unit Operations Lab

Chemical Engineering

Hands-on examination of various chemical engineering unit operations such as separation processes, chemical reactors, and heat transfer equipment.

1 Credit

Prerequisites

- [Ch E 417: Separation Processes](#) (Minimum grade: C-)
- [Ch E 423: Chemical Reactor Analysis and Design](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Ch E 432

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 318: Chem Engineering Heat and Mass Transfer

Chemical Engineering

This course provides the basics of heat transfer as it applies to many real-world engineering problems, and aims to develop an intuitive understanding of heat transfer by studying the physics and mechanisms of heat flow. By analogy, it also introduces the student to the basic principles of mass transfer.

3 Credits

Prerequisites

- [Ch E 316: Chemical Engineering Fluid Mechanics](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Ch E 318

Subject Areas

- [Engineering, General](#)

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Ch E 451: Plant Design I

Chemical Engineering

Design of chemical processes and plants.

4 Credits

Prerequisites

- [Ch E 345: Engineering Economy](#) (Minimum grade: C-)
- [Ch E 423: Chemical Reactor Analysis and Design](#) (Minimum grade: C-)
- [Ch E 417: Separation Processes](#) (Minimum grade: C-)
- [Ch E 421: Chemical Engineering Thermodynamics](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 451

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Faculty in Chemical Engineering

- [F](#)
- [G](#)
- [N](#)
- [P](#)
- [S](#)
- [V](#)
- [X](#)

[Jump to Emeritus faculty](#)

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Emeritus Faculty

- [C](#)
- [O](#)
- [S](#)
- [W](#)

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Ch E 421: Chemical Engineering Thermodynamics

Chemical Engineering

Property estimation; phase and chemical equilibria and multicomponent systems.

3 Credits

Prerequisites

- [Math 264: Unified Calculus & Analytic Geometry IV](#) (Minimum grade: C-)
- [Engr 321: Thermodynamics](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 421

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 593: Graduate Projects in Chemical Engr

Chemical Engineering

Individual design or research projects for chemical engineering students in the nonthesis M.S. program.

Z grade

1 - 3 Credits

Instruction Type(s)

- Indiv Based: Individual Based Study for Ch E 593

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 316: Chemical Engineering Fluid Mechanics

Chemical Engineering

This class discusses fluid mechanics principles applicable to chemical engineering practice, focused on the development of transport balances around control volumes. Course concepts center around mass, energy, and momentum balance principles for incompressible and compressible fluids.

3 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#) (Minimum grade: C-)

One-way corequisites

- [Engr 321: Thermodynamics](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 316

Subject Areas

- [Engineering, General](#)

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Ch E 661: Advanced Transport Phenomena II

Chemical Engineering

Theoretical development and application of the equations of continuity and conservation of energy to solve problems associated with the non-isothermal flow of pure fluids and mixtures.

3 Credits

Prerequisites

- [Ch E 660: Advanced Transport Phenomena I](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 661

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 413: Chemical Process Safety

Chemical Engineering

This course will introduce undergraduates to the fundamental components of a well-organized and comprehensive chemical process safety management program.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Ch E 413

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 411: Chemical Engineering Seminar

Chemical Engineering

Oral presentation of engineering results.

1 Credit

Prerequisites

- Pre-Requisite: 24 Earned Hours

Corequisites

- [Ch E 449: Process Design](#)

Instruction Type(s)

- Seminar: Seminar for Ch E 411

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 543: Introduction to Polymer Science

Chemical Engineering

This course is designed as an upper-level undergraduate and introductory graduate-level elective to teach the fundamentals in polymer chemistry and physics, structure/property relationships, and characterization. The course is taught at an introductory level aimed at students with a background in chemistry (especially organic chemistry).

3 Credits

Prerequisites

- [Chem 221: Elementary Organic Chemistry I](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 543

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 561: Advanced Transport Phenomena II

Chemical Engineering

Development and use of the equations of conservation of mass, energy, and momentum in continuous materials.

3 Credits

Prerequisites

- Pre-requisite: Ch E 560 or Graduate Standing

Instruction Type(s)

- Lecture: Lecture for Ch E 561

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 522: Immunoengineering

Chemical Engineering

The course consists of a sequence of five topical modules: 1) fundamentals of immunology, 2) the immunologist's toolbox, 3) vaccines and immunotherapies, 4) drug delivery principles for vaccines and immunotherapies, and 5) materials for immunoengineering.

3 Credits

Prerequisites

- [Bisc 160: Biological Sciences I](#)
- [Bisc 161: Biological Sciences I Laboratory](#)
- [Bisc 162: Biological Sciences II](#)
- [Bisc 163: Biological Sciences II Laboratory](#)
- [Chem 105: General Chemistry I](#)
- [Chem 106: General Chemistry II](#)
- [Chem 115: General Chemistry Laboratory I](#)
- [Chem 116: General Chemistry Laboratory II](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 522

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Chemical Engineering

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Leadership

- David Silverstein - Chair and Professor of Chemical Engineering

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Overview

The Department of Chemical Engineering offers a Bachelor of Science in Chemical Engineering (B.S.Ch.E.).

At the graduate level, the department has offerings for the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in engineering science with an emphasis in chemical engineering. The latter graduate degrees are listed under the School of Engineering.

Accreditation

The following undergraduate engineering programs are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Geological Engineering, and Bachelor of Science in Mechanical Engineering. The Bachelor of Science in Computer Science (BSCS) program of the Department of Computer and Information Science is accredited as a Computer Science program by the Computing Accreditation Commission (CAC) of ABET <https://www.abet.org>.

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Ch E 521: Drug and Gene Delivery

Chemical Engineering

In-depth introduction to the field of drug and gene delivery to upper- level undergraduate and graduate students. The course covers the fundamentals of drug delivery, including routes of delivery, physiologic drug delivery barriers, and pharmacokinetics/pharmacodynamics.

3 Credits

Prerequisites

- [Bisc 162: Biological Sciences II](#)
- [Chem 106: General Chemistry II](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 521

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 412: Process Control and Safety

Chemical Engineering

Modeling of transient systems; design of feedback control systems and principles of process safety.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#) (Minimum grade: C-)
- [Ch E 308: Chemical Process Principles II](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 412

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 317: Process Fluid Dynamics and Heat Transfer

Chemical Engineering

Macroscopic momentum balances, piping system design; drag coefficients, fluidization, macroscopic energy balances, heat transfer coefficients, heat exchanger design, unsteady/two-dimensional heat transfer.

3 Credits

Prerequisites

- [Ch E 308: Chemical Process Principles II](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 317

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 660: Advanced Transport Phenomena I

Chemical Engineering

Theoretical development and application of the equations of motion (conservation of momentum) to solve problems associated with the isothermal flow of pure fluids.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Ch E 660

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Engr 545: Polymer Nanocomposites

Chemical Engineering

This course is designed as an introductory graduate-level course covering topics related to the design, synthesis, fabrication, testing, and characterization of polymer nanocomposites (PNCs). Different applications of PNCs are also discussed.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Engr 545

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 330: Chemical Eng. R & D Experience

Chemical Engineering

Apply the fundamentals of engineering science (transport phenomena, thermodynamics, chemical reaction engineering, and/or applied mathematics) to the methods, results and significance of goal-driven research. Students will analyze, plan, and execute a research project, including effective communication of results, both orally and in writing.

1 - 2 Credits

Prerequisites

- [Ch E 307: Chemical Process Principles I](#) (Minimum grade: C-)
- Instructor Approval Required

Instruction Type(s)

- Indiv Based: Individual Based Study for Ch E 330

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 535: Experimental Methods in Engineering

Chemical Engineering

Introduces topics related to the introductory design of experiments, acquisition and statistical analysis/processing of experimental data, uncertainty analysis of measurements, basic electrical circuits and measurement/sensing devices, methods for the measurement of physical and engineering properties of various systems, and essentials of report writing and presentation of data.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Ch E 535

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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- [Faculty](#)

Degrees Offered

- [B.S.Ch.E. in Chemical Engineering](#)
 - [Emphasis - Biotechnology](#)
 - [Emphasis - Environmental](#)
 - [Emphasis - Manufacturing](#)
 - [Emphasis - Materials](#)
 - [Pre-Med Option](#)
 - [Standard Option](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Chemical Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Materials Science and Engr](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Aeroacoustics](#)
 - [Emphasis - Chemical Engineering](#)
 - [Emphasis - Environmental Engineering](#)
 - [Emphasis - Materials Science and Engr](#)

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Ch E 308: Chemical Process Principles II

Chemical Engineering

Steady state energy balances; introduction to process simulation.

2 Credits

Prerequisites

- [Math 262: Unified Calculus & Analytic Geometry II](#) (Minimum grade: C-)
- [Ch E 307: Chemical Process Principles I](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 308

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 550: Membrane Science and Engineering

Chemical Engineering

This course covers the science of membrane processes and the engineering of membrane system module and process design. Topics discussed include: membrane transport theory, porous and nonporous membranes, membrane characterization, and unit operations with a focus on the application of membrane theory to unit operations and the optimization of both industrial and academic applications.

3 Credits

Prerequisites

- [Engr 322: Transport Phenomena](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 550

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 470: Principles of Lean Six Sigma

Chemical Engineering

This course will provide undergraduates with a working knowledge of the Lean Six Sigma process improvement methodology.

3 Credits

Instruction Type(s)

- Lecture: Lecture for Ch E 470

Subject Areas

- [Engineering, General](#)

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Chemical Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)

Courses

- [Engr 321: Thermodynamics](#)
- [Engr 322: Transport Phenomena](#)
- [Engr 450: Product Design and Development](#)
- [Ch E 101: Introduction to Chemical Engineering](#)
- [Ch E 251: Programming for Chemical Engineering](#)
- [Ch E 252: Fundamentals of Chem Eng Problem Solving](#)
- [Ch E 307: Chemical Process Principles I](#)
- [Ch E 308: Chemical Process Principles II](#)
- [Ch E 316: Chemical Engineering Fluid Mechanics](#)
- [Ch E 317: Process Fluid Dynamics and Heat Transfer](#)
- [Ch E 318: Chem Engineering Heat and Mass Transfer](#)
- [Ch E 330: Chemical Eng. R & D Experience](#)
- [Ch E 345: Engineering Economy](#)
- [Ch E 407: Chemical Engineering Projects I](#)
- [Ch E 408: Chemical Engineering Projects II](#)
- [Ch E 411: Chemical Engineering Seminar](#)
- [Ch E 412: Process Control and Safety](#)
- [Ch E 413: Chemical Process Safety](#)
- [Ch E 417: Separation Processes](#)
- [Ch E 421: Chemical Engineering Thermodynamics](#)
- [Ch E 423: Chemical Reactor Analysis and Design](#)
- [Ch E 431: ChE Mass and Energy Balance Lab](#)
- [Ch E 432: ChE Unit Operations Lab](#)
- [Ch E 433: ChE Design Lab](#)
- [Ch E 449: Process Design](#)
- [Ch E 450: Process Optimization](#)
- [Ch E 451: Plant Design I](#)
- [Ch E 452: Product and Process Development](#)
- [Ch E 470: Principles of Lean Six Sigma](#)
- [Ch E 511: Process Dynamics and Control](#)
- [Ch E 513: Special Topics in Chemical Engineering](#)
- [Ch E 515: Research Seminar](#)
- [Ch E 520: Biochemical Engineering](#)
- [Ch E 521: Drug and Gene Delivery](#)
- [Ch E 522: Immunoengineering](#)
- [Ch E 523: Molecular and Cellular Biophysics](#)
- [Ch E 524: Microscopy for Engineers](#)
- [Ch E 528: Polymer Processing](#)
- [Ch E 535: Experimental Methods in Engineering](#)
- [Ch E 540: Coating Materials Process & Applications](#)
- [Ch E 543: Introduction to Polymer Science](#)
- [Ch E 545: Colloid and Surface Science](#)
- [Ch E 547: Sufactant Science and Applications](#)
- [Ch E 550: Membrane Science and Engineering](#)
- [Ch E 560: Advanced Transport Phenomena I](#)
- [Ch E 561: Advanced Transport Phenomena II](#)
- [Ch E 593: Graduate Projects in Chemical Engr](#)
- [Ch E 660: Advanced Transport Phenomena I](#)

- [Ch E 661: Advanced Transport Phenomena II](#)
- [Engr 540: Environmental Organic Transport Phenomen](#)
- [Engr 542: Molecular Modeling of Nano Materials](#)
- [Engr 544: Synth and Fab of Nano Materials](#)
- [Engr 545: Polymer Nanocomposites](#)

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Ch E 408: Chemical Engineering Projects II

Chemical Engineering

Specific topic investigated by each student; report due at the end of each semester.

1 - 3 Credits

Prerequisites

- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Indiv Based: Individual Based Study for Ch E 408

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Chemical Engineering

- [Overview](#)
- [Academics & Admissions](#)
- [Programs](#)
- [Courses](#)
- [Faculty](#)
- [Awards](#)

Distinguished Faculty and Staff Awards

School of Engineering, Junior Faculty Research Award

- **Adam Eugene Smith** - ASSISTANT PROFESSOR OF CHEMICAL ENGINEERING AND ACDADEMIC DIRECTOR OF GENERAL ENGINEERING (2016)

Outstanding Staff Award

A staff member of the School of Engineering who has demonstrated exemplary service, leadership, and commitment.

- **Bethany Ferguson LaValley** - Coordinator of Professional Development-CMSE (2010)
- **DORIS T VINSON** - SENIOR SECRETARY (2002)

School of Engineering, Senior Faculty Research Award

- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2017)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2009)
- **AJIT SADANA** - Professor Emeritus of Chemical Engineering (2004)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2003)

Faculty Achievement Award

The Faculty Achievement Award is given annually to recognize unusual effort in the classroom, involvement with students, and active scholarship.

- **John H O'Haver** - CHAIR AND PROFESSOR OF CHEMICAL ENGINERING AND DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION (2011)
- **John H O'Haver** - CHAIR AND PROFESSOR OF CHEMICAL ENGINERING AND DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION (2000)

Elsie M. Hood Outstanding Teacher Award

The Elsie M. Hood Outstanding Teacher of the Year for the University is selected from nominations submitted by students, alumni and faculty.

- **John H O'Haver** - CHAIR AND PROFESSOR OF CHEMICAL ENGINERING AND DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION (2012)

SEC Faculty Achievement Awards Program UM Nominee

The SEC Faculty Achievement Awards program recognizes extraordinary faculty accomplishments at SEC universities. This award honors those with outstanding records in both teaching and scholarship who serve as role models for junior faculty and students.

- **John H O'Haver** - CHAIR AND PROFESSOR OF CHEMICAL ENGINERING AND DIRECTOR OF CENTER FOR

School of Engineering, Faculty Service Award

- **Adam Eugene Smith** - ASSISTANT PROFESSOR OF CHEMICAL ENGINEERING AND ACADEMIC DIRECTOR OF GENERAL ENGINEERING (2016)
- **Marni Reeves Kendricks** - ASSISTANT DEAN FOR UNDERGRADUATE ACADEMICS (2014)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2010)

School of Engineering, Faculty Teaching Award

- **Peter C Sukanek** - Chair Emeritus & Professor Emeritus of Chemical Engineering (2008)
- **Wei-Yin Chen** - PROFESSOR OF CHEMICAL ENGINEERING (2006)

School of Engineering Outstanding Teacher of the Year

- **John H O'Haver** - CHAIR AND PROFESSOR OF CHEMICAL ENGINEERING AND DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION (2010)
- **Paul Scovazzo** - ASSOCIATE PROFESSOR OF CHEMICAL ENGINEERING (2005)
- **John H O'Haver** - CHAIR AND PROFESSOR OF CHEMICAL ENGINEERING AND DIRECTOR OF CENTER FOR MATHEMATICS AND SCIENCE EDUCATION (2001)

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Engr 542: Molecular Modeling of Nano Materials

Chemical Engineering

This course offers the students an introduction to the molecular modeling and simulation of nano materials, chemical and physical behavior, and the properties with an emphasis on the use of existing methodology and software packages.

3 Credits

Prerequisites

- [Math 264: Unified Calculus & Analytic Geometry IV](#) (Minimum grade: C-)
- [Phys 212: Physics for Science & Engineering II](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Engr 542

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 345: Engineering Economy

Chemical Engineering

Time value of money, depreciation, cost estimation, return of investment; risk and selecting alternatives.

3 Credits

Prerequisites

- [Ch E 308: Chemical Process Principles II](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for Ch E 345

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 547: Sufactant Science and Applications

Chemical Engineering

3 Credits

Prerequisites

- [Chem 221: Elementary Organic Chemistry I](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 547

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 515: Research Seminar

Chemical Engineering

Philosophy and principles of engineering research. May not be used to satisfy requirements for a B.S. degree in chemical engineering.

Z grade

1 Credit

Prerequisites

- Prerequisite: Junior standing (60 hr).

Instruction Type(s)

- Seminar: Seminar for Ch E 515
- Seminar: Compressed Video for Ch E 515

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 423: Chemical Reactor Analysis and Design

Chemical Engineering

Reaction mechanisms, rate expressions; reactor design.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#) (Minimum grade: C-)
- [Ch E 316: Chemical Engineering Fluid Mechanics](#) (Minimum grade: C-)
- [Ch E 308: Chemical Process Principles II](#) (Minimum grade: C-)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for Ch E 423

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 540: Coating Materials Process & Applications

Chemical Engineering

This course explores the role of key coating components of paper, metallic and tablet coatings; their chemical and physical interactions with the substrate; application and drying methods; and coating defects.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 540

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Ch E 511: Process Dynamics and Control

Chemical Engineering

Modeling of transient systems; design of feedback control systems.

3 Credits

Prerequisites

- Pre-Requisite Ch E 308 or Graduate Standing

One-way corequisites

- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for Ch E 511

Subject Areas

- [Chemical Engineering](#)

Related Areas

- [Chemical and Biomolecular Engineering](#)

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Emphasis - Aeroacoustics

- [M.S. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Aeroacoustics

Description

A degree of M.S. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

For the emphasis in aeroacoustics, thesis and nonthesis options are available. Both options require as a minimum 30 semester hours of graduate credit (to include 6 hours of math-related courses) in which the student's adviser must approve all course selections. Under the thesis option, the minimum of 30 graduate credits shall consist of 24 hours of graded course work and 6 thesis hours. The nonthesis option requires as a minimum 30 hours of graded course work.

Other Academic Requirements

For both the thesis and nonthesis options, a candidate must pass a final oral examination.

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Emphasis - Environmental Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Environmental Engineering

Description

A M.S. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. Students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Goals/Mission Statement

The program will provide high quality graduate education in a range of environmental disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The M.S. with emphasis in environmental engineering can be completed as either a thesis or nonthesis option. The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit (Engr 697- Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (Engr 699-Special Projects in Engineering Science or Engr 693-Research Topics in Engineering Science) with a written report and oral presentation. The graduate course work for either option must include at least one course in mathematics (e.g., Engr 591-Engineering Analysis I, Math 555- Advanced Calculus I, Math 556-Advanced Calculus II, Math 575- Mathematical Statistics I), one course in numerical method (e.g., Engr 590-Finite Element Analysis), and one course in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

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Emphasis - Chemical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Chemical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Chemical Engineering

Description

A degree of M.S. in engineering science with an emphasis in chemical engineering prepares graduates to apply chemical engineering science (transport phenomena, thermodynamics, chemical reaction engineering, and applied mathematics. It enables them to independently execute complex projects and pursue successful careers in engineering, medicine, law, professional education, public policy, the military, management, and sales.

Course Requirements

The M.S. in engineering science with an emphasis in chemical engineering requires a minimum of 30 hours of graduate credit. The specific coursework depends on the M.S. option pursued by the student. All M.S. students should be able to demonstrate proficiency in transport phenomena, thermodynamics, and chemical reaction analysis. This is accomplished by completion and approval of the chemical engineering proficiency form prior to graduation.

Coursework Option

All 30 hours come from graded 500-/600- level coursework agreed upon by the student and his or her committee, but must include at least two Ch E 510+ courses (6 credit hours).

Students whose undergraduate degree is not in chemical engineering may be required to take additional coursework beyond the 30-hour requirement at the discretion of his or her committee.

Nonthesis Option

This option requires at least 27 hours of graded 500-/600-level coursework agreed upon by the student and his or her committee including at least two Ch E 510+ courses (6 credit hours). In addition, students must complete no less than 3 hours of project (Engr 693 and Engr 694) credit.

Thesis Option

Students must take 21 hours of graded 500-/600- level coursework, plus 3 hours of Research Seminar (Ch E 515). The coursework must include no less than 6 hours selected by the student's committee from any Ch E course 510 or higher. The remaining 15 hours of coursework are agreed upon by the student and his or her committee. All students in the M.S. thesis option must take or have taken at least one course in each of the following topics: reactors design, thermodynamics and transport as graduate or undergraduate students. In addition, students must complete no less than 6 hours of thesis (Engr 697) credit.

Other Academic Requirements

Every candidate for a master's degree must pass a final written or oral examination.

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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Emphasis - Materials Science and Engr

- [M.S. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Materials Science and Engr

Description

A M.S. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

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Emphasis - Aeroacoustics

- [Ph.D. in Engineering Science](#)
- [Emphasis - Aeroacoustics](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Aeroacoustics

Description

A Ph.D. in engineering science with emphasis in aeroacoustics prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics.

Course Requirements

The Ph.D. with emphasis in aeroacoustics requires a minimum 66 semester hours of graduate credit beyond the baccalaureate degree. The student's adviser must approve all course selections.

Other Academic Requirements

At the adviser's discretion, a preliminary examination may be required at or near the beginning of the student's work beyond the master's degree. A comprehensive written examination must be passed before entering the dissertation process.

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Emphasis - Chemical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Chemical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Chemical Engineering

Description

A Ph.D. in engineering science with emphasis in chemical engineering prepares graduates to apply chemical engineering science (transport phenomena, thermodynamics, chemical reaction engineering, and applied mathematics). It enables them to independently execute complex projects and pursue successful careers in engineering, medicine, law, professional education, public policy, the military, management, and sales. It further equips them with the experience to conduct research—generating and disseminating new knowledge.

Course Requirements

The Ph.D. with an emphasis in chemical engineering requires a minimum of 54 hours of graduate credit past the bachelor's degree. No specific courses are required beyond those specified for the M.S. thesis option. The remainder of the coursework is agreed upon by the student and his or her committee, 18 hours of which must be dissertation (Engr 797) credit. Students whose undergraduate degree is not in chemical engineering may need to take additional courses to satisfy prerequisites.

Other Academic Requirements

Students in the Ph.D. track must achieve a GPA of 3.25 or higher on 12 credit hours selected by the committee from Engr 665, Engr 669 or any Ch E 500-/600-level course. Selection must be done by the end of the first semester. To be admitted to candidacy, the student must successfully complete the preselected courses and pass a qualifying examination. The exam consists of writing and defending an Original Research Proposal (ORP). After the ORP, the Ph.D. candidate must successfully complete a dissertation prospectus, then write and defend a dissertation.

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Emphasis - Materials Science and Engr

- [Ph.D. in Engineering Science](#)
- [Emphasis - Materials Science and Engr](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Materials Science and Engr

Description

A Ph.D. in engineering science with emphasis in materials science and engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Emphasis - Environmental Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Environmental Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Environmental Engineering

Description

A Ph.D. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public service. Depending on their career focus, students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Course Requirements

The Ph.D. with emphasis in environmental engineering requires 24 hours of course work beyond a master's degree or 48 hours beyond a bachelor's degree, and 18 hours of dissertation credit. At least two courses must be in mathematics (e.g., Engr 591-Engineering Analysis I, Engr 592- Engineering Analysis II, Math 555-Advanced Calculus I, Math 556-Advanced Calculus II, Math 575-Mathematical Statistics I), one course must be in numerical method (e.g., Engr 590-Finite Element Analysis), and one course must be in mechanics (e.g., Engr 617-Continuum Mechanics). Other graduate course work must be approved by the student's advisory committee.

Other Academic Requirements

Completion of a qualifying examination, a comprehensive examination, a dissertation prospectus, and a dissertation defense is required. Before admission to candidacy, the student must pass written and oral comprehensive exams.

The policies and regulations contained in this online University of Mississippi Catalog are in effect for the current or selected semester. The catalog is not a contract, but rather a guide for the convenience of students. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change the fees, rules, and schedules for admission, registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time. Implicit in each student's enrollment with the university is an agreement to comply with university rules and regulations, which the university may modify to exercise properly its educational responsibility.

Emphasis - Biotechnology

- [B.S.Ch.E. in Chemical Engineering](#)
- [Emphasis - Biotechnology](#)
- [Degree Requirements](#)

B.S.Ch.E. in Chemical Engineering

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Emphasis - Biotechnology

Course Requirements

Biotechnology

Ch E 520	3 Credit Hours
Chem 334, Chem 471, or Bisc 333	3 Credit Hours
Chem 222 or Bisc 160, 161, 162 and 163	3 Credit Hours
300 level or higher Biotech Elective	3 Credit Hours
300 level or higher Technical Electives	6 Credit Hours
Add'l hum/soc sci/gen ed	3 Credit Hours

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.

Requirement Hours		Description
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement Hours		Description
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.

Emphasis - Biotechnology

Requirement Hours		Description
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Requirement Hours		Description
Ch E 520	3	Complete Ch E 520 with a passing grade.
Chem 334 , Chem 471 , or Bisc 333	3	Complete either Chem 334 , Chem 471 , or Bisc 333 with a passing grade.
Chem 222 or Bisc sequence 1 Biotech Emph Elective	3	Complete either Chem 222 or Bisc 160 , 161 , 162 and 163 with a passing grade.
1 Biotech Emph Elective	3	Complete either Bisc 333 , 509 , BME 313 , 413 , Chem 473 , or Pharm 331 with a passing grade.
2 Technical Electives	6	Complete at least 6 credit hours of technical electives at 300 or higher course numbers from among engineering, science, or mathematics with a passing grade. (Alternatives for 300-level technical electives: Chem 222 , Manf 253 , Manf 254 , the combination of [Bisc 160](https://catalog.olemiss.edu/bisc-160), 161 , 162 , and 163 . In the case of the Bisc 160 -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.)
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Manufacturing

- [B.S.Ch.E. in Chemical Engineering](#)
- [Emphasis - Manufacturing](#)
- [Degree Requirements](#)

B.S.Ch.E. in Chemical Engineering

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Emphasis - Manufacturing

Course Requirements

Manufacturing

Course	Hours
Advanced Science 3 Credit Hours	
Bus 250	3 Credit Hours
Manf 150	1 Credit Hour
Manf 152	1 Credit Hour
Manf 251	3 Credit Hours
Manf 252	1 Credit Hour
Manf 253	3 Credit Hours
Manf 255	1 Credit Hour
Manf 351	1 Credit Hour
Manf 353	3 Credit Hour
Manf 355	1 Credit Hour
Manf 455	3 Credit Hours

Other Academic Requirements

Acceptance into the Center for Manufacturing Excellence.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.

Requirement Hours		Description
3 hrs fine arts		Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement Hours		Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement Hours	Description
Chem 221 3	Complete Chem 221 with a passing grade.
Chem 225 1	Complete Chem 225 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.

Emphasis - Manufacturing

Requirement Hours	Description
3 hrs of Adv Science 3	Complete at least 3 hrs of Advanced Science with a passing grade chosen from: Engr 340 , 540 , CHE 543 , 545 , 547 , GEOL 314 , GE 415 , 450 , 503 , CHEM 314 , 331 , 332 , 334 , 373 , 401 , 471 , 473 , PHYS 315 , 317 , 318 , 319 , 321 , 401 , 402 BISC 301 , 306 , 318 , 320 , 327 , 333 , 335 .
Bus 250 3	Complete Bus 250 with a passing grade.
Manf 150 1	Complete Manf 150 with a passing grade.
Manf 152 1	Complete Manf 152 with a passing grade.
Manf 251 3	Complete Manf 251 with a passing grade.
Manf 252 1	Complete Manf 252 with a passing grade.
Manf 253 3	Complete Manf 253 with a passing grade.
Manf 255 1	Complete Manf 255 with a passing grade.
Manf 351 1	Complete Manf 351 with a passing grade.
Manf 353 3	Complete Manf 353 with a passing grade.
Manf 355 1	Complete Manf 355 with a passing grade.
Manf 455 3	Complete Manf 455 with a passing grade.

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Emphasis - Materials

- [B.S.Ch.E. in Chemical Engineering](#)
- [Emphasis - Materials](#)
- [Degree Requirements](#)

B.S.Ch.E. in Chemical Engineering

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Emphasis - Materials

Course Requirements

Students in Materials Option must choose ENGR 309 when given the choice in the Foundation/Engineering Science Topic

Materials

Ch E 543, 545, or 547	3 Credit Hours
Materials elective*	9 Credit Hours
Engineering elective	3 Credit Hours
Technical elective	3 credit Hours
Add'l hum/soc sci/gen ed	3 Credit Hours

*Materials elective courses: Ch E 528, 540, 543, 545, 547, 550, Engr 309, 312, 340, or M E 534

Degree Requirements

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B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following: economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement Hours		Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement Hours		Description
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.

Emphasis - Materials

Requirement Hours	Description
<u>Ch E 543</u> , <u>Ch E 545</u> , or <u>Ch E 547</u>	Complete either <u>Ch E 543</u> , Che E <u>545</u> , or <u>Ch E 547</u> with a passing grade.
9 hrs of Materials 9 Emph Elect	Complete 3 courses chosen from the following: <u>Ch E 528</u> , <u>540</u> , <u>543</u> , <u>545</u> , <u>547</u> , <u>550</u> , <u>Engr 309</u> , <u>312</u> , <u>340</u> , or <u>M E 534</u> with a passing grade.
3 hrs Engineering 3 elective	Complete one of the following engineering technical electives: <u>BME 305</u> , <u>Engr 309</u> , <u>Engr 330</u> , <u>Engr 360</u> , <u>Engr 573</u> , <u>C E 471</u> , <u>C E 472</u> , <u>Ch E 520</u> , <u>Ch E 528</u> , <u>Ch E 535</u> , <u>Ch E 540</u> , <u>Ch E 550</u> , <u>Manf 455</u> , or <u>M E 534</u> .
3 hrs Technical 3 Electives	Complete at least 3 credit hours of technical electives choosing from engineering, science, or mathematics. (Alternatives for 300-level technical electives: <u>Chem 222</u> , <u>Manf 253</u> , <u>Manf 254</u> , the combination of <u>[Bisc 160]</u> (https://catalog.olemiss.edu/bisc-160), <u>161</u> , <u>162</u> , and <u>163</u> . In the case of the <u>Bisc 160</u> -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of <u>Ch E 330</u> may be used to satisfy one of the technical elective requirements.)
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Pre-Med Option

- [B.S.Ch.E. in Chemical Engineering](#)
- [Pre-Med Option](#)
- [Degree Requirements](#)

B.S.Ch.E. in Chemical Engineering

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Pre-Med Option

Course Requirements

Pre-Med

Bisc 160/161 and 162/163	8 Credit Hours
Chem 222 and 226	4 Credit Hours
Chem 471	3 Credit Hours
Engineering elective	3 Credit Hours
300 level or higher Bisc elective	6 Credit Hours
Math 115, 375, or Bisc 300	3 Credit Hours
Add'l hum/soc sci/gen ed	3 Credit Hours

We also recommend that students applying to medical schools take Chem 226, Organic Chem. Lab II, which is not required in chemical engineering but may be required for med school entrance.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.

Pre-Med Option

Requirement Hours		Description
<u>Bisc 160</u>	3	Complete <u>Bisc 160</u> with a passing grade.
<u>Bisc 161</u>	1	Complete <u>Bisc 161</u> with a passing grade.
<u>Bisc 162</u>	3	Complete <u>Bisc 162</u> with a passing grade.
<u>Bisc 163</u>	1	Complete <u>Bisc 163</u> with a passing grade.
<u>Chem 222</u>	3	Complete <u>Chem 222</u> with a passing grade.
<u>Chem 226</u>	1	Complete <u>Chem 226</u> with a passing grade.
<u>Chem 471</u>	3	Complete <u>Chem 471</u> with a passing grade.
3 hrs Engineering elective	3	Complete one of the following engineering technical electives: <u>BME 305</u> , <u>Engr 309</u> , <u>Engr 330</u> , <u>Engr 360</u> , <u>Engr 573</u> , <u>C E 471</u> , <u>C E 472</u> , <u>Ch E 520</u> , <u>Ch E 528</u> , <u>Ch E 535</u> , <u>Ch E 540</u> , <u>Ch E 550</u> , <u>Manf 455</u> , or <u>M E 534</u> .
2 <u>Bisc 300</u> + electives	6	Complete two Bisc courses at the 300-level or higher with a passing grade.
<u>Math 115</u> , <u>375</u> or <u>Bisc</u> <u>300</u>	3	Complete 3 hrs chosen from <u>Math 115</u> , <u>375</u> , or <u>Bisc 300</u> .
<u>Psy 201</u>	3	Complete <u>Psy 201</u> with a passing grade.

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B.S.Ch.E. in Chemical Engineering

- [Overview](#)
- [Degree Requirements](#)

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Specializations

- [Emphasis - Biotechnology](#)
- [Emphasis - Environmental](#)
- [Emphasis - Manufacturing](#)
- [Emphasis - Materials](#)
- [Pre-Med Option](#)
- [Standard Option](#)

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Standard Option

- [B.S.Ch.E. in Chemical Engineering](#)
- [Standard Option](#)
- [Degree Requirements](#)

B.S.Ch.E. in Chemical Engineering

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Standard Option

Course Requirements

Standard	Credit hours
Any approved advanced science	3 Credit Hours
Any approved engineering elective	3 Credit Hours
300 level or higher technical electives	12 Credit Hours
Add'l hum/soc sci/gen ed	3 Credit Hours

No more than 3 credits of undergraduate research can be used to fulfill the technical elective requirements.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.

Requirement	Hours	Description
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement	Hours	Description
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.

Standard Option

Requirement	Hours	Description
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Requirement Hours	Description
3 hrs Engineering elective	3 Complete one of the following engineering technical electives: BME 305 , Engr 309 , Engr 330 , Engr 360 , Engr 573 , CE 471 , CE 472 , Ch E 520 , Ch E 528 , Ch E 535 , Ch E 540 , Ch E 550 , Manf 455 , or ME 534 .
12 hrs Technical Electives	12 Complete at least 12 credit hours of technical electives to include three 3-hour electives of 300 or higher course number from among engineering, science, or mathematics. (Alternatives for 300-level technical electives: Chem 222 , Manf 253 , Manf 254 , the combination of [Bisc 160] (https://catalog.olemiss.edu/bisc-160), 161 , 162 , and Bisc 163 . In the case of the Bisc 160 -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.
3 hrs Adv science course	3 Complete at least one advanced science course. Course can be chosen from Bisc 301 , Bisc 306 , Bisc 318 , Bisc 320 , Bisc 327 , Bisc 333 , Bisc 335 , Ch E 543 , Ch E 545 , Ch E 547 , Chem 314 , Chem 331 , Chem 332 , Chem 334 , Chem 373 , Chem 401 , Chem 471 , Chem 473 , Engr 340 , Engr 540 , G E 415 , G E 450 , G E 503 , Geol 314 , Phys 315 , Phys 317 , Phys 318 , Phys 319 , Phys 321 , Phys 401 , Phys 402 .
3 hrs gen ed, lang, or SS/H/FA	3 Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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Emphasis - Environmental

- [B.S.Ch.E. in Chemical Engineering](#)
- [Emphasis - Environmental](#)
- [Degree Requirements](#)

B.S.Ch.E. in Chemical Engineering

Description

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Program Educational Objectives

Graduates from the Department of Chemical Engineering of the University of Mississippi, within 3-5 years after graduation, will:

1. Meet or exceed the expectations of employers of chemical engineers;
2. Continue their professional development by pursuing advanced study if they so desire; and
3. Continue their professional development by pursuing leadership opportunities and other positions of service in their profession and/or communities.

Student Outcomes

In accordance with ABET accreditation requirements, BSChE students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

Students must complete at least 18 hours of general education requirements: 3 hours of fine arts, 6 hours of humanities from the same department, 6 hours of social science from the same department, and 3 additional hours of humanities, social science, languages (modern, Greek, or Latin), or [general education courses as specified by the School of Engineering](#) with the exception that speech and math content courses may not be used to satisfy any of these required 18 credits.

Course Requirements

Alternatives for 300-level technical electives: Chem 222, Manf 253, Manf 254, the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.

Emphasis - Environmental

Course Requirements

Environmental

GE 503 or Engr 540	3 Credit Hours
C E 471	3 Credit Hours
300 level or higher Environmental Electives	6 Credit Hours
300 level or higher Technical Electives	6 Credit Hours
Add'l hum/soc sci/gen ed	3 Credit Hours

Degree Requirements

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B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following: economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.

Requirement Hours		Description
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement Hours		Description
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.

Emphasis - Environmental

Requirement Hours		Description
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Requirement Hours		Description
<u>G E 503</u> or <u>Engr 540</u>	3	Complete either <u>G E 503</u> or <u>Engr 540</u> with a passing grade.
<u>C E 471</u>	3	Complete <u>C E 471</u> with a passing grade.
2 environmental emph electives	6	Complete two of the following courses: <u>Ch E 545</u> , <u>Ch E 530</u> , <u>Engr 340</u> , <u>Engr 573</u> , <u>G E 450</u> , <u>G E 510</u> , <u>C E 472</u> , <u>Phcl 347</u> , <u>Chem 314</u> , <u>Chem 469</u> , <u>Chem 222</u> , <u>Bisc 505</u> , <u>Bisc 333</u> , or <u>Bisc 511</u> with a passing grade.
2 technical electives	6	Complete at least 6 credit hours of technical electives at 300 or higher course numbers from among engineering, science, or mathematics with a passing grade. (Alternatives for 300-level technical electives: <u>Chem 222</u> , <u>Manf 253</u> , <u>Manf 254</u> , the combination of [<u>Bisc 160</u>](https://catalog.olemiss.edu/bisc-160), <u>161</u> , <u>162</u> , and <u>163</u> . In the case of the <u>Bisc 160</u> -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of <u>Ch E 330</u> may be used to satisfy one of the technical elective requirements.)
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

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B.S.Ch.E. in Chemical Engineering

- [Overview](#)
- [Degree Requirements](#)

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.Ch.E. in Chemical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
6 hrs Serial Humanities	6	Complete 6 hrs with a passing grade (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
6 hrs Serial Social Sciences	6	Complete 6 hours with a passing grade (from the same department) of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.

Major Requirements

Requirement	Hours	Description
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Requirement	Hours	Description
Ch E 101 or 103 /104 or Engr 100	2	Complete Ch E 101 or Ch E 103 /104 or Engr 100 with a passing grade.
Ch E 251	3	Complete Ch E 251 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 316	3	Complete Ch E 316 with a passing grade.
Ch E 318	3	Complete Ch E 318 with a passing grade.
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 412	3	Complete Ch E 412 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 431	1	Complete Ch E 431 with a passing grade.
Ch E 432	1	Complete Ch E 432 with a passing grade.
Ch E 433	2	Complete Ch E 433 with a passing grade.
Ch E 449 & Ch E 450	4	Complete Ch E 449 & CH E 450 with a passing grade.
Ch E 452	3	Complete Ch E 452 with a passing grade.
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.
School of Engineering GPA		Must be at least a 2.0

Major Requirements II

Requirement Hours	Description
Chem 221 3	Complete Chem 221 with a passing grade.
Chem 225 1	Complete Chem 225 with a passing grade.
Engr 310 3	Complete Engr 310 with a passing grade.
Engr 313 3	Complete Engr 313 with a passing grade.
Engr 321 3	Complete Engr 321 with a passing grade.

Standard Option

Requirement Hours	Description
3 hrs Engineering elective 3	Complete one of the following engineering technical electives: BME 305 , Engr 309 , Engr 330 , Engr 360 , Engr 573 , C E 471 , C E 472 , Ch E 520 , Ch E 528 , Ch E 535 , Ch E 540 , Ch E 550 , Manf 455 , or M E 534 .
12 hrs Technical Electives 12	Complete at least 12 credit hours of technical electives to include three 3-hour electives of 300 or higher course number from among engineering, science, or mathematics. (Alternatives for 300-level technical electives: Chem 222 , Manf 253 , Manf 254 , the combination of [Bisc 160] (https://catalog.olemiss.edu/bisc-160) , 161 , 162 , and Bisc 163 . In the case of the Bisc 160 -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.
3 hrs Adv science course 3	Complete at least one advanced science course. Course can be chosen from Bisc 301 , Bisc 306 , Bisc 318 , Bisc 320 , Bisc 327 , Bisc 333 , Bisc 335 , Ch E 543 , Ch E 545 , Ch E 547 , Chem 314 , Chem 331 , Chem 332 , Chem 334 , Chem 373 , Chem 401 , Chem 471 , Chem 473 , Engr 340 , Engr 540 , G E 415 , G E 450 , G E 503 , Geol 314 , Phys 315 , Phys 317 , Phys 318 , Phys 319 , Phys 321 , Phys 401 , Phys 402 ,
3 hrs gen ed, lang, or SS/H/FA 3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Materials

Requirement Hours	Description
<u>Ch E 543</u> , <u>Ch E 545</u> , or <u>3</u> <u>Ch E 547</u>	Complete either <u>Ch E 543</u> , Che E <u>545</u> , or <u>Ch E 547</u> with a passing grade.
9 hrs of Materials 9 Emph Elect	Complete 3 courses chosen from the following: <u>Ch E 528</u> , <u>540</u> , <u>543</u> , <u>545</u> , <u>547</u> , <u>550</u> , <u>Engr 309</u> , <u>312</u> , <u>340</u> , or <u>ME 534</u> with a passing grade.
3 hrs Engineering 3 elective	Complete one of the following engineering technical electives: <u>BME 305</u> , <u>Engr 309</u> , <u>Engr 330</u> , <u>Engr 360</u> , <u>Engr 573</u> , <u>C E 471</u> , <u>C E 472</u> , <u>Ch E 520</u> , <u>Ch E 528</u> , <u>Ch E 535</u> , <u>Ch E 540</u> , <u>Ch E 550</u> , <u>Manf 455</u> , or <u>ME 534</u> .
3 hrs Technical 3 Electives	Complete at least 3 credit hours of technical electives choosing from engineering, science, or mathematics. (Alternatives for 300-level technical electives: <u>Chem 222</u> , <u>Manf 253</u> , <u>Manf 254</u> , the combination of <u>[Bisc 160]</u> (https://catalog.olemiss.edu/bisc-160), <u>161</u> , <u>162</u> , and <u>163</u> . In the case of the <u>Bisc 160</u> -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of <u>Ch E 330</u> may be used to satisfy one of the technical elective requirements.)
3 hrs gen ed, lang, or 3 SS/H/FA	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Biotechnology

Requirement Hours	Description
<u>Ch E 520</u> 3	Complete <u>Ch E 520</u> with a passing grade.
<u>Chem 334</u> , <u>Chem 471</u> , 3 or <u>Bisc 333</u>	Complete either <u>Chem 334</u> , <u>Chem 471</u> , or <u>Bisc 333</u> with a passing grade.
<u>Chem 222</u> or Bisc 3 sequence	Complete either <u>Chem 222</u> or <u>Bisc 160</u> , <u>161</u> , <u>162</u> and <u>163</u> with a passing grade.
1 Biotech Emph 3 Elective	Complete either <u>Bisc 333</u> , <u>509</u> , <u>BME 313</u> , <u>413</u> , <u>Chem 473</u> , or Pharm 331 with a passing grade.
2 Technical Electives 6	Complete at least 6 credit hours of technical electives at 300 or higher course numbers from among engineering, science, or mathematics with a passing grade. (Alternatives for 300-level technical electives: <u>Chem 222</u> , <u>Manf 253</u> , <u>Manf 254</u> , the combination of <u>[Bisc 160]</u> (https://catalog.olemiss.edu/bisc-160), <u>161</u> , <u>162</u> , and <u>163</u> . In the case of the <u>Bisc 160</u> -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of <u>Ch E 330</u> may be used to satisfy one of the technical elective requirements.)
3 hrs gen ed, lang, or 3 SS/H/FA	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Pre-Med Option

Requirement Hours	Description
<u>Bisc 160</u> 3	Complete <u>Bisc 160</u> with a passing grade.
<u>Bisc 161</u> 1	Complete <u>Bisc 161</u> with a passing grade.
<u>Bisc 162</u> 3	Complete <u>Bisc 162</u> with a passing grade.
<u>Bisc 163</u> 1	Complete <u>Bisc 163</u> with a passing grade.
<u>Chem 222</u> 3	Complete <u>Chem 222</u> with a passing grade.

Requirement Hours		Description
Chem 226	1	Complete Chem 226 with a passing grade.
Chem 471	3	Complete Chem 471 with a passing grade.
3 hrs Engineering elective	3	Complete one of the following engineering technical electives: BME 305 , Engr 309 , Engr 330 , Engr 360 , Engr 573 , CE 471 , CE 472 , Ch E 520 , Ch E 528 , Ch E 535 , Ch E 540 , Ch E 550 , Manf 455 , or ME 534 .
2 Bisc 300 + electives	6	Complete two Bisc courses at the 300-level or higher with a passing grade.
Math 115 , 375 or Bisc 300	3	Complete 3 hrs chosen from Math 115 , 375 , or Bisc 300 .
Psy 201	3	Complete Psy 201 with a passing grade.

Emphasis - Environmental

Requirement Hours		Description
GE 503 or Engr 540	3	Complete either GE 503 or Engr 540 with a passing grade.
CE 471	3	Complete CE 471 with a passing grade.
2 environmental emph electives	6	Complete two of the following courses: Ch E 545 , Ch E 530 , Engr 340 , Engr 573 , GE 450 , GE 510 , CE 472 , Phcl 347 , Chem 314 , Chem 469 , Chem 222 , Bisc 505 , Bisc 333 , or Bisc 511 with a passing grade.
2 technical electives	6	Complete at least 6 credit hours of technical electives at 300 or higher course numbers from among engineering, science, or mathematics with a passing grade. (Alternatives for 300-level technical electives: Chem 222 , Manf 253 , Manf 254 , the combination of Bisc 160 (https://catalog.olemiss.edu/bisc-160), 161 , 162 , and 163 . In the case of the Bisc 160 -163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy one of the technical elective requirements.)
3 hrs gen ed, lang, or SS/H/FA	3	Complete 3 additional hours with a passing grade of humanities, languages (modern, Greek, or Latin), social science, or a general education course as defined by the School of Engineering

Emphasis - Manufacturing

Requirement Hours		Description
3 hrs of Adv Science	3	Complete at least 3 hrs of Advanced Science with a passing grade chosen from: Engr 340 , 540 , CH E 543 , 545 , 547 , GEOL 314 , GE 415 , 450 , 503 , CHEM 314 , 331 , 332 , 334 , 373 , 401 , 471 , 473 , PHYS 315 , 317 , 318 , 319 , 321 , 401 , 402 BISC 301 , 306 , 318 , 320 , 327 , 333 , 335 .
Bus 250	3	Complete Bus 250 with a passing grade.
Manf 150	1	Complete Manf 150 with a passing grade.
Manf 152	1	Complete Manf 152 with a passing grade.
Manf 251	3	Complete Manf 251 with a passing grade.
Manf 252	1	Complete Manf 252 with a passing grade.
Manf 253	3	Complete Manf 253 with a passing grade.
Manf 255	1	Complete Manf 255 with a passing grade.
Manf 351	1	Complete Manf 351 with a passing grade.
Manf 353	3	Complete Manf 353 with a passing grade.
Manf 355	1	Complete Manf 355 with a passing grade.
Manf 455	3	Complete Manf 455 with a passing grade.

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graduation; and 3) change other regulations affecting the student body at any time. Implicit in each student's enrollment with the university is an agreement to comply with university rules and regulations, which the university may modify to exercise properly its educational responsibility.

BME 524: Microscopy for Engineers

Biomedical Engineering

Comprehensive study of the principles of optical microscopy and imaging techniques commonly used in engineering research, with an emphasis on biological, biomedical, and chemical engineering fields.

3 Credits

Prerequisites

- Pre-Requisite Phys 212 OR Graduate Standing

Cross-listed Courses

- [Ch E 524: Microscopy for Engineers](#)

Instruction Type(s)

- Lecture: Lecture for BME 524

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 400: Biomedical Engineering Seminar

Biomedical Engineering

Problem solving, algorithm development, and programming techniques, including applications from a range of disciplines.

1 Credit

Prerequisites

- Prerequisite: Senior Standing

Instruction Type(s)

- Lecture: Lecture for BME 400

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 501: Computational and Systems Biomedicine

Biomedical Engineering

This course introduces undergraduate and graduate students to the principles of computational and systems biomedicine. The students will learn how to apply probabilistic and network models to answer biological questions using high-throughput genomic data.

3 Credits

Prerequisites

- Prerequisite: Either 24 earned hours or Math 261 or graduate standing

Instruction Type(s)

- Lecture: Lecture for BME 501

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 522: Immunoengineering

Biomedical Engineering

Immunoengineering describes efforts by immunologists and engineers to design new technologies that can be used to better understand the immune system as well as harness its immense power to improve human health. This course provides an in-depth introduction to immunoengineering through five modules: 1) fundamentals of immunology, 2) the immunologist toolbox, 3) vaccines and immunotherapies, 4) drug delivery principles for vaccines and immunotherapies, and 5) materials for immunoengineering.

3 Credits

Prerequisites

- [Bisc 160: Biological Sciences I](#)
- [Bisc 161: Biological Sciences I Laboratory](#)
- [Bisc 162: Biological Sciences II](#)
- [Bisc 163: Biological Sciences II Laboratory](#)
- [Chem 105: General Chemistry I](#)
- [Chem 106: General Chemistry II](#)
- [Chem 115: General Chemistry Laboratory I](#)
- [Chem 116: General Chemistry Laboratory II](#)

Instruction Type(s)

- Lecture: Lecture for BME 522

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 320: Bioseparations

Biomedical Engineering

Separation of biological components for diagnostics and therapeutic purposes in medicine and bioengineering.

3 Credits

Prerequisites

- [BME 333: Biological Transport](#)

Instruction Type(s)

- Lecture: Lecture for BME 320

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 600: Graduate Professional Development

Biomedical Engineering

To enhance the transferable skills of graduate students in engineering with the goal of improving the career readiness of graduates of the program. Communication skills will be refined through grant writing, grant reviews, manuscript preparation, poster presentations, and podium (oral) research presentations. Additionally, students will gain exposure to professional development skills related to the future careers of engineers with advanced degrees. Topics will include CV preparation; STEM outreach and engagement; responsible conduct in research; issues of diversity, equity, inclusion, and respect (DEIR); and mental health in graduate school and beyond.

3 Credits

Instruction Type(s)

- Lecture: Lecture for BME 600

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 301: Bioinstrumentation

Biomedical Engineering

Design and application of biomedical instrumentation. Topics include physiological measurements, biomedical measurements, electrodes, sensors, amplifiers, and imaging systems. Electrical safety in medical environments is also covered.

3 Credits

Prerequisites

- [Engr 360: Electric Circuit Theory](#)

Instruction Type(s)

- Lecture: Lecture for BME 301

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 314: Biomedical Measurement

Biomedical Engineering

This course is designed to create a hands-on laboratory environment that provides objective-based and inquiry-based teaching options while analyzing common biomedical data. Required lab write-ups and exams will challenge engineering students to report biomedical data in a format that gives appropriate technical information to a reader yet conveys practical information about the physiology being measured.

1 Credit

Prerequisites

- [Math 261: Unified Calculus & Analytic Geometry I](#)
- [Phys 212: Physics for Science & Engineering II](#)

Instruction Type(s)

- Laboratory: Laboratory for BME 314

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Bioengineering and Biomedical Engineering](#)

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BME 520: Biochemical Process Engineering

Biomedical Engineering

Application of cellular and molecular biology to process engineering to describe the manufacture of products derived from cell cultures. Emphasis is placed on enzyme kinetics and technology; bioreaction kinetics; design, analysis, and control of bioreactors and fermenters; and downstream processing of bioreaction products.

3 Credits

Prerequisites

- Prerequisite: BME 305 or Ch E 308 or graduate standing

Cross-listed Courses

- [Ch E 520: Biochemical Engineering](#)

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 413: Biomedical Signal Processing

Biomedical Engineering

Introduction to the electrocardiogram, electroencephalogram, electromyogram, and other diagnostic signals. Analysis of biomedical systems using both time-domain and frequency-domain techniques. Computer techniques for processing and analysis of biomedical signals. Practical applications in cardiac and neurological signal processing.

3 Credits

Prerequisites

- [BME 301: Bioinstrumentation](#)
- Csci 111 or Csci 251

Instruction Type(s)

- Lecture: Lecture for BME 413

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Bioengineering and Biomedical Engineering](#)

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BME 462: Biomedical Engineering Senior Design II

Biomedical Engineering

Biomedical-orientated design projects involving the design, planning, and testing of a prototype; and/or selection of new design projects addressing realistic constraints such as human safety, health care costs, reliability, ethics, and social impact. Part 2 of a two-semester sequence.

2 Credits

Prerequisites

- [BME 461: Biomedical Engineering Senior Design I](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for BME 462

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 200: Introduction to Biomedical Engineering

Biomedical Engineering

Introduction to the basic scientific and engineering concepts of biomedical engineering and its connection with the full spectrum of human activity. Introduction to biomolecular engineering, biomedical systems engineering, and bioinformatics. Discussions will include case studies of medical ethics, and drugs and medical devices to illustrate product development.

2 Credits

One-way corequisites

- [Math 261: Unified Calculus & Analytic Geometry I](#)

Instruction Type(s)

- Lecture: Lecture for BME 200

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 305: Bioengineering Thermodynamics & Kinetics

Biomedical Engineering

To introduce the principles of thermodynamics and kinetics from a biomolecular perspective.

3 Credits

Prerequisites

- [Bisc 160: Biological Sciences I](#)
- [Chem 106: General Chemistry II](#)

One-way corequisites

- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for BME 305

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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Biomedical Engineering

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Faculty in Biomedical Engineering

- [D](#)
- [F](#)
- [H](#)
- [M](#)
- [O](#)
- [R](#)
- [W](#)
- [X](#)

D

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BME 370: Intro to Bioinformatics & Biostatistics

Biomedical Engineering

Principles of bioinformatics analysis applied to translational biomedical studies. Application topics include genomic data analysis, biomarker development, statistical modeling, machine learning, and clinical trial design.

3 Credits

Prerequisites

- [Csci 256: Programming in Python](#)
- [Math 353: Elementary Differential Equations](#)

Instruction Type(s)

- Lecture: Lecture for BME 370

Subject Areas

- [Biomathematics, Bioinformatics, and Computational Biology, Other](#)

Related Areas

- [Bioinformatics](#)
- [Biometry/Biometrics](#)
- [Biostatistics](#)
- [Computational Biology](#)

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BME 256: Programming for Biomedical Engineering

Biomedical Engineering

Python is a powerful, object-oriented programming language to analyze complex biomedical data, uncover patterns, and drive new discoveries in health and science. This Python course provides basic concepts of Python programming, gradually advancing into essential libraries like SciPy, NumPy, Pandas, and Matplotlib, which opens new doors to solving data- driven challenges in modern biomedical research. This course covers everything from the very basics of Python programming to more advanced developments, providing students with the skills needed for research and beyond. Throughout the course, students will explore real-world applications, learning how to use Python for processing, analyzing, and interpreting biomedical data.

3 Credits

Prerequisites

- [Math 261: Unified Calculus & Analytic Geometry I](#)

Instruction Type(s)

- Lecture: Lecture for BME 256

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 311: Biomechanics

Biomedical Engineering

This course includes an introduction to functional and applied anatomy of the musculoskeletal system to create a better understanding of human movement as a mechanical system. A review of current analysis techniques in the field of biomechanics, including 2D and 3D kinematic motion capture and kinetic analysis, will be used to highlight clinical rehabilitation as well as orthopedic device design.

3 Credits

Prerequisites

- [BME 222: Biomaterials](#)

Instruction Type(s)

- Lecture: Lecture for BMS 311

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 511: Computational Biomechanics

Biomedical Engineering

This course will explore the integration between computational methodologies and biomechanical principles. Topics covered include solid mechanics, fluid dynamics, finite element method, biomedical imaging and image processing. Through this course, students will develop a comprehensive understanding of how computational techniques can be applied to analyze and model biological tissues, under both normal and disease conditions. Both theoretical foundations and practical applications will be emphasized to equip students with a solid grasp of the role of computation in biomechanics.

3 Credits

Prerequisites

- Prerequisite: Engr 312 or graduate standing

Instruction Type(s)

- Lecture: Lecture for BME 511

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 322: Sensors and Nanodevices in BME

Biomedical Engineering

Introduction to fundamentals and major types of sensor systems, scaling laws of device, miniaturization, and detection mechanisms, including molecular capture mechanisms; electrical, optical, and mechanical transducers; micro-array analysis of biomolecules; semiconductor and metal nanosensors; microfluidic systems; and microelectromechanical systems (MEMS, BioMEMS) design, fabrication and applications for biomedical engineering.

3 Credits

Prerequisites

- [BME 311: Biomechanics](#)

Instruction Type(s)

- Lecture: Lecture for BME 322

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 333: Biological Transport

Biomedical Engineering

Fundamentals and integration of fluid mechanics, heat transfer, and mass transfer in living systems. Basic concepts of transport phenomena are presented and applied to biological systems and to the design of medical devices.

3 Credits

Prerequisites

- Prerequisite: BME 305 or Ch E 308 or graduate standing

Instruction Type(s)

- Lecture: Lecture for BME 333

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 411: Tissue Mechanics

Biomedical Engineering

This course will delve into the fundamental principles of continuum mechanics and gradually progress to advanced concepts, all within the context of tissues and their behavior. From understanding the continuum kinematics and material symmetry to formulating constitutive equations and exploring specific tissue types such as bone, cartilage, and ligaments, this course will equip students with a profound knowledge of how biological tissues respond to mechanical forces. Practical applications, including modeling poroelastic and electrical effects in soft tissues, will prepare students for real-world challenges in fields such as medical engineering and biomechanics.

3 Credits

Prerequisites

- Prerequisite: BME 311 or Engr 312

Instruction Type(s)

- Lecture: Lecture for BME 411

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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Biomedical Engineering

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Leadership

- Dwight Ernest Waddell - Chair and Associate Professor of Biomedical Engineering and Affiliate Professor of Electrical Engineering and Director of the Center for Diagnostics, Design, Devices, and Biomechanics

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BME 353: Biodevices Design & Development

Biomedical Engineering

Biomedical-oriented design course focused on the design tools used in industry for the design, development, and validation of biodevices.

3 Credits

Prerequisites

- [Engr 312: Mechanics of Materials](#)

Instruction Type(s)

- Lecture: Lecture for BME 353

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 510: Drug and Gene Delivery

Biomedical Engineering

Fundamentals of drug delivery, including routes of delivery, physiologic drug delivery barriers, and pharmacokinetics/pharmacodynamics. Focus on new biomaterials underdevelopment for enabling controlled release, tissue targeting, improved bioactivity of different classes of compounds, and delivery of different classes of nucleic acid based therapeutics.

3 Credits

Prerequisites

- [Bisc 162: Biological Sciences II](#)
- [Chem 106: General Chemistry II](#)

Instruction Type(s)

- Lecture: Lecture for BME 510

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 461: Biomedical Engineering Senior Design I

Biomedical Engineering

Biomedical-orientated design projects involving the design, planning, and testing of a prototype; and/or selection of new design projects addressing realistic constraints such as human safety, health care costs, reliability, ethics, and social impact. Part 1 of a two-semester sequence.

2 Credits

Prerequisites

- [BME 444: Biomedical Systems and Controls](#)
- Pre-Requisite: 24 Earned Hours

Instruction Type(s)

- Lecture: Lecture for BME 461

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 523: Molecular and Cellular Biophysics

Biomedical Engineering

Develop the tools of engineering into a framework that is useful for addressing problems in the biological sciences. Provide a molecular perspective on thermodynamics, transport phenomena, and reaction kinetics in a biological setting.

3 Credits

Prerequisites

- Pre-Requisite Phys 212 OR Graduate Standing

Cross-listed Courses

- [Ch E 523: Molecular and Cellular Biophysics](#)

Instruction Type(s)

- Lecture: Lecture for BME 523

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 313: Physiology for Biomedical Engineering

Biomedical Engineering

Engineering-oriented approach to fundamental concepts of human physiology and related biomedical applications. Lectures and quantitative problem solving cover biomedical, basic science, and selected engineering correlations.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- Csci 111 or Csci 251

Instruction Type(s)

- Lecture: Lecture for BME 313

Subject Areas

- [Electrical and Electronics Engineering](#)
- [Bioengineering and Biomedical Engineering](#)

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Biomedical Engineering

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Degrees Offered

- [B.S.B.E. in Biomedical Engineering](#)
 - [Emphasis - Biodevices](#)
 - [Emphasis - Bioinformatics](#)
 - [Emphasis - Biomolecular](#)
 - [Emphasis - Pre Med](#)
- [M.S. in Engineering Science](#)
 - [Emphasis - Biomedical Engineering](#)
- [Ph.D. in Engineering Science](#)
 - [Emphasis - Biomedical Engineering](#)

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BME 222: Biomaterials

Biomedical Engineering

Introduction to biomaterials science, artificial organs, prosthetic devices, regulatory testing, and evaluation of new biomaterials. Polymeric, ceramic, metallic, and composite biomaterials.

3 Credits

Prerequisites

- [Bisc 160: Biological Sciences I](#) (Minimum grade: C-)
- [Chem 105: General Chemistry I](#) (Minimum grade: C-)

Instruction Type(s)

- Lecture: Lecture for BME 222

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 601: Biomedical Engineering Seminar

Biomedical Engineering

Seminar course for biomedical engineering graduate students. Students will present, participate in, and critique presentations that aim to introduce students to a wide variety of current topics within biomedical engineering, including topics outside of their research concentration, and develop their critical thinking and technical presentation skills through discourse, inquiry, and defense.

1 Credit

Instruction Type(s)

- Lecture: Lecture for BME 601

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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Courses

- [BME 200: Introduction to Biomedical Engineering](#)
- [BME 222: Biomaterials](#)
- [BME 256: Programming for Biomedical Engineering](#)
- [BME 301: Bioinstrumentation](#)
- [BME 305: Bioengineering Thermodynamics & Kinetics](#)
- [BME 311: Biomechanics](#)
- [BME 313: Physiology for Biomedical Engineering](#)
- [BME 314: Biomedical Measurement](#)
- [BME 315: Physiology for Biomedical Engineering II](#)
- [BME 320: Bioseparations](#)
- [BME 322: Sensors and Nanodevices in BME](#)
- [BME 333: Biological Transport](#)
- [BME 350: Immunoengineering](#)
- [BME 353: Biodevices Design & Development](#)
- [BME 370: Intro to Bioinformatics & Biostatistics](#)
- [BME 400: Biomedical Engineering Seminar](#)
- [BME 411: Tissue Mechanics](#)
- [BME 413: Biomedical Signal Processing](#)
- [BME 444: Biomedical Systems and Controls](#)
- [BME 461: Biomedical Engineering Senior Design I](#)
- [BME 462: Biomedical Engineering Senior Design II](#)
- [BME 501: Computational and Systems Biomedicine](#)
- [BME 510: Drug and Gene Delivery](#)
- [BME 511: Computational Biomechanics](#)
- [BME 520: Biochemical Process Engineering](#)
- [BME 522: Immunoengineering](#)
- [BME 523: Molecular and Cellular Biophysics](#)
- [BME 524: Microscopy for Engineers](#)
- [BME 600: Graduate Professional Development](#)
- [BME 601: Biomedical Engineering Seminar](#)

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BME 444: Biomedical Systems and Controls

Biomedical Engineering

Analysis and lumped physical biomedical systems; stability analysis; complex plane, root locus for electrical, fluid, and mechanical systems; linear system transients, steady-state behavior; introduction to biomedical feedback control.

3 Credits

Prerequisites

- [Math 353: Elementary Differential Equations](#)
- [Engr 360: Electric Circuit Theory](#)

Instruction Type(s)

- Lecture: Lecture for BME 444

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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Biomedical Engineering

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Distinguished Faculty and Staff Awards

School of Engineering, Junior Faculty Research Award

- **Dana Reinemann** - Associate Professor of Biomedical Engineering and Affiliate Associate Professor of Chemical Engineering (2023)
- **Thomas Anthony Werfel** - Associate Professor of Biomedical Engineering and Affiliate Associate Professor of Chemical Engineering and Affiliate Associate Professor of Biomolecular Sciences (2022)

School of Engineering, Faculty Service Award

- **Dana Reinemann** - Associate Professor of Biomedical Engineering and Affiliate Associate Professor of Chemical Engineering (2020)
- **Dwight Ernest Waddell** - Chair and Associate Professor of Biomedical Engineering and Affiliate Professor of Electrical Engineering and Director of the Center for Diagnostics, Design, Devices, and Biomechanics (2017)

School of Engineering Outstanding Teacher of the Year

- **Glenn Walker** - Associate Dean for Research and Graduate Programs and Professor of Biomedical Engineering and Professor of Electrical Engineering (2023)

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BME 315: Physiology for Biomedical Engineering II

Biomedical Engineering

This course explores a quantitative approach to human physiology from the biomedical engineering perspective with an emphasis on systems physiology.

3 Credits

Prerequisites

- [BME 313: Physiology for Biomedical Engineering](#)

One-way corequisites

- [BME 314: Biomedical Measurement](#)

Instruction Type(s)

- Lecture: Lecture for BME 315

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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BME 350: Immunoengineering

Biomedical Engineering

Immunoengineering describes efforts by immunologists and engineers to design new technologies that can be used to better understand the immune system as well as harness its immense power to improve human health. This course provides an in-depth introduction to immunoengineering through five modules: 1) fundamentals of immunology, 2) the immunologist toolbox, 3)vaccines and immunotherapies, 4) drug delivery principles for vaccines and immunotherapies, and 5) materials for immunoengineering.

3 Credits

Prerequisites

- [Chem 105: General Chemistry I](#)
- [Chem 106: General Chemistry II](#)
- [Chem 115: General Chemistry Laboratory I](#)
- [Chem 116: General Chemistry Laboratory II](#)

Instruction Type(s)

- Lecture: Lecture for BME 350

Subject Areas

- [Bioengineering and Biomedical Engineering](#)

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M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Specializations

School of Engineering

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)
- [Emphasis - Hydrology & Comp Hydroscience](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Telecommunications](#)

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Emphasis - Biomedical Engineering

- [M.S. in Engineering Science](#)
- [Emphasis - Biomedical Engineering](#)

M.S. in Engineering Science

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Biomedical Engineering

Description

A degree of M.S. in engineering science with an emphasis in biomedical engineering prepares graduates to apply interdisciplinary science and engineering tools to advance biology and medicine. Graduates will be able to independently solve problems, execute complex projects, and pursue successful careers in research, development, or management within engineering or biomedical science fields, as well as professional degrees such as medicine or law.

Course Requirements

The M.S. in engineering science with an emphasis in biomedical engineering requires a minimum of 30 hours of graduate credit with an overall GPA of 3.0. The specific coursework requirements depend on the M.S. option pursued by the student.

Students whose undergraduate degree is not in biomedical engineering or a closely related field may be required to take additional coursework beyond the 30-hour requirement at the discretion of the student's committee. The committee should be formed before the end of the first semester.

Coursework Option

All 30 credit hours come from graded 500+ level coursework agreed upon by the students and their committee. These courses must include at least two BME 500+ level courses (6 credit hours) and BME 600 (3 credit hours). Students must successfully pass a comprehensive final exam before graduation. Parameters for the exam will be agreed upon by the students and their committee, with final approval by the graduate program coordinator. Students must orally defend the comprehensive exam material to their committee.

Nonthesis Option

This option requires at least 27 credit hours of graded 500+ level coursework agreed upon by the students and their committee. These courses must include at least two BME 500+ courses (6 credit hours) and BME 600 (3 credit hours). In addition, students

must complete no less than 3 hours of project credit (Engr 693, Engr 694) and successfully defend their project to their committee before graduation.

Thesis Option

Students must take BME 600 (3 credit hours) and 3 hours of BME 601 (1 credit hour). In addition, students must take 18 credit hours of graded 500+ level coursework agreed upon by them and their committee. The coursework must include at least two BME 500+ courses, not including BME 600 or BME 601. In addition, students must complete no less than 6 credit hours of thesis (Engr 697). Students must successfully write and defend a thesis to their committee before graduation.

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Emphasis - Biodevices

- [B.S.B.E. in Biomedical Engineering](#)
- [Emphasis - Biodevices](#)
- [Degree Requirements](#)

B.S.B.E. in Biomedical Engineering

Description

The Bachelor of Science in Biomedical Engineering (B.S.B.E.) degree program will prepare engineering students at the University of Mississippi to capably apply advanced mathematics, science, and engineering to solve the problems at the interface of engineering, biology, and medicine. Moreover, the curriculum will prepare graduates with the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

The graduates of the program will be able to pursue (i) employment in biomedical or related industries (ii) graduate studies in biomedical engineering or related disciplines, and (iii) pursue professional careers in medicine, dentistry, pharmacy, or patent law.

Program Educational Objectives

Following graduation and during the first several postgraduate years, biomedical engineering baccalaureate degree holders from the University of Mississippi will possess skill sets to accomplish the following:

1. Meet evolving expectations of future employers in the biomedical engineering workplace as well as other professional careers
2. Exhibit a systematic approach to problem solving in their professional practice including quantitative and analytical skills weighted with considerations towards a sustainable future.
3. Continue their professional development by pursuing advanced studies in medicine and other professional fields if desired.

Student Outcomes

Biomedical engineering students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Minimum Total Credit Hours: 126

General Education Requirements

Fifteen Credits of Liberal Arts:

Students must complete at least 15 semester hours consisting of social/behavioral sciences, humanities, modern or ancient languages, and fine arts course work. At least 6 credit hours must be in the social/behavioral sciences (including Econ 310), and at least 9 credit hours must be in humanities, modern or ancient languages, and fine arts courses with at least 3 semester hours from humanities and at least 3 semester hours from fine arts.

For the purpose of these requirements:

Social/behavioral sciences

will include anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203, Liba 313, and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements).

Humanities

will include African American studies (Aas 201, 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201, 202), history (Hst), Liba 202, 312, 305, literature (Eng 103, 220-226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Modern or ancient language courses

will include courses in Ancient Greek (Gr), Arabic (Arab), Chinese (Chin), French (Fr), German (Germ), Italian (Ital), Japanese (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish (Span), and Swahili (Swa).

Fine arts

will include courses in art history (AH), Danc 200, Liba 130, Liba 204, Liba 314, Mus 101, Mus 102, Mus 103, Mus 104, Mus 105, Thea 201, and Thea 202.

Three credits of additional general education course work:

Students must complete an additional 3 semester hours of course work beyond the 15 hours required above. These additional 3 hours are to be composed of any additional fine arts, humanities, modern languages, or social science course work (as defined above) or any combination of credits from the courses listed below: AS 301, AS 302, Bus 250, Bus 271, Edld 110, Edld 111, Edld 120, Edld 220, Engr 400, Mgmt 371, GB 370, Msl 102, Nsc 211, Spch 102, Spch 105

Course Requirements

Specific requirements for the B.S.B.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 225; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 256; Engr 360, 400; BME 200, 222, 305, 311, 313, 314, 315, 333, 370, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (up to 3 hours) in engineering. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Emphasis - Biodevices

Description

The biodevices emphasis incorporates elements from mechanical engineering design with physiological controls and instrumentation allowing for a rich environment where students can employ lessons from bioinstrumentation and systems mechanics to create sensors, test models, and build devices to meet unmet needs in the medical field.

Course Requirements

Specific requirements for the biodevices emphasis include:

- Engr 309
- Engr 312
- BME 301
- BME 413
- Choose three emphasis courses (9 hours) from BME 353, 411, 510, 511, 520, 522, 523, 524; M E 325, 541; Math 301 and 319.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (300 level or higher, 3 hours) to count as an emphasis course. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.B.E. in Biomedical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 with a passing grade.
First Year Writing II	3	Successfully complete one of the following courses with a passing grade: Writ 102 , Liba 102 , Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 with a passing grade.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
BME 200	2	Complete BME 200 with a passing grade.
BME 222	3	Complete BME 222 with a passing grade.
BME 305	3	Complete BME 305 with a passing grade.
BME 311	3	Complete BME 311 with a passing grade.
BME 313	3	Complete BME 313 with a passing grade.
BME 314	1	Complete BME 314 with a passing grade.
BME 315	3	Complete BME 315 with a passing grade.
BME 333	3	Complete BME 333 with a passing grade.
BME 370	3	Complete BME 370 with a passing grade.
BME 444	3	Complete BME 444 with a passing grade.
BME 461	2	Complete BME 461 with a passing grade.
BME 462	2	Complete BME 462 with a passing grade.

Major Requirements II

Requirement	Hours	Description
CSci 256	3	Complete CSci 256 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Biodevices

Requirement	Hours	Description
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Requirement Hours		Description
<u>BME 301</u>	3	Complete <u>BME 301</u> with a passing grade.
<u>BME 413</u>	3	Complete <u>BME 413</u> with a passing grade.
<u>Engr 309</u>	3	Complete <u>Engr 309</u> with a passing grade.
<u>Engr 312</u>	3	Complete <u>Engr 312</u> with a passing grade.
9 hrs emph elect	9	Complete 9 hrs with a passing grade chosen from the following: <u>BME 353</u> , <u>411</u> , <u>510</u> , <u>511</u> , <u>520</u> , 522, 523, 524; <u>M E 325</u> , <u>541</u> ; <u>Math 301</u> , <u>Math 319</u> .

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Emphasis - Pre Med

- [B.S.B.E. in Biomedical Engineering](#)
- [Emphasis - Pre Med](#)
- [Degree Requirements](#)

B.S.B.E. in Biomedical Engineering

Description

The Bachelor of Science in Biomedical Engineering (B.S.B.E.) degree program will prepare engineering students at the University of Mississippi to capably apply advanced mathematics, science, and engineering to solve the problems at the interface of engineering, biology, and medicine. Moreover, the curriculum will prepare graduates with the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

The graduates of the program will be able to pursue (i) employment in biomedical or related industries (ii) graduate studies in biomedical engineering or related disciplines, and (iii) pursue professional careers in medicine, dentistry, pharmacy, or patent law.

Program Educational Objectives

Following graduation and during the first several postgraduate years, biomedical engineering baccalaureate degree holders from the University of Mississippi will possess skill sets to accomplish the following:

1. Meet evolving expectations of future employers in the biomedical engineering workplace as well as other professional careers
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Student Outcomes

Biomedical engineering students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Minimum Total Credit Hours: 126

General Education Requirements

Fifteen Credits of Liberal Arts:

Students must complete at least 15 semester hours consisting of social/behavioral sciences, humanities, modern or ancient languages, and fine arts course work. At least 6 credit hours must be in the social/behavioral sciences (including Econ 310), and at least 9 credit hours must be in humanities, modern or ancient languages, and fine arts courses with at least 3 semester hours from humanities and at least 3 semester hours from fine arts.

For the purpose of these requirements:

Social/behavioral sciences

will include anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203, Liba 313, and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements).

Humanities

will include African American studies (Aas 201, 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201, 202), history (Hst), Liba 202, 312, 305, literature (Eng 103, 220-226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Modern or ancient language courses

will include courses in Ancient Greek (Gr), Arabic (Arab), Chinese (Chin), French (Fr), German (Germ), Italian (Ital), Japanese (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish (Span), and Swahili (Swa).

Fine arts

will include courses in art history (AH), Danc 200, Liba 130, Liba 204, Liba 314, Mus 101, Mus 102, Mus 103, Mus 104, Mus 105, Thea 201, and Thea 202.

Three credits of additional general education course work:

Students must complete an additional 3 semester hours of course work beyond the 15 hours required above. These additional 3 hours are to be composed of any additional fine arts, humanities, modern languages, or social science course work (as defined above) or any combination of credits from the courses listed below: AS 301, AS 302, Bus 250, Bus 271, Edld 110, Edld 111, Edld 120, Edld 220, Engr 400, Mgmt 371, GB 370, Msl 102, Nsc 211, Spch 102, Spch 105

Course Requirements

Specific requirements for the B.S.B.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 225; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 256; Engr 360, 400; BME 200, 222, 305, 311, 313, 314, 315, 333, 370, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (up to 3 hours) in engineering. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Emphasis - Pre Med

Description

Biomedical engineering is a natural course of study to get into medical school. Courses in biology and chemistry coupled with the rigor of a well-established engineering curricula position students to succeed in medical school and their professional career.

Course Requirements

Specific requirements for the pre-med emphasis include:

- Chem 222
- Chem 226
- Chem 471
- Bisc 336
- Bisc 440
- Choose two courses from BME 510, 520, 522, 523, 524.
- Additionally, students must take Psy 201 and Soc 101 (6 hours), which may count as a social science elective.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (300 level or higher, 3 hours) to count as an emphasis course. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Degree Requirements

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B.S.B.E. in Biomedical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 with a passing grade.
First Year Writing II	3	Successfully complete one of the following courses with a passing grade: Writ 102 , Liba 102 , Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 with a passing grade.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
BME 200	2	Complete BME 200 with a passing grade.
BME 222	3	Complete BME 222 with a passing grade.
BME 305	3	Complete BME 305 with a passing grade.
BME 311	3	Complete BME 311 with a passing grade.
BME 313	3	Complete BME 313 with a passing grade.
BME 314	1	Complete BME 314 with a passing grade.
BME 315	3	Complete BME 315 with a passing grade.
BME 333	3	Complete BME 333 with a passing grade.
BME 370	3	Complete BME 370 with a passing grade.
BME 444	3	Complete BME 444 with a passing grade.
BME 461	2	Complete BME 461 with a passing grade.
BME 462	2	Complete BME 462 with a passing grade.

Major Requirements II

Requirement	Hours	Description
CSci 256	3	Complete CSci 256 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Pre Med

Requirement	Hours	Description
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Requirement	Hours	Description
<u>Chem 222</u> & 226	4	Complete <u>Chem 222</u> & <u>Chem 226</u> with a passing grade.
<u>Chem 471</u>	3	Complete <u>Chem 471</u> with a passing grade.
<u>Bisc 336</u>	4	Complete <u>Bisc 336</u> with a passing grade.
<u>Bisc 440</u>	4	Complete <u>Bisc 440</u> with a passing grade.
6 hrs BME courses	6	Complete 6 hrs of BME courses with a passing grade chosen from the following: <u>BME 510</u> , <u>520</u> , <u>522</u> , <u>523</u> , <u>524</u> .

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Emphasis - Bioinformatics

- [B.S.B.E. in Biomedical Engineering](#)
- [Emphasis - Bioinformatics](#)
- [Degree Requirements](#)

B.S.B.E. in Biomedical Engineering

Description

The Bachelor of Science in Biomedical Engineering (B.S.B.E.) degree program will prepare engineering students at the University of Mississippi to capably apply advanced mathematics, science, and engineering to solve the problems at the interface of engineering, biology, and medicine. Moreover, the curriculum will prepare graduates with the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

The graduates of the program will be able to pursue (i) employment in biomedical or related industries (ii) graduate studies in biomedical engineering or related disciplines, and (iii) pursue professional careers in medicine, dentistry, pharmacy, or patent law.

Program Educational Objectives

Following graduation and during the first several postgraduate years, biomedical engineering baccalaureate degree holders from the University of Mississippi will possess skill sets to accomplish the following:

1. Meet evolving expectations of future employers in the biomedical engineering workplace as well as other professional careers
2. Exhibit a systematic approach to problem solving in their professional practice including quantitative and analytical skills weighted with considerations towards a sustainable future.
3. Continue their professional development by pursuing advanced studies in medicine and other professional fields if desired.

Student Outcomes

Biomedical engineering students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Minimum Total Credit Hours: 126

General Education Requirements

Fifteen Credits of Liberal Arts:

Students must complete at least 15 semester hours consisting of social/behavioral sciences, humanities, modern or ancient languages, and fine arts course work. At least 6 credit hours must be in the social/behavioral sciences (including Econ 310), and at least 9 credit hours must be in humanities, modern or ancient languages, and fine arts courses with at least 3 semester hours from humanities and at least 3 semester hours from fine arts.

For the purpose of these requirements:

Social/behavioral sciences

will include anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203, Liba 313, and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements).

Humanities

will include African American studies (Aas 201, 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201, 202), history (Hst), Liba 202, 312, 305, literature (Eng 103, 220-226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Modern or ancient language courses

will include courses in Ancient Greek (Gr), Arabic (Arab), Chinese (Chin), French (Fr), German (Germ), Italian (Ital), Japanese (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish (Span), and Swahili (Swa).

Fine arts

will include courses in art history (AH), Danc 200, Liba 130, Liba 204, Liba 314, Mus 101, Mus 102, Mus 103, Mus 104, Mus 105, Thea 201, and Thea 202.

Three credits of additional general education course work:

Students must complete an additional 3 semester hours of course work beyond the 15 hours required above. These additional 3 hours are to be composed of any additional fine arts, humanities, modern languages, or social science course work (as defined above) or any combination of credits from the courses listed below: AS 301, AS 302, Bus 250, Bus 271, Edld 110, Edld 111, Edld 120, Edld 220, Engr 400, Mgmt 371, GB 370, Msl 102, Nsc 211, Spch 102, Spch 105

Course Requirements

Specific requirements for the B.S.B.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 225; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 256; Engr 360, 400; BME 200, 222, 305, 311, 313, 314, 315, 333, 370, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (up to 3 hours) in engineering. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Emphasis - Bioinformatics

Description

Bioinformatics is an interdisciplinary field at the interface of engineering, biology, computer science, and statistics that develops methods and software tools for interpreting biological data with the goal of increasing our understanding of health and disease. Bioinformatics is an umbrella term for the body of biological studies that uses computer programming and simulation as part of its methodology, as well specific analysis methods that are used to interpret big data, particularly in the field of genomics.

Course Requirements

Specific requirements for the bioinformatics emphasis include:

- Bisc 336
- Csci 343, 475;
- 6 hours of Csci electives chosen from 356, 345, 443, 444, 447, 547.
- Two 300+ level classes (6 hours) from Csci or Engr. *Note: To take Csci 492 (Special Topics in Data Science), Csci 356 must be taken as a Csci elective from Course Requirements above. Special courses with departmental approval may also be considered.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (300 level or higher, 3 hours) to count as an emphasis course. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.B.E. in Biomedical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 with a passing grade.
First Year Writing II	3	Successfully complete one of the following courses with a passing grade: Writ 102 , Liba 102 , Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 with a passing grade.

Requirement Hours		Description
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102

General Education II

Requirement Hours		Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours		Description
BME 200	2	Complete BME 200 with a passing grade.
BME 222	3	Complete BME 222 with a passing grade.
BME 305	3	Complete BME 305 with a passing grade.
BME 311	3	Complete BME 311 with a passing grade.
BME 313	3	Complete BME 313 with a passing grade.
BME 314	1	Complete BME 314 with a passing grade.
BME 315	3	Complete BME 315 with a passing grade.
BME 333	3	Complete BME 333 with a passing grade.
BME 370	3	Complete BME 370 with a passing grade.
BME 444	3	Complete BME 444 with a passing grade.
BME 461	2	Complete BME 461 with a passing grade.
BME 462	2	Complete BME 462 with a passing grade.

Major Requirements II

Requirement Hours		Description
CSci 256	3	Complete CSci 256 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Bioinformatics

Requirement	Hours	Description
<u>Bisc 336</u>	4	Complete <u>Bisc 336</u> with a passing grade.
<u>Csci 343</u>	3	Complete <u>Csci 343</u> with a passing grade.
<u>Csci 475</u>	3	Complete <u>Csci 475</u> with a passing grade.
6 hrs Csci elective	6	Complete 6 hrs from the following with a passing grade: <u>Csci 345</u> , <u>CSci 356</u> , <u>Csci 443</u> , <u>Csci 444</u> , <u>Csci 447</u> , or <u>Csci 547</u> .

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Emphasis - Biomolecular

- [B.S.B.E. in Biomedical Engineering](#)
- [Emphasis - Biomolecular](#)
- [Degree Requirements](#)

B.S.B.E. in Biomedical Engineering

Description

The Bachelor of Science in Biomedical Engineering (B.S.B.E.) degree program will prepare engineering students at the University of Mississippi to capably apply advanced mathematics, science, and engineering to solve the problems at the interface of engineering, biology, and medicine. Moreover, the curriculum will prepare graduates with the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

The graduates of the program will be able to pursue (i) employment in biomedical or related industries (ii) graduate studies in biomedical engineering or related disciplines, and (iii) pursue professional careers in medicine, dentistry, pharmacy, or patent law.

Program Educational Objectives

Following graduation and during the first several postgraduate years, biomedical engineering baccalaureate degree holders from the University of Mississippi will possess skill sets to accomplish the following:

1. Meet evolving expectations of future employers in the biomedical engineering workplace as well as other professional careers
2. Exhibit a systematic approach to problem solving in their professional practice including quantitative and analytical skills weighted with considerations towards a sustainable future.
3. Continue their professional development by pursuing advanced studies in medicine and other professional fields if desired.

Student Outcomes

Biomedical engineering students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Minimum Total Credit Hours: 126

General Education Requirements

Fifteen Credits of Liberal Arts:

Students must complete at least 15 semester hours consisting of social/behavioral sciences, humanities, modern or ancient languages, and fine arts course work. At least 6 credit hours must be in the social/behavioral sciences (including Econ 310), and at least 9 credit hours must be in humanities, modern or ancient languages, and fine arts courses with at least 3 semester hours from humanities and at least 3 semester hours from fine arts.

For the purpose of these requirements:

Social/behavioral sciences

will include anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203, Liba 313, and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements).

Humanities

will include African American studies (Aas 201, 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201, 202), history (Hst), Liba 202, 312, 305, literature (Eng 103, 220-226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Modern or ancient language courses

will include courses in Ancient Greek (Gr), Arabic (Arab), Chinese (Chin), French (Fr), German (Germ), Italian (Ital), Japanese (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish (Span), and Swahili (Swa).

Fine arts

will include courses in art history (AH), Danc 200, Liba 130, Liba 204, Liba 314, Mus 101, Mus 102, Mus 103, Mus 104, Mus 105, Thea 201, and Thea 202.

Three credits of additional general education course work:

Students must complete an additional 3 semester hours of course work beyond the 15 hours required above. These additional 3 hours are to be composed of any additional fine arts, humanities, modern languages, or social science course work (as defined above) or any combination of credits from the courses listed below: AS 301, AS 302, Bus 250, Bus 271, Edld 110, Edld 111, Edld 120, Edld 220, Engr 400, Mgmt 371, GB 370, Msl 102, Nsc 211, Spch 102, Spch 105

Course Requirements

Specific requirements for the B.S.B.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 225; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 256; Engr 360, 400; BME 200, 222, 305, 311, 313, 314, 315, 333, 370, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (up to 3 hours) in engineering. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Emphasis - Biomolecular

Description

Biomolecular Engineering is an emerging discipline at the interface of molecular biology, biophysical chemistry, and chemical engineering — whose express purpose is developing novel molecular tools, materials, and approaches that are the focal point of applied and basic research within academia, industry, and medicine.

Course Requirements

Specific requirements for the biomolecular emphasis include:

- Bisc 333 and
- BME 520
- Choose two BME courses (6 hours) from BME 510, 522, 523, 524.
- Choose three emphasis courses (9 hours) from Bisc 306, 310, 336, 440; Ch E 535, 540, 543, 550; Chem 222 and 471. Any BME 300 level or higher course. Chem 222 and Chem 471 are a required pairing to count as emphasis courses.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course for departmental credit (300 level or higher, 3 hours) to count as an emphasis course. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Degree Requirements

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B.S.B.E. in Biomedical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 with a passing grade.
First Year Writing II	3	Successfully complete one of the following courses with a passing grade: Writ 102 , Liba 102 , Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 with a passing grade.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement	Hours	Description
BME 200	2	Complete BME 200 with a passing grade.
BME 222	3	Complete BME 222 with a passing grade.
BME 305	3	Complete BME 305 with a passing grade.
BME 311	3	Complete BME 311 with a passing grade.
BME 313	3	Complete BME 313 with a passing grade.
BME 314	1	Complete BME 314 with a passing grade.
BME 315	3	Complete BME 315 with a passing grade.
BME 333	3	Complete BME 333 with a passing grade.
BME 370	3	Complete BME 370 with a passing grade.
BME 444	3	Complete BME 444 with a passing grade.
BME 461	2	Complete BME 461 with a passing grade.
BME 462	2	Complete BME 462 with a passing grade.

Major Requirements II

Requirement	Hours	Description
CSci 256	3	Complete CSci 256 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Biomolecular

Requirement	Hours	Description
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Requirement Hours		Description
<u>Bisc 333</u>	4	Complete <u>Bisc 333</u> with a passing grade.
<u>BME 520</u>	3	Complete <u>BME 520</u> with a passing grade.
6 hrs BME courses	6	Complete 6 hrs with a passing grade chosen from the following: <u>BME 510</u> , <u>522</u> , <u>523</u> , & <u>BME 524</u> .
9 hrs emph elect	9	Complete 9 hrs of biomolecular electives with a passing grade chosen from the following: <u>Bisc 306</u> , <u>310</u> , <u>336</u> , <u>340</u> , <u>Ch E 535</u> , <u>540</u> , <u>543</u> , <u>550</u> , <u>Chem 222</u> , <u>Chem 471</u> , Any <u>BME 300</u> +, (<u>Chem 222</u> & <u>471</u> paired).

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B.S.B.E. in Biomedical Engineering

- [Overview](#)
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Description

The Bachelor of Science in Biomedical Engineering (B.S.B.E.) degree program will prepare engineering students at the University of Mississippi to capably apply advanced mathematics, science, and engineering to solve the problems at the interface of engineering, biology, and medicine. Moreover, the curriculum will prepare graduates with the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

The graduates of the program will be able to pursue (i) employment in biomedical or related industries (ii) graduate studies in biomedical engineering or related disciplines, and (iii) pursue professional careers in medicine, dentistry, pharmacy, or patent law.

Program Educational Objectives

Following graduation and during the first several postgraduate years, biomedical engineering baccalaureate degree holders from the University of Mississippi will possess skill sets to accomplish the following:

1. Meet evolving expectations of future employers in the biomedical engineering workplace as well as other professional careers
2. Exhibit a systematic approach to problem solving in their professional practice including quantitative and analytical skills weighted with considerations towards a sustainable future.
3. Continue their professional development by pursuing advanced studies in medicine and other professional fields if desired.

Student Outcomes

Biomedical engineering students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Minimum Total Credit Hours: 126

General Education Requirements

Fifteen Credits of Liberal Arts:

Students must complete at least 15 semester hours consisting of social/behavioral sciences, humanities, modern or ancient languages, and fine arts course work. At least 6 credit hours must be in the social/behavioral sciences (including Econ 310), and at least 9 credit hours must be in humanities, modern or ancient languages, and fine arts courses with at least 3 semester hours from humanities and at least 3 semester hours from fine arts.

For the purpose of these requirements:

Social/behavioral sciences

will include anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203, Liba 313, and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements).

Humanities

will include African American studies (Aas 201, 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201, 202), history (Hst), Liba 202, 312, 305, literature (Eng 103, 220-226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Modern or ancient language courses

will include courses in Ancient Greek (Gr), Arabic (Arab), Chinese (Chin), French (Fr), German (Germ), Italian (Ital), Japanese (Japn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish (Span), and Swahili (Swa).

Fine arts

will include courses in art history (AH), Danc 200, Liba 130, Liba 204, Liba 314, Mus 101, Mus 102, Mus 103, Mus 104, Mus 105, Thea 201, and Thea 202.

Three credits of additional general education course work:

Students must complete an additional 3 semester hours of course work beyond the 15 hours required above. These additional 3 hours are to be composed of any additional fine arts, humanities, modern languages, or social science course work (as defined above) or any combination of credits from the courses listed below: AS 301, AS 302, Bus 250, Bus 271, Edld 110, Edld 111, Edld 120, Edld 220, Engr 400, Mgmt 371, GB 370, Msl 102, Nsc 211, Spch 102, Spch 105

Course Requirements

Specific requirements for the B.S.B.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 225; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 256; Engr 360, 400; BME 200, 222, 305, 311, 313, 314, 315, 333, 370, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (up to 3 hours) in engineering. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Specializations

- [Emphasis - Biodevices](#)
- [Emphasis - Bioinformatics](#)
- [Emphasis - Biomolecular](#)
- [Emphasis - Pre Med](#)

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B.S.B.E. in Biomedical Engineering

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Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

B.S.B.E. in Biomedical Engineering

General Education

Requirement	Hours	Description
First Year Writing I	3	Successfully complete Hon 101 , Writ 100 , or Writ 101 with a passing grade.
First Year Writing II	3	Successfully complete one of the following courses with a passing grade: Writ 102 , Liba 102 , Hon 102 .
3 hrs humanities	3	Successfully complete 3 hrs of humanities with a passing grade chosen from the following: African American studies (Aas 201 , 202), classics (Clc), environmental studies (Envs 101), gender studies (G St 201 , 202), history (Hst), liberal arts (Liba 202 , 305 , 312), literature (Eng 103 , 220 -226), philosophy (Phil), religion (Rel), Southern studies 100-level, and either Hon 101 or 102 (if not being used to fulfill composition requirements).
3 hrs fine arts	3	Complete 3 hrs of fine arts with a passing grade chosen from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Courses that satisfy this requirement are any Art History (AH); Liba 130 , 204 , 314 ; Mus 101 , 102 , 103 , 104 , 105 ; Danc 200 ; Thea 201 , 202 .
3 hrs FA/Lang/Hum	3	Successfully complete 3 hrs of Fine Arts, Humanities, or Modern language with a passing grade. Modern Language include courses in courses in Ancient Greek (Gr), Arabic (Arab) nd Swahili (Swa). (Jpn), Korean (Kor), Latin (Lat), Portuguese (Port), Russian (Russ), Spanish
Econ 310	3	Successfully complete Econ 310 with a passing grade.
3 hrs social sciences	3	Successfully complete 3 hrs of social science with a passing grade chosen from anthropology (Anth), economics (Econ), political science (Pol), psychology (Psy), sociology (Soc), Liba 203 , 313 , or Hon 101 , 102

General Education II

Requirement	Hours	Description
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.

Requirement Hours		Description
Chem 116	1	Complete Chem 116 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

Major Requirements

Requirement Hours		Description
BME 200	2	Complete BME 200 with a passing grade.
BME 222	3	Complete BME 222 with a passing grade.
BME 305	3	Complete BME 305 with a passing grade.
BME 311	3	Complete BME 311 with a passing grade.
BME 313	3	Complete BME 313 with a passing grade.
BME 314	1	Complete BME 314 with a passing grade.
BME 315	3	Complete BME 315 with a passing grade.
BME 333	3	Complete BME 333 with a passing grade.
BME 370	3	Complete BME 370 with a passing grade.
BME 444	3	Complete BME 444 with a passing grade.
BME 461	2	Complete BME 461 with a passing grade.
BME 462	2	Complete BME 462 with a passing grade.

Major Requirements II

Requirement Hours		Description
CSci 256	3	Complete CSci 256 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.

Emphasis - Biomolecular

Requirement Hours		Description
Bisc 333	4	Complete Bisc 333 with a passing grade.
BME 520	3	Complete BME 520 with a passing grade.
6 hrs BME courses	6	Complete 6 hrs with a passing grade chosen from the following: BME 510 , 522 , 523 , & BME 524 .
9 hrs emph elect	9	Complete 9 hrs of biomolecular electives with a passing grade chosen from the following: Bisc 306 , 310 , 336 , 340 , Ch E 535 , 540 , 543 , 550 , Chem 222 , Chem 471 , Any BME 300 +, (Chem 222 & 471 paired).

Emphasis - Biodevices

Requirement Hours		Description
BME 301	3	Complete BME 301 with a passing grade.
BME 413	3	Complete BME 413 with a passing grade.
Engr 309	3	Complete Engr 309 with a passing grade.

Requirement	Hours	Description
Engr 312	3	Complete Engr 312 with a passing grade.
9 hrs emph elect	9	Complete 9 hrs with a passing grade chosen from the following: BME 353 , 411 , 510 , 511 , 520 , 522, 523, 524; M E 325 , 541 ; Math 301 , Math 319 .

Emphasis - Bioinformatics

Requirement	Hours	Description
Bisc 336	4	Complete Bisc 336 with a passing grade.
Csci 343	3	Complete Csci 343 with a passing grade.
Csci 475	3	Complete Csci 475 with a passing grade.
6 hrs Csci elective	6	Complete 6 hrs from the following with a passing grade: Csci 345 , CSci 356 , Csci 443 , Csci 444 , Csci 447 , or Csci 547 .

Emphasis - Pre Med

Requirement	Hours	Description
Chem 222 & 226	4	Complete Chem 222 & Chem 226 with a passing grade.
Chem 471	3	Complete Chem 471 with a passing grade.
Bisc 336	4	Complete Bisc 336 with a passing grade.
Bisc 440	4	Complete Bisc 440 with a passing grade.
6 hrs BME courses	6	Complete 6 hrs of BME courses with a passing grade chosen from the following: BME 510 , 520 , 522 , 523 , 524 .

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Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Specializations

School of Engineering

Chemical Engineering

- [Emphasis - Aeroacoustics](#)

Mechanical Engineering

- [Emphasis - Aeroacoustics](#)

Biomedical Engineering

- [Emphasis - Biomedical Engineering](#)

Chemical Engineering

- [Emphasis - Chemical Engineering](#)

Civil Engineering

- [Emphasis - Civil Engineering](#)

Electrical and Computer Engineering

- [Emphasis - Computer Engineering](#)

Computer & Information Science

- [Emphasis - Computer Science](#)

Electrical and Computer Engineering

- [Emphasis - EE \(Electromagnetics\)](#)
- [Emphasis - Electrical Engineering](#)

Geology & Geological Engineering

- [Emphasis - Environmental Engineering](#)

Chemical Engineering

- [Emphasis - Environmental Engineering](#)

Civil Engineering

- [Emphasis - Environmental Engineering](#)

Geology & Geological Engineering

- [Emphasis - Geological Engineering](#)
- [Emphasis - Geology](#)

Civil Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Geology & Geological Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Mechanical Engineering

- [Emphasis - Hydrology & Comp Hydroscience](#)

Chemical Engineering

- [Emphasis - Materials Science and Engr](#)

Civil Engineering

- [Emphasis - Materials Science and Engr](#)

Mechanical Engineering

- [Emphasis - Materials Science and Engr.](#)
- [Emphasis - Mechanical Engineering](#)

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Emphasis - Biomedical Engineering

- [Ph.D. in Engineering Science](#)
- [Emphasis - Biomedical Engineering](#)

Ph.D. in Engineering Science

Description

The Ph.D. in engineering science is offered in a number of emphasis areas: aeroacoustics, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, and material science and engineering.

Minimum Total Credit Hours: 54

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Emphasis - Biomedical Engineering

Description

A degree of Ph.D. in engineering science with an emphasis in biomedical engineering prepares graduates to apply interdisciplinary science and engineering tools to advance biology and medicine. Graduates will be able to independently solve problems, execute complex projects, and pursue successful careers in research, development, or management within engineering or biomedical science fields, as well as professional degrees such as medicine or law. Graduates will be especially prepared to enter research positions in academia, industry, or government agencies.

Course Requirements

The Ph.D. with an emphasis in biomedical engineering requires a minimum of 54 hours of graduate credit past the bachelor's degree. The only required courses are BME 600 (Graduate Professional Development) and 3 hours of BME 601 (Biomedical Engineering seminar). The remainder of the coursework is agreed upon by the student and his or her committee, 18 hours of which must be dissertation (Engr 797) credit. Students whose undergraduate degree is not in biomedical engineering may need to take additional courses to satisfy prerequisites.

Other Academic Requirements

Students in the Ph.D. program must achieve a GPA of 3.25 or higher on 12 credit hours selected by the committee before being eligible to take the Ph.D. candidacy exam. Selection must be done by the end of the first semester.

To be admitted to candidacy, the student must successfully write and orally defend an Original Research Proposal (ORP). The BME department will allow the ORP to be in the domain of the student's main research thrust with an understanding that the committee's job will be to ensure (through questions at the oral exam) that the student has mastered the course materials identified by the committee as the 12 hours on which he or she must achieve a 3.25 GPA. If a student fails the candidacy exam, he or she may retake the exam one time and this second attempt must be within six months of the first failed attempt.

After successfully passing the candidacy exam, the Ph.D. candidate must successfully write and defend a dissertation prospectus to his or her committee. Two opportunities are given to successfully complete the prospectus. If a student does not pass the first attempt, the second attempt must be completed within six months of the first failed defense. After successfully defending the

dissertation prospectus, the Ph.D. candidate is eligible to write and defend his or her dissertation. The prospectus defense and dissertation defense cannot occur within the same academic term. A candidate may defend his or her prospectus no more than twice. If a defense is not successful after the second attempt, the candidate will have to leave the program.

Dissertation

The student will be eligible to defend his or her dissertation upon: * Completion of at least 18 hours of Engr 797 * Having anticipated completion of the minimum 54 total credit hours by the end of the term of graduation * Approval by the student's committee who will evaluate if the elements of the prospectus have been sufficiently addressed. This defense approval committee meeting cannot occur during the same full term (fall, spring, full summer) as the anticipated defense, and there must be a minimum of four calendar months between these events. The committee's approval or denial to proceed toward a goal dissertation date must be submitted to and acknowledged by the graduate program coordinator. If denied, there must be written justification.

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