

COURSE DESCRIPTIONS

ACCT 204 3 Semester Credit Hours Prerequisite(s): ECON 103	Principles of Financial Accounting	(3:3:0)
This is an introductory course in financial accounting which incorporates International Financial Reporting Standards (IFRS)/GAAP and emphasizes the use of accounting information in an ethical manner. Topics covered include: Basic accounting concepts and processes with particular emphasis on double entries; the accounting cycle; transaction analysis; accounting for assets, liabilities, owner's equity, expenses and revenues recognition, preparation of financial statements and ethical decision-making.		
ACCT 205 3 Semester Credit Hours Prerequisite(s): ECON 103	Principles of Managerial Accounting	(3:3:0)
This is the first course in cost/managerial accounting. It discusses a range of introductory managerial accounting topics such as cost measurement and terminology, costs systems; analyzing cost-volume-profit relationships, job order and process costing, operating budgets, standard costing, introduction to capital budgeting and ethical managerial accounting-related decision-making.		
ACCT 311 3 Semester Credit Hours Prerequisite(s): ACCT 205	Managerial and Cost Accounting	(3:3:0)
This course extends topics studied in Principles of Managerial Accounting (ACCT 205), as well as covers topics; pricing decisions, and joint product costing. The course examines the application of Managerial Management Accounting concepts and skills in decision making, of contemporary management philosophies and techniques in relation to JIT, quality, transfer pricing, performance measurement and questions the relevance of various aspects of traditional management accounting for internal management decision.		
ACCT 321 3 Semester Credit Hours Prerequisite(s): ACCT 204	Governmental and Not-for-Profit Accounting	(3:3:0)
This course covers the conceptual framework of government accounting, restricted funds theory, instructions and procedures and the accounting treatment for government operations, internal control, control over revenues and expenditures, the government budget principles and stages, the general procedures to control government spending, operations and government receipts, the role of audit bureau of financial control, government accounts and types, the financial statements, the internal control systems on government purchases, and finally tendering and receiving supplies and its registration.		
ACCT 331 3 Semester Credit Hours Prerequisite(s): ACCT 204	Intermediate Accounting I	(3:3:0)
The aim of this course is to develop the learner's understanding of financial accounting that comprises complex topics related to measuring and reporting of cash, inventories, investments, property, receivables, revenue recognition principles, plant, and intangible assets, and equipment. Emphasis is placed on both accounting theory and practice and on the development of professional opinion and significant thoughts.		
ACCT 332 3 Semester Credit Hours Prerequisite(s): ACCT 331	Intermediate Accounting II	(3:3:0)
In this course, students examine the liability and equity sections of the balance sheet. Topics include current and other liabilities; applications to long-term liabilities; dilute securities and earnings per share (EPS); income taxes; pensions and other employee future benefits; leases; accounting changes and error analysis; statement of cash flows; and full disclosure in financial reporting.		
ACCT 352 3 Semester Credit Hours Prerequisite(s): ACCT 331	Taxation and Managerial Decisions	(3:3:0)
The objective of this course is to develop a sound conceptual and technical foundation for the study of federal tax system and thus provide students with the tools necessary to stay up to date with ever-changing tax laws, where these apply. The course will imbue students with sufficient understanding of the tax environment to identify important issues when evaluating business transactions.		
ACCT 361 3 Semester Credit Hours Prerequisite(s): ACCT 331	Accounting Information Systems	(3:3:0)
This course discovers the study and development of accounting information systems. The focus is on business processes covering many industries with an emphasis on accounting data modeling and internal control. Special topics including Extensible Business Reporting Language (XBRL) and commercial systems are incorporated throughout the course.		

ACCT 390 Internship in Accounting**3 Semester Credit Hours****Prerequisite(s): Completion of 90 credit hours**

The Internship is designed for candidates on the undergraduate accounting major programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation takes place at the beginning of the internship, and will serve to introduce the student to real-world business practices, culture and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.

ACCT 412 Auditing**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ACCT 331**

This course will cover: [1] Study and evaluation of internal control; [2] audit planning and assessment of risk; [3] audit evidence and documentation; [4] professional ethics; [5] Application of auditing and [6] audit report.

ACCT 444 Accounting Project Based Internship**3 Semester Credit Hours****Prerequisite(s): ACCT 331**

The accounting project-based internship course will provide students an experience of a self-employed work environment. The course will imbibe problem- solving skills and creative thinking among students. These life-long learning skills will enhance the employability skills of the students and their ability to become independent learners. The students will integrate the tools and concepts from the accounting specialization courses to develop strategies to solve problems. Through a coaching and mentoring process, the students would produce a project report, which will allow them to showcase their learning acquired during their four-year study.

ACCT 472 International Auditing**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ACCT 331**

This course discovers a broad overview of the global financial and accounting environment and addresses three areas: financial reporting, financial analysis, and planning and control of multinational enterprises. In addition, the course analyzes how different businesses operating in global environments influence accounting practices.

ACCT 491 Special Topics in Accounting**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ACCT 332**

This is an advanced subject and seminar course which covers major applications of Classical/current issues in Accounting. The topics to be covered will vary and will be announced by the end of the first week of commencing the course.

ARAB 100 Arabic Language and Culture for Visiting Students**(3:3:0)****3 Semester Credit Hours**

The course provides an introduction to the basics of the Arabic language. It aims to develop students' communicative competence in spoken as well as written Arabic. Intended to resonate with the experiences of non-native learners of Arabic who are visiting the UAE, the course's linguistic content is based within the contemporary culture of the region. The course is intended to stand-alone and not to serve as a prerequisite for any other university courses.

ARAB 101 Arabic Language and Culture for Non- Native Learners I**(3:3:0)****3 Semester Credit Hours**

Arabic for speakers of other languages helps develop students' communicative competence in the skills of speaking, listening, reading, and writing. The course provides for the acquisition of vocabulary, the study of grammar, and structures of spoken and written Arabic. Non-native speakers of Arabic gain insights into target language countries.

ARAB 102 Arabic Language and Culture for Non- Native Learners II**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ARAB 101**

Beginner Level Arabic II is a direct continuation of Beginner Level Arabic I. This course is designed to enhance the reading, speaking, and listening skills. With this course, students can increase their vocabulary and improve their grammar in Arabic.

ARAB 110 Arabic Language and Culture for Native Arabic Speakers I**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ENGL 101**

Arabic literature has developed many traditions though originating from a common source. The course is an introduction to representative texts from contemporary Arab writers, and their connections with the traditions of the past.

- ARAB 201 Intermediate Arabic I (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 102
 The course provides an introduction to academic sources of the language. This program is specially designed to teach Arabic to university level Arabic students.
- ARAB 202 Intermediate Arabic II (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 201
 Students engage in simple Arabic conversation on a range of everyday subjects, so students properly introduce themselves, and engage in simple conversation on a range of everyday topics. Building upon the basic foundation provided in Level I, topics include the definite article. Proper pronunciation and listening skills continue to be emphasized. In addition to readings and exposure to Arabic culture, students demonstrate further competence with structure and the pattern of words and sentences.
- ARAB 210 Arabic for Media: Native Speakers (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 110
 This course introduces Arabic language for Media: the language of print, broadcast, and digital media to Mass Communication native-speaking students. It aims to familiarize students with media vocabulary, text structure, and language usage. The course prepares Mass Communication students to apply requisite Arabic language skills and adhere to ethical norms in various mediums used in Mass Communication.
- ARAB 211 Arabic for Media: Non-Native Speakers (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 101
 This course introduces students to language used in Arabic media. The course covers the diverse media platforms and topics in the Arab world including weather news, deaths, special events, sports, advertisements, and economics. In each of those topics, the students will be equipped with requisite vocabulary and jargon used for discussing these in media.
- ARAB 311 Upper Intermediate Level Arabic Language and Culture for Native Arabic Speakers I (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): Arabic Placement Test
 Upper Intermediate Level Arabic Language and Culture I is the first course in a four-course sequence for the native Arabic speaker. All courses in the sequence are taught in Modern Standard Arabic (MSA). The course is designed to provide native Arabic-speakers with higher level linguistic skills in writing, reading, speaking, and listening. Emphasis is placed on grammar review, vocabulary acquisition, and composition. This course and the subsequent sequence of courses are tailored particularly to students interested in Arabic-English translation in the English Language and Mass Communication Programs.
- ARAB 312 Upper Intermediate Level Arabic Language and Culture for Native Arabic Speakers II (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 311
 Upper Intermediate Level Arabic Language and Culture II is a direct continuation of ARAB 311. It is designed to provide Arabic-speaking Translation and Mass Communications majors with the linguistic skills (writing, reading, speaking, and listening) that serve as a solid foundation to the journalistic expression in Arabic. Emphasis is placed on grammar review, vocabulary acquisition, and composition.
- ARAB 411 Advanced Level Arabic Language and Culture for Native Arabic Speakers I (3:3:0)**
3 Semester Credit Hours
Prerequisite(s) (s): ARAB 312
 This is a direct continuation of Arabic 312. The course substantially expands students' existing vocabulary and capability of expression, both orally and in writing. Literary texts of increasing sophistication are used in the course.
- ARAB 412 Advanced Level Arabic Language and Culture for Native Arabic Speakers II (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 411
 Advance -Level Arabic Language and Culture for Native Arabic Speakers II is a direct continuation of ARAB 411 and represents the fourth course in the Arabic Language and Culture for native speakers' sequence. This course provides a survey of themes and genres of Arabic literature from the mid- 19th century to the present. While focus will be on content, students will continue their acquisition of MSA through written and oral assignments designed for their advanced level of competency.
- ARAB 420 Special Topics in Arab Culture and Civilization for Native Arabic Speakers (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARAB 412
 Supplementing the four-course sequence in Arabic Language and Culture for native speakers, ARAB 420 will be taught in MSA. The course

critically examines issues, values, and institutions of the contemporary Arab world primarily through analysis and discussion of current events. While focus will be on content, students will continue their acquisition of Modern Standard Arabic through written and oral assignments designed for their level of competency.

ARCH 121 Basic Design I

(4:0:8)

4 Semester Credit Hours

An introduction to the basic design components: subject, form, content, with a focus on their dynamic interrelation. Through observation, analysis, discussion of traditional and contemporary approaches in fine arts, architecture and interior design, students learn to apply the elements and principles of visual organization to create projects using various methods.

ARCH 122 Basic Design II

(4:0:8)

4 Semester Credit Hours

Prerequisite(s): ARCH 121

The course introduces basics of design process and theory as it relates to the 3-dimensional world. Students are involved in hand-on exploration of simple structures and spaces using diverse materials and textures. Space function, volume, mass are discovered through designing a small-scale residential space(s), where design elements/principles are applied.

ARCH 221 Architectural Design Studio 1

(4:0:8)

4 Semester Credit Hours

Prerequisite(s): ARCH 122

Introduction to the application of design principles in architecture and to the technical conventions and expressions. Focus on elementary architectural design as it relates to function, structure, site, land plot and the environment.

ARCH 222 Architectural Design Studio 2

(4:0:8)

4 Semester Credit Hours

Prerequisite(s): ARCH 221

Design of medium scale buildings with an integrated program and moderate site conditions. Emphasis on human centered design process, impact of human and climatic factors on design solutions. Exploration of sustainability and particularly natural ventilation, daylighting, building materials in regards to the design intent and environment.

ARCH 223 Computer Architectural Drawing

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): INDS 122

Concepts, features and applications related to Building Information Modeling (BIM) are introduced. Students explore Autodesk® Revit Architecture structure, features, modeling and editing techniques, sheet creation and organization. Emphasis on modelling BIM models and rendering 2D and 3D interiors and exteriors (including site), furnishings, accessories and details for architectural projects.

ARCH 231 Building Construction 1

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): INDS 122

This course aims to introduce building materials, their properties, the impact of building materials and construction on environment and building codes. It focuses on sustainable methods of building technology as it relates to the site and construction and explores building systems, structure's types and elements (including foundations).

ARCH 232 Building Construction 2

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): ARCH 231

This course explores materials and buildings technologies employed in building envelope (including windows, doors, other openings) and interior construction (including fixtures, fitments, built-ins) and systems, thermal and acoustic insulation, waterproofing and damp proofing. Accents on selection of materials and building technologies with minimal negative impact on environment.

ARCH 241 History and Theory of Architecture 1

(3:3:0)

3 Semester Credit Hours

Introduction to history of art and architecture, and their development through the ancient civilizations of Egypt, Mesopotamia, Greece, and Rome. Analysis of historical monuments and buildings and their architectural characteristics. Emphasis on the Architectural principles, theories, and impact on the development of buildings throughout ancient times. Examining ancient historical patterns.

ARCH 242 History and Theory of Architecture 2

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): ARCH 241

Introduction to Early Christianity Architecture during the Middle Ages in Europe. The course begins with the origins of Christian architecture of the Early Christianity, Byzantine Architecture, Romanesque Architecture Gothic, Gothic Style in France and England, Gothic Style in Italy. The course concludes with the Architecture of the Baroque and Renaissance age.

- ARCH 321 Architectural Design Studio 3 (4:0:8)**
4 Semester Credit Hours
Prerequisite(s): ARCH 222
 Design of a building or a group of buildings with moderate complexity through different spatial, formal, and functional strategies. Consideration of psychological, environmental, and technical requirements influencing architecture and design. Experiment with green buildings design and explore passive design solutions.
- ARCH 322 Architectural Design Studio 4 (4:0:8)**
4 Semester Credit Hours
Prerequisite(s): ARCH 321
 Create sustainable multifunctional buildings or a group of buildings design, within an urban context, that responds to the nature of the site and intricate topography. Solve design problems related to building structure, building materials and technologies as influenced by the building type, function, urban context and environmental protection.
- ARCH 331 Building Construction 3 (3:2:3)**
3 Semester Credit Hours
Prerequisite(s): ARCH 232
 This course explores advanced building technologies and complex building structural configurations for long span buildings such as structural frames, space structure, suspended roof structure and air-supported structures. Offsite constructions, prefabricated and modular housing, envelopes to above listed types of building structures in relation to impact on environment are discussed.
- ARCH 336 Construction Drawings (3:2:3)**
3 Semester Credit Hours
Prerequisite(s): ARCH 223, ARCH 331
 This course will lead the students to explore the principles of BIM used to visualize, document and communicate professional architectural working drawings respecting national, regional and international building codes and regulations.
- ARCH 341 History and Theory of Architecture 3 (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARCH 242
 The study of the development of Islamic art and architecture and its characteristics since the dawn of Islam and the impact of social, cultural, environmental and functional factors on architecture in the Moslem world. Analysis of selected examples of historical monuments from Islamic countries and interpretations of contemporary Islamic Architecture.
- ARCH 342 History and Theory of Contemporary Architecture (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARCH 341
 The formation of modern theories and trends in contemporary art and architecture since the industrial revolution until today. Analysis of works by the pioneers of modern movements in architecture. Regional and vernacular architecture with special regards to environmental, social and technological issues. Selected examples of characteristic contemporary architecture in the UAE.
- ARCH 372 Sustainable Architecture (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ENVS 102
 The course addresses the relationship of the built environment to natural environment through a whole system approach, with a focus on sustainable design of buildings. The emphasis is on local green design approaches, energy efficiency, renewable energy, and the appropriate use and conservation of resources, including materials, water, and land.
- ARCH 390 Internship I**
3 Semester Credit Hours
Prerequisite(s): 90 credits and a CGPA of 2.0 or higher
 This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.
- ARCH 391 Internship II**
3 Semester Credit Hours
Prerequisite(s): Completion of 130 credits and a CGPA of 2.0 or higher
 This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

- ARCH 421 Architectural Design Studio 5 (4:0:8)**
4 Semester Credit Hours
Prerequisite(s): ARCH 322
 Introduce students to the integrated design process with multiple stakeholders and multidisciplinary approaches (structural, mechanical, environmental) through buildings with shared functions. Via independent study and creative solutions students explore approaches and processes of integrated design process and produce environmentally comprehensive and human-centered design solutions.
- ARCH 422 Architectural Design Studio 6 (4:0:8)**
4 Semester Credit Hours
Prerequisite(s): ARCH 421
 Design of a complex site and buildings through an integrated process taking in consideration the boundaries and exploring their mutual reciprocities. Emphasis on professional design thinking approaches that reflect student's personal values and ethical attitude that address issues of sustainability and technology in response to the project's functional requirements and regional context.
- ARCH 449 Technology of the Built Environment (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARCH 223
 This is an advanced level course that will allow students to discover the fundamentals of Parametric modeling for design applications in Architecture. Students will investigate rule-based and parametric design concepts and techniques in the context of a generative modeling environment: Dynamo for Revit.
- ARCH 454 Urban Planning (3:1:6)**
3 Semester Credit Hours
Prerequisite(s): ARCH 322
 Introduction to the environmental, social and economic aspects necessary in the formation of an urban planning process; the characteristics of the urban fabric and the development of cities and their urban elements into integrated, harmonious and functional unity; social services and infrastructure and their necessary provision according to norms and standards.
- ARCH 456 Sustainable Housing (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ENV5 102
 The course begins with a section on society and housing, exploring how sustainable housing practices build community. The second part of this course focuses on the relationship between society and the environment. We explore questions about how community growth has influenced the environment and how natural events affects our communities.
- ARCH 457 Urban Design (3:1:4)**
3 Semester Credit Hours
Corequisite(s): ARCH 463
 This course focuses on the definition, development and designing urban space concepts that both challenges and demonstrates students' knowledge and skills in urban design. Through advanced investigation of the history, theory and practice of urban design approaches, students learn the principles of place making, connections between people and places within the spatial layers of a city.
- ARCH 459 Conservation of Historic Environment (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): ARCH 341
 This course aims to provide students with knowledge about development of historic conservation theory and practice. Students will learn about the principal schools of thoughts, defining practices and new approaches to definition and assessment of cultural heritage. Students will explore a range of subjects and issues that affect contemporary heritage conservation practice, including its historical and philosophical underpinnings and its relation to sustainable environment.
- ARCH 463 Landscape Architecture (3:1:6)**
3 Semester Credit Hours
Prerequisite(s): ARCH 322
 The natural environmental equilibrium affecting different site scales. History of gardens, evolution through civilizations of the Mediterranean region & plant species in UAE. Landscape as gardens, open spaces & gathering areas. Introduction to environment-friendly concepts, energy conservation implementation on building sites. The influence of local climates to landscape designs.
- ARCH 466 Building Utilities II: Illumination, Acoustics, and Electrical Building Services (3:2:3)**
3 Semester Credit Hours
Prerequisite(s): MENG 468
 This course focuses on sustainable-green architecture design supported by the computer simulation of building energy use, natural ventilation, and daylighting. The simulation process utilizes research and simulation software to produce design evidence of the sustainability criteria. The course also may prepare undergraduate students for their further graduate studies in sustainability.

ARCH 473	Environmental Control	(3:3:0)
3 Semester Credit Hours		
The course focuses on sustainable-green architecture design supported by the computer simulation of building energy use, natural ventilation, and daylighting. The simulation process utilizes research and simulation software to produce design evidence of the sustainability criteria. This course also may prepare undergraduate students for their further graduate studies in sustainability.		
ARCH 485	Professional Practice	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ARCH 422		
An overview of the architectural practice complexities in historic and contemporary context; the roles and responsibilities of the architect with emphasis on the characteristics of best practices; the architects in the office from starting a practice, marketing and strategic planning of practice, methods of project delivery to design contracts and agreements and AIA documents as well as ethics and existence in the society.		
ARCH 487	Project Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ARCH 336		
The course covers key components of project management, including project integration, project scope management, project time and cost management, construction project, contract documents and types of specification depending on project nature, quantity surveying and quality management, human resource considerations, communications, risk management, and procurement management.		
ARCH 521	Architectural Design Studio 7	(4:0:8)
4 Semester Credit Hours		
Prerequisite(s): ARCH 422		
Contextual design of a group of buildings through complex design approaches and integrated urban design framework that might urban infill, upgrading existing built environment, or heritage buildings conservation via reuse, etc. Focus of demographics of the site, socio-economic, environmental conditions for users' wellness and life quality improvement.		
ARCH 591	Graduation Project Thesis Research	(2:1:3)
2 Semester Credit Hours		
Prerequisite(s): ARCH 422		
The course is oriented towards systematic analysis of the graduation project on selected topic, its functional and spatial relationships, location and setting, physical and human environments, use of case studies, and provision of synthesis and alternative concepts as design solutions. The outcome is presented in both forms, written as a report and visual as posters, to a jury of professionals. Writing Intensive Course		
ARCH 592	Graduation Project Design	(5:0:10)
5 Semester Credit Hours		
Prerequisite(s): ARCH 521 and ARCH 591		
Under the supervision of a faculty advisor(s), students independently develop design solutions on investigated architectural topic of personal interest selected for ARCH 591. Through final project jury presentation and portfolio, students demonstrate their ability to professionally develop design solutions and solve problems related to spatial, functional, aesthetic, social, environmental, technical and other aspects of the built environment.		
BIOL 095	Introductory Biology	(3:3:0)
3 Semester Credit Hours		
This course is offered for new science students without high school science backgrounds. The course provides an introduction to basic concepts in biology, cell energetics, genetics, diseases and biotechnology. This course is not for degree credit.		
BIOL 100	Humankind in a Biological World	(3:3:0)
3 Semester Credit Hours		
In this course, students will learn how human beings interact with, affect, and are affected by other living organisms. Ways in which human activities have had an impact on other life on earth, humankind and disease, and the development of scientific thought how we could solve this issue are examined.		
BIOL 112	University Biology I	(3:3:0)
3 Semester Credit Hours		
Corequisite(s): BIOL 113 University Biology I Laboratory		
Introduction to cell chemistry, metabolism, and genetics.		
BIOL 113	University Biology I Lab.	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 112		
Introduction to Cell Structure & Function and Basics on plant biology.		

BIOL 114	University Biology II	(3:3:0)
3 Semester Credit Hours		
Corequisite(s): BIOL 115		
This course is intended for science majors and pre-professionals in life sciences and provides an introduction to Genetics, Microbiology and animal form and function.		
BIOL 115	University Biology II Lab.	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 114		
This course encompasses the basic techniques in Biology for science majors and pre-professionals in life sciences that accompany BIOL 114.		
BIOL 230	General Microbiology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 114		
Corequisite(s): BIOL 231		
This course covers the classification of microorganisms, microbial metabolism, microbial growth, microbial genetics, structure of eubacteria, archaea, bacteria, fungi, and viruses, specific defenses, and diseases.		
BIOL 231	General Microbiology Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 230		
This course focuses on laboratory techniques involved in culturing, staining, and identifying microorganisms.		
BIOL 250	Biochemistry I	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 111 or CHEM 120		
Corequisite(s): BIOL 251		
Structure and chemical behavior of biochemical compounds, levels of protein structure, steady state enzyme kinetics and activities, protein purification, protein functions. Structure and functions of Carbohydrates, Nucleotides and Nucleic Acids, DNA-Based Information Technologies. Lipids and Biological Membranes and Transport.		
BIOL 251	Biochemistry I Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 250		
This experimental course will introduce students with hand practice of some major biochemistry techniques. This course has two parts, part A is wet lab where students learn and practice separation, identification, and quantization techniques that exploit properties of biological molecules. To analyze results, data and write reports to develop analytical reasoning and problem-solving skills. The second part B is dry/computer lab where students will use Geneious to study the 3D structures of biological macromolecules from PDB files (Protein Data Bank).		
BIOL 270	General Genetics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 112 or BIOL 114		
Corequisite(s): BIOL 271		
This course focuses on the basic concepts of heredity and modern developments in Genetics.		
BIOL 271	General Genetics Lab.	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 270		
This course covers basic laboratory techniques in Genetics that accompany the course BIOL 270.		
BIOL 322	Microbial Genetics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 270		
This course covers the basic concepts of microbial genetics including gene structure, gene expression and its control, and evolution of bacterial genetic diversity. The emphasis will be on topics such as mechanisms of genetic exchange, recombination, plasmids, analysis of bacteria and phage genomes, mutagenesis, and DNA repair. The course will also discuss the common methods using bacteria in gene cloning and identification and isolation of mutants		

BIOL 330	Applied and Industrial Microbiology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 230		
Corequisite(s): BIOL 331		
This course covers the biology of microorganisms of ecological and industrial significance and includes topics such as food production, spoilage and preservation, fermentation technology, waste disposal, water purification, biodeterioration, and decomposition.		
BIOL 331	Techniques in Applied and Industrial Microbiology	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 330		
This course includes laboratory exercises that illustrate applied methodologies in microbiology, including isolation of commercially useful strains, and discusses the production and purification of industrial products.		
BIOL 350	Biochemistry II	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 250		
This course covers the bioenergetics, Glycolysis, Gluconeogenesis, the Citric Acid Cycle and the oxidative phosphorylation and photophosphorylation. Lipid, amino acids and nucleotides Biosynthesis. DNA and RNA metabolism and gene expression regulation.		
BIOL 356	Virology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 230		
This course provides an overview of the characteristics of major families of viruses; the intrinsic properties of viruses that cause disease, their development, and life cycles; interaction with host cells; genetics; and tumor-inducing properties and epidemiology.		
BIOL 357	Artificial Intelligence in Biotechnology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): STAT 100 and Completion of 60 credits		
This course provides an overview of Artificial Intelligence (AI) in Biotechnology. It examines various AI-based techniques impacting the Biotechnology field. It provides guidelines to a potent AI decision framework to help understand the considerations associated with implementing AI in Biotechnology.		
BIOL 380	Biotechnology and Genetic Engineering	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 270		
Corequisite(s): BIOL 381		
This course focuses on the theory and applications of Biotechnology to real-world problems, emphasizing significance and societal applications.		
BIOL 381	Biotechnology Lab Methods and Techniques	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 380		
This course focuses on the fundamental practical techniques used in Biotechnology research and industry.		
BIOL 390	Internship	
3 Semester Credit Hours		
Prerequisites(s): Prior completion of 90 credits and CGPA of 2.0 or higher		
This is a supervised training experience for biotechnology-related duties for a duration of 240 hours at an approved biotechnology or biotechnology-related organization under the guidance of a designated site supervisor in coordination with a faculty supervisor.		
BIOL 411	Drug Discovery, Design and Development	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 350		
This course will explore the process of drug development, from target identification to final drug registration. It will present drug development as a process involving target selection, lead discovery using computer-based methods and combinatorial chemistry/high-throughput screening. Safety evaluation, bioavailability, clinical trials, and the essentials of patent law will also be discussed. Along the way, you will learn about molecular recognition, computer aided drug design, and toxicology as applied to the development of new medicines.		
BIOL 420	Molecular Biology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 270		

This course focuses on the basic concepts of structure and function of genetic material at the molecular level. Topics such as DNA replication, chromosome structure, gene expression and mutation, DNA repair, and transposable elements are covered in molecular detail.

BIOL 421 Molecular Biology and Recombinant DNA Lab. (1:0:3)

1 Semester Credit Hour

Corequisite(s): BIOL 420

This course focuses on the techniques in modern molecular biology techniques such as restriction mapping, isolation of DNA and RNA from eukaryotic cells, Southern hybridization, reverse transcription, and polymerase chain reaction (PCR and RT-PCR).

BIOL 423 Advanced Molecular Biology and Forensic Sciences (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 270

This is for forensic DNA practitioners, those interested in a career in forensic DNA and all students interested in broadening their understanding of the genetic principles that underlie the forensic application of DNA typing methods.

BIOL 424 DNA Fingerprinting and Serology Lab (1:0:3)

1 Semester Credit Hour

Prerequisite(s): BIOL 270

Corequisite(s): BIOL 423

Laboratory course to accompany BIOL 423 (Advanced Molecular Biology and Forensic Sciences). Focusing on the basic techniques used in forensic DNA laboratories, this course will introduce the students to the most recent DNA fingerprinting techniques and serological analysis.

BIOL 425 Advanced Genetics (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 270

This course discusses the principles of genetics and the role of genetic variations on the expressed phenotype in unicellular and multicellular organisms. The topics include genome structure and function, gene mutations, recombination, transposable elements, experimental genetics analysis, population genetics and diseases.

BIOL 430 Cell Culture Theory and Technology (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 270

This course aims at providing a strong foundation in the structure, growth, and function of plant and animal cells as well as the technology involved in cell and tissue culture, cell preservation, protoplast culture and fusion, cell cloning and fusion, monoclonal antibody production, breeding and genetic engineering. The applications of stem cells to therapy will also be emphasized in this course.

BIOL 431 Cell Culture Techniques Lab. (1:0:3)

1 Semester Credit Hour

Corequisite(s): BIOL 430

This course deals with the principles and practical applications of animal tissue culture. Molecular techniques or manipulation and maintenance of cells in culture using animal systems.

BIOL 434 Cell Communication and Signal Transduction (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 270

This course focuses on how cells communicate with each other and their microenvironment, the signaling events that result from these interactions, and their translation into cellular responses.

BIOL 435 Stem Cell Biology and Regenerative Medicine (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 270

This course provides a broad overview of the biological principles influencing stem cell populations and emphasizes the functional role of stem cells in regulating normal development and contributing to disease, as well as examines the therapeutic potential of stem cells in regenerative medicine.

BIOL 436 Immunology (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 270

This course focuses on the structure and function of immunoglobulins, the role of cell-mediated immunity, the protective role of the immune system, and disease and injury related to malfunctions of the immune system.

BIOL 440	Medical Microbiology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 230		
This course focuses on mechanisms of microbial pathogenesis, the host response, and the scientific approaches that are used to investigate these processes. The course provides a strong foundation in the methods to prevent, diagnose and treat infectious diseases. It also discusses laboratory tests used for the diagnosis of infectious diseases.		
BIOL 441	Medical Microbiology Lab.	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): BIOL 440		
The course covers a collection of techniques used for culture, isolation, and identification of common microorganisms. The topics aim to provide students with practical training on standardized methods for microbial identification including staining and microscopy, antibiotic susceptibility, and biochemical tests. In addition, the course provides in depth emphasis on some methods of disinfection, sterilization, and antimicrobial therapy.		
BIOL 442	Molecular Diagnostics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 380		
This course covers techniques used to analyze biological markers in the genome and proteome to diagnose human disease. The course examines modern tools employed to identify variations in the genetic material or proteins associated with specific health conditions. Additionally, the course emphasizes specimen handling and quality assurance in the molecular lab.		
BIOL 443	Molecular Diagnostics Lab	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): BIOL 380 and BIOL 381		
Corequisite(s): BIOL 442		
This course covers the basic concepts and techniques that are used in the diagnosis of disease. The students will be trained to have hands-on experience on several assays such as nucleic acid isolation, PCR, gel electrophoresis, restriction fragment length polymorphisms analysis, and ELISA. In addition, the course will prepare students to evaluate the controls for validating results, standardize tests, and discuss quality control for diagnostic laboratory.		
BIOL 450	Bioethics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): 90 credits		
This course examines selected ethical issues arising from the application of modern biotechnology to microorganisms, plants, animals, and humans. It also discusses the ethics and misconduct in research, authorship, and peer-review. (Writing Intensive Course)		
BIOL 462	Crime Scene Investigation	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 270		
This course will introduce students to crime scene investigation procedures and techniques. With a focus on crime scene processing, this course discusses the most recent topics on database technologies and DNA analyses.		
BIOL 464	Criminal Justice	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Completion of 90 credit hours		
This course will introduce students to the real world of criminal justice with a focus on topics related to understanding crimes, roles of the police, and the court system.		
BIOL 473	Bioinformatics and Computational Biology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 270		
This course is designed to provide instruction in the scientific concepts and computer skills currently used in searching biological databases, comparing sequences, looking at protein and DNA characteristics and answering biological and biomedical questions using databases.		
BIOL 480	Food Biotechnology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 270		
This course introduces students to the impact of Biotechnology on food production, the genetic tools applied in Food Biotechnology, the improvement of microbes used in food production by modern biotechnological approaches, and also discusses related ethical, legal, and regulatory issues.		

BIOL 481	Bioprocessing Technology in Pharmaceuticals Industry	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BIOL 380		
This course provides an overview of the main elements, theory and application of biotechnology procedures, and bioprocess design settings and operations related to the development of biopharmaceutical products including good manufacturing practices and bioprocessing equipment standards. The course lays emphasis on fermentation, harvest, primary and final purification, media and buffer preparation, equipment cleaning and sterilization, and critical process utilities.		
BIOL 490	Research Methods in Biology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Completion of 90 credits		
This course provides in-depth knowledge of research design and methodology and trains the student to evaluate scientific literature and write a research proposal. The emphasis is on interpreting and evaluating recent studies from scientific literature and communicating biological findings in a written and oral format to a range of audiences		
BIOL 491	Senior Seminar	(2:2:0)
2 Semester Credit Hours		
Prerequisite(s): 90 credits		
This is a capstone course and involves student participation in seminars on various Biotechnology topics.		
BIOL 493	Research Methodology in the Biological Sciences	(2:2:0)
2 Semester Credit Hours		
Prerequisite(s): Completion of 90 credits		
This course provides in-depth knowledge of research design and methodology and to train the student in writing a research proposal and critically reviewing scientific literature. The emphasis will be on interpreting and evaluating recent studies from the scientific literature and communicating biological findings in a written and oral format to a range of audiences. The course focus is to train students to critically review literature, identify a research question, lay out a detailed experimental plan including the statistical analysis, and discuss anticipated results.		
BIOL 494	Senior Project in Cell and Molecular Biotechnology	(4:0:12)
4 Semester Credit Hours		
Prerequisite(s): Completion of 90 credits and BIOL 490		
Under the guidance of Biotechnology faculty mentors, students will conduct a research project in the field of Cell and Molecular Biotechnology and present their research findings in both oral and written formats.		
BIOL 495	Senior Project in Medical Biotechnology	(4:0:12)
4 Semester Credit Hours		
Prerequisite(s): Completion of 90 credits and BIOL 490		
Under the guidance of Biotechnology faculty mentors, students will conduct a research project in the field of Medical Biotechnology and present their research findings in both oral and written formats.		
BIOL 496	Senior Project in Forensic Biology	(4:0:12)
4 Semester Credit Hours		
Prerequisite(s): Completion of 90 credits and BIOL 490		
Under the guidance of Biotechnology faculty mentors, students will conduct a research project in the field of Forensic Biology and present their research findings in both oral and written formats.		
BUAN 301	Analytics for Decision Making	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): OPMT 311		
This course is an introductory survey course in business analytics and is geared towards providing a broad coverage of descriptive, predictive, and prescriptive analytics techniques and applications within a business context. The course aims to introduce students to foundational concepts, methodologies, and tools required to understand the emerging role of business analytics in organizations, with a focus on decision making for efficiency, profitability, and sustainability. Through hands-on practice tutorials and assignments, students will also be introduced to computer-based modeling approaches to facilitate formulation, resolution, and interpretation of the results, and the process of transforming data into actions.		
BUAN 311	Business Data Mining	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): BUAN 301		
Data Mining (DM) is the non-trivial process of extracting implicit, novel, and useful information from large volume of data. It has emerged as a unique combination of several fields of science and technology including statistics, database systems, computer programming, machine learning, and artificial intelligence. This course is designed to provide undergraduate students with an understanding of data mining		

techniques, including data pre-processing, classification, clustering and association rules, as well as their applications in business intelligence, customer relationship management, marketing, credit scoring, churn and survival analysis. The students will also be introduced to Big Data and Big Data analytics. Students gain hands-on experience with the Rapid Miner software application. They will perform pre-processing and apply data mining techniques to analyze the selected data to discover useful and actionable patterns and information.

BUAN 312 Visual Analytics

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): BUAN 301

This course provides an in-depth view of working with data to extract and present valuable information. Students will learn to collect, clean, manipulate, analyze, and visualize data from various sources correctly and efficiently. Through hands-on application, students will gain an understanding of what problems can occur when dealing with a variety of data and what solutions exist. This course introduces data visualization as an analytical tool, a medium of communication, and the basis for interactive information dashboards. Students will learn best practices in data visualization, sharpen analytical skills, and learn how to design dashboards for use by stakeholders. Computing is a major component of this course, and students will learn a number of in-demand technical skills.

BUAN 390 Internship in Business Analytics

3 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

The Internship is designed for candidates on the undergraduate business analytics major programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation take place at the beginning of the internship and will serve to introduce the student to real-world business practices, culture and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.

BUAN 401 Business Data Engineering

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): MIST 301, BUAN 311

This course introduces students to the foundations of database management systems (DBMS), data warehousing fundamentals, practices, and technologies, and the challenges faced by businesses in managing large amounts of data and making meaningful use of this data for informed decision making. The course focuses on the basics of data pipelines, data pipeline flows and associated business use cases, and how organizations derive value from data and data engineering. Throughout the course, students will be introduced to various computing platforms for developing, deploying, configuring a wide range of data science applications for different business use-cases.

BUAN 411 Business Intelligence & Big Data Analytics

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): MIST 301, BUAN 311

As an intermediate-level course in business analytics, this course covers foundational theories and practices concerned with business intelligence and big data analytics. The course focuses on business applications of big data and provides an introduction to supporting technologies for big data analytics including MapReduce, Hadoop, Spark, and their ecosystems. The course also provides an introduction to the data analytics lifecycle to address business challenges that leverage big data. Examples of various types of BI use-cases for business decision-making will be discussed to allow students to identify and apply appropriate tools and methodologies to real-world business challenges and to facilitate data-driven decision-making.

BUAN 444 Business Analytics Project Based Internship

3 Semester Credit Hours

Prerequisite(s): BUAN 301

The business analytics project-based internship course will provide students an experience of a self-employed work environment. The course will imbibe problem-solving skills and creative thinking among students. These life-long learning skills will enhance the employability skills of the students and their ability to become independent learners. The students will integrate the tools and concepts from the business analytics specialization courses to develop strategies to solve problems. Through a coaching and mentoring process, the students would produce a project report, which will allow them to showcase their learning acquired during their four-year study.

BUSN 301 Business Communications

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): ENGL 101

This course introduces fundamentals of business models and writing as a learning tool. The interrelationships between accounting, finance, information systems, marketing, and operations are the subject of several “learning by writing” deliverables. The course teaches business students effective methods for communicating business-related issues to clients, management, and fellow employees. **(Writing Intensive Course)**

BUSN 304 Business Law

(3:3:0)

3 Semester Credit Hours**Prerequisite(s): Completion of 58 Credit Hours**

This course provides exposure to general legal environment of business, emphasizing government regulatory process, business ethics, and social responsibility. Regulatory topics include torts and crimes, product liability, intellectual property and cyber law, contracts, and issues related to employment and competition.

BUSN 306 International Business**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ECON 104**

This course offers a multi-disciplinary approach to global economic issues from the viewpoint of managing international business. It introduces salient aspects of managing in a globalized environment, including consideration of theoretical concepts. It provides a practical treatment of political-economic aspects of international trade. The course discusses foreign direct investment, global monetary systems, and strategy formulation for international business.

BUSN 307 Research Methodology**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): Completion of 58 Credit Hours**

This course provides essential underpinning support for research elements of higher-level business courses. It allows candidates to make informed decisions and appropriate choices pertaining to research methodology. A range of business research tools, approaches and analytical techniques are discussed, and guidance is given on optimal structuring of research work in the business field, and the generation of research proposals.

BUSN 312 Public Policy and Business Ethics**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): ECON 103**

This course introduces the policy and ethical dimensions of business as they relate to the various stakeholders inside and outside the organization. It includes topics such as actors, institutions and ideas in the policy process, business ethical theory, ethical decision making, ethical leadership, ethical and policy dilemmas, corporate social responsibility, and environmental sustainability.

BUSN 390 Internship**3 Semester Credit Hours****Prerequisite(s): Completion of 90 credit hours**

The Internship is designed for candidates on the undergraduate finance, marketing, human resource management and accounting programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation take place at the beginning of the internship and will serve to introduce the student to real-world business practices, culture, and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.

BUSN 391 International Internship**3 Semester Credit Hours****Prerequisite(s): Completion of 90 credit hours**

This course is designed for candidates on the Bachelor of Science in Business Administration to provide a field experience in which students are able to apply knowledge and skills gained through course work, and to demonstrate their capacity to function successfully in a professional setting. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues in international settings. Through this internship, the students will learn, and apply real-world management skills on an international level, and throughout the process, the student will complete the internship report to fulfil the course requirements. The vast majority of the work and value of this course, however, will come in the form of the international, intercultural, and interpersonal experiences gained throughout the period in the international workplace.

BUSN 498 Strategic Management**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): Completion of 90 credit hours**

This course is designed to help students apply functional knowledge gained from earlier courses and integrate these with more practical information and real-life experiences. The course takes the general management point of view, emphasizing the creation, implementation, and evaluation of strategy in organizations. Students adopt the viewpoint of upper management, strategize, and make essential "Big Picture" decisions, using standard strategic analysis frameworks. Students develop expertise in the analysis of complex business situations and in clearly presenting strategic findings both orally and in writing.

CENG 315 Microprocessors**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 112 and EEEN 331**

Microprocessors as components in a computer system; programmer's view of a microprocessor's architecture; microprocessor instruction set; assembly language programming; interrupts; input and output; interfacing a microprocessor to memory and I/O devices from the programmer's view. At the end of the course, the students should be able to program a modern microprocessor in assembly or C language and perform hardware I/O interfacing.

(1:0:3)

1 Semester Credit Hour

Prerequisite(s): CSCI 112

Corequisite(s): CENG 315

This course introduces microprocessors in a laboratory environment. Topics include: assembly language programming; hardware interface and design with common microprocessor peripherals, uVision Simulation, Software Setup, GPIO: LEDs and Joystick, LCD Display, Keypad, LED in Assembly, Stepper Motor in C and Assembly, System timer, PWM, ADC/Infrared Sensor and DAC / Digital Music.

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 331

Corequisite(s): CENG 336

This course covers details of microprocessor design including the instruction set architecture, memory design, and data path and control design. The course also emphasizes memory performance related concepts such as associativity and multi-level caching. Additional topics include virtual memory and performance speed-up techniques using pipelining, multithreading, and multiprocessing.

(1:0:3)

1 Semester Credit Hour

Prerequisite(s): EEEN 331

Corequisite(s): CENG 335

This course covers modern computer system architecture and computer design principles. A Hardware Description Language is used to design basic components of a microprocessor datapath and control. Additional topics covered include Adders, MUX, Counters, ALU, registers/shift registers, RAM, pipelining, and cache memory.

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 462

This course discusses socket programming, client-server applications, peer-to-peer networks and applications, Web servers, datacenters and load balancing, CDNs, IPV6, NAT, anycasting, DHCP, multimedia networking, network operation and management and basic Internet measurements.

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 215

This course examines in detail the software development process. Topics include concepts such as software processes, software lifecycle models, requirement engineering, system modeling, architectural design, software design implementation, software testing, software evolution, and software reuse.

(3:3:0)

3 Semester Credit Hours

Prerequisite(s):CSCI 232 or CENG 315

Corequisite(s): CENG 432

This course introduces the design and analysis of embedded computer systems that interact with the physical world. The course provides an integrated approach to the development of low-power systems with hardware, software, sensors, actuators, processors and networks. Topics include hardware and software architectures, assembly and C programming, real-time design, interrupts, multitasking, embedded software tools, and embedded systems performance. Students will work on a comprehensive project to design, implement, and evaluate a prototype embedded system.

(1:0:3)

1 Semester Credit Hour

Corequisite(s): CENG 431

In this lab course, students will design microcontroller-based embedded systems for various applications. Topics covered include interfacing to sensors and actuators from both hardware and software perspectives, assembly and C programming for embedded systems I/O, real-time design, and interrupts. Additionally, students will implement and evaluate a complete embedded system.

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CENG 335

This course provides students with a deep understanding of parallel computing architectures including multicore CPUs and GPUs. The course emphasizes trade-offs involved in design of modern parallel computing systems, and techniques necessary to effectively utilize these machines. Topics covered include data-level parallelism, thread-level parallelism, GPU architectures, cache coherence, memory consistency, interconnection networks, reconfigurable computing and domain-specific parallel programming systems.

CENG 461 **Network Security**

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): MATH 225 and CSCI 462 or EEEN 462

This course examines information security services and mechanisms in a network context. Topics include Cryptographic tools, User Authentication, Authorization and Access Control, Database Security, Malicious Software, Denial of Service Attacks, Firewall and Intrusion Prevention, Software Security, Operating System, Internet Security Protocols and Standards. Stack and Buffer Overflow, Security Auditing, Forensics, Ethical and Legal aspects, and Wireless Network Security.

CENG 492 Senior Design Project I

(2:0:6)

2 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

Corequisite(s): ENGR 450

This is the first course of a capstone project that requires students to develop, design, and implement a solution to an engineering problem under the supervision of a faculty advisor. Students are required to consider the ethical, social, and economic implications of their project. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resource, procurement, and communication, with consideration of ethical and professional conduct.

CENG 493 Senior Design Project II

(4:0:12)

4 Semester Credit Hours

Prerequisite(s): CENG 492

Implementation of the project for which preliminary work was done in CENG 492. Project includes designing and constructing software and/or hardware, conducting experiments or studies, and testing and validating a complete system. At the end of the term, each team presents to a committee information related to its project in both written and oral formats.

CHEM 095 Introductory Chemistry

(3:3:0)

3 Semester Credit Hours

This course is an introduction to the basic chemistry notions such as atomic structure, molecules and mole concept, periodic classification of elements, naming of compounds, chemical formulas and equations and its balancing, the basic understanding of simple compounds of carbon and its applications, the influence of chemistry in the environment, and its scope for application in other fields of study. This course is not for degree credit. Placement in this course is based on the student's score on the Chemistry Placement Test.

CHEM 100 Chemistry in Everyday Life

(3:3:0)

3 Semester Credit Hours

This course focuses on chemistry and its impact in everyday life. Basic chemical principles, the impact, and practical everyday applications are examined. Environmental concerns including energy, resource consumption and pollution as well as the crucial role involved in making informed opinions and better consumer choices in our society is addressed.

CHEM 101 Chemistry in Everyday Life Lab

(1:0:3)

1 Semester Credit Hour

A chemistry appreciation course for non-science majors. Covers basic chemistry concepts with technical/fundamental aspects. Emphasizes the practical chemical world of human beings and the chemical nature of everyday products. Hands-on laboratory sessions provide the opportunity to put the scientific method into action allowing further exploration and reinforcement of chemical principles.

CHEM 111 Principles of General Chemistry

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): None

Corequisite(s): CHEM 112

This course introduces students to the fundamental principles and laws of chemistry. This course covers coordination compounds, acid-base equilibrium, chemical equilibrium, solubility and complex-ion equilibria, thermochemistry, gas laws, and solutions. Introduction to organic chemistry, electrochemistry and nuclear chemistry.

CHEM 112 Principles of General Chemistry Lab

(1:0:3)

1 Semester Credit Hour

Corequisite(s): CHEM 111

This course introduces chemistry lab techniques and provides hands-on experience in conducting chemical reactions that accompany the course CHEM111. It provides experience in basic techniques for the synthesis of coordination complexes and physical chemistry-based experiments.

CHEM 120	Analytical Chemistry	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
Corequisite(s): CHEM 121		
This course emphasizes quantitative chemical analysis and underlying principles. Specific analytical techniques or concepts covered are: basic understanding of analytical chemistry including experimental error, statistical analysis of data, quality assurance, calibration methods, introduction of titrations, and polyprotic acid base equilibria. This course will introduce spectroscopic, separation, gravimetric, and combustion methods for quantitative chemical analysis.		
CHEM 121	Analytical Chemistry Lab	(1:0:3)
1 Semester Credit Hours		
Corequisite(s): CHEM 120		
Laboratory techniques and experiments arranged to accompany course Analytical Chemistry (CHEM 120). The aim of this course is to teach students the basic principles of analytical chemistry. The course covers the preparation of reagent, statistical evaluation of replicated data measurements and studies the validity of results. In addition, the analysis of unknowns using different analytical qualitative and quantitative methods is also enclosed.		
CHEM 211	General Chemistry I	(3:3:0)
Prerequisite: None		
3 Semester Credit Hours		
This course forms the foundation of chemical concepts: basic facts and principles of chemistry, including atoms, molecules, ions, chemical reactions, gas theory, thermochemistry, electrochemistry, chemical kinetics and equilibrium, molecular geometry, and states of matter.		
CHEM 212	General Chemistry I Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): CHEM 211		
This is a Laboratory class that is a companion class to CHEM 211 with laboratory techniques and reactions arranged to reinforce concepts. This laboratory course provides experience in physical-chemical measurement, synthesis-based experiments, qualitative, and quantitative analysis.		
CHEM 213	General Chemistry II	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 211		
Corequisite(s): CHEM 214		
This course covers the foundations of chemical concepts including: solutions, chemical reactions, acid base equilibrium, acids and bases, quantum theory of atoms, solubility and complex-ion equilibrium, chemistry of main group elements, polymer chemistry, and introduction of organic and nuclear chemistry, transition elements and coordination complexes.		
CHEM 214	General Chemistry II Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): CHEM 213		
This course introduces Laboratory techniques and reactions arranged to accompany CHEM-213. This laboratory course provides experience in physical /chemical measurement, synthesis-based experiments, qualitative, and quantitative analysis.		
CHEM 215	Organic Chemistry I	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 111 or CHEM 120 or CHEM 211		
Corequisite(s): CHEM 216		
This course provides a foundation in Organic Chemistry and includes the theoretical and synthetic aspects of the chemistry of carbon compounds.		
CHEM 216	General Organic Chemistry Lab I	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): CHEM 215		
This course provides hands-on laboratory experience in techniques and chemical reactions in organic chemistry that accompany CHEM 215. The course includes basic techniques for the preparation, isolation, purification, inter-conversion, and spectroscopic study of common classes of organic compounds.		

CHEM 217	Organic Chemistry II	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 215		
Corequisite(s): CHEM 218		
This course focuses on aromatic organic chemistry, stereochemistry, organic chemistry reaction mechanisms, bio-molecules and the methods used for the synthesis of organic compounds.		
CHEM 218	General Organic Chemistry Lab II	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): CHEM 217		
This course provides practical experience in common techniques for synthesis, separation, purification, and identification of organic molecules such as NMR, Mass Spectrometry, and Fourier Transform Infrared spectroscopy, as well as the qualitative analysis of functional groups.		
CHEM 315	Physical Chemistry	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 215		
Corequisite(s): CHEM 316		
This course will introduce the concepts of physical chemistry, properties of gases, first and second law of thermodynamics, physical transformation, phase diagram, chemical equilibrium, atomic structure and spectra, molecular structure, spectroscopy, chemical reactions, statistical thermodynamics, kinetics and dynamics of chemical reactions.		
CHEM 316	Physical Chemistry Lab.	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): CHEM 315		
Introductions to the techniques and reasoning of experimental chemistry. Lab techniques and reactions arranged to accompany Physical Chemistry.		
CHEM 411	Medicinal Chemistry	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 217		
This course examines principles of structural, physical, and physical-organic chemistry, including mechanistic considerations involved in synthetic organic chemistry, bioorganic chemistry, and the design of chemotherapeutic agents. This course includes mechanisms of action and factors that influence drug action within specific drug classes of pharmaco-dynamic and chemotherapeutic nature, drug structures, chiral drugs, and structure-activity relationships of drugs.		
CHEM 420	Forensic Chemistry	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 120		
Corequisite(s): CHEM 421		
Foundation of forensic chemistry: applications of the principles, methods, and instrumentation of chemistry to forensic problems. Covers topics most commonly applicable to the functions of a crime laboratory professional.		
CHEM 421	Forensic Chemistry Lab	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): CHEM 121		
Corequisite(s): CHEM 420		
This course introduces laboratory techniques to the forensic analysis of trace evidences according to established forensic procedures. The focus of the course will be on identifying and understanding the nature of the samples, sample preparation methods, chemical and instrumental methods for analysis.		
CHEN 202	Principles of Chemical and Petroleum Engineering	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CHEM 211		
This course introduces the students to chemical and petroleum engineering profession. The course is designed to equip students with the fundamental of chemical and petroleum engineering such as introduction to the chemical and petroleum industry, crude oil formation, exploration and drilling, introduction to chemical engineering calculations, problem solving techniques, material and energy balance for reactive and nonreactive systems.		
CHEN 301	Computational Tools in Chemical and Petroleum Engineering	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): CHEN 202		

The course covers the use of various software in solving basic chemical and petroleum engineering problems related to thermodynamics, fluid mechanics, reaction engineering and separation problems. In addition to utilize computational tools for simulation of oilfield economics.

CHEN 312 Chemical Engineering Thermodynamics (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEM 315

This course aims to introduce the principles of Chemical Engineering Thermodynamics and illustrate their application. The content comprises the fundamentals of thermodynamics, such as thermodynamic properties (energy, entropy, enthalpy, heat capacity, etc.), the first and second law of thermodynamics (energy and entropy balance), heat of reactions, thermodynamics of ideal and real gases and liquids, vapor-liquid equilibrium and thermodynamics of chemical reaction processes. In addition, to the use of software tools to solve different thermodynamic problems.

CHEN 351 Chemical Reaction Engineering (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 202 and CHEM 315

This course provides a detailed analysis to the principles of chemical kinetics, and reactor analysis and design. The course covers kinetics of homogeneous and heterogeneous reactions, design of isothermal reactors such as Batch, Continuous Stirred Tank Reactor (CSTR) and Plug Flow Reactor (PFR). Other topics include data collection and handling, non- isothermal reactor design and multiple reactions. The last part of the course considers homogeneous and heterogeneous catalytic reactions. Further, the course introduces the link between the theoretical part and the laboratory scale chemical reactors through physical tour of the Chemical Engineering Laboratory facility.

CHEN 352 Chemical Reaction Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): CHEN 351

This course covers experiments that deal with chemical reactions over different set of reactors including batch, tubular and continuous stirred tank reactors. Performing theoretical calculations and experimentation on real and virtual reactor systems for homogeneous phase as well as catalytic reactions.

CHEN 370 Heat and Mass Transport (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 251

Corequisite(s): CHEN 312

This course introduces the physical origins and the governing laws for heat and mass transfer. The principal topics covered include identification of the driving forces for heat and mass diffusion, development of transport models from first principles, steady state and transient solutions, fundamentals and engineering treatment of convection heat and mass transfer, heat transfer with phase change, radiation heat transfer in addition to interfacial mass transfer and continuous stage-wise contact operations. Further, the course introduces the link between the theoretical and experimental design of heat and mass transfer equipment.

CHEN 372 Thermal and Fluid Sciences Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): CHEN 370

This course is composed of a set of selected experiments which demonstrate and apply the concepts of fluid, heat and mass transfer. The course aims to develop student's basic knowledge in: volumetric properties of pure fluids, principles and concepts related to heat transfer, principles of steam and power systems, principles of fluid flow (laminar flow and turbulent flow) and principles of heat exchangers. The lab also includes an open-ended design of experiment.

CHEN 403 Fundamentals of Biochemical Engineering (3:3:0)

3 Semester Credit Hours

Prerequisite(s): BIOL 112 and CHEN 351

Corequisite(s): CHEN 370

This course aims to apply the principles of Chemical Engineering in bioprocess, in which biocatalysts, i.e. cells and enzymes, play key roles in producing new bioproducts and chemicals. The purpose of this course is to introduce the fundamental principles of biochemical engineering and present a wide spectrum of potential technological applications. This course includes introduction to biochemical and microbiological applications to commercial and engineering processes, including industrial fermentation, ultrafiltration and resulting waste treatment. In addition to introduction to enzyme kinetics, cell growth, energetics and mass transfer.

CHEN 404 Safety and Environmental Impact (3:3:0)

3 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

The course introduces students to sources and type of material and energy hazards in chemical and petroleum industries. Topics include fire and explosion risks, loss prevention strategies, safety program implementation, and adherence to safety regulations. Additionally, it

explores the significance of engineering ethics in process safety, models for the release of materials, energy, and pollutants, as well as industrial hygiene and risk analysis.

CHEN 452 Introduction to Hydrogen Technologies (3:3:0)

3 Semester Credit Hours

Pre-requisite(s): CHEN 351 and CHEN 370

This course covers the fundamentals of hydrogen technologies including: methods of hydrogen production (with emphasis on “green” and ‘blue’ hydrogen production), storage, transportation and utilization for energy applications. The course provides a broad knowledge of hydrogen as an energy carrier, the way it will play an important role in various sectors towards decarbonization, current limitations and future scenarios.

CHEN 462 Petroleum Refining Engineering (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 351 and CHEN 370

This course aims at introducing different techniques for petroleum refining. Topics include refinery feed stocks and products, field processes, crude distillation, coking and thermal processes, catalytic reforming and cracking, hydro- processing, and solvent treating processes. Solve petroleum-refining problems including material balances and process economics. Conduct lab experiments to characterize crude oils and final petroleum products. Students will do a case study of a typical refinery.

CHEN 463 Natural Gas Engineering (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 370

This course introduces the natural gas properties including real gas mixtures behavior in addition to flow of gas in reservoir, wellbore and surface pipelines. The course also deals with natural gas water systems, natural gas condensate systems, hydrate formation and inhibition, separation processes, field treatment of natural gas, absorption and adsorption processes, natural gas dehydration, sweetening and sulfur recovery, designing and sizing of the main equipment and performing nodal analysis for gas production system.

CHEN 464 Industrial Catalysis (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 351

This course will provide a comprehensive overview of homogenous and heterogeneous catalytic science and technology for different chemical engineering industry. Course modules will cover the preparation and characterization of catalyst systems, kinetics and mechanism of catalyzed reactions including adsorption, desorption and surface reactions. Emphasis will be placed on understanding the design, synthesis, characterization and industrial application of various catalytic systems.

CHEN 471 Unit Operation Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): CHEN 472

This course aims to deepen the students’ knowledge of the unit operations with a focus on distillation, absorption, liquid-liquid extraction, membrane and drying processes. This course requires students to integrate and apply knowledge from previous chemical engineering courses to design experiments, collect data, analyse results and make recommendations. Students will also work on developing oral and written technical communication skills. **(Writing Intensive Course)**

CHEN 472 Separation Processes (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 370

This course aims to introduce the fundamental principles of Separation Processes through examining both equilibrium-controlled separation processes as well as separation processes that involve both mass transport and equilibrium considerations. In order to probe the key concepts in depth, the course will focus primarily on binary and multi-component distillation, leaching, absorption, membranes and liquid-liquid extraction. Furthermore, Computer instruction will be employed throughout the course to illustrate important characteristics of these separation systems.

CHEN 473 Water Desalination (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 370

This course covers water resources, chemistry of saline water, modeling and analysis of single effect desalination combined with mechanical vapor compression and thermal vapor compression, modeling of multiple effect desalination (MED), modeling of single and multistage desalination processes, reverse osmosis. Also, cogeneration, scale formation, pre and post treatment operations will be discussed.

CHEN 474 Industrial and Wastewater Treatment (3:3:0)

3 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

This course covers characteristics of industrial wastewater; physical, chemical and biological unit operations/processes in industrial wastewater treatment; non-conventional (advanced) wastewater treatment technologies; case study of industrial wastewater treatment processes.

CHEN 476 Fundamentals of Nanotechnology

(3:3:0)

3 Semester Credit Hours

Pre-requisite(s): CHEN 351 and CHEN 370

The general goal of the course is to provide an introduction to and an overview of nanotechnology (NT). The course handles the basics of nanomaterials and nanotechnology and its applications. It will provide an insight into the chemical materials and fabrication lines nowadays used in nanotechnology. The course will also demonstrate how the applications of NT will influence science of tomorrow and will change many sides of our life as well as discussing the impact of NT on our society.

CHEN 481 Process and Plant Design

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): MENG 241 and MENG 323

Corequisite(s): CHEN 472

Application of chemical engineering principles to the development of process flow diagrams including flow and process conditions. Estimation of capital and manufacturing cost and application of heuristic methods to the design of process equipment. Design of heat and separation sequences of chemical processes. Utilization of process simulators to develop process flow diagram and size equipment.

CHEN 482 Chemical Process Dynamics and Control

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 301 and CHEN 351

This course aims to introduce process dynamics and principles of control for chemical processes. Topics covered include block diagrams, Laplace transforms, development of dynamic equations for elements of control loops, transient response of feed-back systems, stability characteristics of dynamic systems, gain and phase margins. In addition to development of process characterization using mathematical models, controller design, and implementation.

CHEN 483 Advance Simulation Lab

(1:0:3)

1 Semester Credit Hours

Prerequisite(s): CHEN 312

Corequisite(s): CHEN 472

This course focus on the use of process simulators such as HYSYS, ASPEN PLUS and COMSOL in designing and simulation of chemical processes and its applications. In addition to data generation, analysis, thermodynamic modeling, and process economic analysis using simulation software.

CHEN 484 Process Integration and Optimization

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CHEN 481

This course aims to introduce the concepts, tools and applications of heat and mass integration using pinch technology and application of linear and nonlinear programming for process integration and optimization. In addition to application of heat and mass integration in process design and retrofit. Graphical and mathematical procedures are emphasized for analyzing process performance. Case studies and examples will be used to illustrate how process integration helps in optimizing actual industrial processes.

CHEN 485 Carbon Capture, Utilization and Storage

(3:3:0)

3 Semester Credit Hours

Pre-requisite(s): Completion of 90 credit hours

The course aims to provide students with a comprehensive overview of Carbon Capture, Utilization and Storage (CCUS) technologies. The course will cover methods and technologies related to removing CO₂ from the flue gas and the atmosphere, followed by recycling the CO₂ for utilization and determining safe and permanent storage options. In addition, the full spectrum of economic, environmental, regulatory, and their implications for regional and global carbon management strategies of the future will be discussed.

CHEN 486 Data Science in Chemical Engineering

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): ENGR 200

Corequisite(s): Completion of 90 credit hours

This course is an introduction to data science and machine learning with specific focus on chemical engineering applications. It will cover data access and management, databases and data warehousing, statistical methods including classification and clustering, time series, various regression methods and multivariate statistics and data visualization. In addition to the use of artificial intelligence and machine learning to solve chemical engineering problems.

CHEN 491 Senior Design Project I

(3:0:9)

3 Semester Credit Hours

The Senior Design Project entails team work involving development of a two-semester long workflow that includes preparing and presenting a proposal for a major design work. The design work may involve physic-chemical process design and testing, or simulation workflow design related to one or more chemical engineering activities, such as, reaction, separation, mass or heat transfer and dynamic and control– with due consideration of economic, environmental and societal impacts. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resource, procurement, communication, with consideration of ethical and professional conduct.

(3:0:9)

The Senior Design Project entails team work involving development of a two-semester long workflow that includes designing, implementing and evaluate the propose solution to a certain engineering problem. The design work may involve process design and testing, or simulation workflow design related to one or more chemical engineering activities, such as, reaction, separation, mass or heat transfer and dynamic and control – with due consideration of economic, environmental and societal impacts. The SDP-II entails finalizing the tasks planned in SDP-I. Students must present their work in a detailed technical report and defend their project in oral presentation.

(3:3:0)

A specific topic in Chemical Engineering that is not covered in other program courses is presented in a course format.

(3:1:4)

Introduction to computer graphics. Includes the following topics: geometric construction; line convention; orthographic projections, isometric projections; oblique projections; Descriptive projections; dimensioning, and sectional views. Computer-aided design and problem-solving techniques. Uses computer software AutoCAD in data analysis, data display and visualization techniques. Prepare drawings in civil and infrastructure engineering.

(3:3:0)

Vectors, force systems (2D and 3D), equilibrium of particles and rigid bodies (2D and 3D), structures (trusses, cables, frames and machines), distributed forces (centroids and centers of mass), internal forces (shearing force and bending moment diagrams), friction, and moment of inertia.

(3:3:0)

Types of loads, axial stress and strain of determinate and indeterminate system, normal and bending moment diagrams, torsion of determinate and indeterminate system, bending of beams, combined stresses, shearing stress and strain, Mohr's circle of stress and strain, thin walled pressure vessels.

(3:3:0)

Equilibrium of a rigid body, force systems, geometric properties of various shapes, internal forces in beams, trusses, and frames, analysis of three-hinged and tied arches, construction of shear force and bending moment diagrams for beams and frames, mechanical properties of materials, axial, shear, and bending stresses in members, stability, determinacy and indeterminacy of beams and trusses.

(3:3:0)

An introduction to infrastructure management systems, including management process, data collection technologies, interdependence, benchmarking and best practices. Other related issues, such as, resilience security of infrastructure systems are addressed.

(3:3:0)

Prerequisite(s): MATH 123 & GEN 211 (Civil Engineering) and MATH 114 and PHYS 110 (Chemical, Mechanical, and Petroleum Engineering). Properties of fluids, flow regimes, pressure and force calculations under hydrostatic conditions, manometers, buoyancy and stability of floating and submerged bodies, elementary fluid dynamics, conservation equations: mass, energy and momentum, continuity and Bernoulli equations. Boundary layer theory, fluid flow in conduits and determination of head loss in pipes.

CIEN 261	Surveying	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): CIEN 201 (for Civil and Infrastructure Engineering); INDS 122 (for Architecture Students)		
Principles of surveying by conducting tests on distance measurements, levels and theodolites, directions and angular measurements, topographic surveys, areas and volumes; traverse surveys; setting out horizontal and vertical curves, training on Total Station.		
CIEN 265	Geographic Information System (GIS)	(2:1:3)
2 Semester Credit Hours		
Prerequisite(s): CSCI 112 or CSCI 114		
This course exposes students to the principles of GIS (hardware, software, people, data, and methods) and its environmental and infrastructure management applications. Subjects also include the acquisition and compilation of data from maps, field surveys, air photographs and satellite images. The course includes hands-on GIS state-of-the-art software.		
CIEN 301	Numerical Analysis	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 214 and (CSCI 112 or CSCI 114)		
Matrix Algebra: Matrix operations, inverse, determinant, Eigen vectors, Eigen Values and solutions of systems of linear equations. Application of computers to solve engineering problems using various numerical methods, mathematical modeling and error analysis, solution of algebraic and differential equations, numerical differentiation and integration and curve fittings. Presents application examples from civil and infrastructure engineering, industrial engineering and mechanical engineering.		
CIEN 311	Structural Analysis	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CIEN 212		
Structural forms, reactions, determinate structures, degree of determinacy, shear and moment diagrams for beams and frames, influence lines for beams, deflections (principle of moment area theorems, virtual work and conjugate-beam methods), Analysis of indeterminate structures by moment force method, slope-deflection method and distribution method.		
CIEN 316	Structures for Architecture 2	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CIEN 216		
Introduction to concrete, structural steel, and masonry as construction materials. Design of rectangular reinforced concrete beams reinforced concrete one-way slabs, and simple design of reinforced concrete short columns according to ACI 318 design code. Design of simple masonry walls. Design of structural steel beams and structural steel columns according to LRFD design method.		
CIEN 321	Reinforced Concrete Design	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CIEN 311 and CIEN 331		
Properties of concrete and steel, cracked and uncracked section analysis, strength design, stress block, design for bending and shear, singly, doubly reinforced sections, rectangular sections, and T-sections, load cases and moment envelopes, bond requirements, development length and bar cutoffs, one-way solid and one-way ribbed slabs, design of short columns.		
CIEN 331	Construction Materials	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CIEN 212 and CHEM 211		
Cement (types, manufacture, properties and hydration), aggregates, fresh concrete, hardened concrete (strength, strength development, shrinkage, creep), concrete in severe environment (hot and cold), durability, mix design by ACI and DoE methods, use of masonry, fiber reinforcement and metal form decking and structural steel joists.		
CIEN 332	Construction Materials Lab.	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): CIEN 212 and CHEM 211		
Corequisite(s): CIEN 331		
Introduction to testing & specifications, concrete and mortar tests, aggregate testing, fresh and hardened concrete testing, non-destructive tests, design & testing of concrete mixes, brick testing, tests on steel reinforcing bars.		
CIEN 333	Geotechnical Engineering	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): CIEN 212 and CHEM 211		
Index and classification of soils, water flow in soils (one- and two-dimensional water flow), soil stresses, soil compaction, distribution of stresses in soil due to external loads, consolidation and consolidation settlement, shear strength of soils, slope stability.		
CIEN 334	Civil Engineering Testing and Materials	(1:0:3)

1 Semester Credit Hour**Prerequisite(s): CIEN 331, CIEN 333****Corequisite(s): CIEN 361**

Tests on soils: specific gravity, grain size distribution, consistency limits, coefficient of permeability (constant and falling head), consolidation test, direct shear and tri-axial and CBR. Tests on fluids: Center of pressure, orifice and jet flow, Pressure variation in flowing fluid, momentum principle, flow through pipelines and closed conduits. Tests on asphalt properties, and marshal mix design. **(Writing Intensive Course)**

CIEN 351 Environmental Engineering**(2:2:0)****2 Semester Credit Hours****Prerequisite(s): None**

Introduces principles of environmental engineering management and design pertaining to water supply and treatment, wastewater treatment, solid waste management, air pollution control, noise pollution measurement and control, and environmental impact assessment. Includes case studies from UAE.

CIEN 361 Highway Engineering and Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 331**

Pavement types; Materials used in flexible pavement layers (soil, aggregate, and asphalt); Calculation of Equivalent Standard Axle Loads (ESAL); flexible pavement thickness design, Hot Mix Asphalt (HMA) design; Highway construction operations; highway performance.

CIEN 362 Transportation Engineering**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 261**

Role of transportation engineering; Transportation system issues and challenges; Modes of transportation, Main components of highway, mode of transportation (driver, pedestrian, traffic, road); Geometric design of highways and highway facilities; Highway functional classification and special facilities; Intersection design and control. Introduction to rail, air, and water transportation.

CIEN 421 Structural Steel Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 311**

Introduction to steel structures and practical design methods, steel sections, load factors and load combinations, design of various steel elements using LRFD-method, design of tension and compression members, beam design: Compact section criterion, lateral-torsional buckling, lateral supports, and various design aspects of beams. Beam-column elements, design of column base plates, design of simple bolted (or welded) steel connections.

CIEN 422 Advanced Reinforced Concrete Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 321**

Structural layout, estimation of dead and live loads, serviceability, deflections and crack control, design for torsion, design of frames, moment redistribution, slender columns, approximate methods for two-way slabs, detailing of reinforcement.

CIEN 424 Bridge Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 321**

Covers design of highway bridges; history, classification and aesthetics of bridge structures; design philosophy; loading, girder distribution factors; and load combinations; design of concrete deck slab; design of reinforced concrete T-beam and box girders bridges; and design of piers, bearings and abutments. Introduces pre-stressed concrete bridges.

CIEN 431 Foundation Engineering**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 333**

Site investigation, bearing capacity of shallow foundation, distribution of stresses in soils, settlement of shallow foundation, factors to be considered in foundation design, introduction to deep foundation, lateral earth pressure and retaining walls.

CIEN 440 Infrastructure Financing**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 241**

Fundamentals of infrastructure project financing, Public Private Partnerships (PPP), Build Own Transfer (BOT), variation models, financing structures, framework, bonds, life cycle analysis, sponsors and risk management.

CIEN 441 Construction Management**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 331**

Basic concepts of construction project management, Construction planning, project time Management, project cost management, project quality management, value engineering and project life cycle, construction process optimization, construction contracts, contracting methods, project specifications, bidding, procurement methods and contractor applications for payment procedures.

CIEN 442 Construction Planning and Scheduling

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 441

Principles of planning, monitoring, and controlling construction projects. Developing schedules using bar charts, precedence diagrams, program evaluation and review techniques (PERT), and linear schedules. Resource histograms and s-curves. Resource allocation and resource leveling. Schedule constraints. Earned value concept. Includes MS project and Primavera Project Planner software.

CIEN 444 Construction Cost Analysis and Estimating

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 441

Perceptions of construction cost, engineering economic analysis, risk and uncertainty, range estimating, cost fundamentals, types of cost estimating, estimating construction materials cost, estimating construction labor cost, direct versus indirect costs, estimating construction equipment cost, cost of concrete structures, estimating project cost, time/cost trade-off analysis and contractor general requirements.

CIEN 451 Infrastructure Systems

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 351 and CIEN 362

Role of planning, system demands and networking in infrastructure systems, energy systems, water and waste water infrastructure, transportation systems, waste disposal and resources conservation, smart growth and effects of infrastructure on the environment, models of creating sustainable future development, planning, design and architecture in sustainable communities, and integrated infrastructure system models.

CIEN 456 Sustainable Urban Building Sites

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 351

Concept of sustainability, how sustainability applies to infrastructure projects and programs, measuring sustainability, identification and design of sustainable technologies associated with water and energy management for infrastructure projects, green buildings and sustainable housing, sustainable transportation, energy, use of materials and waste management and water use. Includes case studies in sustainability.

CIEN 457 Water Resources Sustainability

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 351

This course provides a comprehensive overview of the challenges and solutions related to the sustainable management of water resources. Students will gain a deep understanding of water supply systems, integrated water resources management, management of water resources in arid regions, and sustainable use of water in urban, agricultural, and industrial sectors. Several case studies will be presented and discussed.

CIEN 462 Advanced Pavement Design

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CIEN 361

Pavement types, Pavement materials; subgrade stabilization methods; Principles of mix design using SUPERPAVE; Analysis of stresses in flexible and rigid pavement, Design methods of highway flexible and rigid pavements; Overlay design, Computer applications.

CIEN 464 Airport Planning and Design

(3:3:0)

3 Semester Credit Hours

Corequisite(s): CIEN 362

Examines airport master planning, forecasting air travel demand and sustainable design of airports, including lighting, terminal facilities, noise-level control, aircraft control, airspace utilization and automobile parking.

CIEN 491 Senior Design Project (1)

(2:0:6)

2 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

This is the first course of a capstone project that requires students to develop, design and implement a solution to an engineering problem under the supervision of a faculty advisor. Students are required to consider ethical, social and economic implications of their project. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resources, procurement, communication with consideration of ethical and professional conduct.

CIEN 492 Senior Design Project (2)	(4:0:12)
4 Semester Credit Hours	
Prerequisite(s): CIEN 491	
Continuation of the senior design project I. The project is a multidisciplinary interaction for infrastructure design and management that includes system analysis and inculcates sustainable engineering principles. Includes use of engineering software's especially project management software such as MS project, Primavera Project Planner and CYCLONE, writing a technical report and developing project drawings, specifications and details.	
CIEN 493 Special Topics in Civil Engineering	(3:3:0)
3 Semester Credit Hours	
Prerequisite(s): Department Consent	
Special up-to-date topic in the civil and infrastructure engineering.	
COMM 101 Interpersonal Communication and Group Interaction	(3:3:0)
3 Semester Credit Hours	
The course presents the principles to develop appropriate and effective communication strategies in one-to-one and small group communication settings. It emphasizes analyzing and assessing communication skills to create and sustain effective communication in personal and professional relationships.	
COMM 102 Reading Image and Film	(3:3:0)
3 Semester Credit Hours	
Prerequisite(s): ENGL 101	
This course allows learners to study aesthetic effects and strategies of persuasion in contemporary visual images. Learning engagement includes images in electronic media, film, photographs, cartoons, advertisements, and public performances and events.	
COMM 111 Introduction to Mass Communication	(3:3:0)
3 Semester Credit Hours	
This course surveys the history and characteristics of mass communication as a field and set of intertwining industries and professions. Learners explore the role of mass media in modern society by considering the impact of technology, culture, government, and economics. Trends are considered in historical context.	
COMM 112 Introduction to Public Relations	(3:3:0)
3 Semester Credit Hours	
This course provides learners with basic knowledge about the theories, concepts, and best practices in communication within the public relations field.	
COMM 113 Introduction to Digital Media	(3:3:0)
3 Semester Credit Hours	
Introduction to Digital Media, allows students to learn and understand the basics of Digital Media. The course content discusses various technologies that will aid students to learn the language of visual imagery. The applications that will be focused on industry standard applications for many graphic design positions. In this course, students will build a blog as a means of communicating and presenting their work as producing print and digital layouts to a wide audience.	
COMM 212 Media Writing	(3:3:0)
3 Semester Credit Hours	
Prerequisite(s): COMM 111 or COMM 112 or COMM 113	
This course introduces learners to the basic norms, values, standards and practices for writing for the mass media.	
COMM 213 Public Relations Writing	(3:3:0)
3 Semester Credit Hours	
Prerequisite(s): COMM 111 or COMM 112 or COMM 113	
Learners improve their media-related writing skills with a focus on standard, professional presentation of information and messages in the public relations setting.	
COMM 214 New Media and Digital Culture	(3:3:0)
3 Semester Credit Hours	
Prerequisite(s): COMM 111 or COMM 112 or COMM 113	
This course examines the cultural impact of new digital technologies, such as the Internet and new telephone and audiovisual media. Students survey the origins of digital communication and the Internet; and they are introduced to contemporary scholarship on digital technologies, the Internet, and the institutions that control these technologies.	

COMM 215	Feature Writing	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
This course is designed to give students experience in recognizing and producing high-quality feature articles. Course materials and lectures will cover the basics of writing the newspaper and magazine feature story. Students will be exposed to, and write in, a diverse variety of approaches and techniques.		
COMM 221	Communication Analysis and Criticism	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
This course investigates media through a variety of theories and methods. The focus will be on some of the dominant critical perspectives that have contributed to our understanding of media and its roles in society. The course provides the basic vocabulary and concepts used to analyze different types of media.		
COMM 222	Intercultural Mass Communication	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
This course explores the communication strategies and techniques within a specific cultural milieu and how those strategies and techniques differ among various cultural milieu, and learners practice in a variety of communication modes how best to accommodate their rhetorical strategies in communicating to both intracultural and intercultural audiences.		
COMM 223	Globalization and Media Cultures	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
Learners in this course apply communication strategies to and investigate real-world case study challenges with a global worldview of various issues of global media cultures. Students learn how to develop a <i>Weltanschauung</i> from which to best communicate in modern technologies with world audience.		
COMM 224	Visual Storytelling	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
This course combines storytelling arts with social, mobile, and digital media technologies. In this course, students apply digital storytelling theory and techniques to write, produce and publish digital stories. They integrate images, text, video and audio to create digital stories, and acquire competency in the use of digital media applications.		
COMM 225	Visual Communication and Digital Photography	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ENGL 101 or COMM 111		
This course explores photography, photographic composition and aesthetics as a form of visual communication. Through a blend of theoretical and practical approaches, students will develop an aesthetic and creative understanding of photography as well as gain knowledge of technical photographic terms and digital photography skills.		
COMM 226	Graphic Communication Design and Print Production	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ENGL 101 or COMM 111		
This course is designed to expose students to study and practice graphic communication design and print production fundamentals. In this course, students apply layout theory and varying techniques to write, produce, and publish news stories in the production process. They integrate images, and text, to create a page makeup, with the use of different digital media applications.		
COMM 227	Film and Video Editing	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ENGL 101 or COMM 111		
This course is designed to provide students with the essential skills and knowledge required for video and film editing. Students will learn the principles and techniques of video editing, including the use of industry-standard software tools and technology.		
COMM 311	Media Law and Ethics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
Learners engage the philosophical underpinnings of ethics and the core principles of journalism and mass communication to develop an understanding and appreciation of the field's normative ethical values. Students will learn how to apply an ethical decision-making framework to a variety of challenges.		

COMM 321	Theories of Media Communication	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 212 or COMM 222 or COMM 223		
Learners identify the major concepts, issues, and theories of media communication, and learners identify and use communication theories in a variety of best practices to demonstrate effective use of the theories learned in the course.		
COMM 322	Digital Resources and Content	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 111 or COMM 112 or COMM 113		
This course is designed to present fundamentals of open /data collecting, gathering, cleaning, analyzing, and create data visualizations. Students will learn how database journalism turns to data journalism; and how data became a strong role in transferring more efficient growing online resources, tools, and techniques.		
COMM 323	News Reporting	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 212 or COMM 215		
This course will engage learners in the values, norms and professional practices newsgathering and writing. Emphasis is on traditional reporting methods, including interviewing and observation, and on the ethical, reliable presentation of news in print/digital formats.		
COMM 334	Digital Journalism	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 212 or COMM 213 or COMM 222		
This course introduces students to the multimedia production skills and techniques associated with broadcast media. Learners will integrate text, audio, photos, and video to produce broadcast journalism content that is attractive, accessible, easy to navigate, and appropriate for the platform and the audience.		
COMM 337	Public Relations Cases	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 212 or COMM 213 or COMM 222		
This course gives learners the context, knowledge, and skills to examine and critically analyze real-world public relations problems and cases. Students will study and apply communication and public relations theories to case studies and problems. Learners examine the four steps included in the design of public relations programs that include research, planning, implementation, and evaluation.		
COMM 344	Public Relations & Event Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 212 or COMM 213 or COMM 222		
This course introduces students to the public relations process, focusing on the strategic planning of PR programs, public relations tactics, media relations management, crisis management, and event management. Students will learn how to develop goals, design strategies, and select tactics that can better serve an organization's goals.		
COMM 390	Internship in Mass Communication	
3 Semester Credit Hours		
Prerequisite(s): Prior completion of 90 credits		
The Internship for Mass Communication is eight weeks (240 hours), and provides exposure to practices, challenges, and opportunities in real-world Media settings. Students apply real-world work strategies throughout the internship, and engage in self-reflection, and incorporate employer feedback to enhance their professional skills in creating an initial record of employment.		
COMM 391	Communication Research Methodology	(2:2:0)
2 Semester Credit Hours		
Prerequisite(s): COMM 212 or COMM 222 or COMM 223		
This course provides an introduction to research methods and the philosophical underpinnings of research inquiry in the field of communication. It includes the topic adherence, overviews of quantitative, qualitative, and mixed-method research methodologies, a range of alternative research methods, including observation, archival research, questionnaire surveys, case studies, and experimentation, research design, data collection, and data analysis, the ethical implications of research with human and non-human subjects, and appropriate connections between research questions and methodologies.		
COMM 421	Social Media: Audiences and Messages	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): COMM 311 or COMM 321 or COMM 334		
Learners explore social media as a unique platform for interaction with multiple audiences and learn how to plan strategies to engage with key stakeholders and disseminate persuasive, effective messages.		

- COMM 422 Streaming Media, Podcasting and Radio Production** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 334
This advanced course covers the technical aspects of live video streaming, podcasting and radio production including live production techniques, audio recording, mixing, and editing techniques.
- COMM 423 Interactive Multimedia** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 334
The course will examine the history, aesthetics, and cultural implications of interactivity through media. Students will gain experience and critical analysis skills by engaging with interactive multimedia works. Students will learn design strategies and development techniques for interactive media and will have the opportunity to explore the latest innovations in this area.
- COMM 424 Capstone: Multimedia Storytelling** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 321 or COMM 323 or COMM 334 or COMM 391
this course, learners apply skills in newsgathering, writing, and multimedia to produce an individual and a group project of publication quality that demonstrates their proficiency in multimedia storytelling.
- COMM 425 Media Management and Entrepreneurship** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 212 or COMM 223
This course introduces students to key concepts, models, and thinkers in media management and examines the practice of and emerging models in entrepreneurial journalism. The course aims to equip learners with analytical tools to understand the current state of media and develop new models for the future.
- COMM 427 Capstone: Media Production in Public Relations** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 321 or COMM 323 or COMM 334 or COMM 391
The course provides learners with practical instruction and experience in a variety of media modes of communication. Students focus on producing clear, persuasive messages in attractive formats.
- COMM 450 Selected Topics in Communication** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 212 or COMM 222 or COMM 223
This course examines current and emerging issues in communication theory, research, and practice, focusing on specific media and public relations topics, trends, and challenges. Students will explore various topics, ideas, and issues that are not typically covered in standard courses. The course will provide an opportunity for students to engage in critical analysis and discussion, as well as research and writing, on a range of contemporary communication issues **(Writing Intensive Course)**.
- COMM 492 Mass Media and Public Opinion** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): COMM 311 or COMM 321 or COMM 323 or COMM 391
This course is designed to prepare students to be informed and critical consumers of polls and media coverage of them, to introduce students to basic theories and findings regarding the influence of mass media on public opinion, to provide students with firsthand experience in conducting and writing about public opinion research.
- CSAI 350 Introduction to Artificial Intelligence** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): CSCI 215
This course provides an introduction to the different sub-areas of Artificial Intelligence (AI). In addition, students learn basic concepts, methods, and algorithms of AI and how they can be used to solve practical AI problems. The topics include classical and adversarial search & heuristic, knowledge representation, probabilistic reasoning, convex optimization methods, Bayesian methods, reinforcement learning, and supervised and unsupervised learning techniques. Particular focus will be placed on real-world applications of the material.
- CSAI 351 Data Science** **(3:3:0)**
3 Semester Credit Hours
Prerequisite(s): CSAI 350 and MATH 203
This course provides an introduction to data science and highlights its importance in real world context. Topics include data science concepts, project lifecycle, tools & programming environment, fundamentals of Python programming, numerical processing, data visualization, exploratory data analysis, data preprocessing, parameter optimization, model performance evaluation, and applications of machine learning algorithms in Python (i.e., Naïve Bayes, k-Nearest Neighbors, Linear/Multiple/Logistic Regressions, Decision Trees, and Clustering Applications), natural language processing, and real-world data science case studies.

CSAI 390 Internship I**3 Semester Credit Hours****Prerequisite(s): Completion of 60 credits and a CGPA of 2.0 or higher**

This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

CSAI 391 Internship II**3 Semester Credit Hours****Prerequisite(s): Completion of 90 credits and a CGPA of 2.0 or higher**

This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

CSAI 450 Machine Learning**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSAI 350 and ENGR 200****Corequisite(s): CSAI 451**

This course introduces fundamental concepts of machine learning, and provides students with knowledge and understanding of the methods, mathematics, and algorithms used in machine learning. Topics include statistical learning concepts, linear & quadratic discriminant analysis, resampling methods, model selection and regularization, regression & smoothing splines, generalized additive models, regression trees, bagging and boosting, support vector machines, principal components analysis, k-means clustering, hierarchical clustering, and neural networks.

CSAI 451 Machine Learning Lab**(1:0:3)****1 Semester Credit Hour****Corequisite(s): CSAI 450**

This course, which is conducted within a laboratory environment, aims to familiarize students with several techniques used in machine learning. The topics covered include Linear Regression, Classification, Resampling, Linear Model Selection, Tree-Based Methods, Support Vector Machines, and Neural Networks. **(Writing Intensive Course)**

CSAI 452 Natural Language Processing**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSAI 351**

This course introduces the fundamental concepts and techniques of natural language processing (NLP). Topics include text corpora and conditional frequency distributions, lexical resources and WordNet, raw text processing and regular expressions, text normalization and lemmatization, structured natural language processing (NLP) programs, part-of-speech tagging, automatic tagging, n-gram, & transformation-based tagging, document and sequence classification, maximum entropy classifiers and modeling linguistic patterns, information extraction, linguistic structure, named entity recognition, & relation extraction, grammatical structure & context free grammar, context free grammar parsers & dependency grammar, and feature based grammars.

CSAI 453 Data Visualization**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSAI 350**

Data visualization is an essential skill required in today's data-driven world. This course presents principles and techniques to design and create data visualization based on gathered data and the goals of the task at hand. Topics include the value of visualization, data, tasks, validation, marks and channels, design guidelines, tables, networks and trees, spatial, temporal and textual data, interaction and navigation, and data reduction.

CSAI 480 Big Data**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 326**

This course provides an in-depth coverage of various topics in big data from data generation, storage, management, transfer, to analytics. Topics include Hadoop ecosystem, Hadoop architecture, YARN & HDFS, Sqoop, Apache Hive & Impala, Apache Flume, Apache Spark, resilient distributed datasets (RDDs) in Spark, map reduce in Spark, Spark applications, Spark parallel processing, SparkSQL, workflow management with Apache Oozie, machine learning in Spark, and big data applications.

CSAI 481 Computer Vision**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSAI 450**

This course provides introduction to fundamental topics in computer vision and the application of statistical estimation techniques in this field. It is intended to give students a good basis for work in this important field. Topics include image representation, image processing, image analysis, image segmentation, object tracking, 3D shape reconstruction, feature detection and tracking, object detection, and convolutional neural networks.

CSAI 482 Data Mining

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSAI 350

Data Mining studies algorithms and computational paradigms that allow computers to find patterns and regularities in datasets, then perform prediction/forecasting and generally improve their performance through interaction with data. The course introduces the fundamental concepts of data mining techniques. Topics include data preparation, data classification, performance measures, association rule mining, clustering, outlier detection, collaborative filtering and data mining case studies.

CSAI 483 Information Retrieval

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 326

The course covers basic and advanced techniques necessary to define, design, and implement Information Retrieval (IR) systems, including the following topics: basic IR models, basic tokenizing, indexing, and implementation of vector-space retrieval, experimental evaluation of IR, query operations and languages, text representation, web search, text categorization, language-model based retrieval, recommender systems, information extraction, and integration.

CSAI 484 Internet of Things System

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): (CSCI 232 or CENG 315) and CSCI 462

The Internet of Things is an emerging technology in which interconnected devices are embedded within everyday objects enabling them to send and receive data. This course introduces core concepts and networking protocols for IoT applications. Topics covered include: IoT architectures, smart objects, sensing and actuation, displaying information, WPANs, WBANs, IoT clouds, security and privacy for IoT systems, IoT robustness and reliability, and IoT applications.

CSAI 485 Introduction to Deep Learning

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSAI 450

The course provides an introduction to neural networks and deep learning. The topics to be covered include basic conceptual understanding of neural networks, deep learning programming environments, shallow neural networks, radial basis function networks, recurrent neural networks, convolutional neural networks, and deep reinforcement learning.

CSAI 486 Special Topics in Artificial Intelligence

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSAI 350

This course gives instructors the opportunity to cover the latest developments and contemporary issues in Artificial Intelligence. Instructors will provide a detailed course outline at the beginning of the semester.

CSAI 487 Introduction to Robotics

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): (MATH 213 or MATH 203) & (CSCI 112 or CSCI 114)

This course introduces fundamentals of robotic systems to the students. Topics covered include robotic system architecture, configuration space, and Robot Operating System (ROS). Moreover, forward and reverse kinematics, robot control systems, and robotic sensors are covered in this course. Students will also explore robot navigation, obstacle avoidance, and Simultaneous Localization and Mapping (SLAM), enabling them to develop and assess robotic systems that can autonomously navigate and interact with their environments. The last part of the course focuses on motion planning to enable students to devise, implement, and optimize algorithms for planned robotic motions.

CSAI 490 Professional Software Practice

(2:2:0)

2 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

Corequisite(s): CSCI 492

The course develops student understanding about various non-technical issues related to the field of computing. The course covers the field from economic, legal, ethical, and professional perspectives. Covered topics include code of conduct, ethics, intellectual property, cyber security, privacy, risk management, and teamwork.

CSCI 104 Introduction to Computing

(3:3:0)

3 Semester Credit Hours

This course serves as an introduction to the field of computer science and the computer's various layers. The course provides exposure to the following layers: information, hardware, programming, operating systems, applications, and communications. Additional topics include ethics, security, privacy, the impact of computing, and widely used software applications.

CSCI 112 Introduction to Computer Programming (3:3:0)

3 Semester Credit Hours

Corequisite(s): CSCI 113

This course introduces students to computers and programming languages and more specifically the C++ language. Additionally, students learn to use computer programming as a problem-solving tool. The topics covered include basic operations, data types, input/output, selection statements, control structures, arrays, functions, and strings, knowledge representation, neural networks and natural language, data summarization and visualization.

CSCI 113 Introduction to Computer Programming Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): CSCI 112

This course introduces the use of computer programming as a problem-solving tool in laboratory environment. Topics in procedural programming include, simple data types, input/output selection statements, control loops, testing, debugging, and programming environments.

CSCI 114 Applied Computational Thinking (3:3:0)

3 Semester Credit Hours

Prerequisite(s): None

This introductory course equips students with essential programming skills while emphasizing Python as a versatile problem-solving tool. Topics include core operations, data types, input/output techniques, conditional statements, control structures, lists, functions, and string manipulation, GUI programming and Python libraries usage.

CSCI 115 Applied Computational Tools (1:0:3)

1 Semester Credit Hour

Prerequisite(s): None

In this course, students will acquire the skills to manage complex equations and both linear and nonlinear systems with practical engineering applications. The course emphasizes the utilization of computational tools for effective problem-solving and optimization. Through an introductory exploration of MATLAB and VBA in Excel, the course focuses on fostering competencies in data visualization, mathematical problem-solving, and the customization of methods.

CSCI 211 Object Oriented Programming (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 112 or CSCI 114

This course is an introduction to object-oriented programming principles and techniques using Java. Topics include Java elementary programming, and Java object-oriented features such as methods, objects, classes, access modifiers, constructors, immutable objects & classes, abstraction, encapsulation, inheritance, polymorphism, dynamic binding, object castings, abstract and interface classes, and exception handling.

CSCI 215 Data Structures and Algorithms (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 211 and MATH 225

This course introduces data structures and various fundamental computer science algorithms. The course covers abstract data-type concepts, stacks, queues, lists, and trees. Several sorting and searching algorithms are covered. Additional topics include an introduction to graphs and their implementation and running time and time complexity measurement.

CSCI 232 Computer Organization (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 112

This course provides a programmer's view of the execution of programs in computer systems. Topics covered include instruction sets, machine-level code, assembly language, performance evaluation and optimization, memory organization and management, address translation, and virtual memory.

CSCI 312 Operating System Fundamentals (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 215

This course covers the principles, components, and design of modern operating systems, focusing on the UNIX platform. Topics include system structure, process concept, multithreaded programming, process scheduling, synchronization, atomic transaction, deadlocks, memory management, and file system.

CSCI 315 Design and Analysis of Algorithms (3:3:0)

3 Semester Credit Hours**Prerequisite(s): CSCI 215**

This course introduces the design and analysis principles for various algorithms. The topics covered include searching algorithms, dynamic programming, greedy algorithms, Huffman coding, graph traversing algorithms, shortest path algorithms, linear programming, and NP-completeness.

CSCI 326 Database Systems**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 211**

This course is an introductory course on database management systems. The goal of the course is to present a comprehensive introduction to the use of data management systems. Some of the topics covered are the following: The Entity-Relationship Model, the Relational Data Model, the SQL language, the database design, and the database integrity and security.

CSCI 372 Compiler Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 232**

The course introduces the theory and practice of compilation. Topics include compiler architecture, components, phases, software tools, lexical roles and specifications, regular expressions, syntax roles and specifications, context-free grammars, top-down parsing, bottom-up parsing, LR parsers & parse trees, syntax directed translation, syntax tree, abstract syntax tree, and finite automata.

CSCI 388 Programming Languages**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 215**

This course is an introduction to basic concepts in the design of programming languages. The course focuses on programming languages within the functional and logic programming paradigms such as Scheme and Prolog. Topics include history of programming languages, language design criteria, functional programming, syntax, logic programming, semantics, and object-oriented principles.

CSCI 390 Internship I**3 Semester Credit Hours****Prerequisite(s): Completion of 60 credits and a CGPA of 2.0 or higher**

This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

CSCI 391 Internship II**3 Semester Credit Hours****Prerequisite(s): Completion of 90 credits and a CGPA of 2.0 or higher**

This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

CSCI 411 Computer Graphics**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 215****Corequisite(s): CSCI 412**

This course introduces interactive computer graphics and drawing algorithms. The topics covered include graphics output primitives and their implementations, two-dimensional and three-dimensional geometric transformations and viewing, hierarchical modeling, computer animation, spline representations, visible-surface detection methods, illumination models, and surface-rendering methods, and texturing and surface-detail methods.

CSCI 412 Computer Graphics Lab**(1:0:3)****1 Semester Credit Hour****Corequisite(s): CSCI 411**

This course introduces computer graphics and drawing algorithms in a laboratory environment. The topics covered include graphics output primitives and their implementations, two-dimensional and three-dimensional geometric transformations and viewing, hierarchical modeling, computer animation, spline representations, visible-surface detection methods, illumination models, and surface-rendering methods, and texturing and surface-detail methods.

CSCI 415 Introduction to Parallel Programming**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CSCI 215**

This course is an introduction to parallel programming principles and techniques. Topics include parallel computing memory architecture, memory organization, parallel programming models, parallel program design, performance evaluation, thread-based parallelism, process-based parallelism, message passing, asynchronous programming, and heterogeneous programming.

CSCI 416 Human Computer Interaction (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 215

This course provides an introduction to and overview of the field of human-computer interaction (HCI). The topics include usability principles, predictive evaluation, design management processes, graphic design, understanding users' requirements gathering, task analysis, handling errors & help, prototyping & UI software, interaction styles, user models, evaluation, and universal design.

CSCI 450 Information Security and Privacy (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 215 or Instructor permission

This course is a survey of information security considerations as they apply to information systems analysis, design, and operations. Topics include information security vulnerabilities, threats, and risk management. Furthermore, the course introduces several cryptographic algorithms in addition to the privacy and secrecy of statistical databases and e-government applications.

CSCI 462 Data Communications and Computer Networks (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 112

This course introduces computer networks. Topics include layering approach, functions of different layers, Internet applications (HTTP, DNS), reliable and unreliable transport (TCP and UDP), routing and IP addressing, data link layer services and protocols, and Ethernet.

CSCI 463 Data Communications and Computer Networks Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): CSCI 462

This course provides students with hands on training on design, troubleshooting, modeling and evaluating of computer networks. Topics include network addressing, Address Resolution Protocol (ARP), basic troubleshooting tools, IP routing, and route discovery. Additionally, student will perform network modeling, simulation, and analysis using Packet tracer and WireShark analyzer. **(Writing Intensive Course)**

CSCI 492 Senior Design Project I (2:0:6)

2 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

This is the first course of a capstone project that requires students to develop, design, and implement a solution to a computing problem under the supervision of a faculty advisor. Students are required to consider the ethical, social, and economic implications of their project. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resource, procurement, and communication, with consideration of ethical and professional conduct.

CSCI 493 Senior Design Project II (4:0:12)

4 Semester Credit Hours

Prerequisite(s): CSCI 492

Implementation of the project for which preliminary work was done in CSCI 492. Project includes designing and constructing software and/or hardware, conducting experiments or studies, and testing and validating a complete system. At the end of the term, each team presents to a committee information related to its project in both written and oral formats.

CSCI 499 Special Topics in Computing (3:3:0)

3 Semester Credit Hours

Prerequisite(s): CSCI 215

This course gives instructors the opportunity to cover the latest developments and contemporary issues in computing. Instructors will provide a detailed course outline at the beginning of the semester.

ECON 103 Principles of Microeconomics (3:3:0)

3 Semester Credit Hours

This course introduces microeconomics in the context of current problems. This course explores how market mechanism allocates scarce resources among competing uses; uses supply, demand, production, and distribution theory to analyze problems.

ECON 104 Macroeconomic Policy (3:3:0)

3 Semester Credit Hours

Prerequisite(s): ECON 103

This course introduces students to the applications of macroeconomics in the context of current problems to business decision making and economic policy. Students will be introduced to the economic way of thinking and how key concepts; theories and methods of modern economic analysis can be applied to everyday economic issues and problems. Key areas covered include the national economy; national

income accounting; business cycles; inflation; economic growth and stability; unemployment; and monetary and fiscal policy. Particular emphasis is placed on reviewing contemporary economic issues and how economics permeates almost every aspect of business, highlighting economics as the fundamental discipline underpinning the study of most business specializations.

EDUC 500 Foundations of Education (3:3:0)
3 Semester Credit Hours

This course examines historical, philosophical, social, and psychological foundations of education. Students will explore the nature of teaching and learning as well as UAE education policy.

EDUC 511 Introduction to Applied Research (3:3:0)
3 Semester Credit Hours

This course provides students and introduction to quantitative, qualitative, and mixed-methods research design in the educational sciences. This is a practical course designed to guide students through the development of their applied research proposals into a gap in practice.

EDUC 515 Educational Psychology for Inclusive Learning (3:3:0)
3 Semester Credit Hours

This course provides an overview of child and adolescent development, teaching and learning theories, strategies, and approaches for inclusive education. Students will utilize covered concepts as the framing for the development of a personal philosophy of teaching and learning.

EDUC 525 Theories and Applications of Leadership (3:3:0)
3 Semester Credit Hours

This course provides students with conceptual and practical knowledge in leadership theories, with an emphasis on application in real world education settings. Students will acquire skills grounded in various leadership theories and use this conceptual knowledge to create an individual, metacognitive Leadership Profile.

EDUC 545 Budgeting and Resource Management (3:3:0)
3 Semester Credit Hours

This course provides students with a broad overview of school finance, budgeting, and the ways in which resources are allocated. Students develop an understanding of the economic, social, and legal principles that inform how schools fund day-to-day operations.

EDUC 620 Evaluation of Instruction for Continuous Improvement (3:3:0)
3 Semester Credit Hours

This course will provide students with the fundamental concepts of instructional evaluation, observation, peer coaching and mentoring. The observation findings will be used to by students to design, create, present, and evaluate staff development.

EDUC 640 Inclusive Leading of Diverse Groups (3:3:0)
3 Semester Credit Hours

This leadership course is designed to prepare students to lead diverse groups and/or teams of individuals in schools and where education meets industry. Throughout the duration of this course, students will engage in meaningful dialogue centered on these authentic, real-world scenarios.

EDUC 660 Organizational Change and Continuous Improvement (3:3:0)
3 Semester Credit Hours

This course provides students with the knowledge and skills to carry out continuous school improvement initiatives which includes determining needs, planning for improvement, understanding challenges and roadblocks to initiatives, and implementing and evaluating results toward established goals.

EDUC 675 Educational Policy and Community Engagement (3:3:0)
3 Semester Credit Hours

In this course students explore the governance of schools and the building of constructive relationships between schools and communities from socio-economical and sociological perspectives grounded in educational research.

EDUC 680 Applied Research I (3:1:6)
3 Semester Credit Hours

Prerequisite(s): EDUC 511

This field-based course provides students with the tools needed to undertake data collection and analysis in real-world settings. Throughout the duration of this course, students will undertake data collection and analysis for their IRB-approved research project.
Thesis Research Course I

EDUC 685 Analytics for Data Driven Leadership (3:3:0)
3 Semester Credit Hours

This course focuses on the role of research in the work of school leaders; ways leaders use research to identify opportunities for improvement and change; relationship between theory, research, and practice; role of research and benchmarking in school improvement; and strategies for change in education.

EDUC 695	Applied Research II	(3:1:6)
3 Semester Credit Hours		
Prerequisite(s): EDUC 680		
This research capstone prepares students in the Master of Education program to finalize their original research for submission to an academic journal. This course is designed to enable students with requisite skills in disseminating research. Thesis Research Course II		
EEEN 220	Signals and Systems	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 113		
Corequisite(s): EEEN 221		
Introduction to methods of representing continuous-time signals and systems, and interaction between signals and systems. Analysis of signals and systems through differential equations and transform methods; Laplace and Fourier transforms; frequency response of systems; stability in time and frequency domains. Presents application examples from communications, circuits, control, and signal processing.		
EEEN 221	Signals and Systems Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): EEEN 220		
Laboratory course to accompany EEEN 220. In this course, the student will acquire hands-on experience with programming in MATLAB. Topics include representation of different signals, system linearity and time invariance, analysis of a first - order system, implementing matched filter for Barker codes, response of second - order systems and damping ratio, synthesis periodic signals		
EEEN 280	Electric Circuit Analysis I	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PHYS 220		
Basic circuit concepts and DC analysis, circuit analysis techniques, circuit theories, fundamental operation of operational amplifiers and their applications, transient and steady state analysis of RL, RC, and RLC circuits and basic AC analysis.		
EEEN 281	Electric Circuit Analysis Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): EEEN 280 or MENG 231		
Laboratory course to accompany EEEN 280. In this course, students will experimentally verify circuit analysis concepts under DC and AC excitations and transient response. They will use different measurement instruments and build DC and AC electric circuits.		
EEEN 282	Electric Circuit Analysis II	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 280		
Review of AC sinusoidal circuit analysis with active and reactive power. Covers magnetically coupled inductors and ideal transformers, three phase circuits, Laplace transform, application of Laplace transform in circuit analysis, passive and active filter analysis and design, two port networks.		
EEEN 283	Electric Circuit Analysis II Lab	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): EEEN 281		
Corequisite(s): EEEN 282		
Laboratory course to accompany EEEN 282. In this course, students will experimentally verify circuit analysis concepts under steady state AC excitation. Students will use different measurement instruments and build AC electric circuits.		
EEEN 305	Electromagnetic Theory	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PHYS 220 and MATH 214		
Course uses vector algebra and vector calculus. Covers topics related to electrostatic and magnetostatic fields, electric and magnetic properties of media, electric boundary value problems, Maxwell's equations, electromagnetic waves and plane wave propagation, Poynting theorem and transmission line theory.		
EEEN 331	Digital System Design	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PHYS 220		
Corequisite(s): EEEN 332		
This course covers principles of digital logic and digital system design. Topics include number systems; Boolean algebra; analysis, design, and minimization of combinational logic circuits; analysis and design of synchronous and asynchronous finite state machines; and an introduction to VHDL and behavioral modeling of combinational and sequential circuits.		

EEEN 332	Digital Systems Design Lab	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s):		
Corequisite(s): EEEN 331		
Laboratory course to accompany EEEN 331. In this course, the student will acquire hands-on experience with basic logic components, combinational and sequential logic circuits, and the use of VHDL.		
EEEN 333	Linear Electronics I	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 280		
Principles of operation and application of electron devices and linear circuits. Topics include semiconductor properties, diodes, bipolar and field effect transistors, biasing, amplifiers, frequency response, operational amplifiers, and analog design.		
EEEN 334	Linear Electronics I Lab	(1:0:3)
1 Semester Credit Hour		
Prerequisite(s): EEEN 281		
Corequisite(s): EEEN 333		
Laboratory course to accompany EEEN 333. In this course, the student will acquire hands-on experience with basic electronic components and circuits. Topics covered include: Semiconductor diodes, rectification, Zener diodes, BJT and FET transistors and Amplifiers.		
EEEN 350	Electric Machines	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 282		
Corequisite(s): EEEN 351		
The general theory of electro-mechanical motion devices relating to electric variables and electromagnetic forces. Basic concepts and operational behavior of DC motors, induction and brushless DC Motors, and stepper motors used in control applications.		
EEEN 351	Electric Machines Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): EEEN 350		
Laboratory course to accompany EEEN 350. In this course, students will acquire hands-on experience with the characteristics of dc motors and dc generators (separate, series, shunt and compound). They will learn to find the parameters of transformers and evaluate their performance characteristics. The starting, speed control and performance of 3-phase induction motors are also studied. (Writing Intensive Course)		
EEEN 360	Random Signal and Noise	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ENGR 200 and EEEN 220		
Introduction to set theory, probability, random variables, and random processes. Modelling various types of noise encountered in communication systems as random processes. Analyzing the system response in the presence of random noise processes and calculating the power spectral density.		
EEEN 412	Power Systems	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 350		
Electric Power Systems, Elements of a Power Systems; The analysis of power systems starting with the calculation of line resistance, line inductance, and line capacitance of power transmission lines; Analysis of power systems in terms of current, voltage, and active/reactive power; Per-Unit Quantities; Load Flow Study; Economic Dispatch; Symmetrical Components; Fault Study; System Protection; System transient and Stability issues.		
EEEN 413	Microcontrollers and Embedded Systems	(3:3:0)
3 Semester Credits Hours		
Prerequisite(s): CSCI 112 and EEEN 331		
Corequisite(s): EEEN 414		
This course provides an in-depth exploration of microcontroller architecture, programming, and their applications in embedded systems. Topics include microcontroller architecture, programming in C and assembly, interfacing, real-time operating systems (RTOS), and the development of embedded systems applications.		
EEEN 414	Microcontrollers and Embedded Systems Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): EEEN 413		

This laboratory course provides practical experience in microcontroller programming, hardware interfacing, and embedded system design, complementing the theoretical course EEEN 413. Students will work directly with microcontrollers, development boards, sensors, and actuators to design and implement embedded systems.

EEEN 421 Power System Protection

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 412

Power systems protection schemes for transmission and distribution networks, connection and standards of current and voltage instrument transformers for protection and metering applications, Protective relays, Protection of generators; Differential protection - Problems with differential protection - Biased differential protection - Biased differential protection of generator - Over current and earth fault protection, P; Buchholz relay - Biased differential protection of transformers - Harmonic restraint – Harmonic blocking - Other transformer protections, Protection of transformers, Protection of transmission lines.

EEEN 422 High Voltage Engineering

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 282

The components of power system and their characteristics. Fundamental electric field calculations (Laplacian fields) in insulation systems of simple geometries, introduction to gas discharge physics, Townsends theory of electric breakdown in air and Paschens law and its implications on gas insulation strength. Experimental techniques applied in high voltage engineering.

EEEN 423 Electrical Energy Systems & Fault Analysis

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 412

Energy and power; forms of energy; energy conversion from energy sources including wind , solar, tidal, bio-fuel, wave, hydro, nuclear and fossil fuel. Structure of a modern power system: operating charts, voltage control, and matrix representation of transmission lines. Two port network representation of transmission lines, per unit system, fault analysis: symmetrical components, transformers: construction, operation, connections, and relevant calculations. Load flow analysis: network matrix representation, Gauss-Seidel and Newton-Raphson solution techniques. AC/DC conversion: converter types, dc transmission, advantages compared to AC transmission. Over-voltages: switching and fault over-voltages, Bewley Lattice diagrams, switchgear principles, current chopping, insulation coordination. Modal component theory: wave propagation.

EEEN 425 Smart Power Grid Systems Theory & Implementation

(3:3:0)

3 Semester Credit Hours

Pre0requisite(s): EEEN 412

This course explores a set of emerging concepts, technologies, applications and business models, and the related trade-off decisions involved in transforming the traditional centralized power grid into a climate and renewable energy-friendly “Smart Grid.” A cross-disciplinary approach intended to deepen individual areas of expertise in the context of multidisciplinary teamwork. Basic Smart Grid literacy, applications of this knowledge base to specific “real world” case studies.

EEEN 426 Renewable Energy Systems

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

The course aims to introduce a general engineering/science audience to the basic concepts of renewable energy. In the interest of time some mathematical criteria will be covered, e.g. Betz limit for wind, limit of efficiency of WEC point absorber. Each lecture contains several examples from real world applications and in-progress industrial developments.

EEEN 431 Digital Circuit Design

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 331 and EEEN 333

Analysis and design of discrete and integrated switching circuits. Topics include transient characteristics of diodes, bipolar, and field-effect transistors; MOS and bipolar inverters; no regenerative and regenerative circuits; TTL, ECL, IIL, NMOS, and CMOS technologies; semiconductor memories; VLSI design principles; and SPICE circuit analysis.

EEEN 432 Nanotechnology Fundamentals & Applications

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

Students will be provided an introduction to the basic principles of the subject of nanotechnology with minimum mathematics involved. The applications of nanotechnology to various fields such as environment, health, alternative energy and electronic/optics will be addressed and explained. Students will be required to do research projects and presentations in class.

EEEN 433 Linear Electronics II

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 333

Differential amplifiers, feedback circuits, power amplifiers, feedback amplifier frequency response, analog integrated circuits, operational amplifier systems, oscillators, wide band and microwave amplifiers, and computer-aided design.

EEEN 434 Linear Electronics II Lab

(1:0:3)

1 Semester Credit Hour

Prerequisite(s): EEEN 334

Corequisite(s): EEEN 433

Laboratory course to accompany ELEN 433. In this course, the student will acquire hands-on experience with Electronic Amplifiers, active filters and oscillators. Topics covered include: Cascade amplifiers, differential amplifier, active filters, oscillators, and feedback amplifier concepts. **(Writing Intensive Course)**

EEEN 435 Introduction to Optical Electronics

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 305

Corequisite(s): EEEN 333

Introduces optoelectronic devices for generation, detection, and modulation of light. Topics include electro-optic modulators, gas, solid state and semiconductor lasers, photodetectors, and detector arrays.

EEEN 437 Power Electronics

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 333

Course examines the application of electronics to energy conversion and control. The subject covers modern power semiconductor devices e.g., diodes, thyristors, MOSFETS, and other insulated gate devices; Static and switching characteristics, gate drive and protection techniques; Various DC-DC, AC-DC and DC-AC converter circuit topologies, their characteristics and control techniques; Analysis of input and output waveforms of these circuits; and their applications. Utility interference and Harmonic issues for power electronics circuits.

EEEN 451 Control Theory

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 220 or MATH 214

Introduction to feedback control systems; Block diagram and signal flow Graph representation; Mathematical modeling of physical systems; Stability of linear control systems; Time-domain and frequency-domain analysis tools and performance assessment; Lead and lag compensator design; Multi input multi output systems; Routh, Nyquist; Bode and root locus diagrams; Introduction to state variable techniques; state transmission matrix and state variable feedback.

EEEN 452 Control Lab

(1:0:3)

1 Semester Credit Hour

Corequisite(s): EEEN 451

Laboratory course to accompany EEN 451. In this course, the student will acquire hands-on experience with feedback control circuits/systems. Topics covered include; Introduction in control systems, DC motor speed controller, open loop/closed, Proportional Integral Derivative PID controller and position control.

EEEN 455 Digital Image Processing

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 220

An exploration of digital image processing fundamentals, including image enhancement, restoration, segmentation, and transformation techniques. Emphasis on practical applications and the use of image processing software tools (MATLAB/Python).

EEEN 460 Communication Systems

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EEEN 220 and ENGR 200

Introduction to analog and digital communications. Topics include review of important concepts from signals and systems theory and probability theory; Gaussian processes and power spectral density; digital transmission through additive white Gaussian channels; sampling and pulse code modulation; analog signal transmission and reception using amplitude, frequency and phase modulation; and effects of noise on analog communication systems.

EEEN 461 Communication Systems Lab

(1:0:3)

1 Semester Credit Hour

Prerequisite(s): EEEN 460

Corequisite(s): EEEN 464.

Laboratory course to follow EEEN 460 and accompany EEEN 464. In this course, the student will acquire hands-on experience with fundamental blocks of Analog and Digital communication systems. Topics covered include: Amplitude and Angle Modulation and demodulation, sampling and reconstruction, PCM Encoding & PCM Decoding and digital modulation and demodulation.

EEEN 462	Data and Computer Communications	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 220 and ENGR 200		
Introduction to modern data communications and computer networks. Topics include point -to-point communication links and transmission of digital information, modems, and codecs; packet switching, multiplexing, and concentrator design; multi-access and broadcasting; local area and wide area networks; ISDN; architectures and protocols for computer networks; OSI reference model and seven layers; physical interfaces and protocols; and data link control layer and network layer.		
EEEN 464	Digital Communication Systems	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 460		
Corequisite(s): EEEN 461		
Introduces digital transmission systems. Topics include quantization, digital coding of analog waveforms, PCM, DPCM, DM, base band transmission, digital modulation schemes, ASK, FSK, PSK, MSK, QAM, pulse shaping, inter symbol interference, partial response, voice band and wideband modems, digital cable systems, regenerative repeaters, clock recovery and jitter, multi path fading, digital radio design, optimal receiver design, MAP receiver, and probability of error.		
EEEN 466	Digital Signal Processing	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 220 and ENGR 200		
This course provides a thorough treatment of digital signal processing including the fundamental theorems and properties of discrete-time linear systems, filtering, sampling, and discrete-time Fourier Analysis.		
EEEN 467	Mobile and Wireless Communications	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 460		
Cellular systems design fundamentals, fading and multipath channels, Modulation techniques for mobile radio systems, Diversity and combining techniques for mobile radio systems, multiple access techniques for mobile systems, Mobile systems and standards.		
EEEN 472	Antenna Theory and Design	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 305		
Course provides the fundamental knowledge in the theory and design of antennas. The theory of electromagnetic radiation is introduced and the fundamental antenna properties and parameters are explained. Standard antenna characterization parameters such as impedance, far-field radiation pattern, gain, directivity, bandwidth, beam width, polarization, efficiency, antenna temperatures are studied. The electromagnetic theory behind antenna operation and an overview of different antenna systems such as monopoles, dipoles, wire antennas and loop antennas etc... are discussed. The principles of analysis and design of antenna arrays are discussed.		
EEEN 473	Radio Frequency and Microwave Engineering	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 305		
This course covers a broad range of topics in the field of radio frequency (RF) and microwave engineering. This includes transmission lines, waveguides, impedance matching, microwave resonators, RF filters, RF amplifiers, and passive RF and microwave devices (mixers, diplexers, etc.). Furthermore, RF/microwave communications link design will be provided.		
EEEN 474	Advanced Information theory and coding	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 460		
Advanced topics in information theory and coding. The course is divided into two main parts, namely, Source coding and data compression, and channel coding and error detection/correction codes. The first part covers, entropy, amount of information source coding techniques, Shannon Fano, Huffman, and Lempel-Ziv codes. The second part covers binary symmetric channels, Z-channels, and E-channels, channel capacity, mutual information, linear block codes and convolutional codes, Viterbi decoders and cyclic redundancy check codes.		
EEEN 481	Concepts of Multimedia Processing and Transmission	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): EEEN 220 or CSCI 462		
The course introduces the fundamentals of signal processing and communications for multimedia applications. It covers various topics relating to audio, image and video processing, storage and transmission. It discusses the human visual and hearing systems and relates them to image and sound digitization processes. The course also covers various lossless and lossy methods for audio, image and video compression. In addition, it gives the student hands on experience on applying the presented processing techniques using suitable software packages.		
EEEN 487	Robotics Engineering	(3:3:0)

3 Semester Credit Hours**Prerequisite(s): (MATH 203 or MATH 213) and EEEN 331**

This course introduces the fundamental principles of robotics, focusing on the design, operation, and application of robotic systems. Topics include robot kinematics, dynamics, control systems, sensors and actuators, and robot programming. The course emphasizes the integration of electrical and electronic components in robotic systems.

EEEN 492 Senior Design Project I**(2:0:6)****2 Semester Credit Hours****Prerequisite(s): Completion of 90 credit hours**

This is the first course of a capstone project that requires students to develop, design, and implement a solution to an engineering problem under the supervision of a faculty advisor. Students are required to consider the ethical, social and economic implications of their project. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resource, procurement, and communication, with consideration of ethical and professional conduct.

EEEN 493 Senior Design Project II**(4:0:12)****4 Semester Credit Hours****Prerequisite(s): EEEN 492**

Implementation of project from EEEN 492. Project includes designing and constructing hardware, writing required software, conducting experiments or studies, and testing complete system. Requires oral and written reports during project and at completion.

EEEN 499 Special Topics in EEEN**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): Completion of 90 credit hours**

Advanced and emerging topics in electronics and communication engineering. Topics are announced through the Schedule of Classes.

EMAC 512 Managerial and Financial Accounting**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): Graduate Standing**

The course deals with managerial and financial accounting techniques and practices. The course examines the impact of cost and cost allocation on business performance analysis, using a variety of costing schemes. It presents accounting as an information system construct, and looks at methods for recording, presenting and analyzing accounting information. The course also looks at budgeting, ratio analysis and other fiscal management measures. The course discusses the impact, on Management and Financial Accounting, of contemporary management philosophies and techniques including JIT practices, quality assurance and performance measurement.

EMFN 514 Managerial Finance**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): Graduate Standing**

The course provides detailed critical treatment of the theory and practice of financial management within organizations. Topics covered include financial modeling, breakeven analysis, investment decision-making (NPV, IRR, etc.), capital budgeting and structure, working capital management, analysis of financial statements, and risk analysis. There is additional treatment of managerial economics.

EMFN 560 International Corporate Finance**(3:3:0)****3 Semester Credit Hours****Prerequisites: EMFN 514**

This course focuses on corporate finance at a global environment context. It explores advanced concepts and practices applicable to multinational company's financing and investment decision- makings. Topics covered include financial analysis for investment decisions in an international setting, international money operations and capital markets, management of foreign exchange risk, direct foreign investment, funding of international projects, political risk analysis, currency derivatives and swap markets..

EMFN 562 Investment Planning and Management**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): EMFN 514**

The course deals with the advanced analysis of equity securities and investment portfolios, predicated on relevant market hypothesis and capital market theory. The course looks at investment risk-return trade-off, asset pricing models, and stock price behavior. The course adds emphasis on stocks, bonds, and financial futures and options.

EMFN 564 Financial Markets and Institutions**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): EMFN 514**

The course deals with financial markets, primarily global equity markets. It looks at markets for handling government debt instruments, and exchange-traded and over-the-counter financial derivative instruments such as futures, options, swaps, and asset-backed securities. There is detailed treatment of derivatives theories, derivatives exchanges, and valuation of derivatives, including standard and other non-standard options on a variety of underlying assets, in relation to relevant financial markets. The course also discusses emerging financial markets, and the effective management of risks emanating from these markets.

EMGN 525 Research Methods for Business

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): Graduate Standing

This course provides the necessary underpinning support for the EMBA dissertation and general business domain research. It allows candidates to make informed decisions and appropriate choices pertaining to research methodology. A range of business research tools, approaches and analytical techniques are discussed, and guidance is given on optimal structuring of business research documents and EMBA dissertations.

EMGN 555 EMBA investigative Thesis or Project I

(3:0:9)

3 Semester Credit Hours

Prerequisite(s): EMGN 525

EMGN 555 is the first part of the EMBA investigative Thesis or Project course, serving to integrate the various topics studied in the School of Business EMBA program. Students undertake a work-based study that focuses on a chosen business /management topic. The outcome for EMGN 555 is to submit a research introduction, literature review, and research methodology that will be used for the completion of this course. Satisfactory performance of the students in this course will move the student into EMBA 556.

EMGN 556 EMBA Investigative Thesis or Project II

(3:0:9)

3 Semester Credit Hours

Prerequisite(s): EMGN 555

EMGN 556 is the second part of the six-credit hour research course, serving to integrate the various topics studied in the School of Business EMBA program. Students undertake a work-based study that focuses on a chosen business/management topic. The outcome is a thesis, an extended piece of work necessitating investigation of secondary data and empirical fieldwork, through collection of primary data, pertaining to an organization and/ or a business domain problem. Analysis of collected data is expected to generate critical commentary and recommendations.

EMHR 590 Applied and Strategic Human Resource Management

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EMMG 510

The course deals with key areas of applied and strategic human resource management, essential for providing supervisors and human resource specialists with a thorough understanding of the strategic role of human resource management and the techniques available to management for making effective use of the human resources of an organization. The material is delivered from the perspective of strategic and applied HRM practice in both the UAE/GCC and internationally.

EMHR 592 Managing Change and Innovation

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EMMG 510

This course discusses issues related to the management of change in organizations. The different types of change typically encountered in organizations are characterized using well- defined analysis frameworks. The effective management of corporate innovation is also considered, looking in detail at the ideas generation, development and diffusion phases.

EMHR 594 Employee Relations and Compensation Management

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): EMMG 510

This course deals with legal and regulatory issues pertaining to employee relations from several perspectives. The compensation management aspect focuses on the theories underlying direct compensation and reward systems in organizations, and the practical administrative practices used to implement such systems, with particular reference to the UAE/GCC sub-region. Compensation management practices, including the analysis and evaluation of jobs, criteria and procedures for determining wage levels, individual wage determination, forms of payment, and incentive systems will be covered.

EMIB 524 International Business

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): Graduate Standing

The course looks in-depth at salient aspects of managing in a globalized environment, including consideration of theoretical concepts. It offers a practical treatment of political-economic aspects of international trade. The course discusses foreign direct investment, global monetary systems, and strategy formulation for international business practice. The course additionally places stress on international business case analysis, within the UAE/GCC context.

EMMG 510	Leadership and Managing People	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
This course provides an in-depth study of concepts relating to leadership and people management within organizations. The work integrates theory, research and applications, with an emphasis on context-driven learning. Students apply principles of leadership and people management to their own occupational situations and will investigate topical case studies. The material is delivered from the perspective of people-management practice in both the UAE/GCC and internationally.		
EMMG 515	Strategic Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
The course deals with the formulation, implementation and evaluation of strategies designed to give organizations a competitive edge. Corporate, business and operational – level strategy types are treated, and the use of various strategy analysis frameworks and models are discussed. Additional emphasis is placed on strategy formulation in the context of business practice in the UAE/GCC.		
EMMI 520	Managing Information Systems Performance	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
The course studies techniques and practices for analyzing business information systems performance with emphasis on support for business processes. The course gives a strategic and integrated view of the exploitation of information and communication technology, with particular emphasis on e-business for improving business performance and business efficiency. The course discusses IT-driven business strategy, and reviews IT-related factors that are necessary for enhancing the performance of organizations in the current competitive global business environment.		
EMMK 518	Marketing Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
This course emphasizes managerial aspects of marketing, including developing marketing strategies and plans, and integrating specific elements of the marketing process. The course additionally places stress on case analysis, as a means for learning the material and for students to develop problem-solving, group work, judgement and decision-making skills.		
ENGL 091	ELP 1: Intensive Listening and Speaking	(6:6:0)
6 Semester Credit Hours		
Prerequisite(s): None		
This course is designed to equip students in the English Language Program (ELP) with the essential listening and speaking skills necessary to communicate effectively in English at the A1-A2 level. The course will provide students with a solid foundation in understanding spoken English, responding appropriately, and engaging in basic conversations.		
ENGL 092	ELP 2: Intensive Reading	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course is designed to equip students in the English Language Program (ELP) with the essential reading skills necessary to understand and interpret basic written English texts at the A1-A2 level. Students will develop their ability to read and comprehend simple texts, basic instructions, and everyday materials as well as increase their vocabulary acquisition.		
ENGL 093	ELP 3: Intensive Writing	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course is designed to equip learners in the English Language Program (ELP) with the essential writing skills necessary to express themselves effectively in written English at the A1-A2 level. The course will provide learners with a solid foundation in sentence structure, grammar, vocabulary, and basic writing mechanics. Through a variety of activities and exercises, students will develop their ability to write simple sentences and paragraphs on familiar topics.		
ENGL 094	ELP 4: Communication Skills Integration	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course is designed for students in the English Language Program (ELP) at the A1-A2 level who need to build a strong foundation in the English language. It focuses on developing and practicing essential communication skills in listening, speaking, reading, and writing, with an emphasis on everyday vocabulary and basic grammar structures. Through interactive lessons, practical exercises, and real-world scenarios, students will learn to engage in simple conversations, comprehend short texts and audio, and express themselves in both spoken and written English.		

ENGL 095	Academic Bridge	(3:3:1)
3 Semester Credit Hours and 1 Lab Hour		
Prerequisite(s): None		
ENGL 095 Academic Bridge uses an integrated skills approach to improve students' English competency in reading, writing, speaking, and listening to prepare them for ENGL 099 Foundations of College English. This course is not for degree credit. Placement in this course is based on the student's score on the English placement test.		
ENGL 099	Foundations of College English	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course focuses on developing students' ability to use academic English in college settings. It refines students' writing and reading skills; improves their ability to understand spoken language and deliver oral presentations in a college setting; and develops their ability to express themselves at an effective operational level of proficiency. This course is not for degree credit. Placement in this course is based on the student's score on the English placement test.		
ENGL 101	Composition	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Requisite score on the EmSAT, IELTS, TOEFL, OOPT, or completion of required English foundation course(s)		
The course introduces students to the reading, writing, and critical thinking skills central to academic discourse. Students will engage critically with contemporary issues through college-level readings. They will practice analytical reading skills, presenting the argument of others, and critically responding to texts through intense practice in the writing process. (Writing Intensive Course)		
ENGL 102	Public Speaking	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): ENGL 101		
This course is designed to provide an overview of principles to develop effective presentations for public and professional settings while integrating appropriate technologies. Course content and assignments emphasize audience analysis, effective and coherent composition development, research strategies and skills, and presentation delivery methods to strengthen confidence and credibility.		
ENGL 200	Advanced Composition	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Completion of a minimum of 45 credit hours and ENGL 101		
In this advanced writing course, students learn to communicate persuasively about and respond to literature to enhance their skills in academic writing and communication. Building on the writing skills acquired in ENGL 101, students extensively study and practice argumentative techniques, considering differing audiences and purposes when responding to literature. (Writing Intensive Course)		
ENGR 107	Introduction to Engineering	(2:1:3)
2 Semester Credit Hours		
Prerequisite(s): Math Placement Test score qualifying student for MATH 113		
This course introduces functions of the engineer, professionalism, engineering ethics, problem-solving techniques, presentation of technical information, estimation, analysis, and design. The course will include a workshop where students develop basic skills in hand filing, turning, welding, carpentry, sheet metal fabrication, metal forming, and basic electric circuit connections.		
ENGR 200	Engineering Statistics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Math 114		
The course introduces principles of statistics and probability for undergraduate students in Engineering. The course covers the basic concepts of probability, discrete and continuous random variables, probability distributions, expected values, joint probability distributions, and independence. The course also covers statistical methods and topics including data summary and description techniques, sampling distributions, hypothesis testing, and regression analysis.		
ENGR 210	Sustainability in Engineering	(2:2:0)
2 Semester Credit Hours		
This course introduces engineering students to the contemporary issue of sustainability and how it should guide engineering practice and design. Topics covered include sustainability concepts, SDGs, climate change, environmental issues, life cycle assessment, sustainable engineering systems (Infrastructure, buildings, clean energy and smart cities, and sustainable business management.		
ENGR 390	Internship I	
3 Semester Credit Hours		
Prerequisite(s): Completion of 60 credits and a CGPA of 2.0 or higher		
This is one of two supervised field experiences of professional-level duties where each is for 240 to 320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the		

end of the internship.

ENGR 391 Internship II

3 Semester Credit Hours

Prerequisite(s): Completion of 90 credits and a CGPA of 2.0 or higher

This is one of two supervised field experience of professional-level duties where each is for 240 to 320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designate site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

ENGR 399 Undergraduate Research Project

(3:0:9)

3 Semester Credit Hours

Prerequisite(s): A minimum of 90 C.H., 3.0 CGPA or Department Chair approval

Student in this course will be engaged in a creative research project under the guidance of the faculty member from school of engineering. The student will prepare a paper suitable for publications in peer review journal, conference or scientific gathering. Fixed credit hours; 3 credits are assigned.

ENGR 410 Climate Change

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): ENGR 210 or ENVS 102

This course offers a comprehensive overview of climate change, exploring its causes, and its environmental and socio-economic impacts. Students will learn about the greenhouse effect and its main drivers, climatic changes in the near and distant past, and the role of climate models in assessing future climatic changes. They will also learn about adaptation and mitigation strategies, and international climate agreements to address climate change. They will actively engage in this course by researching and presenting a topic on climate change.

ENGR 420 Life Cycle Assessment

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): None

This course aims to provide students with a comprehensive understanding of the principles, methodologies, and applications of Life Cycle Assessment (LCA) in assessing the environmental impacts of products, processes, and systems. Students will acquire the knowledge and skills necessary to conduct LCAs and make informed decisions aimed at reducing environmental impacts in various industries. Additionally, students will gain hands-on experience by using LCA software.

ENGR 450 Engineering Seminar

(1:1:0)

1 Semester Credit Hour

Prerequisite(s): Completion of 90 credit hours

Engineering ethics, professionalism, the role of engineers in society, current topics, and employment opportunities.

ENGR 500 Engineering Foundation for Graduate Students

(3:3:0)

3 Semester Credit Hours

This course is designed to provide a foundation in engineering principles, including strategic and systems thinking, statistical analysis of scientific data and sustainability. It is required for students who do not meet the CGPA for enrollment in graduate programs. The course aims to provide students with the skills and education required to pursue a Master's program.

ENVS 101 Energy and Environmental Science

(3:3:0)

3 Semester Credit Hours

The course is an inter-disciplinary study of environmental disruption and management, natural environmental systems, and the human impact on them. Other topics include energy procurement and use, waste management, water resources and water pollution, acid rain, global warming and ozone depletion.

ENVS 102 Sustainability and Human-Environment Relations

(3:3:0)

3 Semester Credit Hours

This course is designed to present the student with an overview of environmental issues. Humans are closely related to their environment and depend upon it to supply all the necessary resources to maintain life and to provide inputs for industrial activities.

FNAN 300 Principle of Business Finance

(3:3:0)

3 Semester Credit Hours

Prerequisite ACCT 204

This course teaches students the fundamental principles of finance. It covers the financial decisions that financial managers should make to maximize shareholders' wealth or a firm's value. These financial decisions include investment, financing, dividend, and working capital decisions. Students are taught how to apply financial theories to real life financial situations, financial ratio analysis, time value of money, stock valuation, bond valuation, capital budgeting and risk and return. It also discusses the difference between profit maximization and shareholders' wealth maximization. The course entails calculations and arriving at conclusions that help financial managers make financial

decisions and measure financial performance.

FNAN 303 Financial Analysis, Forecasting, and Valuation (3:3:0)

3 Semester Credit Hours

Prerequisites: ACCT 204

This course teaches students a range of techniques for examining, analyzing, and interpreting financial statements, and applying the information for both forecasting and making operational or a strategic financial decision that maximize a firm's value. The course aims at providing comprehensive understanding of the role of financial statements play and their impact on financial decision-making. Topics covered in this course include financial statement analysis, analysis of risk and return, development of financial models, financial forecasting, and firm valuation.

FNAN 304 Principles of Risk Management and Insurance (3:3:0)

3 Semester Credit Hours

Prerequisites: FNAN 303

This course introduces students to the techniques of risk management and insurance. The course also discusses the theory and application of risk and insurance to real world financial decisions. Different disciplines define risk differently. However, in finance, we define risk as the possibility or chances of not achieving the firm's set objective of maximizing shareholder wealth or firm value. Students will study how financial managers identify, measure, control, and monitor risk in order to eliminate, reduce, transfer or avoid it in their operational and strategic financial decision-making.

FNAN 321 Financial Institutions (3:3:0)

3 Semester Credit Hours

Prerequisites: FNAN 300

The course examines the functions of financial institutions with particular references to industry structure and regulatory environment. It analyses decision variables that management should concentrate on to achieve objectives. Topics include types of financial institutions, the structure and functioning of financial institutions, regulation of financial institutions, measuring and managing the risk financial institutions are exposed to, and liquidity and liability management.

FNAN 331 Fundamentals of Sustainable Finance (3:3:0)

3 Semester Credit Hours

Prerequisites: FNAN 300

The course offers business students with a comprehensive exploration of finance principles within the context of sustainability. It focuses on how financial decisions can effectively contribute to environmental and social objectives. Using theoretical frameworks, case studies, and practical applications, students will learn essential concepts such as integrating environmental, social, and governance (ESG) factors in financial decision-making, evaluating sustainable finance products, interpreting ESG metrics disclosed by companies, assessing risks associated with sustainability issues like climate change, and understanding the importance of stakeholders and regulatory frameworks in advancing sustainable finance initiatives.

FNAN 390 Internship in Finance

3 Semester Credit Hours

Prerequisites: Completion of 90 credit hours

The Internship is designed for candidates on the undergraduate finance major programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation take place at the beginning of the internship and will serve to introduce the student to real-world business practices, culture and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.

FNAN 401 Advanced Financial Management (3:3:0)

3 Semester Credit Hours

Prerequisites: FNAN 303

The course analyzes financial decision-making in firms. It emphasizes the conceptual structure of problems and the use of advanced analytic techniques. The topics covered include investment decisions, financing decisions, dividend decisions, working capital management, current asset management, capital structure, and corporate planning models.

FNAN 411 Investment Analysis and Portfolio Management (3:3:0)

3 Semester Credit Hours

Prerequisites: STAT 100, FNAN 303

This course focuses on analysis and valuation of investment alternatives and strategies. It will mainly focus on classifying investment alternatives and examining how investors allocate their financial assets and manage their portfolio. The course analyzes modern techniques of portfolio management including evaluating standards for selecting individual securities to include or remove from portfolio. The course also discovers risk-return analysis for portfolio, and portfolio performance measures. The course is practically oriented, but also aims to equip students with conceptual and theoretical background of investment analysis and portfolio management.

- FNAN 412 Futures and Options Markets (3:3:0)**
3 Semester Credit Hours
Prerequisite OPMT 311, FNAN 303, FNAN 411
 This course demonstrates the theoretical and practical aspects of derivative securities and their applications in financial risk management. Over the past few decades, the use of derivatives to manage financial risk has been increasing tremendously. The main goal of this course is to enhance students' knowledge and skills on the use of derivative securities and application of derivative trading strategies in financial risk management. The course emphasizes on the understanding of the features and functions of different derivative securities, and the operation of the derivative market. Topics covered include an overview of the derivative securities, the mechanics of forwards, futures, swaps and options, hedging, option trading strategies, valuation of derivative securities, option Greeks and Volatility smiles.
- FNAN 421 Money and Capital Markets (3:3:0)**
3 Semester Credit Hours
Prerequisite(s): FNAN 303
 This course illustrates the conceptual and real-world applications of the functions and operations of the money and capital markets. The course starts with an introduction of the financial system and proceeds with a detailed analysis of the functions of the central bank, demonstrates the interest rates behaviors and term structure, emphasizes the practical applications related to the function, operation and performance of money and capital markets and the instruments traded within. The course also develops an analytical framework to understand the factors that affect the performance of the financial market with a special emphasis on financial regulations and financial crisis. It also discusses the importance of the mortgage and foreign exchange markets in the financial system. These issues are presented within a unified framework intended to encourage critical thinking and problem-solving skills of students.
- FNAN 431 International Financial Management (3:3:0)**
3 Semester Credit Hours
Prerequisite FNAN 303
 The course focuses on the management of contemporary financial operations of international corporations. The topics include foreign exchange risk, political risk, returns and risks of international projects, international money and capital markets, financial accounting, capital structure, and cost of capital.
- FNAN 444 Finance Project-Based Internship**
3 Semester Credit Hours
Prerequisite(s): FNAN 303
 The finance project-based internship course will provide students an experience of a self-employed work environment. The course will imbibe problem-solving skills and creative thinking among students. These life-long learning skills will enhance the employability skills of the students and their ability to become independent learners. The students will integrate the tools and concepts from the finance specialization courses to develop strategies to solve problems. Through a coaching and mentoring process, the students would produce a project report, which will allow them to showcase their learning acquired during their four-year study.
- HIST 100 Contemporary Middle Eastern History (3:3:0)**
3 Semester Credit Hours
 This course examines the major issues affecting the Middle East in the 21st century while reviewing the origins and development of the modern Middle East. Students will develop an understanding of the social, economic, and political foundations that set the stage for the region this century.
- HIST 101 Ancient History of the Arabian Peninsula (3:3:0)**
3 Semester Credit Hours
 This course concentrates on the geographical background of the Arabian-peninsula including location, descriptions of its provinces, routes, flora and fauna. It also focuses on the commercial importance and its political situation during the period from third Millennium B.C. to the rise of Islam or to the seventh century A.D.
- HIST 111 Introduction to World History (3:3:0)**
3 Semester Credit Hours
 Analytical approach to an overview of world history that surveys the major features of principal existing civilizations of the world, as originally formed and as altered by key global processes, including forces of modernity.
- HIST 281 Survey of Middle Eastern Civilization I (3:3:0)**
3 Semester Credit Hours
 Survey of Middle Eastern history from rise of Islam to present, emphasizing processes that led to emergence of economic, cultural, social, and political institutions that characterize region today. HIST 210 surveys the period from rise of Islam in 570 to medieval period (ca. 1258).

HIST 282	Survey of Middle Eastern Civilization II	(3:3:0)
3 Semester Credit Hours		
Second half of the survey of Middle Eastern history. HIST 282 surveys the period from about 1258 to the present.		
HTMT 311	Survey of the Hospitality & Tourism Industry	(3:3:0)
3 Semester Credit Hours		
A survey of the history, trends, organizational structure, and economic impact of the hospitality and tourism industry on UAE economy. Some study of the problems originating in the operation and management of various segments of the hospitality industry in UAE will be introduced.		
HTMT 312	Sustainable Tourism	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): HTMT 311		
The course will introduce the issues associated with the sustainable management of destinations and tourist attractions. Students will: learn the variety of ways that sustainability can manifest in the hospitality and tourism industry in UAE; understand the roles of international stakeholders involved in sustainable tourism; analyze case studies in key areas related to social, economic, and environmental impacts and consequences; and learn broad perspectives on how tourism relates to ecosystems, poverty, health, education, and social equity.		
HTMT 321	Hospitality Operations I - F&B Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): HTMT 311		
This course involves the concepts and applications of management in food and beverage operations in various types of hospitality firms across UAE. Topics such as menu development, beverage management, catering, service, sanitation, foodservice design, and cost controls will be presented. Management approaches will be developed to provide quality products and services.		
HTMT 322	Hotel Operations	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): HTMT 311		
This course will offer a thorough overview of the management of various lodging properties, taking a generalist view of lodging management, moving from department to department in a typical hotel. While this course will be general in nature, we will take a much more strategic perspective, identifying and considering issues of concern to general managers of all types of lodging properties, with a particular focus on profit maximization (yield/revenue management) and distribution channel management. As such, we will consider the broader political, economic, social, and technological environments and trends and their impact on lodging operations. For example, the recent global economic downturn has had a devastating effect on the lodging industry. Thus, the recession will form a basic issue that we will deal with throughout the semester.		
HTMT 390	Internship in Hospitality and Tourism Management	
3 Semester Credit Hours		
Prerequisite(s): Completion of 90 credit hours		
The Internship is designed for candidates on the undergraduate hospitality and tourism management major programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation take place at the beginning of the internship and will serve to introduce the student to real-world business practices, culture and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.		
HTMT 411	Destination Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): HTMT 311		
The course will introduce the various issues associated with the management of a convention visitor's bureau (CVB). The course will analyze the mission, structure, and business activities of organizations that develop and promote a complex tourism destination in UAE. This includes the management functions of membership services, visitor services, financial and marketing concerns, research activities, and the strategic planning and evaluation of these efforts. Topics covered will include developing the following consumer segments: meetings/conventions, pleasure/tours, and festivals/special events.		
HTMT 412	Meetings and Conventions	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Prior Completion of 84 Credit Hours		
A course dealing with the many issues impacting the management of large convention and exposition centers. The course is taught from an organizational marketing base. Topics include meeting site selection, program planning and budgeting, legal issues and insurance problems, housing, food and beverage arrangements, transportation, exposition management, and audio-visual services."		
HTMT 444	Hospitality & Tourism Management Project Based Internship	

3 Semester Credit Hours**Prerequisite(s): HTMT 311**

The hospitality and tourism management project-based internship course will provide students an experience of a self-employed work environment. The course will imbibe problem- solving skills and creative thinking among students. These life-long learning skills will enhance the employability skills of the students and their ability to become independent learners. The students will integrate the tools and concepts from the hospitality and tourism management specialization courses to develop strategies to solve problems. Through a coaching and mentoring process, the students would produce a project report, which will allow them to showcase their learning acquired during their four-year study.

INDS 111 Color Theory and Rendering**(3:2:2)****3 Semester Credit Hours****Prerequisite(s): None**

The aim of this course is to introduce color theory as a component of the design process that influences human perception of the interior space, behavior, performance and wellbeing and therefore influences design solutions. It offers skills in color selection and rendering for diverse spaces function and design concept communication.

INDS 112 Design Communication 1: Sketching and Drawing for Interiors**(3:2:2)****3 Semester Credit Hours**

This course introduces students to the principles and techniques of interior design's form and space representation and communication. The course makes the students familiar with manual drawing tools and modes of documenting to develop students' sketching, technical drawing and ideation skills.

INDS 121 Interior Design Process, Human Factors and Ergonomics**(3:3:0)****3 Semester Credit Hours**

The aim of this course is to provide knowledge in design process steps, components, human factors, anthropometrics and ergonomics and how they influence design solutions and contribute to the human wellbeing. It offers skills in gathering, analyzing human-centered evidence, application of ergonomics and other human factors in inclusive, universal design.

INDS 122 Design Communication 2: Digital Media for Interiors**(3:2:3)****3 Semester Credit Hours****Prerequisite(s): INDS 112**

This course introduces students to the most common 2D and 3D software used in the field of interior design to create and develop graphical and technical presentations. Emphasis will be on giving the students tools to digitize a sketches, drawings and concepts to examine design idea in terms of accuracy and workability of schematic design.

INDS 211 Interior Design Studio 1**(4:0:8)****4 Semester Credit Hours****Prerequisite(s): ARCH 122****Corequisite(s): INDS 111 and ARCH 223**

This course introduces a small-scale residential environment interior design project. A scenario-based design brief focuses on relationships between the users' needs and space's features leads students through the early phases of the design process (pre-design, schematic design, design development) with an aim of meeting space functional requirements and user(s) needs.

INDS 212 History of Art and Interior Design 1**(3:3:0)****3 Semester Credit Hours**

The course aims to provide knowledge in history as it relates to decorative arts, architecture, interior design, furniture, material culture and understanding of how the design of the built environment changes along with historical periods that are influenced by the social, political, physical changes in design of the built environment.

INDS 213 Interior Construction Methods, Materials and Finishes 1**(3:2:3)****3 Semester Credit Hours****Prerequisite(s): INDS 121****Corequisite(s): INDS 112**

The course aims to provide students with understanding of building material, finishes, and furnishings, their fabrication process, installation methods and maintenance requirements and skills in selecting materials, finishes and furnishings to support the design intent, project criteria and human and environmental wellbeing. The courses focuses on classic materials.

INDS 221 Interior Design Studio 2**(4:0:8)****4 Semester Credit Hours****Prerequisite(s): INDS 211****Corequisite(s): INDS 223**

This studio introduces medium size interior design of office spaces. The studio encourages the students to investigate social interaction in multiusers environments and to use elements that reflect the nature and identity of work activities through the phases of data collection and analyzes, space programming, materials, furnishings and finishes selection.

INDS 222 **History of Art and Interior Design 2**

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): INDS 212

The course aims to provide knowledge in history as it relates to decorative arts, architecture, interior design, furniture, material culture and understanding of how the design of the built environment changes along with historical periods that are influenced by the social, political, physical changes in design of the built environment.

INDS 223 **Interior Construction Methods, Materials and Finishes 2**

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): INDS 213

The course aims to provide students with understanding of building material, finishes, and furnishings, their fabrication process, installation methods and maintenance requirements and skills in selecting materials, finishes and furnishings to support the design intent, project criteria and human and environmental wellbeing. The course focuses on modern materials.

INDS 224 Sustainable Approaches in Interior Design

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): ENVS 102

The course aims to explore the complex context of sustainability, its application in interior design, sustainability approaches in interior design and how sustainable approaches in interior design contribute to environmental and human wellbeing. The course provide practice in systems thinking for understanding how social, economic, cultural sustainability influences the design.

INDS 311 **Interior Design Studio 3**

(4:0:8)

4 Semester Credit Hours

Prerequisite(s): INDS 221

This design studio increases the complexity of the interior design projects by introducing design solutions for commercial spaces in urban, suburban, and shopping mall settings. Students explore space utilization, fixtures, and display as well as the role interior designer plays in supporting the business and branding of the commercial space.

INDS 312 Construction Drawings and Interior Detailing

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): INDS 223

This course will lead the students to continue exploring more advanced software application and the principles of Building Information Modelling used to visualize, document and communicate interior design working drawings.

INDS 313 Environmental Systems 1: Indoor Comfort and Human Wellbeing

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): INDS 224

Corequisite(s): INDS 312

The course aims to explore environmental control systems, types, size, their integration into interior design project, and awareness of these systems in relation to indoor thermal comfort, indoor air quality, environmental and human wellbeing. The course focuses on water, waste, HVAC, electrical, fire safety, conveyance, and communication and security systems.

INDS 321 **Interior Design Studio 4**

(4:0:8)

4 Semester Credit Hours

Prerequisite(s): INDS 311

Corequisite(s): INDS 322 and INDS 323

This design studio deals with contemporary complex interior design project within the hospitality industry and will enable the students to explore the combination of wellness, aesthetics, functionally and operational aspects in designing city restaurants, cafes, and hotels.

INDS 322 Furniture Design

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): INDS 121 and INDS 312

The aim of this course is to provide knowledge and skills in materials, construction methods and details for furniture design and making. The course analyzes materials for furniture design in relation to their impact on environment, healthy and safe living and efficient work within the interior space.

INDS 323 **Environmental Systems 2: Design with light and sound**

(3:2:3)

3 Semester Credit Hours

Prerequisite(s): INDS 313

The course aim to provide knowledge in space's lighting and acoustical design for space quality enhancement in relation to safety, comfort, performance, and wellbeing. The course suggests skills in light and sound integration into design of residences, stages, exhibitions, theaters, halls, etc. with the application of high-tech materials and technologies.

INDS 351 Parametric Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s) INDS 312 or ARCH 336**

This course is an advanced level course that will allow students to discover the fundamentals of Parametric modeling for design applications in Interior Design and Architecture. Students will investigate rule-based and parametric design concepts and techniques in the context of a generative modeling environment: Dynamo for Revit.

INDS 352 Sketching and Painting**(3:2:2)****3 Semester Credit hours**

This course aims to improve students' skills in sketching and painting and focuses on two-dimensional media. Students continue to explore and experiment various techniques in art making. Two-dimensional media art works such as still life, compositions, collage are practiced with the application of various two-dimensional media.

INDS 353 Landscape and Garden Design**(3:3:0)****3 Semester Credit Hours**

This course aims to introduce principles of landscape design throughout all its phases. Students study types of landscape, materials and its relationship with the context, environmental and human wellbeing and apply various representation techniques in landscape design projects.

INDS 390 Internship I**3 Semester Credit Hours****Prerequisite(s): Completion of 60 credits and a CGPA of 2.0 or higher**

This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

INDS 391 Internship II**3 Semester Credit Hours****Prerequisite(s): Completion of 97 credits and a CGPA of 2.0 or higher**

This is one of two supervised field experiences of professional-level duties where each is for 240-320 hours (8 weeks) of full-time training at approved internship sites. The internship takes place under the guidance of a designated site supervisor in coordination with a faculty supervisor. In addition to the regular reports during the internship, students must present their activities and learning experiences at the end of the internship.

INDS 411 Interior Design Studio 5**(4:0:8)****4 Semester Credit Hours****Prerequisite(s): INDS 321**

This course extends the scope of interior design within a medium scale project of a healthcare environment. Students explore design approaches related to this complex and sensitive environment with respect to safety, efficiency, codes and regulations and that will satisfy all end users (including patients, staff, and visitors)' needs and wellness.

INDS 412 Graduation Final Thesis Research**(2:1:3)****2 Semester Credit Hours****Prerequisite(s): INDS 321****Corequisite(s): INDS 411**

The course aims to prepare students for Graduation Project Design that follows next semester. It offers students opportunity to consider their evolving interest, targeted career plan and select a project theme, gather, analyze, systemize relevant to the theme data, and develop a design brief, project statement, design concept and program. **(Writing Intensive Course)**

INDS 414 Professional Practice 1: Codes and Regulations**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): INDS 323**

The aim of this course is to equip students with knowledge of regional and international laws, codes, standards and guidelines that influence the encounter of the inhabitants with interior spaces and skills in application of laws, codes, standards and guidelines concerning built environment, sustainability, wellness, inclusive and universal design.

INDS 421	Graduation Project Design	(5:0:10)
5 Semester Credit Hours		
Prerequisite(s): INDS 412		
Corequisite(s): INDS 422		
The graduation project is a capstone self-directed course under the supervision of one the program's senior faculty member where the project identified during the Graduation Final Thesis Research course is implemented. Students apply gained knowledge and skills in developing a holistic design approach to a design project.		
INDS 422	Professional Practice II: Ethics and Project Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): INDS 414		
The aim of the course is to provide awareness of the context of interior design practice, the influence of local and global context on design practices, understanding of the interior design profession principles, processes, responsibilities and its value to the society, interior design management, business formation, practices, and ethics.		
INDS 451 Portfolio Design		(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course aims to assist and mentor students in assembling a comprehensive portfolio of their academic work, enhancing students' graphic techniques, and provides skills in organizing the layouts of their projects in both book and digital formats.		
INDS 452	Photography	(3:3:0)
3 Semester Credit Hours		
This course aims to provide knowledge in types of cameras and skills in camera operating, taking pictures in different contexts, enhancing the pictures, processing and organizing pictures and application of photographs in interior design presentations.		
INDS 453	Advanced BIM: Scheduling and Coordination	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): INDS 312 or ARCH 336		
The course aims to introduce technologically based collaboration of interior design with multiple disciplines and provides knowledge and training on collaboration tools and methods using Building Information Modelling applications. It focuses on developing, reading, exploring, and coordinating working drawings and executive documents to avoid conflicts and ensure construction documents consistency.		
INDS 454	Research Methods for Interior Design	(3:3:0)
3 Semester Credit Hours		
This course aims to introduce research processes in design related tasks within the framework of Evidence-Based Design Approach. It offers a review of design research methods such as literature review, sampling procedures, questionnaires interviews, and observations.		
ITEC 103	Fundamentals of Information Technology	(3:3:0)
3 Semester Credit Hours		
The course focuses on the nature and uses of computers with an introduction to word processing, spreadsheets, presentation software and effective presentation information, in addition to related lab projects. Additional topics include computer systems organizations, communications and networking, legal and ethical issues, computer security, the Internet, and trending technologies.		
MATH 091	Pre-algebra	(3:3:0)
3 Semester Credit Hours		
This course prepares students to take MATH 101 (Numbers and Data interpretation). It enables them to gain a command in operations with integers, fractions, decimals and percent, geometric figures and their measures, and pre-algebra topics including properties of rational numbers, operations of rational numbers, simplification of polynomials and equation-solving techniques. This course is not for degree credit.		
MATH 093	Intermediate Algebra	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course covers basic algebraic skills including factoring, solving basic linear and quadratic equations, the rules of exponents and radicals, and basic concepts of functions with specific examples, such as polynomial and rational functions. The course serves as a prerequisite to MATH 108. This course is not for degree credit.		
MATH 095	Pre-calculus	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course is a prerequisite to MATH 113. It reviews mathematical skills essential to studying calculus. Topics include inequalities, absolute values, graphs, functions, exponential and logarithmic functions, and trigonometry. This course is not for degree credit.		

MATH 101	Numbers and Data Interpretation	(3:3:0)
Prerequisite(s): MATH 093 or Appropriate Score on the Placement Test		
3 Semester Credit Hours		
This course meets the quantitative reasoning requirement, one of the Foundation requirements of the University General Education program. Topics include Logic Mathematics, Sets and Counting, probability and descriptive statistics. This course is broad in scope, emphasizing applications.		
MATH 102	Mathematics in Civilization	(3:3:0)
3 Semester Credit Hours		
Throughout the history of mankind, the mathematical spirit has been a driving force in the development of the civilized world. This course creates an understanding of the impact of mathematical ways of thinking on the arts and sciences, on the development of technologies, and on the study of history. The goal is to illuminate the role of mathematics in the development of Eastern and Western civilizations and, thereby, to shed on human civilization from a mathematical point of view.		
MATH 108	Calculus with Business Applications	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 093 or Appropriate Score on Math Placement Test		
The course covers standard topics such as functions, limits, derivative, and integral calculus as well as applications of differentiation and integration. Simple introductory examples and applications are drawn from, but do not require, advanced knowledge of business applications.		
MATH 111	Calculus with Life Sciences Applications	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
The course covers standard topics such as functions, limits, derivative, and integral calculus as well as applications of differentiation and integration. Simple introductory examples and applications are drawn from, but do not require advanced knowledge of the life sciences.		
MATH 113	Calculus I	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course covers the concepts of limits and continuity, derivatives of functions, extreme values, curve sketching, L'Hopital's rule, definite and indefinite integrals and integration by substitution.		
MATH 114	Calculus II	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 113		
This course covers techniques and applications of integration, transcendental functions, infinite sequences and series and parametric equations.		
MATH 203	Linear Algebra	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 113		
This course covers systems of linear equations, linear independence, linear transformations, inverse of a matrix, determinants, vector spaces, eigenvalues, eigenvectors, and diagonalization.		
MATH 213	Calculus III	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 114		
This course covers partial differentiation, multiple integrals, line and surface integrals, and three-dimensional analytic geometry.		
MATH 214	Elementary Differential Equations	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 114		
This course covers first-order ODEs, higher-order ODEs, Laplace transforms, linear systems, nonlinear systems, numerical approximations, and modeling.		
MATH 225	Discrete Mathematics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MATH 113 and (CSCI 112 or CSCI 114)		
This course covers elementary discrete mathematics. Topics include propositional logic, tautology and equivalence rules, logical inference rules, logical consistency, predicate logic and quantifiers, graphs, planar graphs, binary and decision trees, and complexity of algorithms.		

MBAC 512	Managerial and Financial Accounting	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
The course deals with managerial and financial accounting techniques and practices. The course examines the impact of cost and cost allocation on business performance analysis, using a variety of costing schemes. It presents accounting as an information system construct, and looks at methods for recording, presenting and analyzing accounting information. The course also looks at budgeting, ratio analysis and other fiscal management measures. The course discusses the impact, on Management and Financial Accounting, of contemporary management philosophies and techniques including JIT practices, quality assurance and performance measurement.		
MBFN 500	Business Graduate Foundation	(3:3:0)
3 Semester Credit Hours		
The course is designed to provide a foundation in business for Graduate students who graduated from a non-business discipline. This course offers a comprehensive introduction to aspects of business. This course aims to equip students with business education and skills to successfully complete the business graduate program. This course does not count toward degree credit.		
MBFN 514	Managerial Finance	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
This course focuses on corporate finance at a global environment context. It explores advanced concepts and practices applicable to multinational company's financing and investment decision- makings. Topics covered include financial analysis for investment decisions in an international setting, international money operations and capital markets, management of foreign exchange risk, direct foreign investment, funding of international projects, political risk analysis, currency derivatives and swap markets.		
MBFN 560	International Corporate Finance	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MBFN 514		
This course focuses on corporate finance at a global environment context. It explores advanced concepts and practices applicable to multinational investing, financing and dividend decision making that maximize firm value. Topics covered include financial analysis for investment decisions in an international setting, international money operations and capital markets, management of foreign exchange risk, direct foreign investment, funding of international projects, political risk analysis, currency derivatives and swap markets.		
MBFN 562	Investment Planning and Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MBFN 514		
The course deals with the advanced analysis of equity securities and investment portfolios, predicated on relevant market hypothesis and capital market theory. The course looks at investment risk-return trade-off, asset pricing models, and stock price behavior. The course adds emphasis on stocks, bonds, and financial futures and options.		
MBFN 564	Financial Markets	(3:3:0)
3 Semester Credit Hours		
Prerequisite MBFN 514		
The course deals with financial markets, primarily global equity markets. It looks at markets for handling government debt instruments, and exchange-traded and over-the-counter financial derivative instruments such as futures, options, swaps, and asset-backed securities. There is detailed treatment of derivatives theories, derivatives exchanges, and valuation of derivatives, including standard and other non-standard options on a variety of underlying assets, in relation to relevant financial markets. The course also discusses emerging financial markets, and the effective management of risks emanating from these markets.		
MBGN 525	Research Methods for Business	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
This course provides the necessary underpinning support for the MBA dissertation and general business domain research. It allows candidates to make informed decisions and appropriate choices pertaining to research methodology. A range of business research tools, approaches and analytical techniques are discussed, and guidance is given on optimal structuring of business research documents and MBA dissertations.		
MBGN 555	MBA Investigative Thesis or Project I	(3:0:9)
3 Semester Credit Hours		
Prerequisite(s): MBGN 525		
MBGN 555 is the first part of the MBA Investigative Thesis or Project course, serving to integrate the various topics studied in the School of Business MBA program. Students undertake a work-based study that focuses on a chosen business/management topic. The outcome for MBGN 555 is to submit a research introduction, literature review and research methodology that will be used, for the completion of this course. Satisfactory performance of the students in this course will move the student into MBGN 556.		

MBGN 556	MBA Investigative Thesis or Project II	(3:0:9)
3 Semester Credit Hours		
Prerequisite MBGN 555		
MBGN 556 is the second part of the six-credit hour research course, serving to integrate the various topics studied in the School of Business MBA program. Students undertake a work-based study that focuses on a chosen business/ management topic. The outcome is a thesis, an extended piece of work necessitating investigation of secondary data and empirical fieldwork, through collection of primary data, pertaining to an organization and/or a business domain problem. Analysis of collected data is expected to generate critical commentary and recommendations.		
MBHR 590	Applied and Strategic Human Resource Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MBMG 510		
The course deals with key areas of applied and strategic human resource management, essential for providing supervisors and human resource specialists with a thorough understanding of the strategic role of human resource management and the techniques available to management for making effective use of the human resources of an organization. The material is delivered from the perspective of strategic and applied HRM practice in both the UAE/GCC and internationally.		
MBHR 592	Managing Change and Innovation	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MBMG 510		
This course discusses issues related to the management of change in organizations. The different types of change typically encountered in organizations are characterized using well- defined analysis frameworks. The effective management of corporate innovation is also considered, looking in details at the ideas generation, development and diffusion phases.		
MBHR 594	Employee Relations and Compensation Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MBMG 510		
This course deals with legal and regulatory issues pertaining to employee relations from several perspectives. The compensation management aspect focuses on the theories underlying direct compensation and reward systems in organizations, and the practical administrative practices used to implement such systems, with particular reference to the UAE/GCC sub-region. Compensation management practices, including the analysis and evaluation of jobs, criteria and procedures for determining wage levels, individual wage determination, forms of payment, and incentive systems will be covered.		
MBIB 524	International Business	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
The course looks in-depth at salient aspects of managing in a globalized environment, including consideration of theoretical concepts. It offers a practical treatment of political-economic aspects of international trade. The course discusses foreign direct investment, global monetary systems, and strategy formulation for international business practice. The course additionally places stress on international business case analysis, within the UAE/GCC context.		
MBMG 510	Leadership and Managing People	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
This course provides an in-depth study of concepts relating to leadership and people management within organizations. The work integrates theory, research, and applications, with an emphasis on context-driven learning. Students apply principles of leadership and people management to their own occupational situations and will investigate topical case studies. The material is delivered from the perspective of people-management practice in both the UAE/GCC and internationally.		
MBMG 515	Strategic Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
The course deals with the formulation, implementation and evaluation of strategies designed to give organizations a competitive edge. Corporate, business and operational – level strategy types are treated, and the use of various strategy analysis frameworks and models are discussed. Additional emphasis is placed on strategy formulation in the context of business practice in the UAE/GCC.		
MBMI 520	Managing Information Systems Performance	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Graduate Standing		
The course studies techniques and practices for analyzing business information systems performance with emphasis on support for business processes. The course gives a strategic and integrated view of the exploitation of information and communication technology, with particular emphasis on e-business for improving business performance and business efficiency. The course discusses IT-driven business strategy, and reviews IT-related factors that are necessary for enhancing the performance of organizations in the current competitive global		

MBMK 518	Marketing Management	(3:3:0)
3 Semester Credit Hours		

This course looks in-depth at techniques for crafting effective marketing strategies, for a variety of market environments. Customer-focused marketing strategy design implementation and management are discussed using contemporary frameworks within a market-driven setting. The course emphasizes managerial aspects of marketing, including integrating specific elements of the marketing process. The course additionally places stress on case analysis, within the UAE/GCC context.

This course equips students with skills and knowledge needed to excel in today's digital landscape. It covers Digital Marketing Analytics, Digital Retail, Content Marketing, Customer Experience Design, Social Media and Viral Marketing, Digital Marketing Metrics, and Neuromarketing. The course offers a blend of theory and practical application, preparing students to implement effective marketing strategies in their future careers.

The course introduces the fundamental rules of an international language that enables ideas to be expressed and communicate in an easy and clear way through visual illustration. Includes the following topics: geometric construction; line convention; orthographic projections, Position student feet on the first step of the engineering design based on the visual representation. The course covers the following topics: isometric projections; oblique projections; Perspective projections; dimensioning, and sectional views. Computer software design, prepare parts drawing and assembly it using the software CREO.

This course will consider the fundamental science of classical thermodynamics and its practical applications. Problem solving will be emphasized, including problem formulation, analytic, and computational solutions. Topics include the first law of thermodynamics, work, heat, properties of substances and state equations, the second law of thermodynamics and applications to engineering systems.

This course is a continuation of MENG 211 - Thermodynamics I. It provides more depth in the study of cycles, with applications to gas power and refrigeration cycles, and vapor and combined power cycles; mixtures of gases and vapors, psychrometrics, chemical reactions, and energy analysis.

Kinematics of a Particle, Kinetics of a Particle: Force and Acceleration, Kinetics of a Particle: Work and Energy, Kinetics of a Particle: Impulse and Momentum, Planar Kinematics of a Rigid Body, Planar Kinetics of a Rigid Bodies.

This course introduces the theory behind engineering measurements. Basic definitions, error analysis, characteristics of mechanical systems, system response and signal analysis. Students will apply the knowledge learned in this course in experiments preformed in the BSME program's required laboratory courses.

This course describes the material science and why should an engineer know about it. It covers: Classification of engineering materials, bonding forces and atomic structure and structure of crystalline materials, imperfections and defects, diffusions in solids. Phase diagrams and phase transformation diagrams and heat treatment also covered. Properties of materials such as mechanical, thermal, corrosive and electrical properties of materials included. Moreover, the mechanical failure of engineering materials and the application and processing of metal alloys will be discussed.

Corequisite(s): MENG 241

This laboratory course provides an introduction to material science that covers the main material experimentations. General introduction and safety procedures are introduced. Physical and mechanical properties will be inspected. This include microstructure, hardness, creep, impact, tensile, compression and torsion test. Further the microstructure/processing properties relationships are also investigated. Steel heat treatments is also included.

MENG 311 Internal Combustion Engines (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MENG 212

Engine classifications and terminology. Engine operating characteristics and performance parameters. Air standard engine cycles including: Otto, Diesel, Dual and two-stroke cycles. Common fuels used in IC engines, combustion reactions and the associated thermochemical calculations. Engine emissions and their control technologies and strategies. Air and fuel induction methods and technologies, the physics of the combustion phenomena. Friction losses, lubricants and lubrication systems.

MENG 312 Manufacturing Processes (3:3:0)

3 Semester Credit Hours

Pre-requisite(s): MENG 241

This course introduces the principles and importance of manufacturing processes with some practical applications. It describes and differentiate between manufacturing processes groups. That's is forming and shaping processes of metals including casting, forging, rolling and drawing and for polymers including injection molding and extrusion. Machining processes such as turning, milling and drilling and their associated machining processes also identified as well as introducing the advanced machining processes. Joining processes including fusion welding processes, solid-state processes as well as brazing, soldering, adhesive bonding, and mechanical-fastening processes also explained. Surface modifications and surface treatments and coatings processes also included. The product design and process selection and considerations in a competitive environment is highlighted and identified.

MENG 313 Manufacturing Processes Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): MENG 312

This laboratory course provides an introduction to manufacturing processes experimentation. Experiments include Oxy, Arc, Spot welding as well as mechanical fastening by riveting, screwing and assembling, metal fabrication and sheet metal, machining processes of milling, turning and CNC. Advance manufacturing technologies of LASER and FDM are introduced. (Writing Intensive Course).

MENG 321 Vibration and Control (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MATH 214, MENG 221

Introduction to Vibration, Oscillatory Motion, Free Vibration, Forced Vibration, Rotating Unbalance, Multiple-Degree-of-Freedom Systems, Introduction to control, block diagrams, modeling of systems, state space representation, Laplace transform, solution of linear systems, stability, input/output description, PID controllers, transfer function methods, tracking.

MENG 323 Engineering Economy (3:3:0)

3 Semester Credit Hours

Pre-requisite(s): MATH 113

Principles of economic analysis and methods in engineering including: time value of money, discounted cash flow techniques equivalence, economic measures of worth, single and multiple alternatives evaluation and selection, replacement decisions, cost estimation, equipment depreciation, the use of Minimum Attractive Rate of Return MARR and Benefit/cost analysis.

MENG 342 Fluid Mechanics Lab (1:0:3)

1 Semester Credit Hour

Prerequisite(s): MENG 231

Corequisite(s): CIEN 251

This course is composed of a set of selected experiments about general fluid mechanics. The experiments will be either performed in groups by the students or demonstrated by the instructor. Individual class work will be strongly encouraged as well as teamwork. The lab also includes an open-ended design of experiment.

MENG 361 Heat Transfer (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MENG 212 and MATH 214

Introduction to heat transfer mechanisms, heat conduction equation, steady heat conduction including the thermal resistance networks, transient heat conduction, lumped systems, fundamental of convection and thermal boundary layers, external and internal forced convection, natural convection, boiling and condensation, thermal radiation, and heat exchangers.

MENG 362 Thermal Sciences Lab (1:0:3)

1 Semester Credit Hour

Prerequisite(s): MENG 211 and MENG 231

Corequisite(s): MENG 361

This course is composed of a set of selected experiments which demonstrate and apply the concepts of thermodynamics and heat transfer. The experiments will be either performed in groups by the students or demonstrated by the instructor. Individual class work will be strongly encouraged as well as teamwork. The lab also includes an open-ended design of experiment.

MENG 421 Theory of Machines**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): MENG 221**

This course focuses on the kinematic and kinetic analysis of mechanisms. It introduces the fundamental concepts, definitions and terminologies in mechanisms, basic mechanisms and applications, linkages and mobility, dynamic analysis of cams, gears and gear trains, velocity and acceleration analysis in mechanisms, and static and inertia force analysis of machinery.

MENG 422 Building Utilities II: Illumination, Acoustics, and Electrical Building Services**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): PHYS 110, MENG 468**

This course explores building electrical system and controls, lighting and acoustic design and assist integrating them into architectural design of the building. Evaluates systems types, components, and installation and maintenance procedures as it relates to building regulations and systems impact human's indoor comfort and on environment.

MENG 441 Turbo Machinery**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 251**

Turbomachinery classifications and terminology. Implementation of dimensional analysis for predicting performance of turbomachines and designing engineering systems. Understand the fundamentals of energy transfer between rotating rotors and fluid flow. Demonstrate the ability to construct velocity diagrams for various turbomachines (axial-flow compressors and turbines, radial-flow compressors and turbines, pumps, fans, blowers, hydraulic turbines) and their relation to design. Perform elementary analysis for determining input/output work of various turbo devices. Design and selection of turbomachines for various engineering applications.

MENG 451 Mechanical Design I**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): CIEN 212, MENG 241**

Introduction to Mechanical Engineering Design, Materials Properties, Load and Stress Analysis, Deflection and Stiffness, Failure Prevention, Fatigue Failure, Design of Mechanical Elements, Screws Fasteners and Nonpermanent Joints, Mechanical Springs.

MENG 452 Mechanical Design II**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): MENG 451**

This course is a continuation to the machine design I course. Students will be introduced to the analysis and design concepts of various types of machine elements that include: bearings (journal and anti-friction); spur, helical and bevel gears; flexible drives and flywheels; clutches and brakes.

MENG 453 Computer Aided Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): MENG 201**

This is an upper-year mechanical engineering course. It introduces students to the analytical basis to CAD software and the three main ways to represent an entity, namely wireframe, surface and solid modeling. The course aims at introducing the concept and importance of CAD as part of the design process. Also it focuses on mathematical representation and manipulation of geometry. The course introduces students to Computer-Aided Mechanical Design (CAMD) tools and their applications to mechanical systems design.

MENG 455 Finite Elements in Machine Design**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): MENG 451**

The objective of this course is to learn how to design and analyze structural components of machine system, especially using the finite element method. The course exposes students to analytical and numerical methods for computing stresses and strains in structures, use of finite element software for static structural analysis and the application of design and failure criteria to ensure that mechanical components can carry the design load without failure. Another important area of the course is to make the students recognize the importance of self-education and life learning.

MENG 461 HVAC and Refrigeration Systems**(3:3:0)****3 Semester Credit Hours****Prerequisite(s): MENG 361 and MENG 212**

Review of psychrometry. Air conditioning processes. Thermal comfort, inside and outside design conditions. Ventilation and infiltration. Heating and cooling load calculations. Solar radiation. Water heating systems layout and design. Air systems design. Under floor heating.

Review of vapor compression and absorption cycles; compressors, condensers, evaporators, expansion devices; refrigerants (including new ones); cooling towers; components of an absorption cycles, controls.

MENG 462 Design of Thermal Systems

(3:3:0)

Semester Credit Hours

Prerequisite(s): MENG 361 and CIEN 251

Application of principles of fluid mechanics heat transfer and thermodynamics in the component design of thermal systems. Examples are drawn from power generations, environmental control, and industrial processes such as design and sizing of piping systems, piping networks, pumps sizing and selection, and heat exchangers selection and performance evaluation. Students work individually and on group to conduct assignments and projects for integration of these components in the design of thermal systems.

MENG 463 Energy Conversion and Management

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): MENG 361

An introduction to the basic technical and economic criteria for the design of efficient energy conversion systems, including traditional as well as alternative power systems. To discuss strategies for increased energy efficiency and more environmentally sound operation. To assess design alternatives and selection criteria based on long-term economic viability and overall energy management strategies.

MENG 468 **Building Utilities I: HVAC and Mechanical Building Services**

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): PHYS 110, ARCH 336

This course explores building systems such as heating, ventilating and air-conditioning, water supply, drainage, fire safety, vertical transportation, building control systems, and assist integrating them into architectural design of building. Evaluates systems types, components, and installation and maintenance procedures as it relates to building regulations, systems impact on indoor comfort and environment.

MENG 471 Sustainable Product Design

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): None

This course is designed to equip engineering students with a comprehensive knowledge of the principles, methods, and tools needed to design environmentally responsible and sustainable products. It covers various aspects of sustainability, including ecological, economic, circular economy, and social considerations. This course aims to equip students with the tools to design products that minimize their ecological footprint while meeting user needs and market demands.

MENG 491 **Senior Design Project I**

(2:0:6)

2 Semester Credit Hours

Prerequisite(s): Completion of 90 credit hours

This is the first course of a capstone project that requires students to develop, design, and implement a solution to an engineering problem under the supervision of a faculty advisor. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resource, procurement, and communication, with consideration of ethical, economical, social and professional conduct. In this course, students will learn several personal and professional skills such as teamwork, time management, leadership and oral and written presentations.

MENG 492 Senior Design Project II

(4:0:12)

4 Semester Credit Hours

Prerequisite(s): MENG 491

The Mechanical Engineering Senior Design Projects Program coordinates the completion of the second half of the capstone design sequence required of all Mechanical Engineering seniors. Students apply engineering design methodology, using both analysis and synthesis, to solve open-ended problems. The range of design problems considered spans other engineering fields as well as non-engineering disciplines. At the end of the term, each student design team is expected to present information related to their project in both written and oral formats.

MENG 493 **Special Topics in Mechanical Engineering**

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): Dept. Approval

Special up-to-date topic in one of the mechanical engineering streams of applied mechanics or thermal sciences.

MEPM 511 Project Management Fundamentals

(3:3:0)

3 Semester Credit Hours

The fundamentals of project management including: overview and concepts of project management (principles, body of knowledge, strategies); planning successful projects (defining, specifying, delivery options, scheduling, budgeting); implementing (organizing the team, work assignments, team building, effective leadership); executing (performance measurement, maintaining the schedule, adjustments/mid-course corrections, record keeping, status reporting, communications, managing conflict, time management); and

closeout (performance measurement, maintaining the schedule, adjustments/mid-course corrections, record keeping, status reporting, communications, managing conflict, time management).

MEPM 512	Engineering Contracts and Procurement	(3:3:0)
3 Semester Credit Hours		
This course presents fundamental concepts and techniques for project procurement. Students are introduced to the PMBOK Guide four-step procurement process and expected to develop an in-depth understanding of project contracting, negotiation, and procurement execution.		
MEPM 513	Project Implementation and Performance	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MEPM 511		
This course examines various topics related to project initiation and performance, Key performance indicators and criteria for measuring project success. The course includes using project performance software. Topics include: team building and management, organization structure, performance and success measures and earned-value technique. Other topics include: work breakdown structure, stakeholder management and project communication management.		
MEPM 514	Global Projects Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MEPM 511		
This course provides an overview of the global project management process with specific emphasis on cross-cultural considerations, environmental factors, challenges, benefits & risks of global projects and leadership in global projects. The course also includes best practices that apply to global project management.		
MEPM 515	Project Scheduling	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MEPM 511		
The course will prepare students to master project scheduling. Project scheduling methods are covered including: network construction, forward pass and backward pass calculations, activity slakes or floats calculations, critical path method (CPM), critical chain scheduling, Program Evaluation Review Technique (PERT), resource loading and resource leveling, Project crashing, and scheduling risk analysis. Students will have the opportunity to learn and use one of the project management software's for project scheduling.		
MEPM 516	Project Quality Management	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): MEPM 511		
This course covers the fundamentals of quality control and management, quality principles, quality control techniques, quality control tools (Check Sheets, Histograms, Pareto Diagram, Cause and Effect Diagram, Scatter Diagram, Flow Process Charts and Control Charts), Control Charts for Variables and for Attributes, Lot-by-Lot acceptance sampling, acceptance sampling system, quantitative techniques, quality decision-making techniques. Examples and case studies on project quality management are presented and discussed from a wide variety of engineering discipline.		
MEPM 521	Project Cost Accounting and Finance	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
This course covers the fundamentals of project cost accounting and finance. It reviews the fundamentals of accounting; examines cost accounting principles, applications, and the impact on profitability. It also examines the principles of project costing and covers the elements and introduces a framework for using an effective project cost system. Moreover, it introduces a framework for how projects are financed.		
MEPM 522	Financial Analysis and Decision Making	(3:3:0)
3 Semester Credit Hours		
This course covers some of the theory and practice of decision-making, as well as basic procedures for the application and interpretation of financial statement analysis. Topics covered in this context will include the concept of time value of money, project analysis and evaluation, cost of capital, stock valuation and capital budgeting.		
MEPM 531	Operation Research	(3:3:0)
3 Semester Credit Hours		
This course introduces the modeling techniques, theory and computation of linear programming. Topics include: The structure of linear programming, basic feasible solutions, simplex method, sensitivity analysis and linear programming duality. Linear programming modeling techniques for different applications: blending problem, inventory problem, minimum cost network flow problem, transportation problem, capital budgeting and fixed charge problems. Basic integer programming, dynamic programming and queening theory methodologies and techniques will be introduced.		
MEPM 532	Engineering Management	(3:3:0)
3 Semester Credit Hours		

The fundamentals of engineering management including: overview and concepts of engineering management (Introduction to engineering management, Management cycle includes (Planning, organizing, Leading and controlling. Different aspects of engineering managements will be introduced; like managing research and development, managing engineering design and managing production activities and operations. Market management and service activities for engineers will be clarified as well. Engineers as managers and Engineers code of ethics concepts and elements will be clarified. Finally, the globalization concept and the new challenges for engineering managers in the future will be discussed.

MEPM 533 Information Systems for Project Management (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MEPM 511

This course will assist the student in understanding the challenges, opportunities and risks involved in information technology management. It introduces the management information systems foundations; current trends; MIS technology fundamentals; its applications to business functions and management practice and in an ethical manner. The impact of information technology on project management will be stressed since it affects the planning process. This course will also cover various system applications for specific project and business functions and their importance to today's manager.

MEPM 541 Organization Behavior and Project Team Management (3:3:0)

3 Semester Credit Hours

This course deals with human behavior as individual and as groups in organizations. Individual-level characteristics such as personality, attitudes and values, perceptions and judgment, motivations, career development and ethics are emphasized. Topics include group formation, development, structure, leadership, diversity, and dynamics, as well as the processes of communication, decision making, power, and conflict. Class sessions and assignments are intended to help participants acquire skills and analytic concepts to improve organizational relationships and project team management effectiveness.

MEPM 542 Supply Chain Management for Project Managers (3:3:0)

3 Semester Credit Hours

This course focuses on management and improvement of supply chain processes and performance. It will be valuable for project managers who would like to pursue a career in consulting or take a position in operations, marketing or finance functions in a manufacturing or distribution firm. We explore important supply chain metrics, primary tradeoffs in making supply chain decisions, and basic tools for effective and efficient supply chain management, production planning and inventory control, order fulfillment and supply chain coordination.

MEPM 543 Risk Management for Project Managers (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MEPM 511

This course addresses fundamental issues, principles, and theory of project risk management and planning. It covers the quantitative and qualitative approaches to identifying, analyzing, assessing, and managing risks inherent to engineering projects. Other topics include risk response strategies and planning.

MEPM 590 Thesis I (3:0:9)

3 Semester Credit Hours

Prerequisite(s): Department Approval

A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project. The thesis work must make a significant contribution to knowledge in the field of infrastructure engineering. The project will be of suitable complexity for results to be published for an expert audience. **Thesis Research Course**

MEPM 591 Thesis II (3:0:9)

3 Semester Credit Hours

Prerequisite(s): MEPM 590

Continuation of the Master Thesis I. A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project. The thesis work must make a significant contribution to knowledge in the field of engineering project management. The project will be of suitable complexity for results to be published for an expert audience. **Thesis Research Course**

MEST 100 Introduction to Islam in World Culture (3:3:0)

3 Semester Credit Hours

This course is the introductory course on Islamic Studies that is required for all majors. The course provides an introduction to the basic sources and historical contexts for the origins of Islam. **(Writing Intensive Course)**

MGHR 301 Human Resource Management (3:3:0)

3 Semester Credit Hours

Prerequisites: MGMT 301

This course is a broad survey of key areas of human resources management, designed to provide line students wishing to become future supervisors and/or staff human resource specialists with a thorough understanding of the role of human resource management and the

techniques available to management in making effective use of the human resources of an organization. The material is delivered from the perspective of HRM practice in both the UAE/GCC and internationally.

MGHR 302 Compensation Management (3:3:0)

3 Semester Credit Hours

Prerequisites: MGHR 301

The Compensation Management course focuses on the theories underlying direct compensation and reward systems in organizations, and the practical administrative practices used to implement such systems, with particular reference to the UAE/GCC sub-region. Compensation management practices, including the analysis and evaluation of jobs, criteria and procedures for determining wage levels, individual wage determination, forms of pay, and incentive systems will be covered.

MGHR 304 Human Resource Recruitment and Selection (3:3:0)

3 Semester Credit Hours

Prerequisites: MGHR 301

The Human Resource recruitment and selection course focuses on employee staffing, training and development processes in organizations. Topics covered include human resource planning, job analysis for selection, multiple recruitment and selection methods are investigated, and the course looks in detail at how these HRM elements are typically implemented in the UAE/GCC region. Through a blend of theory and application, the course introduces students to a wide range of issues, principles, practices and trends in recruitment and selection.

MGHR 390 Internship in Human Resource Management

3 Semester Credit Hours

Prerequisites: Completion of 90 credit hours

The Internship is designed for candidates on the undergraduate human resource management major programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation take place at the beginning of the internship, and will serve to introduce the student to real-world business practices, culture and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.

MGHR 403 Cross Cultural and International Human Resource Management (3:3:0)

3 Semester Credit Hours

Prerequisites: MGHR 301

The course introduces students to the field of international human resource management (I-HRM). Topics covered include: HR planning for international operations, the impact of national cultures on I-HRM, including standardized cultural models; Divergent and Convergent International-HRM practices; Integration versus Differentiation; International people-resourcing; HR cultural adaptation and adoption issues; Organizational Culture and I-HRM practice; comparative I-HRM studies featuring country comparisons. A number of contemporary I-HRM models are also discussed and utilized, with particular reference to I-HRM within and out of the UAE/GCC.

MGHR 431 Employee Relations (3:3:0)

3 Semester Credit Hours

Prerequisites: MGHR 301

The course is aimed at students who are interested in pursuing a career in human resource management. The course focuses on legal and regulatory issues that affect employee relations in the GCC and UAE. Students will compare and contrast policies and procedures related to employee benefits and possible labor violations. They will also examine the core issues and applications of UAE/GCC labor regulations in managing employee regulations. At the end of this course, students will have developed an understanding of individual and collective labor relations in the UAE/GCC region and the appropriate methods of dealing with employee disputes.

MGHR 444 HRM Project Based Internship

3 Semester Credit Hours

Prerequisite(s): MGHR 301

The HRM project-based internship course will provide students an experience of a self-employed work environment. The course will imbibe problem-solving skills and creative thinking among students. These life-long learning skills will enhance the employability skills of the students and their ability to become independent learners. The students will integrate the tools and concepts from the HRM specialization courses to develop strategies to solve problems. Through a coaching and mentoring process, the students would produce a project report, which will allow them to showcase their learning acquired during their four-year study.

MGHR 461 Diversity in Organizations (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MGMT 301

The course enables the student to understand the role of diversity in human affairs particularly in the workplace. The course discusses and analyzes the role of diversity in the workplace, along with the procedures and practices of diversity management. Students will be able to apply these concepts to discussions of specific dimensions of diversity, including gender, race-ethnicity, sexual orientation,

religion and disability. It also offers students the opportunity to develop their critical thinking on topics such as identity, relationships across difference and bias, and equality of opportunity in organizations around the world and how they relate to organizational issues of equality of opportunity, inclusion, and effectiveness.

MGHR 462 Strategic Human Resource Management (3:3:0)

3 Semester Credit Hours

Prerequisite MGHR 301

This course will explore the contribution strategic Human Resource Management (HRM) makes towards the development and support of sustainable organizational strategies. On successful completion of this unit students will have the confidence to contribute to strategic decision-making in an HR context. This will be based on strong theoretical and applied foundations which will add value to an organization's HR function and role.

MGHR 463 Negotiations in Organizations (3:3:0)

3 Semester Credit Hours

Prerequisite MGHR 301

This course focuses on developing the conflict management and negotiating skills of the learner. By the end of this course, the learner will be able to evaluate negotiation situations, strategize and plan upcoming negotiations, and engage in more effective negotiations. The course content will contextualize conflict management and negotiation to the local UAE/GCC environment, looking at cross-cultural influences. Consequently, to assist the learner in developing effective negotiation and conflict management skills, this course emphasizes experiential learning through student participation in a variety of exercises and role-plays.

MGHR 464 Training and Development (3:3:0)

3 Semester Credit Hours

Prerequisite MGHR 301

The purpose of this course is to provide students a firm understanding of human resource training and development systems in today's business environment. A constant theme setting the foundation for this course will be on the various kinds of changes facing organizations, with a focus of UAE/GCC organizations, and how these changes relate to human resource training and development. Topics will cover assessing training needs, developing and delivering training, evaluating training outcomes, career planning and career management. Aspiring HR professionals will gain essential knowledge to effectively manage employee training and development systems in a variety of companies. The course looks in detail as to how these HRM elements are typically implemented in the UAE/GCC region.

MGMT 301 Principles of Management (3:3:0)

3 Semester Credit Hours

Prerequisites: Sophomore Standing

This course presents essential management theories and concepts. It examines the nature of managerial work under a range of business models and under rapidly changing business conditions. Managerial functions and activities such as planning, organizing, leading, and controlling are examined in depth, and in the context of current organizational practices and scenarios.

MGMT 401 Organizational Behavior (3:3:0)

3 Semester Credit Hours

Prerequisite Completion of 90 credit hours

This course applies essential organizational behavior and leadership theories and concepts to organizational practices. It examines the complexities of human behavior in a range of organizational work settings under rapidly changing business environment. Individual personality, group/team dynamics, motivation, performance, communication, and leadership concepts are examined in depth, and in the context of current organizational practices.

MIST 301 Introduction to Business Information Systems (3:3:0)

3 Semester Credit Hours

Prerequisite(s): Sophomore Standing

This course introduces fundamentals of computer hardware, software, networking, Internet and its technology components. The discussions are centered on the role of technology in contemporary business, and include basic relational storage concepts, with hands-on experience in building business database applications and web sites.

MKTG 301 Principles of Marketing (3:3:0)

3 Semester Credit Hours

Prerequisites: ECON 103

This course examines marketing principles, concepts, strategies, tactics, and analytical tools used by profit and nonprofit organizations to market ideas, products, or services to selected target groups. The course emphasizes how to promote, distribute, and price firm's offerings in dynamic economic, social, political, and international environments.

MKTG 311 Sales Management (3:3:0)

3 Semester Credit Hours

Prerequisite(s): MKTG 301

The course familiarizes students with marketing –sales interfaces including sales force role and capabilities, personal selling strategies, organizational relationships, and responsibilities of sales managers including training, motivating, and evaluating sales force.

MKTG 312 Consumer Behavior

(3:3:0)

3 Semester Credit Hours

Prerequisites: MKTG 301

The Consumer Behavior course studies the purchasing behavior of consumers and the exchange process involved in acquiring, consuming and disposing of goods, services, experiences and ideas. In this course students learn to deal with an unstructured situation by the usage of a buyer decision – making model and buyer behavior concepts enabling them to identify important considerations and their possible resolutions.

MKTG 313 Integrated Marketing Communications

(3:3:0)

3 Semester Credit Hours

Prerequisites: MKTG 301

This course involves an in-depth study on the application of advertising and other forms of marketing communication with an emphasis on their role in marketing planning. The course includes a study of the identification of relevant data to analyze the marketing situation, the development of a product position, marketing and marketing communications objectives, creative strategy, media planning, and evaluation. This is an applied course that utilizes real-world examples, course materials, and project assignments whenever possible in order to allow students to gain practical experience related to the course topics.

MKTG 315 Social Media and Digital Marketing

(3:3:0)

3 Semester Credit Hours

Prerequisites: MKTG 301

This course provides a comprehensive overview of the ever-changing landscape of social media and digital marketing. It aims to equip students with a strong grasp of the strategies, tools, and analytical techniques employed in the field. By integrating technology, innovation, and data-driven decision-making, the course seeks to enable students to create effective digital campaigns, evaluate their performance, and interact with audiences in a meaningful manner. Students will delve into content creation, curation, social media advertising, search engine optimization, email marketing, and influencer marketing. By combining theoretical knowledge with hands-on practice, students will examine how these tools influence consumer behavior, brand communication, and overall marketing approaches.

MKTG 316 Luxury Brand Management

(3:3:0)

3 Semester Credit Hours

Prerequisites: MKTG 301

This course provides an in-depth exploration of the complexities and subtleties of luxury brand management. It sheds light on the strategies and strategic challenges crucial for navigating the affluent luxury goods market. Students will develop a comprehensive understanding of the principles that govern the marketing and management of prestigious brands, with a focus on creating a luxury brand identity that resonates with consumer perceptions and stands out in a competitive landscape. The course will examine the strategic opportunities and challenges of luxury goods while also refining practical marketing skills tailored to the high-end market. Additionally, students will learn through an analysis of current luxury market trends, consumer behavior, and the essential ethical and sustainable practices that are increasingly important in responsible luxury brand management.

MKTG 332 Retailing and E-Commerce

(3:3:0)

3 Semester Credit Hours

Prerequisite MKTG 301

Examination of retailing as a specialized economic and social institution within the distribution process and as it relates to society, fashion, and overall marketing activities. The planning and implementing of store and non-store (catalog, Internet) retail marketing strategies are addressed. Critical decision alternatives, variables, forces, and processes are considered from a managerial perspective. This is an applied course that utilizes real-world examples, course materials, and project assignments whenever possible in order to allow students to gain practical experience related to the course topics.

MKTG 351 Marketing Research Techniques & Applications

(3:3:0)

3 Semester Credit Hours

Prerequisites: MKTG 301 & OPMT 311

The course introduces the student to tools used in marketing research which are both quantitative and qualitative. Quantitative tools used are questionnaires, experiments, and conjoint analysis and qualitative tools used are focus groups and interviews. In the process, both primary and secondary research may be used. The course emphasizes problem formulation skills and takes a managerial perspective on research methodology that focuses on the kinds of decisions that each method can support. This is an applied course that utilizes real-world examples, course materials, and project assignments whenever possible in order to allow students to gain practical experience related to the course topics.

MKTG 390 Internship in Marketing

3 Semester Credit Hours

Prerequisites: Completion of 90 credit hours

The Internship is designed for candidates on the undergraduate marketing major programs. It lasts for eight weeks (240 hours), and provides exposure to business practices and issues, in appropriate settings. Candidates will typically opt to carry out internship with local UAE-based companies. The internship program is viewed as a "steppingstone" for a career in the field of the student's major. Students will receive orientation, induction, and relevant on-the-job training during their internship. The initial induction and orientation take place at the beginning of the internship, and will serve to introduce the student to real-world business practices, culture and management, and provide them with a knowledge base to draw upon throughout the remainder of the internship.

MKTG 407 International Marketing

(3:3:0)

3 Semester Credit Hours

Prerequisite MKTG 301

The course is multidisciplinary approach to international marketing from viewpoint of business management, examines major marketing issues affecting companies operating in a global environment. Students understanding of economics, political and cultural differences among nations as they affect marketing opportunities and operations and develop skills to identify international marketing opportunities.

MKTG 412 Marketing of Services

(3:3:0)

3 Semester Credit Hours

Prerequisites: MKTG 301

This course introduces the student to various aspects of Services Marketing. Specifically, the course examines the unique characteristics of services marketing, management and evaluation of service quality, techniques for service recovery and improvement, and services marketing in global environments. Particular emphasis is placed on analyzing the service encounter and the perception of service quality by service recipients and the service providers. This is an applied course that utilizes real-world examples, course materials, and project assignments whenever possible in order to allow students to gain practical experience related to the course topics.

MKTG 444 Marketing Project Based Internship

3 Semester Credit Hours

Prerequisites: MKTG 301

The marketing project-based internship course will provide students an experience of a self-employed work environment. The course will imbibe problem- solving skills and creative thinking among students. These life-long learning skills will enhance the employability skills of the students and their ability to become independent learners. The students will integrate the tools and concepts from the marketing specialization courses to develop strategies to solve problems. Through a coaching and mentoring process, the students would produce a project report, which will allow them to showcase their learning acquired during their four-year study.

MKTG 471 Marketing Strategy

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): MKTG 301

The course emphasizes managerial aspects of marketing, including developing marketing strategies and plans, and integrating specific elements of the marketing process. The course additionally places stress on case analysis, as a means for learning the material and for students to develop problem-solving, group work, judgement and decision-making skills. This is an applied course that utilizes real-world examples, course materials, and project assignments whenever possible in order to allow students to gain practical experience related to the course topics.

MSRE 511 Energy Conversion

(3:3:0)

3 Semester Credit Hours

Forms of energy. Energy needs and available sources of energy. Conversion of thermal energy into mechanical energy, including power, and heat engine cycles, internal and external combustion systems and turbines. Basic technical and economic criteria for the design of efficient energy conversion systems, including traditional as well as alternative power systems.

MSRE 512 Energy Systems Modeling and Optimization

(3:3:0)

3 Semester Credit Hours

Review of renewable energy resources; solar energy and photovoltaic, wind energy, wave energy, biomass energy conversion, fuel cells and batteries. Hydroelectric power and geothermal energy. Modeling methodology including system conceptualization. Model construction and validation (computational accuracy). Model evaluation and calibration. Simulation of energy and environmental systems. Optimization techniques; Classical direct search-for-optimum methods, Golden Mean, Conjugate Gradients, Modified Newton Method. Methods for constrained optimization such as Lagrange Multipliers, Search methods, Linear and Dynamic Programming. Use of software packages.

MSRE 513 Energy Economics

(3:3:0)

3 Semester Credit Hours

Comprehensive understanding of energy markets. Technological, cost, and environmental fundamentals of energy sources and environmental systems. Economic principles underlying the supply and demand for energy in a modern economy, through considerations of topics such as energy demand at the individual and economy-wide level, the supply of renewable and non-renewable energy resources,

MSRE 514	Direct Research	(3:0:9)
3 Semester Credit Hours		
Prerequisite(s): Department Approval		
Under the guidance of an engineering faculty member, the Directed Research Project provides the student with a meaningful research experience. It requires that the student conduct a research topic or issue of significance to the field of renewable and sustainable energy.		

MSRE 521	Photovoltaics	(3:3:0)
3 Semester Credit Hours		
Introduction to solar radiation and some important related concepts like blackbody, solar spectrum, irradiance, irradiation, air mass and peak sun hour. Semiconductor and P-N junctions. PV cells properties, design, interconnection and module fabrication. Modules and arrays, stand-alone PV schemes with battery energy storage and grid-connected PV schemes.		

MSRE 523	Biofuels	(3:3:0)
3 Semester Credit Hours		
<p>Fundamentals and applications of biofuels and bioenergy produced from biomass including processes of production, availability and attribution of biofuel/bioenergy production. Types of biomass raw material and methods of selection. First, second and third generation of biofuels. Methods of biomass conversion to fuel including thermochemical conversion, biochemical conversion and catalytic conversion. Production of hydrogen, biodiesel and microbial fuel cells. Environmental impacts of biofuel production. Economics and life-cycle analysis of biofuel. Value-added processing of biofuel residues.</p>		

MSRE 524	Sustainable Desalination	(3:3:0)
3 Semester Credit Hours		
<p>Basic science and technology of water desalination to ensure sustainable water supply. Water production via desalination within the water-energy-cost nexus, evaluation of renewable energy- powered desalination processes, power-desalination cogeneration analysis, evaluation and applications of novel desalination systems, such as thermal desalination, membrane distillation and forward osmosis. Recent technological improvements for enhanced desalination processes, and fouling issues in current technologies. Assessing economic feasibility and the environmental impact of new desalination processes.</p>		

MSRE 525	Concentrated Solar Power	(3:3:0)
3 Semester Credit Hours		
Introduction to solar energy, solar radiation; review of the basics of thermodynamics and heat transfer, power plant technologies; types of CSP systems including CSP parabolic trough systems, CSP dish technology, CSP Fresnel technology and solar tower; heat storage systems; hybridization; secondary use of CSP systems; operation and maintenance of CSP systems; power quality control and grid integration; CSP plant project planning; economic, social and environmental considerations and site assessment.		

MSRE 526	Green Buildings	(3:3:0)
3 Semester Credit Hours		
<p>Green building initiatives, their origin, characteristics of a green building, certification of green buildings rating systems, criteria for rating. Policies and drivers that are leading to the more widespread uptake of green building technologies; green building codes, policies and planning from the past, present and future from around the globe. Integrated design: urban micro-climate design, passive and active architectural interventions.</p>		

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3 Semester Credit Hours**Prerequisite(s):** Department Approval

A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project. Topic to be agreed in consultation with a supervisor. The project will be of suitable complexity for results to be published for an expert audience. This is the first part of the master thesis course. **Thesis Research Course**

MSRE 591 Thesis II**(6:0:18)****6 Semester Credit Hours****Prerequisite(s):** MSRE 590

Continuation of the Master Thesis I. A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project. Topic to be agreed in consultation with a supervisor. The project will be of suitable complexity for results to be published for an expert audience. **Thesis Research Course**

OPMT 301 Operations Management**(3:3:0)****3 Semester Credit Hours****Prerequisite(s):** Sophomore Standing

The course examines principal aspects of organizational operations in various settings. It emphasizes the application of planning and decision-making activities associated with managing operations, with particular focus on production and service operations. It uses analytical models to describe key operations planning and control activities.

OPMT 311 Methods and Models of Management Science**(3:3:0)****3 Semester Credit Hours****Prerequisite(s):** STAT 100

This is a course in applied operations research for business management. Business situations are represented by analytical mathematical models solved by the effective application of the methods mathematical programming and probabilistic process analysis. This course introduces operation research and management sciences techniques for supporting business management decisions. Specific mathematical programming and probabilistic topics include linear programming, transportation models, network flow models, decision analysis, inventory models, queuing models, and Monte Carlo simulation.

OPMT 405 Supply Chain Management**(3:3:0)****3 Semester Credit Hours****Prerequisite(s):** OPMT 311

A comprehensive study of the concepts, processes, and strategies used in the development and management of global supply chains. Supply-chain management (SCM) is a systems approach to managing the entire flow of information, materials, and services from raw material suppliers through factories and warehouses to the final end-customer. SCM represents a philosophy of doing business that stresses processes and integration. Specific topics include global supply chain management, procurement, electronic commerce, information technologies, and logistics activities. This course will be taught through the use of textbook materials, outside readings, and case analysis.

PENG 322 Drilling Fluids Laboratory**(1:0:3)****1 Semester Credit Hour****Corequisite(s):** PENG 361

This course deals with lab measurements of cement and mud properties. Mud preparation, mud rheology, filtration, wall building and resistivity, mud weight control, drilling fluid contamination test, oil well cementing experiment. (Writing Intensive Course)

PENG 351 Reservoir Rock and Fluid Properties**(3:3:0)****3 Semester Credit Hours****Prerequisite(s):** CHEM 215

This course covers the origin of the earth and its shells, composition of the earth's crust and oceans, and their geological characteristics. Furthermore, it covers the fundamental properties of reservoir rocks, hydrocarbon phase behavior and the fundamental properties of reservoir fluids. The course also deals with the measurement of fundamental properties of reservoir rocks and fluids.

PENG 361 Drilling Engineering I**(2:2:0)****2 Semester Credit Hours****Prerequisite(s):** PENG 231**Corequisite(s):** CIEN 251

This course introduces basic drilling techniques and drilling fluid properties. Topics include rock characteristics, drilling fluids, mud weight calculations, components of rotary drilling rig, drilling hydraulics, drilling bits, factors affecting rate of penetration, cementing operations.

PENG 362 Drilling Engineering I**(3:3:0)****3 Semester Credit Hours****Prerequisite(s):** CIEN 251

The course aims to provide students with a fundamental understanding of petroleum well drilling procedures, its mechanics, and design methodology. The course covers topics include rock characteristics, drilling fluids and its properties, components of rotary drilling rig,

drilling hydraulics, pore pressure, fracture pressure, casing design and directional and horizontal drilling. Lab measurement of mud and cement properties is an integral part of the course.

PENG 371 Petroleum Reservoir Engineering (3:3:0)

3 Semester Credit Hours

Prerequisite(s): PENG 351

This course deals with material balance (MB) techniques to estimate reserves. Topics covered in this course include generalized MB equations, fluid drive mechanisms, PVT data selection, water influx, flow through porous media, displacement of oil, fractional flow, and oil recovery by the internal drive as well as decline curves analysis.

PENG 381 Well Logging (3:3:0)

3 Semester Credit Hours

Prerequisite(s): PENG 351

Logging is an essential operation to determine the key formation parameters, such as porosity, permeability, reservoir thickness, water saturation. All types of well logging techniques such as Logging while Drilling, Cased Hole Logging, and Production Logging are included. Logs are also run to gain information about well casing and cementing.

PENG 382 Petroleum Production Engineering (Well Performance) (4:4:0)

4 Semester Credit Hours

Prerequisite(s): CIEN 251

This course covers basic well performance calculations necessary for the design and analysis of naturally flowing and artificially lifted wells. Topics include Inflow Performance Relationship (IPR), Tubing Performance Relationship (TPR), Flow line Performance Relationship (FPR), Choke Performance Relationship (CPR), Gas-Lift, Electric Submersible Pumps (ESP), and production forecasting.

PENG 384 Petroleum Production Engineering (3:3:0)

4 Semester Credit Hours

Prerequisite(s): CIEN 251

This course covers basic well performance calculations necessary for the design and analysis of naturally flowing and artificially lifted wells, and the handling of the produced oil, water and gas at the surface. Topics include Inflow Performance Relationship (IPR), Tubing Performance Relationship (TPR), Flowline Performance Relationship (FPR), Choke Performance Relationship (CPR), Gas-Lift, and Electric Submersible Pumps (ESP). It also covers phase behavior of water/hydrocarbon systems, surface production facilities, oil, water and gas separations, flash calculations, separator sizing and design.

PENG 403 Petroleum Property Evaluation (3:3:0)

3 Semester Credit Hours

Prerequisite(s): PENG 371 and MENG 323

Applications of reservoir engineering techniques, reserve calculations, decline curve analysis, rate of return calculations to project design and evaluation.

PENG 404 Petroleum Economics (3:3:0)

3 Semester Credit Hours

Pre-requisite(s): PENG 371 and PENG 384

This course provides engineers with skills to assess the costs and benefits of engineering investments. Applications of reservoir engineering techniques, reserve calculations, decline curve analysis, rate of return calculations to project design and evaluation.

PENG 422 Fluid Flow in Porous Media Lab (1:0:3)

1 Semester Credit Hour

Corequisite(s): PENG 485

This course deals with the design aspects of oil displacement by another fluid in rock samples. It builds on the experiences of students obtained in lab measurements of individual reservoir rock and fluid properties in PENG 321 to create an integrated lab measurement of all properties needed to analyze oil displacement by a displacing fluid. The displacing fluid can be chosen to study the relative permeability and displacement efficiency of water flooding, gas flooding, or any enhanced oil recovery fluids (acidic water, microbial water, polymer solution, or steam) using cores, fractured cores (sand packs and glass beads may be considered as alternatives) in one-dimensional geometry or packed layers in two-dimensional geometry.

PENG 464 Data Science in Petroleum Engineering (3:3:0)

3 Semester Credit Hours

Pre-requisite(s): ENGR 200

This course will cover the fundamentals of data science with applications in the oil and gas industry. Covering topics related to descriptive data analytics, predictive data analytics, prescriptive data analytics, distribution, probability, decision tree analysis, parametric vs. non-parametric, confidence intervals, hypothesis testing, F-Test and ANOVA, correlations, linear and multiple linear regression, nonlinear linear regressions, and state-of-the-art machine learning and AI algorithms.

PENG 472	Applied Reservoir Geology	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 101		
Corequisite(s): PENG 381		
Oil distribution in the world and in the UAE: geology of reservoirs, which includes the formation of reservoir rocks, cap rocks, source rocks and the environments of depositions: petrophysical parameters of parameters of reservoir fluids: oil field waters, crude oil and natural gas; reservoir conditions: pressure, temperature and their effects on oil maturation, migration and accumulation: oil generation. Oil migration: types of oil traps: methods of exploration.		
PENG 473	Reservoir Simulation	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 371		
This course covers fundamental concepts of reservoir simulation to model single-phase flow in petroleum reservoirs. Topics include reservoir engineering concepts, mathematical concepts, derivation of reservoir flow equations, finite difference approximations, and their solutions, and applications to predict reservoir performance.		
PENG 474	Applied Reservoir Simulation	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 371		
Corequisite(s): PENG 473		
This course covers advanced topics in reservoir simulation. These include reservoir fluid flow equations in multiphase, multidimensional flow, up-scaling of rock properties, pseudo functions, vertical equilibrium, analysis of data for consistency, history matching, and applications to field cases.		
PENG 482	Natural Gas Engineering	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 371 and PENG 382		
This course introduces the properties of natural gas, covers flow of gas in reservoir, wellbore and surface pipelines. Based on such knowledge, students are able to run nodal analysis for gas production system design. This course also covers gas compression and gas operation issues.		
PENG 483	Well Testing	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 371 and MATH 214		
This course covers reservoir characterization by pressure test analysis. Topics include fluid flow equations in porous media under transient and pseudo-steady state flow conditions, pressure buildup and pressure drawdown tests, average reservoir pressure, type curve matching, well testing of heterogeneous reservoirs, pressure derivatives analysis technique, multiple well testing, and test design and instrumentation.		
PENG 484	Stimulation and Intervention in Petroleum Production Operations	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 382		
Topics include well completions, perforations, wellbore damage sources and detection, hydraulic fracturing, fracturing fluids, acid/rock interactions, and acid treatment of oil wells, design and evaluation of treatments, evaluation by nodal system analysis.		
PENG 485	Water Flooding	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 371		
This is a senior level course on reservoir engineering series courses. The course covers the reservoir engineering aspects of water flooding. Topics include introduction to reservoir forces and concepts of surface and interfacial tension, wettability, capillary pressure, relative permeability; trapping and mobilization of residual oil; fluid distribution and frontal displacement theory, concept of mobility ratio, flood patterns and areal sweep efficiency considerations, pattern injection rates and pressures; characterization of reservoir heterogeneity; vertical and volumetric sweep efficiency, waterflood performance prediction models; waterflood pilot test; designing, monitoring and evaluating a waterflooding operation; water for water flooding, its sources and treatment.		
PENG 486	Enhanced Oil Recovery	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PENG 351		
This course covers chemical and thermal method of EOR. Specific topics include interfacial tension, entrapment and mobilization of oil in porous media, residual oil, miscibility, adsorption at solid/liquid interfaces, surfactants and micro-emulsions, miscible gas flooding, polymer flooding, thermal methods, and the effect of reservoir heterogeneity.		

PENG 491	Senior Design Project I	(3:0:9)
3 Semester Credit Hours		
Prerequisite(s): Completion of 90 credit hours		
The Senior Design Project entails team work involving development of a two-semester long workflow that includes preparing and presenting a proposal for a major design work. Throughout the course students are required to develop, design and implement a solution to one of the petroleum engineering problem under the supervision of a faculty advisor. The course also introduces project management topics including project life cycle, integration, scope, time, cost, risk, quality, resource, procurement, and communication, with consideration of ethical, economic, social and professional conduct.		
PENG 492	Senior Design Project II	(3:0:9)
3 Semester Credit Hours		
Prerequisite(s): PENG 491		
Continuation of phase (1).		
PENG 493	Special Topics in Petroleum Engineering	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): Department Consent		
A specific topic in Petroleum Engineering that is not covered in other program courses is presented in a course format.		
PHIL 100	Critical Thinking and Reasoning	(3:3:0)
3 Semester Credit Hours		
This introduction to basic principles of reasoning and critical thinking enhances the learner's abilities to evaluate various forms of reasoning in everyday life and in academic disciplines. The course explores such topics as inductive and deductive reasoning, the nature and function of definitions, fallacy types, statistic use and misuse, and the rudiments of logic. (<i>Writing Intensive Course</i>)		
PHIL 101	Ethics in Today's World	(3:3:0)
3 Semester Credit Hours		
This course addresses theoretical foundations of ethical thought, and background to traditions and movements in the development of ethical theory and methods of reasoning. Students apply ethical principles and perspectives to analyze, compare and critically evaluate relevant personal, social and professional problems and engage in ethical reasoning and decision-making processes.		
PHIL 102	World Philosophies	(3:3:0)
3 Semester Credit Hours		
The course surveys major philosophers from the most important world philosophical traditions. Some of the topics addressed include the internal world of personal identity, the nature of knowledge, the concept of happiness, the nature of reality and the external world, the relation of language to the world, meaning, and truth.		
PHYS 095	Introductory Physics	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s):		
This course is intended for students who need a general introduction to the fundamental principles of Physics and laws of nature before taking University-level Physics courses required in their major. Topics covered include on Dimensional Motion, Fluids, Heat and Thermodynamics. This course is not for degree credit.		
PHYS 110	University Physics I	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): None		
Corequisite(s): PHYS 111		
This is a calculus-based physics course covering the fundamental principles of mechanics. It concentrates on the conservation of energy, the particle motion, the collisions, the rotation of solid bodies, simple machines and on the fluid mechanics. The focus lies on the resolution of one and two-dimensional mechanical problems.		
PHYS 111	University Physics I Lab	(1:0:3)
1 Semester Credit Hour		
Corequisite(s): PHYS 110		
This course is intended to be taken with Physics 110. It primarily includes experiments on classical mechanics. Particular emphasis is placed on laboratory technique, data collection and analysis and on reporting.		
PHYS 220	University Physics II	(3:3:0)
3 Semester Credit Hours		
Prerequisite(s): PHYS 110		

This second calculus-based physics course includes a detailed study of the fundamental principles of classical electricity and magnetism, as well as an introduction to electromagnetic waves. The course's focus targets the resolution of dc- and alternating circuits.

PHYS 221 University Physics II Lab

(1:0:3)

1 Semester Credit Hour

Corequisite(s): PHYS 220

This course is intended to accompany Physics 220. It includes experiments on electricity, magnetism and RLC circuits. Particular emphasis is placed on three aspects of experimentation: laboratory technique, data analysis (including the treatment of statistical and systematic errors) and written communication of experimental procedures and results.

PHYS 222 University Physics III

(3:3:0)

3 Semester Credit Hours

Prerequisite(s): PHYS 220

Corequisite(s): PHYS 223

This course covers important theoretical bases and experiments that support the development of modern physics with applications in various technological and scientific fields. Topics include physical optics, thermodynamics, special relativity, quantum physics, atomic and molecular physics and nuclear physics. The course's focus is on applications that have led to key discoveries.

PHYS 223 University Physics III Lab

(1:0:3)

1 Semester Credit Hour

Prerequisite(s): PHYS 221

Corequisite(s): PHYS 222.

This course is intended to be taken with Physics 222. It includes experiments on optics, thermodynamics and atomic physics. Particular emphasis is placed on three aspects of experimentation: laboratory technique (including both the execution and the documentation of an experiment); data analysis (including the treatment of statistical and systematic errors, as well as computer-aided analysis of experimental data); and written communication of experimental procedures and results.

POLI 100 Contemporary Global Issues

(3:3:0)

3 Semester Credit Hours

This course gives students a broad, interdisciplinary, comprehensive, and balanced, introduction to key debates, theories, major trends, and topics, relating to Globalization and global developments.

POLI 101 **Politics of Scarcity**

(3:3:0)

3 Semester Credit Hours

The problems of scarcity and security are as much political as they are economic or technological. This course identifies the political aspects of global economic exchange and distribution, flows of labor and capital, and international cooperation, global security and conflict.

POLI 102 **State and Society in the UAE**

(3:3:0)

3 Semester Credit Hours

The course traces the history of the UAE, the establishment of the federation and the development of the UAE as a nation with significant global impact. It covers contemporary life, the economy, society, population, political system, social customs and traditions, and current changes.

PSYC 100 Introduction to Psychology

(3:3:0)

3 Semester Credit Hours

This course provides an overview of major areas in the field of psychology including: the history of psychology, psychology research methods, organization of human brain and biological basis of behavior, sensation, perception, learning, language, intelligence, emotion, motivation, developmental psychology, personality theories /assessment, stress, abnormal behavior and therapies, social psychology.

PSYC 102 Self and Society

(3:3:0)

3 Semester Credit Hours

Study of how society shapes us as individuals and how we as individuals shape society. Explores how we experience life as individuals and as members of cultural systems that shape our personalities, behavior, and perceptions of the world.

SOCI 100 **Introduction to Sociology**

(3:3:0)

3 Semester Credit Hours

Introduction to basic sociological concepts. Examines aspects of human behavior in cultural framework including: individual and group interaction, social mobility and stratification, status and class, race and gender relations, urbanism, crime and criminology, and social change and reform.

SOCI 101	Contemporary Social Issues	(3:3:0)
3 Semester Credit Hours		
The course is an introduction to basic sociological concepts and examines aspects of human behavior in a cultural framework including: individual and group interaction, social mobility and stratification, status and class, race and gender relations, urbanism, crime and criminology, and social change and reform.		
STAT 100	Introductory Probability and Statistics	(3:3:0)
3 Semester Credit Hours		
This course introduces students to the basics of probability theory and statistical inference with examples and applications in sciences. At the end of this course, students will acquire the necessary quantitative competency in the program.		
STAT 210	Probability and Statistics for Life Sciences	(3:3:0)
3 Semester Credit Hours - Prerequisite(s): STAT 100		
This course involves the use of probability and descriptive and inferential statistical techniques in interpreting biological data.		
STAT 346	Probability for Engineers	(3:3:0)
3 Semester Credit Hours - Prerequisite(s): MATH 114		
The course introduces principles of statistics and probability for undergraduate students in Engineering. The course covers the basic concepts of probability, discrete and continuous random variables, probability distributions, expected values, joint probability distributions, and independence. The course also covers statistical methods and topics including data summary and description techniques, sampling distributions, hypothesis testing, and regression analysis.		
UAES 200	Survey of United Arab Emirates Studies	(3:3:0)
3 Semester Credit Hours		
This course presents the UAE from multiple perspectives in an attempt to expose the students to the distinct qualities of the UAE. The purpose of this course is to give students a broad, interdisciplinary, and comprehensive introduction to key features and issues in the UAE's historical, cultural, political and economic landscapes. (Writing Intensive Course)		
UNIV 100	University First-Year Transition	(1:1:0)
1 Semester Credit Hour		
This course is designed to assist students with the transition from secondary school to university life. Students in this course transition to university life by focusing on academic adjustment, by developing decision-making skills, and by learning about services and opportunities for involvement.		
UNIV 200	Innovation, Entrepreneurship, and Sustainability	(3:3:0)
3 Semester Credit Hours		
The course aims at equipping next generation of leaders with an innovative and entrepreneurial mindset and related core skills. The course explains key qualities of entrepreneurs and analyses how entrepreneurs make utilize innovation in creating new ventures. Design-thinking and business model innovation are key frameworks that underpin the course. (Writing Intensive Course)		
UPAS 100	University Preparation for Academic Success	(1:1:0)
1 Semester Credit Hour		
The focus of this course is on the development and application of college-level study skills, personal success strategies, and the use of campus resources that enhance individual student achievement. Designed for matriculated students who are at risk of being placed on Academic Probation 1 due to having a CGPA of less than 2.0. Graded as Satisfactory/Unsatisfactory.		