

Course Descriptions

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C

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D

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E

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G

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H

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I

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J

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K

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L

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M

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N

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O

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P

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R

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S

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T

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W

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Z

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Accounting and Finance (ACFI)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ACFI 801 - Corporate Finance

Credits: 3

This course provides the foundation of corporate finance. Topics include investment criteria, capital structure, valuation, merger and acquisitions, real options, and payout policy.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 802 - Investments

Credits: 3

This course provides an overview of several important topics in investments: securities and markets, asset pricing theory, stock analysis and valuation, fixed income securities, stock options, and applied portfolio management.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 803 - International Financial Management

Credits: 3

This course explores the financial management of firms operating in a global environment. Topics typically include foreign exchange markets, the financing of international trade, multinational tax management, derivatives used to mitigate international exposure, and the financial impact of foreign currency usage.

Mutual Exclusion: No credit for students who have taken [ADMN 846](#).

Grade Mode: Letter Grading

ACFI 804 - Derivative Securities and Markets

Credits: 3

This course explores the basic types of derivative instruments (forwards, futures, options, swaps) and their use in the context of financial risk management by investors, firms and financial institutions. Topics include the mechanics of derivatives markets, practical and theoretical aspects of hedging and speculating using derivatives, and methodologies for pricing derivatives.

Prerequisite(s): [ACFI 801](#) with a minimum grade of B- and [ACFI 802](#) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 805 - Financial Institutions

Credits: 3

This course explores the financial institutions that create credit and liquidity for businesses and other borrowers, the financial instruments that facilitate credit and liquidity creation, and the markets in which those instruments are sold or traded. Special emphasis is paid to commercial banks.

Prerequisite(s): [ACFI 801](#) with a minimum grade of B- and [ACFI 802](#) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 806 - Financial Modeling and Analytics

Credits: 3

The main objective of the course is to bridge the gap between theory and practice by using software applications and real-world data to solve a variety of financial problems. The course is very 'hands-on' and is expected to help students develop skills that are useful in a variety of jobs in finance, accounting, insurance, and real estate.

Prerequisite(s): [ACFI 801](#) (may be taken concurrently) with a minimum grade of B- and [ACFI 802](#) (may be taken concurrently) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 807 - Equity Analysis and Firm Valuation

Credits: 3

This course is intended to provide practical tools for analyzing and valuing a company's equity. Primarily an applications course, covers several valuation models such as market multiples and free cash flow models, and focuses on the implementation of finance theories to valuation problems. This course is not recommended if you have already taken the undergraduate [FIN 707](#) at UNH.

Prerequisite(s): [ACFI 801](#) with a minimum grade of B- and [ACFI 802](#) with a minimum grade of B- and [ACFI 872](#) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Equivalent(s): [ADMN 838](#)

Grade Mode: Letter Grading

ACFI 810 - Big Data in Finance

Credits: 3

This course serves as an introduction to many aspects of big data utilization, specifically as it applies to finance. Topics typically include high frequency trading, stock market anomalies, data management, fintech innovations, and safety and ethics when working with big data. Programming languages common to finance, such as Stata, SAS, and Python, are learned and used to analyze and manipulate data.

Prerequisite(s): [ACFI 801](#) with a minimum grade of B- and [ACFI 802](#) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 811 - Investment Banking

Credits: 3

This course provides an introduction to investment banking, focusing on the strategic considerations and financial analysis that are utilized when performing research related to investment banking activities. Specific topics typically include valuation, deal structuring, initial public offerings (IPOs), mergers and acquisitions (M&A), and leveraged buyouts (LBOs).

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 820 - Corporate Taxation

Credits: 3

Provides coverage of advanced topics from a strategic viewpoint and an understanding of the history and development of taxation, the role taxes play in financial and managerial decisions, and how taxes motivate people and institutions. The major tax issues inherent in business and financial transactions and their consequences are also explored.

Grade Mode: Letter Grading

ACFI 825 - Ethics and Non-Profit Accounting

Credits: 3

This course aims to: (1) increase students' understanding of, and sensitivity to, ethical issues in accounting and (2) provide a foundation for the conceptual and practical issues surrounding accounting for not-for-profit entities. Ethics topics include: ethical reasoning and cognitive processes, business ethics and corporate governance, ethics in accounting judgments and decisions, and legal/regulatory/professional responsibilities of accountants. Not-for-profit accounting topics include: planning, budgeting, accounting, and internal and external financial reporting for not-for-profit entities.

Equivalent(s): ACFI 897

Grade Mode: Letter Grading

ACFI 830 - Advanced Auditing

Credits: 3

This course is designed to establish an advanced competence in auditing theory and practice. Specifically, students will gain an in depth understanding of current academic auditing research and the philosophy of strategic-systems auditing through readings, presentations, case studies, and a service learning project with a local non-profit organization.

Grade Mode: Letter Grading

ACFI 835 - Governmental Accounting**Credits:** 3

The objective of this course is to provide a foundation for the conceptual and practical issues surrounding accounting for governmental entities. Topics include: planning, budgeting, accounting, and internal and external financial reporting for government organizations.

Equivalent(s): ACFI 895

Grade Mode: Letter Grading

ACFI 840 - Forensic Acctg & Fraud Exam**Credits:** 3

This course builds on audit coursework, but is not limited to an audit perspective. It covers the major schemes used to defraud organizations and individuals. Students develop skills in the areas of fraud protection, detection, analysis, and some skills related to investigations.

Grade Mode: Letter Grading

ACFI 844 - Topics in Advanced Accounting**Credits:** 3

Theory and practice of accounting for corporate acquisitions and mergers and the preparation and presentation of consolidated financial statements. Other topics include multinational consolidations, interim reporting and partnership accounting.

Grade Mode: Letter Grading

ACFI 845 - International Accounting**Credits:** 3

The first goal of this course is to provide an overview of how accounting is practiced differently around the world. This goal is accomplished by the first part of the course, which mainly discusses differences between International Financial Reporting Standards (IFRS) and U.S. Generally Accepted Accounting Principles (U.S. GAAP). The second goal of this course is to understand accounting issues uniquely confronted by companies involved in international business, such as the accounting for foreign currency transactions, the translation of foreign currency financial statements for the purpose of preparing consolidated financial statements, and other issues that are of particular importance to multinational corporations. This goal is accomplished by the second part of the course.

Prerequisite(s): ACC 621 with a minimum grade of D-.

Grade Mode: Letter Grading

ACFI 850 - Accounting Theory and Research**Credits:** 3

The objective of this course is to study the role of accounting information both in a decision-making and in a performance-evaluation context. This objective will be achieved by studying various accounting theories and the role that research has played developing and testing those theories.

Grade Mode: Letter Grading

ACFI 860 - Advanced Business Law**Credits:** 3

Focuses on legal issues such as the formation, management, and operation of corporations, and partnerships, and rights and liabilities of shareholders and partners; as well as an analysis of securities regulations. Also covers the due process and equal protection provisions of the Constitution as they relate to business activities. Includes an in depth analysis of the Uniform Commercial Code such as sales, secured transactions, and negotiable instruments. Real and personal property issues are also explored.

Grade Mode: Letter Grading

ACFI 870 - Programming in Finance with Quantitative Applications

Credits: 3

This course provides students with tools necessary to manipulate, analyze, and interpret financial data. Programming languages covered may include C++, Python, R, SAS, and Stata. Quantitative applications involving data from Bloomberg, CRSP, and Compustat are incorporated into the material.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 871 - Financial Theory

Credits: 3

This course provides a rigorous overview of modern financial analysis. Topics include valuation, risk analysis, corporate investment decisions, and security analysis and investment management.

Prerequisite(s): [ACFI 801](#) with a minimum grade of B- and [ACFI 802](#) with a minimum grade of B- and [ACFI 870](#) (may be taken concurrently) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 872 - Corporate Financial Reporting

Credits: 3

This course covers the preparation and analysis of financial statements. It focuses on the measuring and reporting of corporate performance for investment decisions, stock valuation, bankers' loan risk assessment, and evaluations of employee performance. Emphasizes the required interdisciplinary understanding of business. Concepts from finance and economics (e.g., cash flow discounting, risk, valuation, and criteria for choosing among alternative investments) place accounting in the context of the business enterprise.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 873 - Cases in Finance

Credits: 3

This course is an application of financial knowledge to case studies. A number of Harvard business cases will be analyzed and discussed in detail, including buy vs. rent decisions, corporate governance, weighted average cost of capital calculations and merger and acquisition strategies.

Prerequisite(s): [ACFI 801](#) (may be taken concurrently) with a minimum grade of B- and [ACFI 802](#) (may be taken concurrently) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 874 - Finance Experience

Credits: 3

This course enhances student knowledge regarding real-life applications of finance concepts, and includes activities such as: Bloomberg Terminal trainings, executive guest speaker talks, and career opportunities in the field. Presentation skills and networking abilities are emphasized.

Prerequisite(s): [ACFI 801](#) (may be taken concurrently) with a minimum grade of B- and [ACFI 802](#) (may be taken concurrently) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 890 - Accounting Information Systems

Credits: 3

Accounting information systems and the use of computers for decision making with emphasis on sources and types of information and the use of analytical tools in solving accounting management problems.

Grade Mode: Letter Grading

ACFI 892 - Independent Study

Credits: 1-6

Projects, research, and reading programs in areas required for concentration within a specialized master's program in accounting or finance. Approval of the student's plan of study by adviser or by proposed instructor required.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

ACFI 896 - Topics

Credits: 3

Special topics.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

Administration (ADMN)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ADMN 801 - The U.S. Healthcare System

Credits: 3

This course focuses on the organization, financing, and delivery of healthcare in the U.S. It contrasts the private and public sectors and examines the effects of market competition and government regulation. It examines the ways that medical providers are paid and explores the major issues currently facing physicians, hospitals, and the pharmaceutical industry. It also discusses several potential small-scale and large-scale reforms to the U.S. healthcare system and evaluates their likely effects on healthcare spending, quality of care, and access to care.

Equivalent(s): [HDS 801](#)

Grade Mode: Letter Grading

ADMN 829 - Corporate Financial Strategy

Credits: 3

Corporate Financial Strategy examines analytical tools and practical skills for recognizing and solving complex problems of business finance. An in-depth application of knowledge and skills in corporate financial management, this course covers the major decision-making areas of managerial finance and some selected topics in financial management such as real options, leasing, mergers and acquisitions, corporate reorganizations, financial planning, and working-capital management. This course centers on analysis and discussion of cases.

Prerequisite(s): [ADMN 930](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 830 - Investments

Credits: 3

This course covers several topics related to investing, including asset pricing models, efficient markets, portfolio theory, stock analysis and valuation, fixed income securities, and derivatives.

Prerequisite(s): [ADMN 930](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 834 - Private Equity/Venture Capital

Credits: 3

The focus is financing innovation whether one is approaching private equity investors or corporate management for budget support. The course covers screening entrepreneurial ideas and business plans through the spectrum of all entrepreneurial financing stages from seed/start-up financing to acquisition/buyouts and IPOs. Students will research, discuss and present state-of-the-art analyses and practices and have exclusive access to PitchBook database that provides intelligence on the private markets, angels, venture capital, mergers & acquisitions, and private companies.

Prerequisite(s): [ADMN 930](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 835 - Financial Institutions

Credits: 3

Financial Institutions is a graduate level seminar on the financial management techniques used by financial institutions. What distinguishes financial institutions from corporations is the financial nature of both their assets and liabilities. Financial institutions are central to the financial system and consequently require and receive special regulation. This course discusses tools for identifying, measuring, evaluating, and managing risks including interest rate, credit, foreign exchange, liquidity, market, sovereign, operational, and systemic risk. This course also examines the causes, the recommendations proposed, and the solutions implemented for the World Financial Crisis of 2007 to 2010 through the perspective of The Squam Lake Report. We will

also discuss Financial Bubbles and the 2023 collapse of Silicon Valley Bank.

Prerequisite(s): [ADMN 930](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 838 - Equity Analysis and Firm Valuation

Credits: 3

This course is intended to provide practical tools for analyzing and valuing a company's equity. Primarily an applications course, covers several valuation models such as market multiples and free cash flow models, and focuses on the implementation of finance theories to valuation problems. This course is not recommended if you have already taken the undergraduate [FIN 707](#) at UNH.

Prerequisite(s): [ADMN 919](#) with a minimum grade of B- and [ADMN 930](#) (may be taken concurrently) with a minimum grade of B-.

Equivalent(s): [ACFI 807](#)

Grade Mode: Letter Grading

ADMN 839 - Applied Financial Modeling and Analytics

Credits: 3

This course bridges the gap between financial theory and practice by using software applications and real-world data to solve a variety of financial problems. The course is very hands-on and will help students develop skills that are useful in a variety of jobs in finance and other business-related disciplines.

Prerequisite(s): [ADMN 930](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

ADMN 840 - International Business

Credits: 3

This course explores the fundamental concepts and challenges of international business, encompassing globalization, political and economic environments, cultural dynamics, international trade, foreign direct investment, market entry strategies, and the ethics, sustainability, and corporate social responsibility of global enterprises. It is designed to develop a global mindset and equip students with the skills necessary to navigate the complexities of global markets and competitive landscapes.

Prerequisite(s): [ADMN 970](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

ADMN 841 - International Management

Credits: 3

Develops an understanding of international business from the point of view of management and leadership, human resource management, and organizational structure and change. Emphasis on cultural impact on management thinking and business practice and on skills for managing effectively in international and multicultural environments.

Prerequisite(s): [ADMN 912](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 842 - Project Management

Credits: 3

Project Management is essential for business leaders, from startups to global enterprises. This course combines theory with hands-on experience, exploring methodologies, tools, and best practices. Offered asynchronously, it includes small-group synchronous components where students collaborate on real-world challenges. Through assignments, interactive discussions, a team projects, students apply key concepts in practical settings. Whether new to project management or refining your skills, this course prepares you with the capability to effectively contribute to and lead projects.

Grade Mode: Letter Grading

ADMN 845 - Supply Chain Management

Credits: 3

The purpose of this course is to learn how to design, plan, and operate supply chains for competitive advantage; to develop an

understanding of how the key drivers of supply chain operations (inventory, transportation, information, and facilities) can be used to improve performance; and to develop knowledge of logistics and supply chain methodologies and the managerial context in which they are used.

Prerequisite(s): [ADMN 940](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 846 - International Financial Management

Credits: 3

An exploration of financial management of firms operating in a global environment. Topics include foreign exchange markets, translation, transaction, and operating risk exposures, risk exposure management, sourcing capital globally, the financing of international trade, multinational tax management, and derivatives used to mitigate international exposure. Students also discuss and analyze trade agreements and the 2030 UN development and sustainability goals framework.

Co-requisite: [ADMN 930](#)

Mutual Exclusion: No credit for students who have taken [ACFI 803](#).

Grade Mode: Letter Grading

ADMN 847 - Human Resource Management

Credits: 3

This course will explore key human resource management functions and the strategic role human resources play in maximizing value of the workforce. Managing talent is a responsibility of every manager, in partnership with HR, and vital to organizational success. The course addresses concepts from an HR perspective, considering HR systems and practices, and drawing on example from the field of Hospitality Management.

Grade Mode: Letter Grading

ADMN 852 - Marketing Research

Credits: 3

Focuses on identification of research questions and objectives as well as collection and analysis of data to improve marketing decision making. Covers qualitative and quantitative methods, internal and external secondary data, sampling, analytical methods, and reporting.

Grade Mode: Letter Grading

ADMN 856 - Leading Organizational Change

Credits: 3

In today's dynamic business landscape, this course delves into the critical aspects of diversity, equity, and inclusion (DEI) while exploring change management at both micro and macro levels. It equips participants with the knowledge and skills needed to foster a more inclusive workplace environment, examining change processes from the perspectives of individuals and organizations. Through interactive sessions, case studies, and discussions, students gain practical insights into driving change initiatives that prioritize DEI and understand how these initiatives impact individuals and the broader organizational context.

Grade Mode: Letter Grading

ADMN 858 - Revenue Management and Pricing Strategies

Credits: 3

Revenue management is increasingly important in hospitality management. This course is for those interested in learning more about formulating tactics and strategies to maximize revenues for their organizations. The course will prepare students for roles responsible for financial performance and operation. Topics include history of revenue management, reservation systems, forecasting demand, inventory control, cost analysis, pricing strategy, channel management, revenue management tactics (i.e., overbook, discount allocation, and demand management and applications). Appropriate for any business application.

Prerequisite(s): [ADMN 960](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 860 - International Marketing

Credits: 3

This course examines marketing practices in a global environment. The course assumes familiarity with marketing management

and utilizes this as a base to develop insights and understanding in an international context. Special emphasis is placed on how to develop global marketing strategies, adaptation of marketing execution (communications, products, pricing, channels), and multinational and global structuring of the marketing and sales organization.

Prerequisite(s): [ADMN 960](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 863 - Marketing Analytics

Credits: 3

Marketing Analytics is the art and science of developing and utilizing quantitative marketing decision models to plan, implement and analyze marketing strategies and tactics. The course is primarily designed for graduate students who have already acquired basic data analysis skills as well as principles of marketing. Using marketing cases and related exercises tied to Marketing Engineering for Excel (ME-EL), students will develop marketing plans in various decision contexts. Specifically, this course will introduce a wide variety of quantitative models to improve marketing decision making in such areas as market response, customer segmentation/targeting, product/brand positioning, new product development, and allocation of marketing mix expenditures.

Prerequisite(s): [ADMN 960](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 864 - New Product Development

Credits: 3

Provides a practical introduction to the process of designing and marketing new products. Covers the major phases of market-focused product development from idea to launch, including opportunity identification and market definition, customer research and product concept development, pre-marketing testing and launch marketing. Presents proven approaches and techniques used in new product development. Allows student teams to apply lessons to the development and testing of new product concepts.

Prerequisite(s): [ADMN 960](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 865 - Digital Marketing

Credits: 3

As technology has changed, so have the ways consumers acquire information about goods and services. Marketers must be able to engage with their customers via a variety of digital platforms. This course develops the digital marketing skills that will enable success in today's marketing environment. We cover a number of topics including (but not limited to) website and search engine optimization, email marketing, social media, paid search, mobile marketing, customer persona development, and influencer marketing.

Grade Mode: Letter Grading

ADMN 866 - Negotiating in Business

Credits: 3

Negotiating is an essential managerial skill necessary for influencing employees and stakeholders. This course will draw on the latest research, to help participants learn how to negotiate successfully and with integrity. Topics covered include bargaining with one or more parties, influence strategies, ethical and social dilemmas, and negotiating with difficult people. The course will allow participants the opportunity to develop these skills experientially and to understand negotiation in the context of useful analytic frameworks.

Grade Mode: Letter Grading

ADMN 872 - Predictive Analytics

Credits: 3

This course will focus on modern predictive analytic techniques. Each module is designed to introduce a set of statistical techniques and their application to real data from various business fields. The course will focus on 4 broad topics 1) Finding the most appropriate model for the data, 2) selecting optimal set of predictors, 3) reducing dimensionality of the data, 4) improving prediction performance. Programming using R, open source software, is fundamental to the course.

Prerequisite(s): [ADMN 950](#) with a minimum grade of B-.

Mutual Exclusion: No credit for students who have taken [DATA 822](#).

Grade Mode: Letter Grading

ADMN 873 - Data Management and Visualization**Credits:** 3

With improvements in computing technology and the ability to generate/collect vast amounts of data, many organizations are quickly finding themselves data rich yet information poor. The goal of this course is to expose students to techniques and technologies that will enable them to become key players in helping organizations transform unstructured and structured data from various sources including, social media, the web, databases and archival data, into meaningful and insightful information facilitating effective decision making.

Prerequisite(s): ADMN 926 with a minimum grade of B-.**Grade Mode:** Letter Grading**ADMN 875 - Prescriptive Analytics****Credits:** 3

This course is concerned with the final frontier of business analytics, and develops student knowledge of the uses of descriptive statistics and forecasts to find and suggest optimal courses of action, focusing on the development and use of optimization and Monte-Carlo simulation models for making quantitative business decisions. Optimization topics include linear and mixed-integer programming, network flow optimization, and nonlinear optimization. Application areas include operations & supply chain management, marketing, and finance.

Prerequisite(s): ADMN 950 with a minimum grade of B-.**Grade Mode:** Letter Grading**ADMN 882 - Managing Growth and Innovation****Credits:** 3

This course deals with central concepts and applications at the intersection of technological innovation, organizational growth, and corporate entrepreneurship or intrapreneurship. Building an organization to achieve high growth and successfully and repeatedly bring innovations to market is a daunting managerial challenge. The first part of the course examines why it is so challenging to maintain sustained growth in disruptive environments. In the second part, the course takes a look at technological innovation as a lever that can help firms achieve sustained growth, by providing a number of applied tools, frameworks, and practices managers can use to manage growth and innovation in their organizational contexts.

Grade Mode: Letter Grading**ADMN 898 - Topics****Credits:** 3

Special Topics; may be repeated. Pre- and co-requisite courses vary. Please consult time and room schedule for the specific 898 topics section you are interested in for details.

Repeat Rule: May be repeated up to 4 times.**Grade Mode:** Letter Grading**ADMN 901 - PAUL Assessment of MBA Core Knowledge****Credits:** 0

One of the learning objectives in the MBA Program is that all students will graduate with an understanding of these core knowledge assembled from various disciplines that contribute courses to the program. We assess the learning as part of our Assurance of Learning Program. This zero credit course provides an administrative mechanism for accomplishing this goal.

Grade Mode: Graduate Credit/Fail grading**ADMN 902 - MBA Internship****Credits:** 1-3

The internship provides an opportunity for MBA students to gain business experience in a professional setting, applying their course-based learning to challenges in a business or non-profit enterprise. Students explore the relationship between theory and practice while completing at least 250 hours of time on site. Required of all full-time MBA students (unless waived due to significant prior relevant professional experience). The internship is completed in the summer term, but students can begin it in the spring by registering for it in term IV if needed.

Repeat Rule: May be repeated for a maximum of 3 credits.**Grade Mode:** Graduate Credit/Fail grading

ADMN 905 - Corporate Consulting Project**Credits:** 3

Designed as the capstone experience for the Full-time MBA program, student teams will work with real-world clients on strategic business challenges. Teams will be coached by a faculty member and/or industry professional as they engage with their assigned client. Students will integrate and apply concepts learned in the MBA program as they manage their projects and deliver value to their clients.

Grade Mode: Letter Grading**ADMN 912 - Managing Yourself & Leading Others****Credits:** 3

Uses the evidence from behavioral science to develop an understanding of individual and work group dynamics in relation to personal and group effectiveness in diverse organizations. Case studies, group projects and personal application will provide students with the opportunity to put theory into practice as they learn to understand individual differences, lead teams, enhance their personal influence, and plan to lead employees, teams and organizations during times of rapid change.

Grade Mode: Letter Grading**ADMN 919 - Accounting/Financial Reporting, Budgeting, and Analysis****Credits:** 3

An introduction to the preparation and interpretation of financial information, with emphasis on the use of accounting information for management decision-making. It highlights the guiding principles by which accounting reflects the underlying economic events. It also focuses on reporting and measurement issues that help managers make better decisions.

Grade Mode: Letter Grading**ADMN 926 - Leveraging Technology for Competitive Advantage****Credits:** 3

Building competitive advantage depends on a company's ability to strategically and tactically manage its information systems. Information technology is quickly expanding its importance in the business models and operations of companies. Managers in today's world depend on accurate, accessible and useful information to make decisions. The course provides the student with an understanding of the strategic role of information technology and its use within the enterprise to creative sustainable competitive advantage for the organization.

Grade Mode: Letter Grading**ADMN 930 - Financial Management/Raising and Investing Money****Credits:** 3

The purpose of this course is to develop an appreciation for and an understanding of the theory and practice of contemporary corporate finance. Topics include time value of money, capital budgeting, capital costing, capital raising, capital restructuring, and risk management. The theories and concepts receiving the greatest attention are Net Present Value, Agency, Asset Pricing, and Market Efficiency.

Prerequisite(s): [ADMN 919](#) with a minimum grade of B-.**Grade Mode:** Letter Grading

> [View Course Learning Outcomes](#)

ADMN 940 - Managing Operations**Credits:** 3

This course provides a foundation for dealing with managerial decisions about technology and operations issues. Based on the premise that the technology and operations can be a significant source of competitive advantage for a firm. Prepares students to identify and implement operating improvements that directly affect firm performance.

Grade Mode: Letter Grading**ADMN 950 - Data Driven Decisions****Credits:** 3

Introduction to the basics of applied statistics for decision-making and for assessing risk and uncertainty. The course will mainly cover the broadly defined subjects of descriptive statistics, probability, decision trees, random variables, random sampling,

hypothesis testing for continuous/categorical data and regression analysis/model building. Course delivery will be a mix of lectures, hands-on problem solving and data-driven case discussions led by students.

Grade Mode: Letter Grading

ADMN 960 - Marketing/Building Customer Value

Credits: 3

Serves as the core marketing course in the MBA program. Provides an introduction and overview to the theory and practice of marketing. Explores the theory and applications of marketing concepts through a mix of cases, discussions, lectures, guest speakers, individual assignments, simulations, and group projects. Focuses on understanding and building customer value in consumer, business-to-business, and services settings. Examines strategic marketing elements (segmentation, targeting, positioning), as well as executional elements (pricing, channels, promotion, and value proposition).

Grade Mode: Letter Grading

ADMN 970 - Economics of Competition

Credits: 3

A study of economic principles useful to business managers. Microeconomic topics include market behavior, economic costs, and economic decision-making. Macroeconomic topics include macroeconomics performance, financial markets, international trade and finance, and monetary and fiscal policy.

Grade Mode: Letter Grading

ADMN 982 - Creating Winning Strategies

Credits: 3

A "capstone" course, focused on industries, companies, and other organizations in operation, and studied through the role of the strategic manager and case examples, with emphasis on integration of materials covered in prior courses, providing students with synergistic knowledge and a "strategy tool kit" to help achieve organizational purpose, excellence, and competitive advantage.

Co-requisite: [ADMN 901](#)

Prerequisite(s): [ADMN 912](#) with a minimum grade of B- and [ADMN 919](#) with a minimum grade of B- and [ADMN 930](#) with a minimum grade of B- and [ADMN 950](#) with a minimum grade of B- and [ADMN 960](#) with a minimum grade of B- and [ADMN 970](#) with a minimum grade of B- and [ADMN 926](#) (may be taken concurrently) with a minimum grade of B- and [ADMN 940](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

ADMN 992 - Special Projects and Independent Study

Credits: 1-6

Projects, research, and reading programs in areas required for concentration. Sixty days advance approval of the student's plan of study by adviser and by proposed instructor required.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

Agriculture, Nutrition and Food Systems (ANFS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ANFS 850 - Food system solutions; increasing sustainability and equity

Credits: 4

We will study a range of solutions to address cross-cutting issues in the food system, including unsustainable farming systems, inequitable access to nutritious food, dietary patterns that promote chronic disease, and the lack of sustainable livelihoods for farmers and food chain workers. Students will learn to critically examine policies, programs and social movements aimed at increasing the equity and sustainability of the food system. We will identify the strengths and weaknesses of these approaches, recognizing the limits and blind spots, uneven impacts, and leverage points of the proposed solutions we study. Food systems coursework required prior to taking this course.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

ANFS 895 - Special Topics

Credits: 1-4

Advanced studies in specific areas of relevance to agriculture, nutrition, and/or food systems.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

ANFS 899 - Master's Thesis

Credits: 1-10

Master's thesis research.

Repeat Rule: May be repeated for a maximum of 10 credits.

Grade Mode: Graduate Credit/Fail grading

ANFS 901 - Introduction to Agriculture, Nutrition, and Food Systems Graduate Studies

Credits: 1

This course explores foundational ANFS graduate program expectations (proposed timelines, programmatic requirements, resources, and research opportunities) while modeling collaborative, interdisciplinary, and inquiry-based systems learning. Students will investigate selected topics that permeate across traditional discipline boundaries, thus developing skills ubiquitously applicable to all. Students will sharpen critical thinking, writing and presentation skills to apply systems thinking to graduate research studies. The importance of values, ethics, networking, and work/life balance will be explored.

Grade Mode: Letter Grading

ANFS 933 - Design, Analysis, and Interpretation of Experiments

Credits: 4

Through in-depth consideration of common general linear models used in the analysis of variance, this course introduces graduate students to the fundamental concepts and statistical methods necessary to plan, conduct, and interpret effective experiments. This course provides an opportunity for graduate students to receive critical input on the experimental design and analysis of their individual research projects. All analyses are conducted using the open-source package R; no previous coding experience is required.

Grade Mode: Letter Grading

ANFS 997 - Agriculture, Nutrition, and Food Systems Seminar

Credits: 1

Graduate student, faculty and invited presenters on current topics in agriculture, animal science, plant science, nutritional

sciences and food systems. Open to COLSA graduate students only.

Repeat Rule: May be repeated for a maximum of 4 credits.

Grade Mode: Graduate Credit/Fail grading

ANFS 999 - Doctoral Dissertation Research

Credits: 0

Doctoral dissertation research.

Grade Mode: Graduate Credit/Fail grading

Analytics (DATA)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

DATA 800 - Introduction to Applied Analytic Statistics

Credits: 3

This course is designed to give students a solid understanding of the experience in probability, and inferential statistics. The course provides a foundational understanding of statistical concepts and tools required for decision making in a data science, business, research or policy setting. The course uses case studies and requires extensive use of statistical software.

Grade Mode: Letter Grading

DATA 820 - Programming for Data Science

Credits: 3

In this class, students will build their foundational toolbox in data science: upon completion, students will be able to use the computer from the command line; practice version control with GIT & GitHub; gain a mastery of programming in Python; data wrangling with Python and perform an exploratory data analysis (EDA) in Python. All learning objectives are achieved through active application of these techniques to real world datasets.

Prerequisite(s): [DATA 800](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

DATA 821 - Data Architecture

Credits: 3

In this class, students will learn the foundations of databases and large datasets: upon completion, students will be able to explore out-of-ram datasets though traditional SQL databases and NoSQL databases. Students will also be introduced to distributed computing. All learning objectives are achieved through active application of these techniques to world datasets.

Prerequisite(s): [DATA 800](#) with a minimum grade of B- and [DATA 820](#) with a minimum grade of B-.

Grade Mode: Letter Grading

DATA 822 - Data Mining and Predictive Modeling

Credits: 3

In this class, students will learn foundations of practical machine learning: upon completion, students will be able to understand and apply supervised and unsupervised learning in Python to build predictive models on real world datasets. Techniques covered include (but not limited to): preprocessing, dimensionality reduction, clustering, feature engineering and model evaluation.

Models covered include: generalized linear models, tree-based models, bayesian models, support vector machines, and neural networks. All learning objectives are achieved through active application of these techniques to real world datasets.

Prerequisite(s): [DATA 800](#) with a minimum grade of B- and [DATA 820](#) with a minimum grade of B- and [DATA 821](#) (may be taken concurrently) with a minimum grade of B-.

Mutual Exclusion: No credit for students who have taken [ADMN 872](#).

Grade Mode: Letter Grading

Animal Sciences (ANSC)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ANSC 808 - Ruminant Nutritional Physiology

Credits: 3

Anatomy of the ruminant gastrointestinal tract, physiological factors related to rumen function, and microbial and whole-body metabolism of carbohydrates, protein, and lipids.

Grade Mode: Letter Grading

ANSC 810 - Dairy Nutrition

Credits: 4

Feeding and related management of dairy cows, nutrients and their use, digestive anatomy, physiology, energy systems, forage quality and conservation methods, metabolic disorders, ration balancing.

Grade Mode: Letter Grading

ANSC 815 - Physiology of Lactation

Credits: 4

Examines the biological and biochemical influences of the lactation process. Emphasis on the physiological effects of environments, hormones, and nutrition on milk synthesis and secretion, mammary physiology, and maternal response.

Grade Mode: Letter Grading

ANSC 827 - Advanced Dairy Management I

Credits: 4

Advanced management evaluation of milking procedures, reproduction, nutrition, mastitis, and calf and heifer management.

Grade Mode: Letter Grading

ANSC 828 - Advanced Dairy Management II

Credits: 4

Advanced management evaluation of dairy cattle, housing, milking equipment, milk quality, record keeping, herd health, financial personnel management, environmental issues. Visits to farms in the area to provide critical assessments of dairy farm businesses.

Grade Mode: Letter Grading

Special Fee: Yes

ANSC 895 - Investigations

Credits: 1-4

Investigations in genetics, nutrition, management, diseases, histology, equestrian management/agribusiness, physiology, cell biology, microbiology, dairy management, or teaching experience.

Repeat Rule: May be repeated for a maximum of 4 credits.

Grade Mode: Letter Grading

ANSC 899 - Master's Thesis

Credits: 1-6

Master's students must enroll for a total of 6 credits of this course. Students may enroll in 1-6 credits per semester.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

ANSC 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Applied Studies (APST) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

APST 805 - Grant Writing

Credits: 3

This course prepares participants to effectively write different types of grant narratives based on organizational need(s). Topics may include the strategic purpose of grants, basic grant elements, effective grant-writing strategies, and grant management and stewardship process and tools.

Equivalent(s): APST 805G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Arts/History & Studio (ARTS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Biochemistry (BCHM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

BCHM 802 - Endocrinology

Credits: 4

Structure and function of vertebrate endocrine systems through the lens of physiology, biochemistry, and cell and molecular biology, with special reference to mammals. Current investigations of the body's major endocrine glands, such as the brain, thyroid, pancreas, adrenals and gonads, as regulators and integrators of biological systems. A previous cell biology course is recommended. One semester of biochemistry recommended.

Equivalent(s): ANSC 802

Grade Mode: Letter Grading

BCHM 825 - Cell Phenotyping and Tissue Engineering Laboratory

Credits: 4

Introduction to culture and phenotyping of mammalian cells (cell line models), with applications to bioengineering and biomedical sciences.. Skills, techniques, and knowledge covered include sterile technique, cell culture, cell line models, cell proliferation, cell survival, cell migration, cell adhesion, and drug response. Inquiry-based team projects investigate cell proliferation, cell death, transfection, flow cytometry, 3D scaffolds, or cell imaging. Introductory microbiology and microbiology lab recommended.

Grade Mode: Letter Grading

Special Fee: Yes

BCHM 850 - Physical Biochemistry

Credits: 3

Structure, interactions, and physical-chemical properties of biomolecules. Thermodynamic, kinetic, and spectroscopic methods for the study of proteins and nucleic acids. 1-2 semesters of organic chemistry and one semester of calculus recommended.

Grade Mode: Letter Grading

BCHM 851 - Principles of Biochemistry I

Credits: 4

In-depth survey of biochemistry: macromolecule structure; structure and function of proteins, nucleic acids, carbohydrates, and lipids; introduction to metabolic pathways. One semester of organic chemistry recommended.

Grade Mode: Letter Grading

BCHM 852 - Principles of Biochemistry II

Credits: 4

In-depth survey of biochemistry: metabolism of amino acids, nucleotides, carbohydrates and lipids; synthesis and regulation of macromolecules; molecular biology of the eukaryotic cell.

Prerequisite(s): [BCHM 851](#) with a minimum grade of B-.

Grade Mode: Letter Grading

BCHM 853 - Cell Culture

Credits: 5

Principles and Technical Skills fundamental to the culture of animal and plant cells, tissues and organs. Introduction to the techniques of sub-culturing, establishing primary cultures, karyotyping, serum testing, cloning, growth curves, cryopreservation hybridoma formation and monoclonal antibody production, and organ cultures. Application of cell culture to contemporary research in the biological sciences. Lab. Introductory microbiology and microbiology lab recommended.

Grade Mode: Letter Grading

Special Fee: Yes

BCHM 854 - Molecular Biology Research Methods

Credits: 5

Theory and application of current technologies to manipulate DNA. Hands-on experience that includes DNA isolation and quantitation methods, cloning, PCR, DNA sequencing, and analysis of gene products. Lab. Introductory genetics recommended.

Equivalent(s): GEN 854, PBIO 854

Grade Mode: Letter Grading

Special Fee: Yes

BCHM 855 - Protein Biochemistry Laboratory

Credits: 5

Application of modern approaches to the characterization and purification of proteins. Emphasis on recombinant protein production and purification, analytical techniques for characterization of proteins, enzyme kinetics, and molecular visualization protein structure. One semester of biochemistry recommended.

Grade Mode: Letter Grading

Special Fee: Yes

BCHM 860 - Pharmacology

Credits: 4

Introduction to the basic principles and fundamental concepts of pharmacology, with a focus on molecular mechanisms and pathological basis of therapeutics and the curative effects. Foundations of pharmacology including pharmacodynamics and pharmacogenomics; drugs affecting the nervous system (neuropharmacology); drugs affecting other systems; chemotherapeutic drugs. One semester of biochemistry recommended.

Grade Mode: Letter Grading

BCHM 863 - Biochemistry of Cancer

Credits: 4

Evaluation of the hallmarks of cancer, including molecular mechanisms of carcinogenesis, roles of oncogenes and dysregulated cell development, function and metabolism, tumor immunology, and the biological basis of cancer therapy. One semester of biochemistry recommended.

Grade Mode: Letter Grading

BCHM 894 - Protein Structure and Function

Credits: 4

Analysis of how the three-dimensional architecture of soluble and membrane proteins contributes to their biochemical function; methods for determining the structure of proteins; protein folding; protein targeting; and mechanisms of enzyme catalysis.

Computer resources used for protein modeling and structural prediction. One semester of biochemistry recommended.

Grade Mode: Letter Grading

Biology (BIOL)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

BIOL 801 - Plant Physiology

Credits: 4

This course covers general principles of plant physiology relating plant structure to function and introduce basic physiological processes underlying plant growth and development and plant responses to the environment. Course topics include plant cell structure, plant water relations, plant mineral nutrition, metabolism, photosynthesis, plant respiration, signal transduction, plant growth regulators, photomorphogenesis, plant development, reproduction, senescence, and stress physiology. Course format consists of lectures and laboratory session. The laboratory session is designed to accompany lectures in plant physiology. The laboratories' core objective is to help students visualize main basic concepts and common techniques in plant physiology by running basic experiments, analyze data, and present results. It is strongly encouraged that students have a background knowledge of plant biology and chemistry for success in this class.

Grade Mode: Letter Grading

Special Fee: Yes

› [View Course Learning Outcomes](#)

BIOL 804 - Plant-Microbe Interactions

Credits: 3

Microbes and plants have developed intriguing strategies to encourage, resist or profit from their coexistence. The primary objective of the course is to provide students with a comprehensive overview of the various ways in which microbes interact with plants, the outcomes of that interplay, and applications of these interactions and explore how these interactions impact ecosystem function. One year of general biology and a semester of Microbiology or Genetics recommended.

Grade Mode: Letter Grading

BIOL 806 - Data Science with R for the Life Sciences

Credits: 4

Introduces students to the basic data analysis and programming tools commonly used throughout the life sciences. Students will become proficient in R programming, data wrangling and cleaning, the principles of open and reproducible science, SQL database management, version control via Git/Github, building maps, and Bash command lines. Data sets and case studies from across the life sciences will be used throughout the course. The class culminates with a small group project.

Grade Mode: Letter Grading

BIOL 811 - Experimental Design & Analysis

Credits: 4

Design and analysis of biological and ecological research experiments. "Real world" studies used to discuss the identification of hypotheses, appropriate experimental design, and the application of statistical analyses including ANOVA, ANCOVA, correlation and regression, cluster analysis, classification and ordination techniques. Theoretical statistical concepts tailored to consider students' own thesis and dissertation research, allowing statistical problems to be addressed at various stages of the research process. Common computer packages used for analyses include Excel, JMP, Systat and R.

Grade Mode: Letter Grading

BIOL 814 - Model Organisms in Biological and Medical Research

Credits: 2

Animals, plants, and microbes serve as powerful tools for both basic and biomedical research. This course integrates historical, philosophical, sociological, and biological perspectives to examine how models are chosen and used, and how to evaluate their strengths and weaknesses. Students will study particular model species in depth, and address general epistemological questions about the choice and use of model organisms. This course is designed for graduate students and advanced undergraduates.

interested in research.

Grade Mode: Letter Grading

BIOL 820 - Plant-Animal Interactions

Credits: 4

Animals and plants engage in a range of interactions, from plant-pollinator and plant-ant mutualisms to plant-herbivore and carnivorous plant antagonisms. This course will explore the consequences of a variety of interactions on the evolution of traits in both animals and plants, considering implications for both conservation and agriculture. Weekly recitation. One year of general biology recommended.

Grade Mode: Letter Grading

BIOL 827 - Animal Communication

Credits: 4

This course examines the principles underlying how animals communicate with each other and why they communicate the way they do by using perspectives drawn from a broad range of disciplines including physics, chemistry, ecology, psychology, economics, and behavioral ecology. Students will explore the primary literature, and work in teams to conduct independent research. The course is intended for advanced undergraduate or graduate students interested in neuroscience and behavior, evolution, wildlife and conservation biology, or zoology. One year of general biology recommended.

Grade Mode: Letter Grading

BIOL 828 - Marine Bioacoustics

Credits: 3

Marine bioacoustics is a highly interdisciplinary field of science that requires knowledge of marine biology, oceanography, physics and engineering. This course provides an introduction to the role of acoustics in aquatic biological systems and how acoustics is used to study biological processes and ecosystem dynamics. Topics include: marine animal hearing; sound production; behavior echolocation; remote sensing; research methods; and the impacts of sounds on marine animals. It is suggested that students have a strong background in biology. College level physics and calculus is suggested.

Grade Mode: Letter Grading

BIOL 840 - Acoustic Ecology

Credits: 4

This course examines the acoustic environment and how alterations to the acoustic environment from human activities and climate change result in permanent changes to animal behavior and the resulting soundscape. Focusing on using acoustics as a tool to monitor species and habitats, students will learn quantitative approaches and best practices for acoustic ecology investigations. Students will explore the emerging field of ecological acoustics through primary literature and hands-on, independent research in habitats surrounding UNH campus. This course is intended for advanced undergraduate or graduate students interested in animal behavior, ecology, wildlife and conservation biology, or zoology. Two semesters of college-level biology required prior to taking this course.

Grade Mode: Letter Grading

Special Fee: Yes

BIOL 852 - New England Mushrooms: a Field and Lab Exploration

Credits: 4

This is a hands-on field, lab and lecture course in the identification, classification, life histories, and ecology of mushrooms and other macrofungi. Lectures focus on macrofungal ecology and systematics. Laboratory instruction emphasizes morphological, microscopic, and molecular identification techniques, plus the use of smart-phone field note recording and on-line resources. Several field trips are required in addition to the weekly laboratory. Previous experience with fungi is not required. Grades are based on a collection, a project, and presentations. Intro course in Biology or Plant Biology, recommended.

Equivalent(s): PBIO 852

Grade Mode: Letter Grading

Special Fee: Yes

BIOL 855 - Biological Oceanography

Credits: 3

Biological processes of the oceans, including primary and secondary production, trophodynamics, plankton diversity, zooplankton ecology, ecosystems and global ocean dynamics. One year of general biology recommended.

Equivalent(s): ESCI 850, ZOOL 850

Grade Mode: Letter Grading

BIOL 873 - Physiology of Fishes**Credits:** 4

Investigates the physiological processes responsible for maintaining homeostasis in fishes. Focuses on the function and regulation of the major organ systems during stress and environmental adaptation. Topics include reproduction, osmoregulation, digestion, endocrinology, and sensory perception.

Equivalent(s): ZOOL 873

Grade Mode: Letter Grading

Special Fee: Yes

BIOL 895 - Advanced Studies**Credits:** 1-4

Advanced research or seminar, supervised by a faculty member.

Grade Mode: Letter Grading

BIOL 899 - Master's Thesis**Credits:** 1-10

Master's thesis research.

Repeat Rule: May be repeated for a maximum of 10 credits.

Grade Mode: Graduate Credit/Fail grading

BIOL 901 - Introductory Graduate Seminar**Credits:** 2

This seminar provides an introduction to the Biological Sciences Graduate Program, offering students an overview of program structure and requirements, introducing faculty research and campus resources, and helping participants develop skills and strategies useful in graduate school. Requirements include preparation of a written research proposal and a brief oral presentation.

Equivalent(s): ZOOL 901

Grade Mode: Graduate Credit/Fail grading

BIOL 902 - Writing and Publishing Science**Credits:** 2

Participants in this seminar (1) make significant progress on one or more of their current academic writing projects; (2) increase their understanding of the genres, protocols, and mechanisms of scientific writing and publishing; and (3) develop strategies and skills for getting professional writing done efficiently and well, in graduate school and beyond.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

BIOL 950 - Scientific Communication**Credits:** 2

Professional success in science depends on the ability to communicate, both by publishing in professional journals and by explaining the implications of research to a broad audience. This course covers a wide range of topics related to scientific communication. Students work on multiple forms of communication, practice communicating science to the public, strengthen peer reviewing skills, explore online scientific communities, and enhance awareness of relevant economic, legal, and ethical issues.

Equivalent(s): LSA 950

Grade Mode: Graduate Credit/Fail grading

BIOL 999 - Doctoral Dissertation Research

Credits: 0

Doctoral dissertation research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Biotechnology (BIOT)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

BIOT 804 - New and Emerging Biotechnology

Credits: 3

This course is a graduate-level investigation of emerging technologies, innovations and new products in the biotechnology industry, taught using case studies and scientific literature. Modern biotechnology focuses mainly on medicine. New treatments for rare and complex diseases as well as genetic testing to identify genetically-inherited diseases are continually being developed and discovered. Technology that makes these and other advances possible is the focus of this course.

Grade Mode: Letter Grading

BIOT 825 - Biotech Products and Regulation

Credits: 3

The biopharma industry begins with foundations in basic science and works through various stages to turn ideas into marketable therapies. The business, clinical, and regulatory steps that are required to bring a product to market are important to understand in order to maximize ones effectiveness in any department in a biopharma setting. This course draws upon field experts to help deliver the content and tackle important discussions about the processes involved in drug development.

Grade Mode: Letter Grading

BIOT 830 - Neurobiotechnology

Credits: 3

Why is the human brain so difficult to understand? When scientists uncover basic science principles of the neuron, how does that scale up to system-wide understanding or to clinical treatments? The instruments that help us investigate the function of an individual neuron are very different from the instruments needed to parse subjective human experience. This notion of scale, in both time and space, will be integral to exploring the obstacles of neuroscience research and to surveying the neurobiotech tools that help answer these difficult questions.

Grade Mode: Letter Grading

BIOT 837 - Microbial Genomics

Credits: 0 or 3

Microbial genomes (primarily bacteria and bacteriophages) and genome-scale approaches to addressing questions in microbial physiology and pathogenesis will be the focus of this course. Large-scale sequencing projects, genome structure and evolution, metagenomics, and other challenges in comparative genomics, will be discussed. Hands-on wet laboratory and bioinformatics projects will be included in this laboratory-lecture course.

Grade Mode: Letter Grading

BIOT 840 - Antibiotic Discovery Research

Credits: 0 or 3

Students will identify antibiotic-producing bacterial isolates from environmental samples. They will participate in a self-directed research project that will involve working with faculty to generate hypotheses. Students will also perform one or more antibiotic discovery and/or antibacterial chemical experiments and use advanced lab techniques including the UHPLC to fractionate and analyze chemical extracts. Cannot earn credit if already taken [BIOT 897](#) Special Topic "Antibiotic Discovery".

Grade Mode: Letter Grading

BIOT 850 - Cancer Biology: From Benchtop Research to Therapeutic Interventions

Credits: 3

The development and progression of cancer can be defined by several molecular and cellular biological characteristics. In this course, we will utilize primary literature to begin to understand (1) how specific cellular processes are altered during cancer

initiation and progression; (2) how different cancers and the genetic landscape underlying them are being studied using models in the laboratory; and (3) how innovative therapeutics are being designed to target tumors based upon their individual molecular signatures.

Grade Mode: Letter Grading

BIOT 853 - Cell Culture

Credits: 0 or 3

Principles and technical skills fundamental to the culture of animal cells. Introduction to the techniques of sub-culturing, establishing primary cultures, karyotyping, cloning, growth curves, and cryopreservation. Techniques involving culturing mammalian cells in bioreactors will be introduced. Application of cell culture to contemporary research in biotechnology through independent projects.

Grade Mode: Letter Grading

Special Fee: Yes

BIOT 855 - Advanced Therapies

Credits: 3

In this course students will gain an understanding of the fundamentals of biomaterials, gene therapy, cell therapy, and tissue engineering. We will cover chemical, structural, and biological aspects of therapeutic materials along with systemic literature reviews involving advanced therapy medical products (ATMPs) utilizing molecules, genes, cells, and tissues. We will also discuss synthetic polymers and biomolecules such as peptides, proteins, polysaccharides and oligonucleotides. No credit for students who have taken [BIOT 897 "Top/Advanced Therapies"](#).

Grade Mode: Letter Grading

BIOT 860 - Numerical & Statistical Analysis in Biotechnology

Credits: 0 or 3

In this course, students will gain an understanding of how best to conduct data analysis experiments utilizing data specific to biotechnology applications. Hands-on exercises involve using computer software programs such as Matlab and JMP. Data input/manipulation, descriptive and inferential statistics, hypothesis testing, curve fitting, and Matlab coding will be covered. Upon completion of the course, students should be able to conduct data analysis experiments within the context of biotech. No credit for students who have taken [BIOT 897 "Top/Num & Statistical Analysis"](#).

Grade Mode: Letter Grading

BIOT 866 - Protein and Immunological Techniques

Credits: 0 or 3

Laboratory course focused on application of molecular biology techniques of the isolation, quantitation, detection, analysis, and use of proteins. Substantial emphasis will be on the use of immunoassays and antibodies in protein work. Modern proteomics techniques will also be discussed. Emphasis will be on recombinant protein expression in the field of biotechnology.

Grade Mode: Letter Grading

Special Fee: Yes

BIOT 870 - Stem Cell and Biomaterials Engineering Laboratory

Credits: 0 or 3

Introduction to stem cells and how biomaterials are utilized in their applications involving biotechnology and biomedical engineering. Lab topics such as aseptic technique, stem cell cultures, biomaterials engineering, bioprinting, biocompatibility and bioactivity analyses will be covered. Lectures will focus on the current literature while the lab portion involves inquiry-based projects that will investigate how biomaterials and molecules modulate stem cell proliferation and differentiation.

Grade Mode: Letter Grading

BIOT 872 - Pluripotent Stem Cell Laboratory

Credits: 0 or 3

Introduction to human pluripotent stem cells (hPSCs) and how they are utilized in biomedical applications. Lab topics such as aseptic techniques, pluripotent stem cell cultures, stem cell differentiation, and cellular analyses will be covered. Lectures will focus on the current literature while the lab portion involves inquiry-based projects that will investigate how pluripotent stem ce

proliferate and differentiate. Special focus will be given to induced pluripotent stem cell (iPSC) cultures. Students must have previous cell culture experience.

Grade Mode: Letter Grading

Special Fee: Yes

BIOT 875 - Biopharmaceutical Production Processes

Credits: 0 or 3

This course will provide the students with an overview of biopharmaceutical production processes through lectures. The course begins by introducing students to the proteins and biotechnology companies and to cGMP. During lab, students will use mammalian cells to produce a monoclonal antibody by developing manufacturing SOPs, including upstream and downstream processing and quality control and assurance. Students will also gain experience with T-cell culture as part of the CAR-T technology utilized in personal medicine.

Grade Mode: Letter Grading

BIOT 877 - Molecular Biology and Biotechnology

Credits: 0 or 3

The organization, expression, and control of RNA and protein-coding genes in prokaryotic and eukaryotic cells. The focus of the course is on mechanisms of genetics at the molecular level and the application of modern techniques to laboratory biotechnology projects.

Grade Mode: Letter Grading

Special Fee: Yes

BIOT 880 - Techniques in Microscopy and Image Analysis

Credits: 0 or 3

Laboratory course focused on application of microscopy techniques (light, fluorescent, confocal) and the subsequent analysis strategies for investigating biological specimens. Special focus will be directed towards cellular microscopy-based assays, both structural and functional. Image analysis topics will touch on filtering, segmentation, and registration.

Grade Mode: Letter Grading

BIOT 888 - Graduate Independent Study

Credits: 1-4

Advanced individual study under the direction of a faculty mentor. Content area to be determined in consultation with faculty mentor.

Repeat Rule: May be repeated for a maximum of 4 credits.

Grade Mode: Letter Grading

BIOT 889 - Biotech Career Planning

Credits: 1

This course is intended for any student seeking internship, co-op, and/or employment opportunities. Participants research and evaluate biotech-related career opportunities related to their interests, create application portfolios, conduct interviews, use networking and job search resources, and participate in employer-based resume reviews and/or mock interviews. This course cannot be repeated for credit.

Grade Mode: Graduate Credit/Fail grading

BIOT 890 - Training Workshop

Credits: 1-3

Through the Graduate Training Workshop, students will gain experience in emerging topics and techniques relevant to careers in the biotech industry. These will include, but not be limited to: flow cytometry, various chromatography techniques, and high-throughput sample processing.

Repeat Rule: May be repeated up to 6 times.

Grade Mode: Letter Grading

BIOT 891 - Applied Research

Credits: 3-6

The applied research experience enhances the student's academic achievements with real-world, professional industry projects through placement at biopharma industry organizations. The student is expected to apply knowledge and skills acquired through other coursework in the major to address and solve new, authentic problems identified by the employer. Under the direction of a faculty advisor and workplace supervisor, the student is expected to contribute effectively within a team at the organization.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

BIOT 892 - Graduate Internship**Credits:** 3-6

The internship experience enhances the student's academic achievements with real-world, professional industry projects through placement at biopharma industry organizations. The student is expected to apply knowledge and skills acquired through other coursework in the major to address and solve new, authentic problems identified by the internship employer. Under the direction of a faculty advisor and workplace supervisor, the student is expected to contribute effectively within a team at the organization.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

BIOT 893 - Directed Graduate Research**Credits:** 3-6

The research project experience enhances the student's academic achievements with a project-based experience in an academic lab. The student is expected to apply knowledge and skills acquired through other coursework in the major to address and solve new, authentic basic or applied science questions under the direction of a faculty advisor. The student is expected to contribute effectively within a lab team.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

BIOT 895 - Graduate Co-op Experience**Credits:** 1-9

This intensive internship experience enhances the student's academic achievements with real-world, professional industry projects through placement at biopharma industry organizations. The student is expected to apply knowledge and skills acquired through other coursework in the major by working in an industry setting alongside professionals to hone their technical and business skills. Under the direction of a faculty advisor and workplace supervisor, the student is expected to contribute effectively within a team at the organization.

Repeat Rule: May be repeated for a maximum of 9 credits. May be repeated up to 2 times.

Grade Mode: Letter Grading

BIOT 896 - Graduate Seminar in Biotechnology**Credits:** 1

The graduate seminar in biotechnology will run each semester with different topics. For example: 1) Cutting-edge issues facing the biotech industry will be encountered through case studies in order to apply what is being learned in other courses, hone communication skills, and stay up to date in the fields. 2) Instrumentation and technologies utilized in the biotechnology industry will be described through lectures, readings, and site visits to nearby facilities.

Repeat Rule: May be repeated for a maximum of 3 credits.

Grade Mode: Graduate Credit/Fail grading

BIOT 897 - Special Topics in Biotechnology**Credits:** 1-3

This course explores and investigates advanced topics in biotechnology that would not normally be covered in other courses in the curriculum.

Repeat Rule: May be repeated for a maximum of 9 credits.

Grade Mode: Letter Grading

Special Fee: Yes

BIOT 898 - Special Laboratory Topics in Biotechnology**Credits:** 0-3

This laboratory course explores and investigates advanced topics in biology that would not normally be covered in other courses in the curriculum.

Repeat Rule: May be repeated for a maximum of 9 credits.

Grade Mode: Letter Grading

Chemical Engineering & Bioengineering (CHBE)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CHBE 805 - Fossil Fuels and Renewable Energy Sources

Credits: 4

Processing and refining of coal, crude oil, natural gas, tar sands and shale oil. Biomass co-combustion, biofuel extraction, impediments to widespread utilization. Exploration of environmental issues with energy generation and consumption. Lab.

Equivalent(s): CHE 805

Grade Mode: Letter Grading

CHBE 806 - Electrochemical Methods: Fundamentals and Applications

Credits: 4

Fundamentals and applications of thermodynamics of electrochemical processes; kinetics of electrochemical reactions; examples in electrochemistry current technology.

Equivalent(s): CHE 806

Grade Mode: Letter Grading

CHBE 812 - Introduction to Nuclear Engineering

Credits: 4

Development of nuclear reactors; binding-energy; radioactivity; elements of nuclear reactor theory; engineering problems of heat transfer, fluid flow, materials selection, and shielding; environmental impacts.

Equivalent(s): CHE 812

Grade Mode: Letter Grading

CHBE 814 - Chemical Sensors

Credits: 4

Interdisciplinary approach using thermodynamic, physical and surface chemistry, kinetic, electrochemical, and optical principle to analyze and design chemical sensors. Topics will include selectivity and sensitivity of sensors, biosensors, electrochemical sensors, mass sensors, optical sensors, and multivariate sensors. Lab.

Equivalent(s): CHE 814

Grade Mode: Letter Grading

CHBE 822 - Introduction to Microfluidics

Credits: 4

Fundamentals and applications of microfluidics; scaling laws; microfabrication technology; hydrodynamics and electrodynamic; interfacial phenomena; capillary effects and diffusion; microvalves; micropumps; lab-on-a-chip systems; biochips. Fluids mechanics course required prior to taking this course.

Equivalent(s): CHE 822

Grade Mode: Letter Grading

CHBE 825 - Cell Phenotyping and Tissue Engineering Laboratory

Credits: 4

Introduction to culture and phenotyping of mammalian cells (cell line models), with applications to bioengineering and biomedical sciences. Skills, techniques, and knowledge covered include sterile technique, cell culture, cell line models, cell proliferation, cell survival, cell migration, cell adhesion, and drug response. Inquiry-based team projects investigate cell proliferation, cell death, transfection, flow cytometry, 3D scaffolds, or cell imaging.

Equivalent(s): BENG 825

Grade Mode: Letter Grading

CHBE 835 - Interfacial Engineering and Nanotechnology**Credits:** 4

Fundamentals of interfacial phenomena and nanotechnology and applications in chemical engineering and bioengineering. Topics will include thermodynamics, surface forces, surface tension, adhesion and surface chemistry and characterizations, colloidal stability in paint, thin film technologies, self-assembly of micelles and lipid bilayers, nanoparticles for drug delivery, adsorption in biomaterials, and crystallization. Lab.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CHBE 844 - Corrosion**Credits:** 4

Fundamentals of corrosion processes in industrial and environmental settings; thermodynamics, kinetics, and mass transport in local corrosion cells; protection by electrochemical, chemical, surface modification or barrier methods; instrumental methods in corrosion science. Lab.

Equivalent(s): CHE 844**Grade Mode:** Letter Grading**CHBE 852 - Process Dynamics and Control****Credits:** 4

Dynamic behavior of chemical engineering processes described by differential equations; feedback control concepts and techniques; stability analysis. Lab.

Equivalent(s): CHE 852**Grade Mode:** Letter Grading**CHBE 855 - Computational Molecular Bioengineering****Credits:** 4

Introduction to fundamental concepts in bioengineering with primary emphasis on understanding details of biomolecular structures integrated with molecular modeling, simulation, and visualization techniques. The course will introduce structural details of various biomolecules (proteins, nucleic-acids, sugars, and lipids), followed by concepts in thermodynamics and physical chemistry (such as intermolecular forces, energy, entropy, chemical potential, and Boltzmann's distribution), the applications of which will be discussed in the context of drug-receptor interactions, molecular recognition, biomolecular folding, enzyme catalysis, allosteric communication, diffusion, and transport. The laboratory will include training and learning about advanced simulation and visualization software engines.

Equivalent(s): BENG 855**Grade Mode:** Letter Grading**CHBE 860 - Principles of Bioengineering****Credits:** 3

This course aims to provide students with the fundamental framework of how bioengineering works. Topics covered include basic of molecular and cellular principles, important physiological principles of human body, specific applications of bioengineering such as drug delivery, tissue engineering, nanotechnology, immune-bioengineering, artificial organs, and cancer therapy. Knowledge of differential equations and general chemistry/physics is required for this course.

Grade Mode: Letter Grading**CHBE 861 - Biochemical Engineering****Credits:** 4

Immobilized enzyme technology, microbial biomass production, transport phenomena in microbial systems, biological reactor design, process instrumentation and control, applications in separation and purification processes. Lab.

Equivalent(s): CHE 861**Grade Mode:** Letter Grading**CHBE 862 - Biomedical Engineering****Credits:** 4

Overview of the biomedical engineering through topical studies such as drug delivery and sensors. Discussion of modern engineering methods through primary research sources. Prereq: differential equations and statistics.

Equivalent(s): BENG 862, CHE 862

Grade Mode: Letter Grading

CHBE 866 - Biomaterials

Credits: 4

Fundamental principles of biology and material science, along with latest topics in biomaterials research. Topics include cell biology, wound healing, host response to foreign materials, polymers, hydrogels, diffusion and methods of material characterization. Specific medical applications of biomaterials such as orthopedic and dental implants, heart valves, artificial blood vessels, cochlear and ophthalmic implants and tissue engineering. Laboratory. Students are expected to have some background in chemistry, mathematics, and high school biology.

Equivalent(s): BENG 866, CHE 866

Grade Mode: Letter Grading

CHBE 898 - Chemical Engineering Project

Credits: 3

Concluding experience for Master of Engineering Degree.

Repeat Rule: May be repeated for a maximum of 6 credits.

Equivalent(s): CHE 898

Grade Mode: Graduate Credit/Fail grading

CHBE 899 - Master's Thesis

Credits: 1-9

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 9 credits.

Equivalent(s): CHE 899

Grade Mode: Graduate Credit/Fail grading

CHBE 900 - Seminar

Credits: 0 or 1

Topics of interest to graduate students; reports of research ideas, progress, and results; lectures by outside speakers. Must be taken twice for 1.00 credit. Students register for 0.00 credits for all other semesters in ChE graduate program.

Repeat Rule: May be repeated for a maximum of 2 credits.

Equivalent(s): CHE 900

Grade Mode: Graduate Credit/Fail grading

CHBE 923 - Advanced Chemical Engineering Thermodynamics

Credits: 3

The multi-component open system; the volumetric and phase behavior of pure substances and of multi-component systems at physical and chemical equilibrium, fugacity and activity; thermal properties of equilibrium, chemically reacting systems; introduction to statistical thermodynamics.

Equivalent(s): CHE 923

Grade Mode: Letter Grading

CHBE 932 - Advanced Chemical Engineering Kinetics

Credits: 3

Specialized applied kinetics problems; catalysis; fast reaction and shock tubes; combustion and detonation processes; non-isothermal kinetics; heat and mass transfer in non-equilibrium, chemically reacting systems.

Equivalent(s): CHE 932

Grade Mode: Letter Grading

CHBE 940 - Advanced Transport Phenomena

Credits: 3

This course is a graduate level engineering course designed to review the governing relations of momentum, heat, and transfer at an advanced level for students who have already been exposed to transport at the undergraduate level. Principal concepts will be illustrated through their application to classical and practical paradigms in transport phenomena. Students will learn useful analytical methods for studying and solving steady state and unsteady state (transient) transport problems with and without fluid convection. Prior to taking this course, completion of the following courses are required; fluid mechanics, heat transfer, and mass transfer.

Equivalent(s): CHE 940

Grade Mode: Letter Grading

CHBE 996 - Graduate Independent Study**Credits:** 1-4

Directed reading or investigation at the advanced level on topics in chemical engineering, including internships for graduate students.

Equivalent(s): CHE 996

Grade Mode: Letter Grading

CHBE 999 - Doctoral Research**Credits:** 0

Doctoral Research.

Equivalent(s): CHE 999

Grade Mode: Graduate Credit/Fail grading

Chemistry (CHEM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CHEM 800 - Introduction to Chemistry Teaching and Research Practices

Credits: 1

Introduction to professional responsibilities, safety, and ethics of teaching and research. Theory-based teaching, learning, and assessment, and reflective practice. Departmental research overview and seminar participation. Pre-semester sessions and periodic seminars during semester.

Grade Mode: Graduate Credit/Fail grading

CHEM 801 - Modern Tools for Researchers in the Chemical Sciences

Credits: 1

Series of professional development workshops on essential research skills, including intellectual property, literature searching a management, data management, building individual development plan and ethical concerns in chemistry.

Grade Mode: Graduate Credit/Fail grading

CHEM 802 - Critical Thinking for Chemists

Credits: 1

Students begin writing their Thesis Research Proposal document and participate in structured peer-review of evolving drafts. They also participate in a claim-and-question process in which peers challenge claims made in the document and authors explain the. The activities prepare students to present and discuss their proposal with their committee after the end of the semester.

Prerequisite(s): [CHEM 801](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

CHEM 803 - Creative Thinking for Chemists

Credits: 1

Students engage in a specific focus on the creative process in scientific research and the formal processes of research proposal development by inspection of existing proposals, discussion of grant agency functions, and developing an original research idea that undergoes a mock panel review.

Prerequisite(s): [CHEM 802](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

CHEM 808 - Spectroscopic Investigations of Organic Molecules

Credits: 3

Identification and structural analysis of chemical compounds by selected instrumental methods. Typical topics include proton and carbon-13 NMR spectroscopy, IR and UV spectroscopy, and mass spectrometry.

Grade Mode: Letter Grading

CHEM 840 - Chemical Biology

Credits: 3

How does the COVID vaccine work? What is an antibody conjugate? What is bioconjugation? How do we see mRNA in living cells? How do we evolve enzymes? Chemical Biology is the interdisciplinary study of the chemical and chemical reactions involved to probe, manipulate, and control biological systems *in vitro* and *in vivo*. This course is designated for biologists, chemists, and engineers who want to understand cutting-edge and relevant research techniques used in modern medicine.

Prerequisite(s): ([CHEM 547](#) with a minimum grade of D- and [CHEM 548](#) with a minimum grade of D-) or ([CHEM 651](#) with a minimum grade of D- and [CHEM 652](#) with a minimum grade of D-).

Grade Mode: Letter Grading

CHEM 855 - Advanced Organic Chemistry**Credits:** 3

An overview of organic chemistry at the intermediate levels. Aspects of synthetic organic chemistry and physical organic chemistry, including stereochemistry, are covered.

Grade Mode: Letter Grading**CHEM 862 - Advanced Chemical Analysis Instrumentation****Credits:** 3

Theory, instrumentation, and application of methods to qualitative identification and quantitative measurement of trace chemical substances including environmental pollutants. Includes methods of such as atomic spectroscopy, gas and liquid chromatography, IR and UV-VIS spectrophotometry, electrochemistry, fluorescence, mass spectrometry, X-ray techniques.

Grade Mode: Letter Grading**CHEM 874 - Inorganic Chemistry****Credits:** 3

Intermediate level overviews of modern inorganic chemistry including structure, bonding, and reactivity. Coursework in organic chemistry and physical chemistry required.

Grade Mode: Letter Grading**CHEM 876 - Physical Chemistry III****Credits:** 3

Application of quantum theory to atomic electron structure, spectroscopy, and molecular structure.

Grade Mode: Letter Grading**CHEM 895 - Special Topics****Credits:** 2-4

New or specialized topics not covered in regular course offerings. May be repeated. Lab. (Not offered every year.)

Grade Mode: Letter Grading**CHEM 899 - Thesis/Problems****Credits:** 1-10

Conferences, library, and experimental work in some field of chemistry.

Repeat Rule: May be repeated for a maximum of 10 credits.**Grade Mode:** Graduate Credit/Fail grading**CHEM 902 - Theoretical Organic Chemistry II****Credits:** 3

A continuation of CHEM 901. (Not offered every year.)

Grade Mode: Letter Grading**CHEM 903 - Advanced Inorganic Chemistry I****Credits:** 3

Survey of important advanced topics in concepts of modern inorganic chemistry.

Grade Mode: Letter Grading**CHEM 904 - Advanced Inorganic Chemistry II****Credits:** 3

Overview of current trends in inorganic research, including transition metal reactions and mechanisms and organometallic chemistry. (Not offered every year.)

Grade Mode: Letter Grading**CHEM 911 - Synthetic Organic Chemistry I**

Credits: 4

Fundamentals of synthetic organic methodology and applications in multiple syntheses. Fourth hour recitation session.

Grade Mode: Letter Grading

CHEM 918 - Advanced Special Topics**Credits:** 2-4

Advanced courses dealing with specialized sub-disciplines in chemistry. (Not offered every year.)

Grade Mode: Letter Grading

CHEM 925 - Surface Chemistry**Credits:** 3

Bulk and surface structure of solids, experimental methods of surface characterization, molecule-surface interactions, principles homogeneous and heterogeneous catalysis. This course typically discusses adsorption/desorption kinetics, surface reaction mechanisms, adsorption isotherms, volcano plots, zeolite catalysis, applications to renewable energy, photovoltaics, nanoscience all from a chemical standpoint.

Grade Mode: Letter Grading

CHEM 930 - Advanced Optical Methods**Credits:** 3

Techniques of chemical identification and analysis utilizing optical instrumentation from the standpoint of theory and application. Topics include UV-visible absorption, luminescence, atomic spectroscopy, IR, NMR, x-ray methods, and mass spectrometry. (Not offered every year.)

Grade Mode: Letter Grading

CHEM 935 - Advanced Analytical Chemistry**Credits:** 3

Advanced analytical chemical methods, including: potentiometry and voltammetry, X-ray fluorescence, electron spectroscopy, scanning electron microscopy and modern methods of mass spectrometry.

Grade Mode: Letter Grading

CHEM 991 - Graduate Presentation Portfolio**Credits:** 1

A graduate course for Chemistry Master of Science students designed to provide them with expertise in preparing, organizing, and giving research presentations.

Grade Mode: Graduate Credit/Fail grading

CHEM 992 - Graduate Writing Portfolio**Credits:** 1

A graduate course for students to acquire and practice appropriate professional data documentation and writing skills.

Grade Mode: Graduate Credit/Fail grading

CHEM 995 - Colloquium**Credits:** 1-4

A) Inorganic Chemistry; B) Organic Chemistry; C) Theoretical Organic Chemistry; D) Physical Chemistry; E) Analytical Chemistry; F) Chemical Education. (Not offered every year.)

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

CHEM 997 - Seminar**Credits:** 1

Presentation and discussion of recent investigations in chemistry.

Grade Mode: Graduate Credit/Fail grading

CHEM 998 - Seminar**Credits:** 1

Presentation and discussion of recent investigations in chemistry.

Grade Mode: Graduate Credit/Fail grading**CHEM 999 - Doctoral Research****Credits:** 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading**Special Fee:** Yes

Civil and Environmental Engineering (CEE)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CEE 804 - Transportation Engineering Highway Geometric Design

Credits: 3

This course covers the principles and practices of geometric design for rural and urban highways. Key topics include design controls, criteria, and elements such as sight distance, horizontal and vertical alignments, cross-sections, and intersection design. Students will explore the impact of traffic volumes, speed-flow-density relationships, and safety considerations on highway design. The course also addresses grade separation and interchange design, equipping students with the skills to develop efficient and safe roadway systems.

Equivalent(s): CIE 854

Grade Mode: Letter Grading

CEE 805 - Introduction to Sustainable Engineering

Credits: 3

Course begins with exploration of the precept that we live in, and must design engineering works for, a world with a finite supply of natural resources and with limited life support capacity. Tools for sustainability engineering are the major focus of the course, which include life cycle analysis and life cycle impact analysis, the metrics and mass and energy flow analyses used in the field of industrial ecology, and environmental management systems.

Equivalent(s): CIE 851

Grade Mode: Letter Grading

CEE 806 - Environmental Life Cycle Assessment

Credits: 3

This course teaches knowledge and hands-on skills in conducting environmental life cycle assessment (LCA), which is a widely used technique by industries, academics, and governments. Students will learn to use popular LCA software (e.g., SimaPro), apply proper LCA techniques, critically analyze LCA results, and provide client-oriented suggestions during this course. Class time is primarily devoted to a combination of lectures and computer labs.

Grade Mode: Letter Grading

CEE 820 - Waste Management and Site Remediation

Credits: 3

The course has two main areas of focus: (1) solid and hazardous waste management, including the key regulations and engineering approaches, such as landfills, waste-to-energy combustion, composting, and material recovery facilities; and (2) contaminated site remediation, including the key regulations, site characterization, risk-based decision making, transport and fate of contaminants, and an introduction to remediation technologies.

Equivalent(s): CIE 842

Grade Mode: Letter Grading

CEE 821 - Environmental Sampling and Analysis

Credits: 4

Theory of analytical and sampling techniques used in environmental engineering. Topics include potentiometry, spectroscopy, chromatography, automated analysis, quality control, sampling design, and collection methods. Methods discussed in lecture are demonstrated in labs.

Grade Mode: Letter Grading

CEE 822 - Introduction to Marine Pollution and Control

Credits: 4

Introduction to the sources, effects, and control of pollutants in the marine environment. Dynamic and kinetic modeling; ocean disposal of on-shore wastes, shipboard wastes, solid wastes, dredge spoils, and radioactive wastes; and oil spills. Prior coursework in fundamental aspects of environmental engineering required.

Equivalent(s): CIE 847

Grade Mode: Letter Grading

CEE 823 - Environmental Engineering Chemistry

Credits: 4

Chemical equilibrium principles of thermodynamics, acids/bases, precipitation/dissolution, oxidation/reduction, and complexation applied to surface water, groundwater, water and wastewater treatment. Applications to legacy and emerging organic and inorganic contaminants.

Equivalent(s): CIE 849

Grade Mode: Letter Grading

CEE 824 - Environmental Engineering Microbiology

Credits: 4

Concepts of environmental engineering microbiology including microbial metabolism, growth kinetics, bioremediation applications, mass transfer kinetics and effects of environmental parameters. Coursework includes reading and discussion of the microbial literature. Laboratories cover microbiological monitoring and biological treatment experiments. Lab. Prior coursework in fundamental aspects of environmental engineering required.

Equivalent(s): CIE 856

Grade Mode: Letter Grading

CEE 829 - Sources, Control, and Stewardship of Air Pollution

Credits: 4

Sources and fate of air pollutants from natural and engineered systems. Fundamentals of pollutant chemistry, atmospheric dispersion, and engineering controls. Includes regulatory policy, environmental, and social justice issues. Prior coursework in so and hazardous waste engineering or permission required.

Grade Mode: Letter Grading

CEE 830 - Public Health Engineering for Rural and Developing Communities

Credits: 3

The design principles are to impart to the student specific information that can be used to design public health control facilities such as small water treatment systems and on-site wastewater disposal systems. The engineering control methods taught are particularly applicable to rural areas and developing countries.

Equivalent(s): CIE 840

Grade Mode: Letter Grading

CEE 831 - Advanced Water Treatment Design

Credits: 4

The advanced design of physical, chemical, and biological treatment processes for water and wastewater systems. Emphasis on both conventional and innovative treatment processes, including technologies for emerging issues and contaminants.

Grade Mode: Letter Grading

CEE 832 - Solid Waste Facility and Remediation System Design

Credits: 4

Focuses on the design of solid waste facilities, including landfills, waste-to-energy facilities and materials recovery facilities, and the design of remediation systems including soil vapor extraction and thermal treatment. Landfill design will include the basic design principles of the liner, leachate collection system, and landfill gas management. Remediation system design will focus on cleanup technologies implemented at contaminated sites.

Equivalent(s): CIE 848

Grade Mode: Letter Grading

CEE 833 - Public Infrastructure Asset Management**Credits:** 4

The course provides a thorough examination of the growing engineering field of Public Infrastructure Assess Management (IAM). The course enables the student to design an IAM system. It touches upon all types of public infrastructure with a particular focus on water infrastructure for the semester design project. Students build upon their engineering economics and project engineerir skills and use simple IAM software along with GIS applications. Practice leaders from the industry provide guest lectures throughout the semester. A focus on triple bottom line or the Societal, Environmental and Economic aspects of IAM are included. The format is a modified team base design learning experience providing practice in processing of technical lecture material, personal performance evaluation (frequent quizzes) and team based performance evaluation. Student groups will present their design to the class and provide a written engineering report. Prior coursework in fundamental aspects of environmental engineering required.

Equivalent(s): CIE 839**Grade Mode:** Letter Grading**CEE 835 - Properties and Production of Concrete****Credits:** 3

Basic properties of hydraulic cements and mineral aggregates and their interactions in the properties of plastic and hardened concrete; modifications through admixtures; production handling and placement problems; specifications; quality control and acceptance testing; lightweight, heavyweight, and other special concretes. Prior coursework in fundamental aspects of materials engineering required.

Equivalent(s): CIE 822**Grade Mode:** Letter Grading**CEE 836 - Asphalt Mixtures and Construction****Credits:** 3

Specification of asphalt cements, aggregates and proportioning of mixture constituents for paving applications. Asphalt mixture design methods, production, construction, and quality control are discussed. Current and new material production and construction technologies are introduced. Prior coursework in fundamental aspects of materials engineering required.

Equivalent(s): CIE 823**Grade Mode:** Letter Grading**CEE 837 - Pavement Rehabilitation, Maintenance, and Management****Credits:** 3

This course covers the technical and financial strategies to extend the life of highway and airfield pavements. The course topics v include: Assessment of pavement functional and structural condition, suitability of pavement maintenance and repair technique use of pavement preservation processes, and application of asset management to extend the life of pavement infrastructure.

Grade Mode: Letter Grading**CEE 849 - Pavement Design and Analysis****Credits:** 4

Introduction to flexible and rigid pavement design and analysis for highways and airports. Examines design inputs, materials, analysis methods, design tools, and maintenance treatments. Students will conduct a pavement design project. This course satisfies a graduate elective requirement for students enrolled in M.S. or Ph.D. program in the CEE department with Materials foc area.

Equivalent(s): CIE 821**Grade Mode:** Letter Grading**CEE 851 - Open Channel Flow****Credits:** 3

Energy and momentum principles in open channel flow; flow resistance; channel controls and transitions; unsteady flow concep and dam failure studies. Modeling with HEC programs. Prior coursework in fundamental aspects of environmental engineering required.

Equivalent(s): CIE 841**Grade Mode:** Letter Grading

CEE 853 - Snow Hydrology**Credits:** 3

Snow is a significant component of the hydrologic cycle in high latitude and high elevation environments. It is also a part of engineering design and practice that is frequently overlooked. In this course, we will examine spatial controls on snow accumulation and the dynamics of snowmelt processes through readings in snow hydrology, field assays of snow distribution, and analytical exercises. Of particular interest will be the role of snow in water resource engineering.

Grade Mode: Letter Grading**CEE 854 - Engineering Hydrology****Credits:** 3

Hydrologic cycle, probability theory related to hydrology and the design of water resources structures, water flow, flood discharge prediction, hydrograph development, hydraulic and hydrologic river routing, reservoir routing, theory of storage, reservoir operations, hydropower development, modeling of watershed hydrology with program HEC-1, HEC-HMS, multipurpose projects.

Equivalent(s): CIE 845**Grade Mode:** Letter Grading**CEE 855 - Design of Pressurized Water Transmission Systems****Credits:** 4

Theory developed for individual components to large complex systems. Analysis and designs of components and systems. Topics include steady and unsteady closed conduit flow, valves and meters, pump requirements, pump selection, system planning and layout, water hammer, and system operation and maintenance. Pressure system modeling with program EPANET. Coursework in fluid mechanics required.

Equivalent(s): CIE 855**Grade Mode:** Letter Grading**CEE 858 - Stormwater Management Designs****Credits:** 3

Historic review of stormwater management leading up to the current regulatory framework. Overview of stormwater management strategies, strategy selection and the targeting of specific contaminants, contaminant removal efficiencies, construction and site selection, and system maintenance. Hydrologic concepts including watershed and storm characteristics, design hydrology (peak flows, storm and treatment volumes), hydrograph routing, and critical review of hydrology and drainage reports. Design and sizing of treatment systems including conventional BMPs, low impact development, and manufactured devices. Rainfall runoff calculations with US SCS TR55 model. Coursework in fluid mechanics required.

Equivalent(s): CIE 858**Grade Mode:** Letter Grading**CEE 859 - Stream Restoration****Credits:** 4

Explores the assessment, planning, design, engineering, and monitoring of stream and watershed practices intended to protect and restore the quality and quantity of flowing and surface waters and stream corridors. Lecture material covers hydrology, geomorphology, and ecosystems, with the intent of understanding the variables associated with stream systems and their interplay. Students measure field variables and then are challenged with actual designs. Examples of stream restoration issues include in-stream flow, dam removal, induced recharge, improvements to fish habitat, and channel stabilization. Coursework in fluid mechanics required.

Equivalent(s): CIE 859**Grade Mode:** Letter Grading**CEE 865 - Engineering Behavior of Soils****Credits:** 4

Review of stress and strain in soil. Introduction to continuum mechanics. Development of engineering soil properties. Application of soil mechanics to shear strength and stress-strain behavior of soils. Failure states and residual strength. Application of stress paths in engineering problems. Unsaturated soil mechanics. Laboratory exercises using the direct shear test, triaxial test, and soil water retention measurements. Coursework in foundation design required.

Equivalent(s): CIE 867

Grade Mode: Letter Grading

CEE 866 - Introduction to Geotechnical Earthquake Engineering

Credits: 3

Overview of earthquake source mechanisms; magnitude and intensity; seismicity of the U.S.A. Dynamics of simple structures; response spectra. Selection of design parameters; source, magnitude, input records. Measurement of dynamic characteristics of soils; site response, liquefaction, and ground deformation.

Prerequisite(s): [CEE 878](#) with a minimum grade of B-.

Equivalent(s): CIE 862

Grade Mode: Letter Grading

CEE 868 - Geo-Environmental Engineering

Credits: 3

Soil composition and structure; hydrogeology; attenuation and contaminant transport; containment design including landfills, geosynthetics for liners and covers, leachate collection systems, vertical cutoff walls, and stability analyses; geo-environmental site characterization and investigation using geotechnical and geophysical methods; ground water, soil and gas monitoring, and sampling; remediation including in-situ and ex-situ techniques and treatment methods. Prior coursework in fundamental aspect of geotechnical engineering required.

Equivalent(s): CIE 866

Grade Mode: Letter Grading

CEE 878 - Foundation Design I

Credits: 4

Foundation design based on subsurface investigation and characterization using current methods of laboratory and in situ testing. Use of consolidation theory and bearing capacity theory for the design of shallow foundations, including footings and rafts. Basic design of pile foundations. Earth pressure theory applied to design of retaining walls. Slope stability theory and applications. Prior coursework in fundamental aspects of geotechnical engineering required.

Equivalent(s): CIE 860

Grade Mode: Letter Grading

CEE 879 - Foundation Design II

Credits: 3

Advanced pile and pier design under vertical and lateral loads. Slope stability by circular and noncircular arc methods. Design of flexible bulkhead walls and mechanically stabilized walls. Excavation and dewatering. Soil and site improvement.

Prerequisite(s): [CEE 878](#) with a minimum grade of B-.

Equivalent(s): CIE 861

Grade Mode: Letter Grading

CEE 880 - Matrix Structural Analysis and Modeling

Credits: 3

Modeling and analysis of determinate and indeterminate structures by matrix computer methods. Creation of matrix elements using compatibility, equilibrium, and consecutive relationships. Plane trusses, beams, frames, and space trusses. Prior coursework in fundamental aspects of structural engineering required.

Equivalent(s): CIE 883

Grade Mode: Letter Grading

CEE 881 - Dynamics of Structures

Credits: 3

Dynamics of single- and multi-story buildings. Response due to earthquakes, blasting, traffic, and mechanical equipment. Analysis in the time domain and through the Fourier Transform. Fundamentals of structural vibration measurement.

Prerequisite(s): [CEE 880](#) with a minimum grade of B-.

Equivalent(s): CIE 887

Grade Mode: Letter Grading

CEE 889 - Timber Design**Credits:** 3

Introduction to the design of timber structures. Structural properties of wood. Determination of horizontal and vertical loads. Horizontal and vertical load-resisting systems. Design of horizontal diaphragms, shear walls, beams, and columns. Bolted, screwed, and nailed connections. Prior coursework in fundamental aspects of structural engineering required.

Equivalent(s): CIE 882**Grade Mode:** Letter Grading**CEE 890 - Structural Design in Masonry****Credits:** 3

Introduces the design of reinforced masonry structural members by the stress and strength method and considering deflection and other serviceability performance criteria. Includes development of wind and seismic load, curtain wall, shear wall, lintels and columns. Prior coursework in fundamental aspects of materials and structural engineering required.

Equivalent(s): CIE 876**Grade Mode:** Letter Grading**CEE 891 - Reinforced Concrete Design****Credits:** 0 or 4

Introduction to the design of reinforced concrete structural members by the strength method and considering deflection performance. Includes loads, approximate analysis, slabs, beams, and columns. Prior coursework in fundamental aspects of materials and structural engineering required.

Equivalent(s): CIE 874**Grade Mode:** Letter Grading**CEE 892 - Pre-stressed Concrete****Credits:** 3

Analysis and design of pre-stressed and post-tensioned concrete sections in flexure and shear. Strength, deflection, and losses in flexural members. Optimization of section and pre-stressing force selection.

Prerequisite(s): CEE 891 with a minimum grade of B-.**Equivalent(s):** CIE 891**Grade Mode:** Letter Grading**CEE 893 - Structural Design in Steel****Credits:** 4

Introduction to steel member design, including horizontal and vertical members for design and analysis of buildings. Examines design inputs, material choice, analysis methods and design and construction methodologies. Prior coursework in fundamental aspects of materials and structural engineering required.

Equivalent(s): CIE 893**Grade Mode:** Letter Grading**CEE 894 - LRFD Bridge Design****Credits:** 3

AASHTO LRFD Bridge Design Specifications using SI units. Design objectives, loads, load case analysis and selection, load distributions, static analysis, and design for axial loads, flexure, and shear. Design of slender columns, composite beams, and plate girders. Senior-level structural design course required prior to taking this course.

Equivalent(s): CIE 892**Grade Mode:** Letter Grading**CEE 895 - Independent Study****Credits:** 1-4

A limited number of qualified graduate students will be permitted to pursue independent studies under faculty guidance. May be repeated.

Equivalent(s): CIE 895

Grade Mode: Letter Grading

CEE 896 - Special Topics

Credits: 1-4

Advanced or specialized topics not normally covered in regular course offerings. May be repeated, but not in duplicate areas.

Equivalent(s): CIE 896

Grade Mode: Letter Grading

Special Fee: Yes

CEE 897 - Masters Student Seminar

Credits: 1

Topics of interest to graduate students and staff; reports of research ideas, progress, and results; lectures by outside speakers. Requires one presentation from students on their research, self-assessment, and a minimum attendance level. Continuing course instructor may assign IA grade (continuous grading) at the end of one semester. Course held simultaneously with 897/997.

Equivalent(s): CIE 900

Grade Mode: Graduate Credit/Fail grading

CEE 898 - Master's Project Paper

Credits: 3

Concluding project paper required of Master's level students who utilize the non-thesis option.

Equivalent(s): CIE 888

Grade Mode: Letter Grading

CEE 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Equivalent(s): CIE 899

Grade Mode: Graduate Credit/Fail grading

CEE 902 - Machine Learning for Engineering Applications

Credits: 3

This project-based course offers students the critical machine learning modeling skillsets for application to graduate level research in engineering disciplines. The course covers a wide range of ML topics ranging from basic regression and tree-based models to advanced methods such as computer vision, deep learning, graph models and reinforcement learning. A key aspect of the course is its research-focused approach. Students will apply machine learning techniques to their own graduate-level research projects and datasets, allowing them to advance their research projects while gaining experience with state-of-the-art ML modeling techniques. Example projects include: Image-based structural anomaly detection; Water quality prediction; Computer vision with remote sensing data; Causal inference of contamination; Graph model of transportation connectivity; Optimization of management decision making. By the end of the course, students are expected to have gained the skills needed to apply cutting-edge machine learning techniques in their research.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CEE 907 - Systems Thinking and Modeling

Credits: 3

This course teaches knowledge and hands-on skills in system dynamics modeling, which is one of the most commonly used tools in analyzing the mechanisms, tradeoffs, and feedbacks in environmental, social, and economic procedures and systems. Student will also be trained with the ability of systems thinking during this course. Class time is primarily devoted to a combination of lectures and computer labs.

Grade Mode: Letter Grading

CEE 936 - Advanced Asphalt Materials**Credits:** 3

Examination of chemical composition of asphalt cements, current technologies for modification, and inclusion of recycled materials to meet desired physical properties. Advanced characterization of asphalt materials, modelling, advanced mixture design tools.

Prerequisite(s): [CEE 836](#) with a minimum grade of B-.**Equivalent(s):** CEE 923**Grade Mode:** Letter Grading**CEE 949 - Advanced Pavement Design and Analysis****Credits:** 3

Advanced flexible pavement design and analysis including rehabilitation/overlay design. Includes development of mechanistic-empirical methods, advanced pavement structural analysis, and advanced material characterization.

Prerequisite(s): [CEE 849](#) with a minimum grade of B-.**Equivalent(s):** CEE 921**Grade Mode:** Letter Grading**CEE 951 - Statistical Hydrology****Credits:** 3

Course examines statistical methods used to address water resources planning and management problems involving uncertainty objectives and hydrologic inputs. Application of statistics and probability to uncertainty in the description, measurement, and analysis of hydrologic variables and processes, including extreme events, error models, simulation, and sampling. A hydrology course and basic statistics required prior to taking this course.

Equivalent(s): CIE 951**Grade Mode:** Letter Grading**CEE 959 - Advanced Stream Restoration Topics****Credits:** 3

Course focuses on: stream crossing analysis and design, dam removal, and designs for aquatic species passage. Prior coursework in fundamental aspects of stream restoration required.

Equivalent(s): CIE 959**Grade Mode:** Letter Grading**CEE 966 - Geotechnical Modeling****Credits:** 4

Introduction to geotechnical modeling, soil constitutive modeling, introduction to numerical modeling and applications, physical modeling, centrifuge modeling, and theoretical modeling. Prior coursework in fundamental aspects of geotechnical engineering required.

Equivalent(s): CIE 962**Grade Mode:** Letter Grading**CEE 967 - In Situ Geotechnical Testing****Credits:** 3

In situ geotechnical testing methods for site characterization; theory and practice. Geotechnical testing methods include the piezocene, the pressuremeter, the flat plate dilatometer, the field vane, and the standard penetration test. Includes sampling techniques, geophysical exploration, and recent innovations in site and soil characterization.

Prerequisite(s): CEE 965 with a minimum grade of B-.**Equivalent(s):** CIE 961**Grade Mode:** Letter Grading**CEE 968 - Soil-Structure-Interaction****Credits:** 3

Introduction to soil-structure-interaction, elastic and plastic analyses, serviceability calculations, relative foundation stiffness,

Pile-soil-interaction, flexible retaining walls, tunnel lining, bridge abutments, dynamic soil-structure-interaction, case studies, ar modeling techniques. Prior coursework in fundamental aspects of geotechnical engineering required.

Equivalent(s): CIE 963

Grade Mode: Letter Grading

CEE 995 - Problems

Credits: 2-4

The study and investigation of problems selected to meet the needs of the students.

Equivalent(s): CIE 995

Grade Mode: Letter Grading

CEE 997 - Doctoral Student Seminar

Credits: 1

Topics of interest to graduate students and staff; reports of research ideas, progress, and results; lectures by outside speakers.

Requires one presentation from students on their research, self-assessment, and a minimum attendance level. Continuing course instructor may assign IA grade (continuous grading) at the end of one semester. Course help simultaneously with 897/997.

Equivalent(s): CIE 901

Grade Mode: Graduate Credit/Fail grading

CEE 999 - Doctoral Research

Credits: 0

Doctoral Research.

Equivalent(s): CIE 999

Grade Mode: Graduate Credit/Fail grading

Communication (COM) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

COM 800 - Foundations of Organizational Communication

Credits: 3

This course examines fundamental principles and theories of organizational communication. Students analyze the effects of communication on organizational quality; discuss specific skill sets necessary for effective internal communication; analyze methods of managing information; discuss the value and methods used to create organizational networks; and study the influence of organizational culture on organizational communication. Crisis communication, intercultural communication, and communication assessment are introduced.

Equivalent(s): COMM 800G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Communication Sciences & Disorders (COMM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

COMM 800 - Graduate Independent Study

Credits: 1-4

Faculty supervised graduate independent studies. The graduate student engages in independent study under the direction of one of the Faculty members of the department.

Grade Mode: Letter Grading

COMM 801 - Principles of Assessment

Credits: 2

Principles and practice for diagnosis of speech and language disorders; examination procedures and measurement techniques.

Grade Mode: Letter Grading

COMM 802 - Principles of Intervention

Credits: 2

An introduction to the clinical process. Part I emphasizes the theory and practice of interventions. Part II addresses oral and written communication involved in the clinical process, the importance of clinical writing, and common reports/documents. CSD majors only.

Grade Mode: Letter Grading

COMM 803 - Ethical and Professional Issues in Communication Sciences and Disorders I

Credits: 1

Introduction to ethical and professional issues that professionals will encounter in various work settings including regulatory, billing practices, service delivery models, and the role of advocacy for client services.

Equivalent(s): COMM 876

Grade Mode: Letter Grading

COMM 804 - Counseling Clients and Families with Communication Disorders

Credits: 2

This course focuses on counseling in the area of communication sciences and disorders. Specifically, the course will examine the application of therapeutic principles in clinical settings with people who have speech, language, and hearing communication difficulties. More specifically, this course is intended to provide the student with a broad overview of contemporary counseling approaches and issues that apply to specific clients and their family members. The course involves formal lectures and group discussion.

Equivalent(s): COMM 915

Grade Mode: Letter Grading

COMM 805 - Research Methods in Communication Sciences and Disorders

Credits: 3

This course introduces students to concepts, procedures, and application of research methods in communication sciences and disorders. The course covers group, single subject, experimental, quasi-experimental, correlational, and qualitative designs with an emphasis on clinical application. CSD majors only.

Equivalent(s): COMM 917

Grade Mode: Letter Grading

COMM 811 - Brain and Behavior

Credits: 3

This course is an overview to Neuroscience/Neurology as it applies to Communication Sciences and Disorders (CSD). Neuroscience is a multidisciplinary field that combines biological, chemical and psychological perspectives to better understand neuron structure and function, thought, emotion, and behavior. It integrates research approaches of a variety of disciplines, ranging from cellular and molecular neurosciences to the psychology of cognition and perception. The focus will be limited to the brain and cognition and application to CSD.

Equivalent(s): COMM 891

Grade Mode: Letter Grading

COMM 812 - Dysphagia**Credits:** 3

This course addresses swallowing problems occurring in the preparatory, oral, and pharyngeal stages of the swallow. Assessment and treatment are discussed.

Equivalent(s): COMM 901

Grade Mode: Letter Grading

COMM 821 - Speech Sound Disorders**Credits:** 3

Course provides students with detailed knowledge of speech sound disorders in children and adults with communication disorders. Current practices are discussed in relation to the early identification, screening, differential diagnosis, and possible etiology of speech sound disorders. Evidence-based practices across the life-span are critically reviewed related to different speech sound disorders and how different remediation approaches are needed depending on the specific problem demonstrated by a client.

Equivalent(s): COMM 900

Grade Mode: Letter Grading

COMM 822 - Stuttering**Credits:** 3

This course provides students with an in-depth knowledge of stuttering from theoretical and clinical perspectives. Emphasis is placed on clinical decision making. Current practices are discussed that cover diagnosis of stuttering, differentiating it from "normal" dysfluencies, etiological considerations, and treatment options. Emphasis is placed on a psycho-social approach to intervention. Evidence based practices in stuttering are covered as well as issues associated with diverse populations.

Equivalent(s): COMM 902

Grade Mode: Letter Grading

COMM 823 - Voice Disorders**Credits:** 3

Study of vocal habilitation and rehabilitation. Focus will be on the use of voice and its modification in health and disease. Included in the course will be specific assessment and treatment approaches for clients who want to modify their vocal behavior including professional voice users, people with voice disorders, and transgender voice and communication change.

Equivalent(s): COMM 906

Grade Mode: Letter Grading

COMM 824 - Motor Speech Disorders**Credits:** 3

Diagnosis and treatment of motor speech disorders in children and adults including dysarthria and apraxia of speech. Focus in this class will be on understanding perceptual and acoustic measures of speech, differential diagnosis and evidence based practice.

Equivalent(s): COMM 905

Grade Mode: Letter Grading

COMM 831 - Early Childhood Language Disorders**Credits:** 3

Examination of interrelationships between early language, social, and cognitive development, with emphasis on collaborative

inter-professional models of assessment and intervention. Reviews implications for special populations (e.g., intellectual and developmental delay/disorder, autism spectrum disorder, sensory impairment, and English language learners).

Equivalent(s): COMM 912

Grade Mode: Letter Grading

COMM 832 - School-Age & Adolescent Language Disorders

Credits: 3

This course addresses language acquisition in school-age children, adolescents, and young adults, and provides an overview of current language assessment and intervention issues. Topics include neurotypical development relative to developmental language delays and disorders, in the context of empirical research, clinical decision-making, and professional issues. Current evidence-based practices related to assessment and intervention are critically reviewed. Designed for future speech-language pathologists but may be relevant to others with an interest in language development and disorders.

Equivalent(s): COMM 875

Grade Mode: Letter Grading

COMM 833 - Aphasia in Adults

Credits: 3

Principles concerning etiologies, evaluation, classification, and methods of clinical management including the team approach to rehabilitation of aphasia in adults.

Equivalent(s): COMM 904

Grade Mode: Letter Grading

COMM 841 - Cognitive Communication Disorders

Credits: 2

This course addresses the nature of cognitive-communicative impairments in children and adults with acquired brain injury and links theory and practice to community reintegration.

Prerequisite(s): [KIN 706](#) with a minimum grade of D- and [KIN 707](#) with a minimum grade of D-.

Equivalent(s): COMM 913

Grade Mode: Letter Grading

COMM 842 - Autism Spectrum Disorders

Credits: 2

Provides an overview of autism spectrum disorders (ASD) including perspectives of individuals and their families. Current practices are discussed in relation to early identification, screening, diagnosis, and possible etiology of ASD, including an overview of medical considerations. Evidence-based practices across the life-span are critically reviewed in areas of behavior, communication, play, social interactions, and sensory-motor. Teaming approaches and transition to adult life to support a high quality of life are presented. Current "hot topics" in ASD research are presented.

Equivalent(s): COMM 916

Grade Mode: Letter Grading

COMM 843 - Augmentative and Alternative Communication

Credits: 3

An overview of how augmentative and alternative communication systems can be used to foster the participation, interaction, and inclusion of children and adults for whom speech is not a primary mode of communication. Students are exposed to a broad variety of assessment and intervention techniques, some of which involve the use of assistive technology.

Equivalent(s): COMM 914

Grade Mode: Letter Grading

COMM 844 - Seminar in Advanced Child Language Acquisition

Credits: 2

Young infants and children are in a process of continual learning. This course takes an advanced and interactive approach to understanding child language acquisition, exploring specific aspects of early language development as well as the interaction of different developmental processes. We will delve deeper into how language acquisition interacts with cognitive development,

prosodic development and assessment, multilingual and multicultural populations, and populations that are developing along a different path.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

COMM 870 - Clinical Practicum

Credits: 1-3

On-campus practicum provides graduate students with the opportunity to apply advanced theoretical knowledge in clinical setting with clients demonstrating speech, language, hearing, and/or swallowing disorders. Students acquire therapy and diagnostic experience under supervision. A minimum of 3 credits is required for the M.S. degree.

Repeat Rule: May be repeated for a maximum of 3 credits.

Equivalent(s): COMM 910

Grade Mode: Letter Grading

COMM 872 - Externship

Credits: 1-4

Application of advanced theoretical knowledge through clinical work in an off-campus clinical setting. A total of 8 credits in COMM 870 required prior to taking this course.

Prerequisite(s): COMM 870 with a minimum grade of B.

Repeat Rule: May be repeated for a maximum of 8 credits.

Equivalent(s): COMM 911

Grade Mode: Letter Grading

COMM 895 - Special Topics

Credits: 1-3

Advanced study in specific areas; involves an independent project.

Repeat Rule: May be repeated for a maximum of 4 credits. May be repeated up to 2 times.

Grade Mode: Letter Grading

COMM 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

COMM 995A - Independent Study

Credits: 1-4

Individual or group projects involving faculty-directed study of an area of communication sciences and disorders that students wish to explore in greater depth than is covered in the required curriculum.

Grade Mode: Letter Grading

COMM 995B - Independent Study: Bilingual Speech-Language Pathology

Credits: 1-4

Individual or group projects involving faculty-directed study of bilingual speech-language pathology for students who wish to explore the topic in greater depth than is covered in the required curriculum.

Grade Mode: Letter Grading

Computer Science (CS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CS 800 - Internship

Credits: 1

Provides an opportunity to apply academic experience in settings associated with future professional employment. A written proposal for the internship must be approved by the department chair. The proposal must specify what the student will learn from the internship, why the student is properly prepared for the internship, and what supervision will be available to the student during the internship. A mid-semester report and a final report are required.

Repeat Rule: May be repeated for a maximum of 3 credits.

Grade Mode: Graduate Credit/Fail grading

CS 812 - Compiler Design

Credits: 4

Formal languages and formal techniques for syntax analysis and parsing; organization of the compiler and its data structures; code generation. LL and LR parsing; automatic generation of scanners and parsers from high-level descriptions. Implementation of features from imperative and object-oriented languages. Students are required to design and implement a compiler for a simple language. Students are expected to have background in computer organization.

Grade Mode: Letter Grading

CS 820 - Systems Programming

Credits: 4

Study and simulation of various types of systems that include assemblers, linkers, memory management, concurrency and other resource management techniques. Students are expected to have background in Computer Organization, Operating Systems Fundamentals or equivalent.

Grade Mode: Letter Grading

CS 822 - Cloud Computing Systems

Credits: 4

The course covers a variety of topics in cloud computing systems, or more precisely, distributed systems that enable modern cloud computing. The topics include virtualization and its impact on system design, cloud-scale storage, cloud data processing and machine learning systems, and cloud configuration management. The course also covers the latest advancements in cloud computing/systems, IoT, edge, and fog computing. Students are expected to have background in operating systems fundamentals.

Grade Mode: Letter Grading

CS 823 - Performance Evaluation of Computer Systems

Credits: 4

This class introduces the main concepts, techniques, and tools needed to evaluate the performance of computer systems under various configurations and workloads. The techniques allow one to perform capacity planning based on quality of service requirements of users and workload characteristics. The course is mainly based on the use of analytic queuing network models for computer systems. The performance techniques are applied to study the performance of centralized, distributed, parallel, and client/server systems. The course also discusses performance measuring tools for operating systems such as Unix and Windows NT. Students are expected to have background in operating systems fundamentals.

Grade Mode: Letter Grading

CS 825 - Computer Networks

Credits: 4

Introduction to fundamental concepts of computer networks and exploration of widely-used networking technologies. Topics

include principles of congestion and error control; network routing; local, wireless and access networks; application protocol design; and network programming. In-depth discussion of the Internet suite of protocols.

Grade Mode: Letter Grading

CS 827 - Software Security

Credits: 4

Mechanisms and implementation of techniques in software security. Various fundamental security topics include cryptography, access control, protocols, software vulnerabilities, and reverse engineering. Students are expected to have background in Computer Organization, Assembly Language, Fundamentals of Cybersecurity.

Grade Mode: Letter Grading

CS 830 - Introduction to Artificial Intelligence

Credits: 4

In-depth introduction to artificial intelligence concentrating on aspects of intelligent problem-solving. Topics include situated agents, advanced search techniques, knowledge representations, logical reasoning techniques, reasoning under uncertainty, advanced planning and control, and learning. Students are expected to have background in data structures.

Grade Mode: Letter Grading

CS 833 - Mobile Robotics

Credits: 4

An introduction to the foundational theory and practices in mobile robotics. Topics include Kinematics of wheeled mobile robots Seniors for mobile robots, robot navigation and perception, robot vision, localization and mapping of mobile robots. Hands-on experience directed towards implementation with a real robot. Students are expected to have background in programming.

Grade Mode: Letter Grading

CS 835 - Introduction to Parallel and Distributed Programming

Credits: 4

Programming with multiple processes and threads on distributed and parallel computer systems. Introduces programming tools and techniques for building applications on such platforms. Course requirements consist primarily of programming assignments Students are expected to have background in operating systems fundamentals and computer organization.

Grade Mode: Letter Grading

CS 845 - Formal Specification and Verification of Software Systems

Credits: 4

Course focuses on the formal specification and verification of reactive systems, most notably concurrent and distributed systems. Topics relevant to these systems, such as non-determinism, safety and liveness properties, asynchronous communication or compositional reasoning, are discussed. We rely on a notation (T LA+, the Temporal Logic of Actions) and a support tool (TLC, the TLA+ Model Checker). Students are expected to be knowledgeable in logic and to be able to write symbolic proofs in predicate calculus. A basic understanding of the notions of assertion, precondition, and post-condition is also assumed.

Grade Mode: Letter Grading

CS 850 - Machine Learning

Credits: 4

An introduction to fundamental concepts and common methods in machine learning. In addition to theoretical topics, the course involves hands-on experience in making predictions using synthetic and real-world datasets. Students are expected to have background in statistics and programming.

Grade Mode: Letter Grading

CS 851A - Reinforcement Learning

Credits: 4

Reinforcement learning studies how agents can learn to act to achieve goals in complex, stochastic environments. This course introduces students to fundamental theoretical concepts of reinforcement learning, standard algorithms, and practical techniques. In addition to theoretical topics, the course involves implementing basic algorithms in a high-level programming

language. Programming and statistics required prior to taking this course.

Grade Mode: Letter Grading

CS 852 - Foundations of Neural Networks

Credits: 4

Neural networks are a class of machine learning models which have recently revolutionized many applied machine learning domains such as natural language understanding, image/video processing, bioinformatics, time series analysis. This course teaches students to develop new neural network architectures from scratch and customize them. The course covers all necessary foundations of neural networks including gradient descent optimization and vector calculus. Students will learn how to design models using idioms such as observed variables, latent variables, gate variables and different functions as well as a wide range of state-of-the-art architectures as design examples. Students are expected to have background in data structures.

Grade Mode: Letter Grading

CS 853 - Information Retrieval and Generation Systems

Credits: 4

Fundamental algorithms and techniques for text processing and text-based information retrieval, synthesis, and generation systems. Topics include how to build an end-to-end information access system, such as a Web search engine or a chat agent.

Grade Mode: Letter Grading

CS 855 - Computer Vision

Credits: 4

Studying techniques that make a machine 'see' and 'understand' the world in a human-like fashion. The course discusses the theory behind common computer vision techniques and trains students on designing their own algorithms for understanding image or video. Students are expected to have background in statistics and programming.

Grade Mode: Letter Grading

CS 857 - Mathematical Optimization for Applications

Credits: 4

This course introduces the foundations of mathematical optimization and reinforces them via applications. The content includes convex optimization, first and second-order methods, constrained problems, duality, linear and quadratic programming, as well as discrete and non-convex optimization. Applications will focus on machine learning methods but also include problems from engineering and operations research. Students are required to have a mastery of Calculus II and programming proficiency in MATLAB, R, Java, C, Python, or equivalent.

Equivalent(s): MATH 857

Grade Mode: Letter Grading

CS 858 - Algorithms

Credits: 4

An introduction to important concepts in the design and analysis of algorithms and data structures, including implementation, complexity, analysis, and proofs of correctness. Understanding of basic data structures, familiarity with proof methods and basic concepts from discrete mathematics and the ability to program with recursion.

Grade Mode: Letter Grading

CS 859A - Natural Language Processing

Credits: 4

This class covers natural language processing, including both methods and well-known applications. Methods discussed will range from classical probabilistic methods such as Naive Bayes and Hidden Markov Models, to contemporary neural network methods, including word vector models, recurrent neural networks, and Transformer-based models. Applications discussed will include text classification, machine translation, and conversation systems. Data structures and statistics required prior to taking this course.

Grade Mode: Letter Grading

CS 861 - Programming Language Concepts and Features

Credits: 4

Explores the main features of modern, high-level, general-purpose programming languages from the user (programmer) standpoint. Students learn how specific features of programming languages can be used effectively in solving programming problems. The course is also an opportunity to use paradigms that expand on simple imperative programming, such as object-oriented, functional and concurrent programming. Students are expected to have background in operating systems fundamentals and Computer organization, and some knowledge of Java.

Grade Mode: Letter Grading

CS 870 - Computer Graphics

Credits: 4

Input-output and representation of pictures from hardware and software points of view; interactive techniques and their applications; three-dimensional image synthesis techniques. Students are expected to have background in Data Structures and Computer Organization.

Grade Mode: Letter Grading

CS 875 - Database Systems

Credits: 4

Database analysis, design, and implementation. Focus on the relational model. Data description and manipulation languages, schema design and normalization, file and index organizations, data integrity and reliability. Usage of selected DBMS. Students are expected to have background in data structures.

Grade Mode: Letter Grading

CS 880 - Topics

Credits: 4

Material not normally covered in regular course offerings. May be repeated.

Grade Mode: Letter Grading

CS 881 - Data Science for Knowledge Graphs and Text

Credits: 4

This course covers advanced text processing and machine learning algorithms and techniques for data science with knowledge graph and text data. This includes a wide range of algorithms for neural networks, machine learning, graph processing, text processing, and information retrieval with a focus of gaining insights into the knowledge stored in data. This is an implementation-intensive research-oriented seminar, where a particular data science application will be developed by reading research publications and implementing a software prototype.

Prerequisite(s): [CS 852](#) with a minimum grade of B- or [CS 853](#) with a minimum grade of B- or [CS 859A](#) with a minimum grade of E
Grade Mode: Letter Grading

CS 898 - Master's Project

Credits: 3

Master's Project.

Grade Mode: Letter Grading

CS 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

CS 900 - Graduate Seminar

Credits: 1

Regularly scheduled seminars presented by outside speakers, UNH faculty, and graduate students. Topics include reports of research ideas, progress, and results.

Grade Mode: Graduate Credit/Fail grading

CS 920 - Distributed Systems and Algorithms**Credits:** 3

Covers fundamental topics in distributed systems: time, global state, synchronization, election, consensus, distributed file systems, security. Also includes a study of several distributed applications. Students are expected to have background in operating system fundamentals.

Grade Mode: Letter Grading**CS 925 - Advanced Computer Networks****Credits:** 3

Design and analysis of computer networks. Modeling and performance evaluation, queuing theory applied to computer network traffic flow management and error control. Routing algorithms and protocols. Switch and router architectures. Selected issues in high-speed network design. Optical networks.

Prerequisite(s): [CS 825](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**CS 927 - Software Security Analysis****Credits:** 3

This course covers advanced research topics in software security. The main focus is automatic software analysis techniques, such as symbolic execution, taint analysis, and fuzz testing.

Grade Mode: Letter Grading**CS 931 - Planning for Robots****Credits:** 3

How do drones, self-driving cars, and underwater robots decide what to do? This graduate seminar is focused on research in the area of planning, which is the part of AI concerned with deciding what to do. The idea is to learn what research in the area is like and actually doing some of it. The exact topic will be determined by the interests of the participants. Students from prior years are welcome to take the class again and either extend their previous work or choose a new topic.

Prerequisite(s): [CS 830](#) with a minimum grade of B- or [CS 833](#) with a minimum grade of B-.**Repeat Rule:** May be repeated for a maximum of 6 credits. May be repeated up to 2 times.**Grade Mode:** Letter Grading**CS 933 - Human Robot Interaction****Credits:** 3

Human robot interaction (HRI) is a multidisciplinary research domain that investigates the issues involved with smooth integration of robots in the human society. This course will discuss the evolution of HRI research over the past two decades with an emphasis on HRI algorithms that promote safe, meaningful, and goal-oriented human-robot interactions. Topics also include experimental design methodologies commonly used in HRI studies.

Prerequisite(s): [CS 830](#) with a minimum grade of B- or [CS 833](#) with a minimum grade of B- or [CS 850](#) with a minimum grade of B-**Repeat Rule:** May be repeated for a maximum of 6 credits.**Grade Mode:** Letter Grading**CS 950 - Advanced Machine Learning****Credits:** 3

Course covers advanced machine learning techniques for making good decisions driven by data. The main focus areas are reinforcement learning, exploration-exploitation trade-off, mathematical optimization methods, and practical applications. Group-based Project on a selected topic.

Repeat Rule: May be repeated for a maximum of 9 credits.**Grade Mode:** Letter Grading**CS 980 - Advanced Topics****Credits:** 3

Advanced Topics.

Grade Mode: Letter Grading

CS 998 - Independent Study**Credits:** 1-6

Independent Study.

Grade Mode: Letter Grading**CS 999 - Doctoral Research****Credits:** 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading**Special Fee:** Yes

Computer/Information Tech (CMPL)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CMPL 801 - Principles of Information Technology for IT Managers

Credits: 3

This course introduces foundational concepts in technology management, with a focus on the strategic and operational aspects overseeing technology resources within organizations. Topics include IT staff formation, project governance, data compliance and security, IT asset management, financial management, contracts and service-level agreements, AI trends, and disaster recovery.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CMPL 802 - Managing Virtualization and Cloud Systems

Credits: 3

Through theoretical and practical exercises, students design and configure cloud and virtual environments essential to managing cloud technologies. Students engage directly with foundational cloud concepts, virtual hardware, migration strategies, and networking to develop cloud security, identity management, storage, and performance management implementations. Emphasis is on employing automated processes in maintaining and optimizing cloud resources, and using platforms like AWS, Microsoft Azure, and Google Cloud Platform.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

CMPL 810 - Current and Emerging Technologies

Credits: 3

This course introduces foundational concepts in technology management, with a focus on the strategic and operational aspects overseeing technology resources within organizations. Topics include IT staff formation, project governance, data compliance and security, IT asset management, financial management, contracts and service-level agreements, AI trends, and disaster recovery.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CMPL 815 - Managing Artificial Intelligence

Credits: 3

This course explores the transformative potential of artificial intelligence in the business context. Participants will learn how to effectively manage AI technologies to enhance business operations, foster innovation, and drive competitive advantage. Through a mix of theoretical content, case studies, interactive discussions, and practical exercises, learners will gain a deep understanding of how to blend AI with human capabilities to optimize performance and strategy.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CMPL 820 - Information Privacy, Security, and Continuity

Credits: 3

This course focuses on critical aspects of IT security and risk management, emphasizing how an IT Manager will handle these responsibilities. It comprises threat assessment, risk mitigation, security policies, incident response, and compliance with legal and regulatory requirements. Students will learn not only the vulnerabilities of an organization but also security controls and risk management plans to mitigate risks to data security and the organization's continuity. In this regard, the course uses case studies, practical exercises, and discussions to equip IT managers with adequate tools to manage IT security and risk management issues.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CMPL 825 - Designing and Analyzing Information Systems

Credits: 3

This course explores the integration of Business Intelligence (BI) strategies and Big Data technologies to enhance organizational decision-making and performance. Students will develop a comprehensive BI strategy that aligns with an organization's goals and objectives, leveraging the Hadoop Ecosystem to manage and process large datasets. Emphasis is placed on understanding the Software Development Lifecycle (SDLC) and its impact on long-term systems planning within IT departments. Through case studies and practical applications, students will learn to design data-driven systems that support key performance indicators (KPIs) and executive decision-making, while transforming Information Systems (IS) and Decision Support Systems (DSS) to meet organizational needs.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

CMPL 850 - Managing Information Technology Capstone

Credits: 3

Information Technology Management Capstone is the culminating, research-based course for the Master of Science in Informatic Technology Management program. This graduate-level course integrates and applies the knowledge and skills acquired throughout the program. The capstone course requires students to engage in comprehensive research and demonstrate their ability to manage IT strategy, operations, and projects in a real-world or simulated environment. Students will explore advanced concepts of IT management, including IT strategy, operations management, project management, agile methodologies, IT portfolio management, project governance, and IT security. The course emphasizes the practical application of these principles through research, preparing students to effectively lead and manage IT departments.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Computing Technology (COMP)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

COMP 801 - Integrated Computing Practice

Credits: 3

Student learning in this course focuses on the development and application of professional computing competencies. To achieve this goal, students will engage in project management activities, collaborate with peers and participate in teamwork, give presentations and receive feedback, make effective use of appropriate tools and platforms, and gain practice with test-driven iterative development and version control.

Grade Mode: Letter Grading

COMP 805 - Full Stack Development

Credits: 3

Students work in teams and implement, test, document, demonstrate, and deploy web systems that solve organizational needs expressed by real clients. Emphasis is on advanced server-side and client-side programming and integration of web applications with database and web server applications. Free and open source development and communication tools are used to carry out course project.

Grade Mode: Letter Grading

COMP 815 - Information Security

Credits: 3

Topics include general security principles and practices, network and system security, access control methodology, and cryptography. Students develop a basic cryptographic system based on sound mathematical principles, elaborate on its features and refine it, and experiment with various ways to attack it. Some programming required.

Grade Mode: Letter Grading

COMP 820 - Database Systems and Technologies

Credits: 3

This is a project course that provides practical experience with database systems and technologies. Topics include data modeling, database design, system development and integration, database administration, and configuration and project management. The course emphasizes communication and collaboration with online tools. Project artifacts and activities are supported by current version control and database development and administration tools.

Grade Mode: Letter Grading

COMP 821 - Big Data for Data Engineers

Credits: 3

In this course students gain practical experience developing data-oriented applications in modern infrastructure frameworks, also known as cloud data solutions. Guided by what a data scientist profile is, students become familiar with the use cases of data oriented applications. They will apply key data modeling and data design concepts to meet business requirements. Students will also apply modern software development to iteratively construct solutions using established reference architectures. Project work will be based in Google Cloud Platform and Amazon Web Services.

Grade Mode: Letter Grading

Special Fee: Yes

COMP 825 - Programming Languages

Credits: 3

Explores the main features of modern, high-level, general purpose programming languages from the user point of view. Provides students with an opportunity to use non-imperative programming paradigms, such as object-oriented, functional, and visual, an

to learn how specific features of such languages can be used efficiently in solving problems. The purpose is to gain knowledge regarding the languages studied as well as providing the basis to conduct analysis related to comparisons and divergence in capabilities.

Grade Mode: Letter Grading

COMP 830 - Software Development

Credits: 3

Presents an iterative methodology for developing software systems. Development activities include requirements elicitation and analysis, system and object design, implementation and testing, project and configuration management, infrastructure maintenance, and system deployment to end user. Students work in teams, assume developer roles, build models of a real-world system, and deliver a proof-of-concept or prototype.

Grade Mode: Letter Grading

COMP 835 - Secure Networking Technologies

Credits: 3

In this course students study modern computer networking and focus on principles, architectures, protocols, security, and cloud. Modern IT and cloud computing call for expertise in security, which is a theme across all computing subjects, as well as a core area of study. Course requirements include both programming and administrative exercises to explore and gain practice with networking topics.

Grade Mode: Letter Grading

COMP 840 - Machine Learning Applications and Tools

Credits: 3

Introduces students to practical approaches of machine learning. The course is an exploration of creative applications of artificial intelligence using modern machine learning components and tools, including deep learning techniques. Different application domains are considered, such as computer vision, natural language processing, and cyber security. Students learn to evaluate the effectiveness of machine learning systems as well as their potential prediction problems.

Grade Mode: Letter Grading

COMP 841 - Practical Artificial Intelligence

Credits: 3

Balancing the science of AI with its engineering applications, the course focuses on AI foundations and principles for building intelligent computational systems. Reasoning, planning, learning, explaining, and acting with certainty and uncertainty are AI areas in which students will practice how to build AI systems that solve real-world problems. Particular attention is given to the impact of AI applications on our society and related ethical, privacy, security, and safety implications.

Grade Mode: Letter Grading

COMP 842 - Fundamentals of Computer Vision

Credits: 3

This course provides a comprehensive introduction to computer vision, covering both the theoretical and practical skills needed to pursue a career in computer vision, pattern recognition, image processing, and signal processing. Students will learn basic concepts as well as hands-on experience to solve various real-life problems in image processing, feature extraction, object recognition, and image understanding. Not offered for credit if credit is received for [COMP 880 Topics Computer Vision](#).

Grade Mode: Letter Grading

COMP 851 - System Integration and Architecture

Credits: 3

Students work in teams to explore and practice various system integration techniques to address requirements, software and hardware acquisitions, integration issues, and acceptance testing. Specific focus is given to diagnosing and troubleshooting systems interoperability and interface integration issues. Students develop project plans and study the influence of business processes and culture on system architecture decisions. Studied techniques are compared and contrasted to derive lessons learned, best practices, and critical success factors.

Grade Mode: Letter Grading

COMP 855 - Digital Forensics

Credits: 3

This course studies cyber-attack prevention, planning, detection, response, and investigation with the goals of counteracting cybercrimes. The topics covered in this course include fundamentals of digital forensics, forensic duplication and analysis, network surveillance, intrusion detection and response, incident response, anti-forensics techniques, anonymity and pseudonymity, computer security policies and guidelines, and methods and standards for extraction and preservation of digital evidence.

Grade Mode: Letter Grading

COMP 860 - Data Visualization & Communication

Credits: 3

Through hand-on experience with a leading data-visualization tool, the course introduces the concepts of data visualization to allow students to communicate and analyze data effectively using visual techniques.

Grade Mode: Letter Grading

COMP 865 - Secure Software Principles

Credits: 3

This course will explore the fundamentals of software security, covering important software vulnerabilities and attacks that exploit them. This includes, but not limited to, such topics as buffer overflows, SQL injection, session hijacking and considers defenses that prevent or mitigate these attacks, including advanced testing and program analysis techniques. Will look at techniques at each phase of the development cycle that can be used to strengthen the security of software systems.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

COMP 880 - Topics

Credits: 1-3

This course includes topics and emerging areas in computing. Barring duplication of subject the course may be repeated for credit. **Repeat Rule:** May be repeated up to unlimited times.

Grade Mode: Letter Grading

COMP 885 - Applied Cryptography

Credits: 3

This course aims to give students an overview of cryptographic concepts and methods, a good knowledge of some commonly used cryptographic primitives and protocols, a sound understanding of theory and implementation, as well as limitations and vulnerabilities, and an appreciation of the engineering difficulties involved in employing cryptographic tools to build secure systems. Some programming required.

Grade Mode: Letter Grading

COMP 890 - Internship and Career Planning

Credits: 1

This course is recommended for any student seeking internship and/or employment opportunities. Participants research and evaluate computing-related career opportunities related to their interests. create application portfolio, conduct informational interviews, use networking and job search resources, and participate in employer-based resume reviews and mock interviews. This course cannot be repeated for credit.

Grade Mode: Letter Grading

COMP 891 - Internship Practice

Credits: 1-3

The Internship Practice provides field-based learning experience through placement in a computing field. Students gain practical computing experience in a business, non-profit, or government organization. Under the direction of a workplace supervisor and faculty advisor, the student is expected to contribute to the computing products, processes, or services of the organization.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

COMP 892 - Applied Research Internship**Credits:** 1-3

This Applied Research Internship enhances the student's academic achievements with real-world, professional computing applications research projects at a sponsoring organization. The student is expected to apply knowledge and skills acquired through other coursework in the major to address a research question in information technology related fields under the direction of a faculty advisor and a site supervisor at the organization.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Letter Grading**COMP 893 - Team Project Internship****Credits:** 1-3

The internship course provides experiential learning experience through placement in team projects. This hands-on experience allows students to gain practical skills and insights into the field of computing. By working on a collaborative project with external stakeholders, they will contribute to the development of real-world information technology products, processes, or services, and understand the challenges involved in implementing technology solutions in a professional setting.

Grade Mode: Letter Grading**COMP 895 - Independent Study****Credits:** 1-3

Advanced individual study under the direction of a faculty mentor. Content area to be determined in consultation with faculty mentor. May be repeated.

Grade Mode: Letter Grading**COMP 898 - Master's Project****Credits:** 3

Guided project on a topic which has been approved as a suitable subject for a master's project. Supervision and advising by faculty in the Computing Technology program. Completion of 24 credits in the major.

Grade Mode: Letter Grading**COMP 899 - Master's Thesis****Credits:** 1-6

Guided research on a topic which has been approved as a suitable subject for a master's thesis. Supervision and advising by faculty of the Computing Technology program.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Graduate Credit/Fail grading

Cybersecurity Policy & Risk Management (CPRM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CPRM 810 - Foundations of Cybersecurity Policy

Credits: 3

Examine the societal and organizational impacts of cybersecurity policy in our interconnected world that is increasingly dependent on advanced technologies and systems for communications and control. Explore the components of information systems and control systems and review the history and development of cybersecurity. Gain an appreciation of policy as one tool for managing risk, and start to consider the challenges of cybersecurity policy-making.

Grade Mode: Letter Grading

CPRM 820 - Policy Development and Communication

Credits: 3

Discover the fundamental concepts and practices for developing and drafting organizational policy, including related documents to support implementation. Explore how to communicate policies to internal and external audiences (in both written and oral communications). Learn how to incorporate organizational priorities and mandates into managerial policies. Case studies are primarily based in security studies, but other professional fields are welcomed.

Grade Mode: Letter Grading

CPRM 830 - Security Measures I

Credits: 3

This course introduces common technological and organizational measures for cybersecurity, with a focus on protection concepts. Students assess the organizational impacts of security measures, and explore how best practices, standards, and organizational policy can help manage such measures. Topics include identity management, authentication, access control, data and system security and availability, encryption, integrity mechanisms, system maintenance, and continuity of operations. Note that we do not focus on how to technically implement these security systems.

Prerequisite(s): [CPRM 810](#) with a minimum grade of B-.

Grade Mode: Letter Grading

CPRM 840 - Cybersecurity Standards, Regulations, and Laws

Credits: 3

We survey laws, regulations, and standards for cybersecurity in the United States, including "soft law" and self-regulation. Topics include the pros and cons of regulatory solutions and market solutions; the different approach to data protection regulation in the European Union; and cybersecurity concerns and regulatory authorities in various U.S. industries and sectors. Students become familiar with key standards bodies involved in cybersecurity, and explore organizational processes for remaining current with industry best practices.

Grade Mode: Letter Grading

CPRM 850 - Security Measures II

Credits: 3

This course continues surveying common technological and organizational measures for cybersecurity, with a focus on detection and organizational relationships. Topics include auditing and log records; monitoring and testing for threat detection; vulnerability scans; and the security of external services (e.g., cloud providers) and supply chains. We do not focus on how to technically implement these measures. Students assess organizational impacts and explore how best practices and standards can help manage such measures.

Prerequisite(s): [CPRM 830](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

CPRM 860 - Incident Response and Investigation

Credits: 3

This course fosters cybersecurity incident response and investigative knowledge, from both the organizational and system perspective. Material includes laws, standards, codes of behavior and best practices for incident response, including the management of relationships (e.g., regulators, clients, vendors). Case studies are presented and discussed in light of organizational resource limitations, legal mandates, and jurisdictional boundaries.

Prerequisite(s): [CPRM 830](#) with a minimum grade of B- and [CPRM 850](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

CPRM 870 - Cybersecurity Risk Management

Credits: 3

This course establishes foundations for addressing cybersecurity as a risk management concept and process, and as a component of overall risk management within an organization. Students will become familiar with theories of risk and methods of risk management, as well as frameworks/models for applying these theories and methods to cybersecurity.

Prerequisite(s): [CPRM 840](#) with a minimum grade of B- and [CPRM 860](#) with a minimum grade of B-.

Grade Mode: Letter Grading

CPRM 880 - Cybersecurity Metrics and Evaluation

Credits: 3

This course provides an overview of analytical techniques for the documentation and evaluation of cybersecurity metrics, and the incorporation of such assessments in organizational risk management. Students will become familiar with methods for cybersecurity evaluation and the translational impacts to function and mission success of an organization (business, public administration, homeland security, etc.); as well as processes for security measurements, comparisons, and reassessments for purposes of risk management.

Prerequisite(s): [CPRM 870](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

CPRM 890 - Organizations, Change Management, and Leadership

Credits: 3

This course examines both private and public institutions as systems whose effectiveness depends on how an organization adapts to opportunities, threats, and demands (external and internal). Students explore the design and leadership of ethical and socially responsible organizations. In course examples and exercises, students will apply this knowledge to their respective research interests (e.g., cybersecurity, analytics, criminal justice, public health, etc.).

Grade Mode: Letter Grading

CPRM 895 - Independent Study

Credits: 3

This course allows students to complete a graduate-level course in Cybersecurity Policy and Risk Management program via independent study if they were unable to take the course when it was offered. This course can substitute for a required course.

Repeat Rule: May be repeated for a maximum of 6 credits. May be repeated up to 1 time.

Grade Mode: Letter Grading

CPRM 898 - Capstone Project

Credits: 3

This capstone integrates all disciplines and competencies that have been learned in this degree program, plus the student's past experiences, areas of specialization, and professional goals, into a single work-based project, internship experience, or other appropriate activity. In consultation with an advisor, each student develops a project plan, establishes goals and objectives; collects and analyzes information; and prepares and delivers a final project agreed upon by the student and advisor.

Prerequisite(s): (CPRM 720 with a minimum grade of B- or [CPRM 820](#) with a minimum grade of B-) and [CPRM 880](#) with a minimum grade of B- and (CPRM 790 (may be taken concurrently) with a minimum grade of B- or [CPRM 890](#) (may be taken concurrently) with a minimum grade of B-).

Grade Mode: Letter Grading

CPRM 899 - Capstone: Thesis Option**Credits:** 3

Students synthesize, evaluate, and integrate past experiences, new research, and the cross-disciplinary knowledge constructed during this degree program to create a publishable quality, graduate-level thesis. In continuation with an advisor, each student develops a project plan; establishes goals and objectives; collects and analyzes information; and prepares and delivers a final product agreed upon by the student and advisor.

Prerequisite(s): (CPRM 720 with a minimum grade of B- or [CPRM 820](#) with a minimum grade of B-) and [CPRM 870](#) with a minimum grade of B- and (CPRM 879 with a minimum grade of B- or [EDUC 882](#) with a minimum grade of B-) and (CPRM 790 (may be taken concurrently) with a minimum grade of B- or [CPRM 890](#) (may be taken concurrently) with a minimum grade of B-).

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

Decision Sciences (DS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

DS 801 - Business Intelligence

Credits: 3

This course is designed to introduce students to the skills needed to succeed in today's big data environment through the application of data management techniques, business-oriented hands-on cases and exercises. Students will acquire concepts and techniques in the theory, design, and implementation of relational databases and Data Warehousing (DW) systems, queries in Structured Query Language (SQL), next generation query language (NoSQL).

Grade Mode: Letter Grading

DS 802 - Probability and Simulation

Credits: 3

The course is designed to provide an introductory understanding of the fundamentals of uncertainty quantification in business decision making. The course will serve as a building block for subsequent course work in inferential statistics, predictive analytic and time series analysis. The topics include the axioms of probability theory, random variables, probability distributions, random variable generation using simulation methods, and system simulation for relevant business applications (e.g. inventory management, supply chain management, and staffing in call centers). An introduction to the programming language R will be part of the learning experience.

Grade Mode: Letter Grading

DS 803 - Fundamentals of Statistical Analysis

Credits: 3

The course is designed to introduce the fundamentals of statistics needed for solving business analytics problems. The course will mainly cover the broadly defined subjects of random sampling, likelihoods, estimation using maximum likelihood, Bayesian inference using priors, computational statistics methods, interval estimation, hypothesis testing for continuous data, Gaussian linear models, and model diagnostics. The course will conclude with a brief introduction to nonparametric analysis.

Prerequisite(s): DS 802 with a minimum grade of B-.

Grade Mode: Letter Grading

DS 804 - Exploration and Communication of Data

Credits: 3

The goal of this course is to expose students to techniques and technologies that will enable them to collect, harvest and transform unstructured and structured data into useful business insights. The first half of the course deals with data management and provides an introduction to data types and sources, data acquisition and harvesting tools and techniques and effective strategies and methods for data aggregation and analysis. In the second half of the course, students learn about the theoretical underpinnings of data visualization and use a variety of software tools to visualize business data in order to generate insightful information that facilitates effective business decision making.

Grade Mode: Letter Grading

DS 805 - Statistical Learning

Credits: 3

This course introduces students to statistical tools for modeling and identifying patterns in complex data sets. The goal of statistical learning is to develop predictions informed by data. Topics to be covered include Gaussian linear models, cross-validation techniques, penalized regression methods such as ridge and LASSO, nonlinear models, logistic regression, tree-based models including random forests, bagging, and boosting, and support vector machines. Application areas include Marketing (e.g. effectiveness of advertising and customer satisfaction), Financial Economics (valuation), and Operations Management (resource

allocation). The course delivery will be a mix of lectures, readings/podcasts with discussion, and hands-on data analyses.

Prerequisite(s): [DS 803](#) with a minimum grade of B-.

Grade Mode: Letter Grading

DS 806 - Optimization Methods I

Credits: 3

This course introduces students to fundamental quantitative methods for modeling, analyzing, and determining the best course action in complex decision-making situations. Topics to be covered include decision trees and tables, price of uncertainty, utility theory, linear programming, LP sensitivity analysis, and network flow optimization. Application areas include Marketing and Operations management (e.g., advertising, production and inventory planning, project or personnel scheduling, shipping and distribution, routing, ride matching, etc.)

Grade Mode: Letter Grading

DS 807 - Modeling Unstructured Data

Credits: 3

This course introduces students to statistical and machine learning tools for modeling unstructured data; including emails, documents, text messages, and social media data. Topics to be covered include text mining, clustering, mixture models, deep learning, and topic models. The course integrates numerous applications to demonstrate practical approaches to analyzing large unstructured collections of data. Application areas include Marketing (Yelp and Trip Advisor reviews), Human Resources (health care plan analysis), Social Media (Twitter, YouTube, and Instagram). The course delivery will be a mix of lectures, readings/podcasts with discussion, and hands-on data analysis.

Prerequisite(s): [DS 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

DS 808 - Optimization Methods II

Credits: 3

This course introduces students to more advanced concepts and modeling techniques in mathematical programming. Topics to be covered include integer programming, nonlinear programming, multi-objective optimization, goal programming, and Monte Carlo simulation. Application areas include Marketing (e.g., pricing and revenue optimization), Finance (capital budgeting and portfolio optimization), and Operations management (e.g., production and inventory planning, shipping and distribution, routing, location selection, etc.). The course delivery will be a mix of lectures, hands-on problem solving, and case discussions.

Prerequisite(s): [DS 806](#) with a minimum grade of B-.

Grade Mode: Letter Grading

DS 809 - Time Series Analysis

Credits: 3

The course is designed to introduce analytical techniques needed in the estimation and analysis of temporal (time series) data in various business disciplines. The course focuses on theoretical and application aspects of stationary/non-stationary univariate as well as multivariate time series models. Emphasis will be given to topics such as time series regression, random walks, ARIMA/SARIMA processes, ARCH/GARCH for modeling conditional volatility, Vector ARMA models, and transfer functions. Modern software implementation is fully integrated into the course. Some examples of the business application areas include demand forecasting, financial asset return modeling, stochastic volatility modeling of financial indexes and securities, mortgage default risk assessment, online webpage click-rate modeling, market share modeling.

Prerequisite(s): [DS 803](#) with a minimum grade of B-.

Grade Mode: Letter Grading

DS 810 - Big Data and AI: Strategy and Analytics

Credits: 3

This course is designed to be a capstone experience with emphasis on the integration of materials covered in prior courses. In addition, the course provides students with the knowledge and skills to manage and model vast quantities of data for business analytics. The course covers deep neural networks and large-scale data processing using ecosystems of computing tools such as TensorFlow and Apache Spark. Students learn how to store, analyze, and derive insights from large-scale datasets and develop a understanding of the implications of deep learning for business. As a part of the capstone experience, students complete a team project that focuses on using big data and artificial intelligence for business insights, and present and discuss their work.

Prerequisite(s): [DS 801](#) with a minimum grade of B- and [DS 804](#) with a minimum grade of B- and [DS 805](#) with a minimum grade of C-.

Grade Mode: Letter Grading

DS 815 - Programming for Business Analytics

Credits: 3

This course introduces students to business programming. The course covers the Python programming language and students learn to collect, wrangle and manipulate data. Students also gain hands-on experience generating and presenting meaningful visualizations of quantitative and qualitative data to aid peer/managerial decision-making.

Grade Mode: Letter Grading

DS 816 - Tools for Business Analytics

Credits: 3

The goal of this course is to expose students to popular software tools used in all stages of data analytics in business, to create actionable insights. The course will cover and introduce tools for the three key areas of data analytics: a) Data Preparation & Blending b) Data Analysis & Visualization c) Model Building for Predictive Analytics .Students learn about the overall capabilities of these tools and will practice applying them to diverse types of sample data.

Grade Mode: Letter Grading

DS 872 - Predictive Analytics and Modeling

Credits: 3

The course introduces students to commonly used predictive analytics methods and necessary programming with a focus on regression analysis, classification, and model building. The course coverage is supported using real data applications and illustrations. The topics include linear and non-linear regression model building/selection, residual analysis, search algorithms, generalized linear models/classification, and applied machine learning methods for business use.

Prerequisite(s): [ADMN 510](#) with a minimum grade of C-.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

DS 874 - E-Business

Credits: 3

This course immerses students in the intersecting realms of technology and business. Students will explore key domains such as Artificial Intelligence, Cybersecurity, Global e-Business, Application Design, and Enterprise Systems, engaging in a hands-on, collaborative curriculum. Students will develop a strategic perspective on using IT innovations to drive business value, tackle real world challenges, and build in-demand skills for dynamic technology careers.

Prerequisite(s): [ADMN 410](#) with a minimum grade of C-.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

DS 898 - Topics in Business Analytics

Credits: 3

Special Topics; may be repeated. Pre- and co-requisite courses vary. Please consult time and room schedule for the specific 898 topics section you are interested in for details.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

Development Policy & Practice (DPP)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

DPP 801 - Integrative Approaches to Development Policy and Practice

Credits: 3

This course aims to provide students with a general introduction to the basic core competencies and practical skills required of a "generalist" development practitioner and serves as the foundation course for the curriculum. Case studies will be used to demonstrate the interconnectedness of natural sciences and engineering, social science, health sciences, and management, especially as they relate to communities.

Equivalent(s): DPP 901

Grade Mode: Letter Grading

DPP 802 - Economic Analysis for Development

Credits: 3

This course provides the practitioner with tools of economic analysis that are necessary for effective community development practice. Drawing upon principles of macroeconomics, the course explores how markets, property rights, political institutions, government policies, environmental conditions and cultural values interact to produce development outcomes.

Equivalent(s): DPP 902

Grade Mode: Letter Grading

DPP 805 - Fiscal Management for Development Organizations

Credits: 3

Budgeting, goal setting, financial planning and financial analysis for development organizations. As part of the requirements, students will identify an organization (can be nonprofit or for profit as long as they are committed to development) that allows them to have access to the person who is responsible for the financial management of the organization.

Equivalent(s): DPP 905

Grade Mode: Letter Grading

DPP 806 - Organizational Management and Leadership

Credits: 3

Combines theory and practical information for students to learn traditional and contemporary organizational and leadership theories and apply them to their experience in organizations particularly non-profit institutions, non-governmental organization. The course will focus on personal and inter-personal development such as self-awareness, stress and problem solving, interpersonal skills such as supportive communication, power and influence, motivation and conflict management: group skills such as delegation and team building; and leadership. Students should have an interest and ideally some experience working with nonprofits as a volunteer or staff member. Possessing a basic understanding of the various roles nonprofits play in low to moderate-income communities would be helpful but is not required. As part of the course requirements, students will design, conduct and then report back on a leadership interview.

Equivalent(s): DPP 906

Grade Mode: Letter Grading

DPP 808 - Policy Seminar

Credits: 3

This seminar will reinforce the multidisciplinary breadth and trans-disciplinary perspective of the master's program, providing students with the opportunity to sharpen critical policy analysis skills. The goal of the course is to help students understand the sources of public policy, that is, why we have various public policies and how to produce professional policy analysis.

Equivalent(s): DPP 908

Grade Mode: Letter Grading

DPP 861 - Community Development Finance

Credits: 3

This course examines the historic, theoretical, and applied foundations of community development lending and investment. The course critically examines what works, what doesn't work, and how community development financial institutions, investors, government agencies, private donors, and the capital markets have all contributed to the field of community development finance. The course also covers which methodologies, strategies, products, services, organizational models, and evaluation and reporting protocols have the greatest efficacy towards building and improving the industry.

Equivalent(s): DPP 961

Grade Mode: Graduate Credit/Fail grading

DPP 980 - Introduction to Community Development Projects

Credits: 3

During the first semester, students will identify a community problem or issue, research and analyze the issue in consultation with colleagues and community stakeholders, and design a project. A preliminary design will be submitted at the end of the first semester.

Grade Mode: Letter Grading

DPP 981 - Project Design and Planning

Credits: 3

Studies how project plan inputs are accurately gathered, integrated, documented and managed; the tools and techniques used in project management; and the outputs of a project plan to viable stakeholders. Considers the development of project scope, work breakdown structures, and the importance of quality, risk, and contingency management in planning development projects.

Grade Mode: Letter Grading

DPP 982 - Project Implementation and Monitoring

Credits: 3

Students will begin implementation activities in field placement communities. Regular progress reports and online postings will be required.

Grade Mode: Letter Grading

DPP 983 - Project Evaluation

Credits: 3

This semester students will conduct an evaluation of their project and manage closure processes. At the end students will submit final written report and present it to the faculty and peers. This final project and the final report detailing the project will serve as the capstone course of the program.

Grade Mode: Letter Grading

DPP 990 - Independent Study

Credits: 1-4

Under the guidance of an MCD Faculty member, the Independent Study Course ([DPP 990](#)) provides students with the opportunity to study a unique topic in-depth that is not offered as a traditional course. Often this topic is a relevant aspect of their capstone project which they wish to explore in more depth.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

Earth Sciences (ESCI)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ESCI 801 - Quantitative Methods in Earth Sciences

Credits: 4

Introduces quantitative tools necessary for upper level Earth Science courses. Includes basic statistical descriptions of spatially and temporally varying data, curve fitting, and time-series analysis with emphasis on atmospheric, oceanic and terrestrial data sets. Students learn to construct simple numerical models of Earth Systems. Instruction in data analysis and modeling in Python Calculus through integration and differentiation and at least one semester of intermediate Earth Science required.

Grade Mode: Letter Grading

ESCI 805 - Principles of Hydrology

Credits: 4

Basic physical principles important in the land phase of the hydrologic cycle, including precipitation, snow melt, infiltration and soil physics, evapotranspiration, and surface and subsurface flow to streams. Problems of measurement and aspects of statistical treatment of hydrologic data. Field trips. Transportation fee. One term of calculus including differentiation and integration and one term of physics required, and statistics recommended. Lab.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 810 - Groundwater Hydrology

Credits: 4

Principles for fluid flow in porous media with emphasis on occurrence, location, and development of groundwater, but with consideration of groundwater as a transporting medium. Major topics include well hydraulics, regional groundwater flow, exploration techniques, and groundwater modeling. Laboratory exercises involve use of fluid, electrical, and digital computer models to illustrate key concepts. One year each of calculus and physics required. Lab.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 820 - Ocean Measurements Lab

Credits: 4

Measurements of fundamental ocean processes and parameters. Emphasizes understanding typical coastal and estuarine measurements their applications, and the use of acquired data in terms of the effects on structures and processes in the ocean.

Equivalent(s): OE 810

Grade Mode: Letter Grading

ESCI 826 - Igneous and Metamorphic Petrology

Credits: 4

This course focuses on the origin and evolution of igneous and metamorphic rocks from field, petrographic mineral chemistry, experimental, and theoretical studies. Igneous systems include volcanic and plutonic suites, with emphasis on mineralogic record of magma chamber systematics. Metamorphic systems include pelitic, mafic, and calc silicate rocks, with special emphasis on closed- and open-system reactions, multi-systems, reaction space, and pressure-temperature-time paths. Intermediate courses in petrology, calculus, chemistry, and physics required. Field trips. Lab.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 834 - Global Geophysics

Credits: 4

This course focuses on the structure of the Earth and dynamic processes within it. Topics include: plate tectonics, earthquakes and seismic waves, mantle convection, rheology and ice age dynamics, Earth's gravity field and geodesy, and the geodynamo. One year of calculus, one year of college physics required. Lab.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 841 - Geochemistry

Credits: 4

Course focuses on the application of chemical principles to solve problems in the Earth sciences. Students learn the chemical tools of thermodynamics and kinetics, element partitioning, conservation of mass, and isotope geochemistry. Explore geochemical properties/processes in the deep Earth and the Earth surface, atmosphere and marine systems, and cosmo-chemistry and investigate the interactions between these components of the Earth system. Lab. Calculus including integration and at least one term of chemistry is required.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 845 - Isotope Geochemistry

Credits: 4

Course focuses on the application of radiogenic, radioactive and stable isotopes to improve students' knowledge about the processes and timescales relevant to the formation of the planet and solar system, the evolution of the Earth system and interactions in the hydrosphere and biosphere. Topics include geochronology, tracer applications, Earth surface applications, as well as applications in the hydrosphere and biosphere. Systems discussed include the classic radiogenic systems (K-Ar, Rb-Sr, Sr-Nd, Lu-Hf and U-Th-Pb), traditional (H, C, N, O) as well as nontraditional (e.g., Mg, Ca, Fe) stable isotope systems, and radioactive isotopes (e.g., radiocarbon). Course consists of lecture, where students are exposed to these applications, and a lab section to work through any questions on the homework assignments, discuss relevant papers from the literature, and carry out a project. Lab. Calculus including integration and at least one term of chemistry is required.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 847 - Aqueous Geochemistry

Credits: 4

The chemical processes that determine the composition of aquatic systems such as rivers, lakes, groundwater and the ocean. The goal is to quantitatively understand the behavior of inorganic species such as carbon dioxide, nutrients, trace metals and inorganic pollutants in natural waters. Topics include, acid-based equilibria, carbonate chemistry, reduction-oxidation reactions, organic complexation and mineral precipitation and dissolution. Lab. One term of calculus including differentiation and integration and one year of chemistry or geochemistry is required.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 849 - Ocean Biogeochemistry

Credits: 3

This course focuses on the elemental cycles of the major bioactive elements carbon, nitrogen, phosphorus, oxygen, and iron in the ocean. Topics include the biological and microbial carbon pumps, nitrogen fixation, iron fertilization, the carbon-climate system, ocean acidification, and deoxygenation. This course will provide insight and corresponding critical review of the current outstanding scientific questions being pursued by ocean biogeochemists. Students will become familiar with data analysis and visualization using open-source software.

Grade Mode: Letter Grading

ESCI 852 - Chemical Oceanography

Credits: 3

This course investigates the physical and biogeochemical processes that determine the composition of seawater. Topics include biological effects on chemistry, ocean nutrient cycles, air-sea gas exchange, radiogenic and stable isotopes as tracers of ocean processes, sediment and trace-metal chemistry. One term of calculus including differentiation and integration and one year of chemistry or geochemistry is required.

Grade Mode: Letter Grading

ESCI 854 - Sedimentology

Credits: 4

This course focuses on modern sedimentary processes and ancient sedimentary records through the examination, identification and interpretation of sediments and sedimentary rocks. Topics such as sediment transport mechanisms, depositional environments, and time in sedimentary records will provide a strong framework for any student studying Earth processes and sedimentary systems.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 856 - Geotectonics

Credits: 3

The geological record of plate tectonics past and present. The first part of the course focuses on modern tectonic settings with an emphasis on plate geometries, geodynamical processes, and sedimentary products. The second part of the course focuses on reconstructing ancient tectonic settings with an emphasis on methodology (paleomagnetism, basin analysis, provenance) and case studies (e.g. India-Asia collision). Field trip. Intermediate level courses in structural geology or petrology required.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 858 - Introduction to Physical Oceanography

Credits: 3

Descriptive treatment of atmosphere-ocean interaction; general wind-driven and thermo-haline ocean circulation; waves and tides; continental shelf and near-shore processes; instrumentation and methods used in ocean research. Simplified conceptual models demonstrate the important principles. Calculus-based physics and introductory oceanography required.

Grade Mode: Letter Grading

ESCI 859 - Geological Oceanography

Credits: 4

Major geological features and processes of the ocean floor; geological and geophysical methods; composition of the earth, sedimentary processes, plate tectonics and paleoceanography.

Grade Mode: Letter Grading

ESCI 860 - Paleoceanography

Credits: 3

This course introduces the basic principles of paleoceanography, such as the preservation of ocean history in sediment archives and the analysis/interpretation of paleoceanographic data. The course focuses on the capabilities and limitations of paleoceanographic techniques, and empowers students to critically assess the strengths and weaknesses of results presented in scientific journals. Topics include Milankovitch cycles, faunal assemblages, temperature and circulation proxies, linear and non-linear responses to climate forcings, abrupt climate events atmospheric teleconnections and monsoons. One year of chemistry and one course in introductory geology required.

Grade Mode: Letter Grading

ESCI 862 - Glacial Geology

Credits: 4

This course covers almost everything you always wanted to know about glaciers. More specifically, the course provides a survey of glacier dynamics and processes, with an emphasis on understanding the origin and significance of glacial deposits and landforms. The first half of the course examines the physics of glaciers, and the second half focuses on glacial geologic processes. Lectures discuss glaciers and ice sheets as key agents of geomorphic change and their central role in the Earth's climate system. Labs involve analysis of glaciological data, glacial-geomorphic map interpretation, and short field exercises. A required term project involves a written report and class presentation on a topic of active research in glacial geology.

Grade Mode: Letter Grading

Special Fee: Yes

ESCI 864 - Spectral Analysis of Geophysical Time Series Data**Credits:** 4

This course considers basic exploratory techniques and in-depth spectral analysis for estimation with geophysical time series data including calculations of confidence intervals and significance testing. This course prepares students for interpreting time series data with science and engineering applications. Topics include sampling theory, filtering, statistics, probability, spectral analysis and empirical orthogonal functions. Students gain experience in code-writing for the analysis of time series data. One year of calculus required.

Equivalent(s): OE 864**Grade Mode:** Letter Grading**ESCI 865 - Paleoclimatology****Credits:** 3

Course reviews the study of past changes in the Earth's climate system. Main discussion topics include astronomical theories of ages, Quaternary dating methods, Antarctic and Greenland ice core records, greenhouse gases, marine-based climate proxies, glacial mega-floods, and linkages between ocean circulation and abrupt climate change. Emphasis on climate variability during the Quaternary period (the last approximately 1.8 million years), a time interval dominated by cycles of global glaciation. Lecture include discussion of recent and emerging scientific papers in order to keep pace with the latest findings in paleoclimatic research.

Grade Mode: Letter Grading**ESCI 868 - Applied Physical Oceanography for Hydrographic Surveyors****Credits:** 2

This course provides a context-specific examination of physical oceanographic phenomena that impact the quality of hydrographic surveys. This includes a review of global scale ocean circulation followed by a particular focus on processes controlling the variability of coastal and continental shelf oceanography. The instruments used, and the available ocean climatological database are emphasized. The course is designed to meet the oceanography requirement for the Category A FIG/IHO/ICA Standards of Competence for Hydrographic Surveyors.

Grade Mode: Letter Grading**ESCI 869 - Marine Geology and Geophysics for Hydrographic Surveyors****Credits:** 2

This course provides an overview of the geology, physiography, and sediments of the ocean basins, continental margins, shelves and coastal zone, formation and distribution of sediments, major substrate types, and gravity and magnetic fields. It introduces the main marine geophysical techniques (seismics, gravity, magnetics) and describes their methodology and derived information content. The course is designed to meet the marine geology and geophysics requirement for the Category A FIG/IHO/ICA Standards of Competence for Hydrographic Surveyors.

Grade Mode: Letter Grading**ESCI 870 - Geodesy for Ocean Mapping****Credits:** 3

Ocean mapping requires precise positioning and navigation. For this we need to precisely know Earth's shape, gravity field, and orientation in space. Data used for this purpose include satellite-based positioning, gravity measurements, and ground surveys. Reference frames can then be created allowing the integration of geometric observations for the creation of mapping products. One year of calculus and one year of college physics prior to taking this course.

Grade Mode: Letter Grading**ESCI 871 - Positioning for Ocean Mapping****Credits:** 4

Ocean mapping requires precise positioning and navigation. For this we need to precisely know Earth's shape, gravity field, and orientation in space. Data used for this purpose include satellite-based positioning, gravity measurements, and ground surveys. Reference frames can then be created allowing the integration of geometric observations for the creation of mapping products. This course will focus on this integration of measurements and the uncertainty associated to them. One of OE 770, OE870, or ESCI 870, required.

Equivalent(s): OE 871**Grade Mode:** Letter Grading

ESCI 872 - Applied Tools for Ocean Mapping

Credits: 2

A review course on research tools commonly used in ocean mapping. The course focuses on teaching problem solving skills, not merely the application of tools. The course consists of modules addressing the use of: IVS Fledermaus; GeoMappApp, GIS, Google Earth, Matlab as well as the effective library research and use of Wikis. One year of calculus required.

Grade Mode: Graduate Credit/Fail grading

ESCI 874 - Integrated Seabed Mapping Systems

Credits: 4

Overview of typical applications that involve mapping the sediment-water interface in the ocean and adjacent waters. Emphasis on defining the task-specific resolution and accuracy requirements. Fundamentals of acoustics relevant to seabed mapping. Progressions through typical configurations involving single beam, sidescan, phase differing and multibeam systems. Integration of asynchronous 3D position, orientation and sound speed measurements with sonar-relative acoustic travel times and angles. Analysis of impact of offsets, mis-alignments and latency in all integrated sensors. Prereq: two terms each of college calculus and physics. One year each of calculus and physics required.

Prerequisite(s): [ESCI 870](#) (may be taken concurrently) with a minimum grade of B-.

Equivalent(s): [OE 874](#)

Grade Mode: Letter Grading

ESCI 875 - Advanced Topics in Ocean Mapping

Credits: 4

The second of two courses covering the principles and practices of hydrography and ocean mapping. In this course the following topics are covered: Verification and Field QA/QC, Water Levels (Tides); Mapping Standards; Survey Planning, Execution and Reporting; Terrain Analysis; Optical Remote Sensing; Data Presentation; Seafloor Characterization; Electronic Navigational Chart Hydrography for Nautical Charting, Product Liability and contracts; and the United Nations Common Law of the Sea (UNCLOS). One year each of calculus and physics required.

Prerequisite(s): [ESCI 872](#) with a minimum grade of B- and [ESCI 874](#) with a minimum grade of B- or [OE 874](#) with a minimum grade of B- and [ESCI 870](#) with a minimum grade of B- or [OE 870](#) with a minimum grade of B-.

Equivalent(s): [OE 875](#)

Grade Mode: Letter Grading

ESCI 877 - GIS for Earth & Environmental Sciences

Credits: 4

Geospatial technologies provide insight into spatial and temporal aspects of environmental and earth systems. Students will master basic skills of a geographical information system. Weekly laboratory exercises will build upon a foundation of conceptual knowledge and data processing skills. Focus on applied research questions and projects will be addressed. The course will use the open source program QGIS. Additional work will develop programming skills using the python language. Programming background is not required but beneficial. Course in earth sciences or natural resources required.

Equivalent(s): [GSS 807](#)

Grade Mode: Letter Grading

ESCI 878 - Remote Sensing Earth & Environmental Sciences

Credits: 4

Remote sensing provides insight to spatial and temporal aspects of environmental and Earth systems. Students will examine digital image processing techniques, different sensor and platform technologies, and new trends and frontiers in remote sensing science. Weekly laboratory exercises build upon conceptual knowledge, data processing skills, and development of programming skills. Applied research questions and projects will use Google Earth Engine. Hyperspectral, lidar, and unmanned aerial systems will be presented. Course in earth sciences or natural resources required.

Equivalent(s): [GSS 817](#)

Grade Mode: Letter Grading

ESCI 895 - Topics

Credits: 1-4

Study on an individual or group basis in geologic, hydrologic, or oceanographic problems, under members of the graduate staff.

Topics include: geochemistry, geomorphology, geophysics; glaciology; groundwater, structural, and regional geology; crystallography, mineralogy; petrology; thermodynamics; ore deposits; earth resource policy; paleontology; sedimentation; stratigraphy; water resources management; chemical, physical, and geological oceanography; earth systems; earth science teaching methods.

Repeat Rule: May be repeated for a maximum of 9 credits.

Grade Mode: Letter Grading

ESCI 896 - Topics

Credits: 1-4

Study on an individual or group basis in geologic, hydrologic, or oceanographic problems, under members of the graduate staff. Topics include: geochemistry, geomorphology, geophysics; glaciology; groundwater, structural, and regional geology; crystallography, mineralogy; petrology; thermodynamics; ore deposits; earth resource policy; paleontology; sedimentation; stratigraphy; water resources management; chemical, physical, and geological oceanography; earth systems; earth science teaching methods. Special fee on some topics.

Repeat Rule: May be repeated for a maximum of 9 credits.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

ESCI 898 - Directed Research

Credits: 2

Research project on a specified topic in the Earth Sciences, guided by a faculty member.

Grade Mode: Graduate Credit/Fail grading

ESCI 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

ESCI 972 - Hydrographic Field Course

Credits: 4

A lecture, lab, and field course on the methods and procedures for the acquisition and processing of hydrographic and ocean mapping data. Practical experience in planning and conducting hydrographic surveys. Includes significant time underway (day trips and possible multi-day cruises) aboard survey vessel(s).

Prerequisite(s): [ESCI 871](#) with a minimum grade of B- and [ESCI 874](#) with a minimum grade of B- and [ESCI 875](#) with a minimum grade of B-.

Equivalent(s): [OE 972](#)

Grade Mode: Letter Grading

ESCI 973 - Seafloor Characterization

Credits: 3

Remote characterization of seafloor properties using acoustic (echo sounders, sub-bottom profilers, side-scan, multi-beam and interferometric sonars) and optical (video and laser linescanner) methods. Models of sound interaction with the seafloor will be explored as well as a range of possible geologic, geotechnical, morphologic, acoustic, and biologic descriptors. Upper level courses in ocean mapping and geodesy required.

Grade Mode: Letter Grading

ESCI 995 - Advanced Topics

Credits: 1-4

Advanced work on an individual or group basis.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

ESCI 996 - Advanced Topics**Credits:** 1-4

Advanced work on an individual or group basis.

Repeat Rule: May be repeated for a maximum of 12 credits.**Grade Mode:** Graduate Credit/Fail grading**ESCI 997 - Seminar in Earth Sciences****Credits:** 1

Readings, discussion, and presentation of recent investigations in the earth sciences. Required of all M.S. students in Earth Sciences. Can not be concurrently enrolled in ESCI 993.

Grade Mode: Graduate Credit/Fail grading**ESCI 998 - Proposal Development****Credits:** 1

Introduction to research in the earth sciences and development of thesis and directed research proposals. Required of all M.S. students in Earth Sciences. Can not be concurrently enrolled in ESCI 994.

Grade Mode: Letter Grading

Economics (ECON)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ECON 825 - Mathematical Economics

Credits: 0 or 4

Principal mathematical techniques and their application in economics. Topics covered: matrix algebra, derivatives, unconstrained and constrained optimization, linear and nonlinear programming, game theory, elements of integral calculus.

Grade Mode: Letter Grading

ECON 871 - Macroeconomic Consulting

Credits: 3

Assess a macroeconomy's condition over the short-run and long-run. Emphasis is given to the construction of data from the National Income and Product Accounts (NIPA), Bureau of Labor Statistics (BLS), the Federal Reserve System (FRS), and other sources. This course also considers the role and functioning of financial markets and how business decisions are impacted by short-run and long-run macroeconomic developments.

Prerequisite(s): [ECON 611](#) with a minimum grade of D- or [ADMN 970](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 875 - Strategy Analysis: Games and Auctions

Credits: 3

Game theory is the study of strategic interactions. It models conflict and cooperation between rational agents. Applications include, statistical decision theory, artificial intelligence, auctions, pricing, bargaining, etc. The focus of this course is on business strategy. Students formalize strategic situations as well-defined games, analyze and solve a wide variety of games and business applications, and develop optimal auctions given specific corporate requirements. On-line auctions will be emphasized.

Prerequisite(s): [ECON 605](#) with a minimum grade of D- or [ECON 606](#) with a minimum grade of D- or [ADMN 970](#) with a minimum grade of B- or [ADMN 510](#) with a minimum grade of D-.

Grade Mode: Letter Grading

ECON 890 - Analytical Economics in Practice

Credits: 3

The course gives students an opportunity to use their economics, analytics, and data analysis skills in a business or consulting setting. To this end, students undertake an internship and/or corporate project.

Co-requisite: [ECON 927](#)

Prerequisite(s): [ECON 926](#) with a minimum grade of B- and [ECON 976](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 898 - Economic Problems (Special Topics)

Credits: 3

Special topics in economics. Pre- and co-requisite courses may vary. Please consult time and room schedule for the specific [ECON 898](#) topics section of interest for details.

Grade Mode: Letter Grading

ECON 908 - Environmental Economics: Theory and Policy

Credits: 4

Applies microeconomic tools to issues in environmental economics. Considers the role of government, externalities, public good property rights, and market failure. Identifies and compares different policy instruments such as administrative regulation, marketable permits, tax incentives, and direct subsidies, along with consideration of complicating factors such as information, uncertainty and risk. These tools are applied to various policy issues such as air pollution, solid waste management, and recyclin

Prerequisite(s): [ECON 926](#) with a minimum grade of B- and [ECON 976](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 909 - Environmental Valuation

Credits: 4

Focuses on the theory and methods for estimating the economic values of environmental resources and public goods (such as clean air and water, preservation of wetlands or coastal resources, etc.) many of which are not exchanged in established markets and therefore do not have prices associated with them. The valuation of environmental resources is an important component in benefit-cost analyses which are used in policy making. Provides a blend of theory and hands-on applications of methods and real data sets.

Prerequisite(s): [ECON 926](#) with a minimum grade of B- and [ECON 927](#) with a minimum grade of B- and [ECON 976](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 926 - Econometrics I

Credits: 0 or 4

Application and theory of statistical and econometric methods to problems in economics. Topics: basic statistical theory, simple and multiple regression, violations of the basic assumptions, generalized least squares, and introduction to simultaneous equation models. [MATH 545](#) is strongly recommended prior to taking this course.

Prerequisite(s): [ECON 726](#) with a minimum grade of D- and ([MATH 424A](#) with a minimum grade of D- or [MATH 425](#) with a minimum grade of D-).

Grade Mode: Letter Grading

ECON 927 - Econometrics II

Credits: 0 or 4

Asymptotic theory, likelihood estimation, simultaneous equations, panel data analysis, binary and multiple choice models, count data analysis, selection models, survival analysis.

Prerequisite(s): [ECON 926](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 928 - Econometrics III, Time Series Econometrics

Credits: 4

Basic and advanced time series models with up-to-date empirical techniques with emphasis on the application of econometric tools to economic issues. Selected topics include stationary ARMA models, unit roots and cointegration, VAR, ARCH dynamic panel data models, structural break models, and non-linear time series models.

Prerequisite(s): [ECON 926](#) with a minimum grade of B- and [ECON 927](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 929 - Econometrics IV, Advanced Econometrics

Credits: 4

Advanced nonlinear Econometrics and an introduction to the asymptotic theory of nonlinear regression. A summary of selected topics include nonlinear least squares (NLLS), generalized method of moments (GMM), numerical optimization, bootstrap, maximum likelihood (MLE), quasi-maximum likelihood (QMLE), nonparametric and semiparametric regression, cross-validation.

Prerequisite(s): [ECON 926](#) with a minimum grade of B- and [ECON 927](#) with a minimum grade of B-.

Equivalent(s): [ECON 898](#)

Grade Mode: Letter Grading

ECON 941 - Empirical Analysis in Health Economics

Credits: 4

Provides students with an understanding of key issues in the field of health economics from an empirical perspective. Topics (which align with those in [ECON 942](#)) include: production of health; health behaviors; supply of care by physicians, hospitals and nurses; cost-effectiveness and measuring quality of care; features of the U.S. health insurance system; and the effect of insurance on demand for care and health status.

Prerequisite(s): [ECON 927](#) with a minimum grade of B- and [ECON 977](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 942 - Theoretical Analysis in Health Economics

Credits: 4

Covers the seminal theoretical papers in the field of health economics. The first set of papers covered in the course focus on the determinants of health and demand for healthcare services; the second set of papers cover healthcare providers and their supply of healthcare services in competitive, monopolistic, and government-regulated markets; and the third set of papers cover private and public health insurance markets.

Prerequisite(s): [ECON 977](#) with a minimum grade of B- and [ECON 927](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 945 - International Trade

Credits: 4

Contemporary issues in international economic theory and policy. Analysis of trade theory, dynamics of world trade and exchange and international commercial policy.

Equivalent(s): ECON 845

Grade Mode: Letter Grading

ECON 946 - Open Economy Macroeconomics

Credits: 4

This course introduces you to the frontier of research in open economy macroeconomics and builds on the tools currently used in modern macroeconomic analysis. This course first examines real business cycle fluctuations of small open economies, and then turns to considering monetary and fiscal policies. By the end of the course, students are expected to demonstrate the ability to formulate new theoretical models and be able to apply them to conduct policy analysis.

Prerequisite(s): [ECON 973](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 957 - History of Economic Thought

Credits: 4

Traces the development of economic thought, with careful examination and critical appraisal of the contributions made by important figures and schools of thought.

Grade Mode: Letter Grading

ECON 958 - Topics in Economic Thought and Methodology

Credits: 4

Advanced seminar in a selected topic in economic thought or methodology.

Grade Mode: Letter Grading

ECON 972 - Macroeconomics I

Credits: 0 or 4

Development of the major macro models and approaches to macroeconomics: classical, Keynes' "General Theory," Keynesian, Monetarists, New Classical, and New Keynesian models and views. Introduction to open economy macro and growth models.

Grade Mode: Letter Grading

ECON 973 - Macroeconomics II

Credits: 0 or 4

Theory, empirical specification, and tests of macroeconomic functions. National econometric models. Theories and empirical models of the business cycle and economic growth. Use of models for policy analysis and forecasting.

Prerequisite(s): [ECON 926](#) with a minimum grade of B- and [ECON 972](#) with a minimum grade of B-.

Grade Mode: Letter Grading

ECON 976 - Microeconomics I**Credits:** 0 or 4

Survey and applications of modern microeconomic theory. Analysis of households, firms, product and resource markets, and behavior under uncertainty.

Grade Mode: Letter Grading**ECON 977 - Microeconomics II****Credits:** 0 or 4

Analysis of stability, cooperative and non-cooperative game theory, information economics, exhaustible resources, disequilibrium, public goods, public choice, and input-output analysis.

Prerequisite(s): ECON 976 with a minimum grade of B-.**Grade Mode:** Letter Grading**ECON 979 - Research Skills****Credits:** 2

Aids students in completing a paper for which they conduct research on a particular economic problem or issue using the knowledge and skills they have gained from their other classes. Students meet regularly with their faculty advisor throughout the semester. They also present their work at various stages of completion. Presentations of students' topics and final papers are made to the faculty.

Prerequisite(s): ECON 926 with a minimum grade of B- and ECON 972 with a minimum grade of B- and ECON 976 with a minimum grade of B-.**Grade Mode:** Letter Grading**ECON 988 - Graduate Economics Seminar****Credits:** 0-4

Attend weekly graduate economics seminars; write reviews and critiques of seminar papers; participate in discussion at seminar. May be repeated up to a maximum of 4 credits for Masters students and up to 8 credits for Ph.D. students.

Repeat Rule: May be repeated for a maximum of 8 credits. May be repeated up to 4 times.**Grade Mode:** Graduate Credit/Fail grading**ECON 995 - Independent Study****Credits:** 1-6

Independent Study.

Grade Mode: Letter Grading**ECON 996 - Research Workshop****Credits:** 2

Present research papers in the graduate economics seminar series; serve as a discussant for seminar presentations; write review and critiques of seminar papers; participate in discussion at seminars. May be repeated up to a maximum of 4 credits for Ph.D. students.

Repeat Rule: May be repeated for a maximum of 4 credits.**Grade Mode:** Graduate Credit/Fail grading**ECON 999 - Doctoral Research****Credits:** 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading**Special Fee:** Yes

Education (EDC) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

EDC 800 - Introduction to Clinical Experience

Credits: 1

This course is required for all students enrolled in teaching licensure programs. Students develop prerequisite skills in lesson planning, assessment creation, data collection, and the formative assessment cycle as they gain the technical and professional understandings required for successful completion of teacher certification programs.

Equivalent(s): EDU 700G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 801 - Special Education Law

Credits: 4

The current field of special education was established by law and further refined through the courts in litigation. In this writing intensive class, students trace the historical development of federal, state, and local laws and regulations such as the Individuals with Disabilities Education Act (IDEA) and the New Hampshire Standards for the Education of Students with Disabilities. Students will gain an understanding of the relationship between constitutional law, statutory law, regulatory law and case law as it relates to current special education law. The focus on policies and procedures provides the background future teachers and paraprofessionals need to fulfill their legal and ethical responsibilities and to understand the ever changing, complex nature of special education law.

Equivalent(s): EDU 721G

Mutual Exclusion: No credit for students who have taken [EDUC 951](#).

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 802 - Young Children with Exceptionalities, Birth to Age 8

Credits: 4

In this course, students examine typical and non-typical development of children from birth through age 8. This is a time of rapid brain growth and overall development that forms the foundation for all learning. For young children who have exceptionalities in the physical, behavioral, developmental, or learning domains, these years are even more critical. The purpose of this course is to provide current, research-based knowledge and resources for professionals and their families who nurture, support, and provide services to exceptional children.

Equivalent(s): EDU 761G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 803 - The Dynamic Role of the Special Educator

Credits: 4

In this clinical course, students will examine the multifaceted role of the special education teacher as evaluator, consultant, case manager and teacher. Courses taken throughout the teacher certification program support the development of skills for each of these roles. This is an introductory course designed to accomplish the following outcomes: (a) explore the college's digital library; (b) introduce the American Psychological Association annotation and format requirements; (c) provide a beginning teacher with organizational framework for the varying roles of a special education teacher; (d) provide an in-depth understanding of their caseload management responsibilities; (e) plan for the effective supervision of paraeducators; (f) introduce the reflective analysis of student work teaching and assessment cycle; and (g) apply the components of systematic direct instruction in lesson plan development.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 701G

Mutual Exclusion: No credit for students who have taken [EDUC 901C](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 804 - Assessment of Young Children in EC/ECSPED - Birth to Age 8

Credits: 4

In this course, students use procedures involved in the evaluation process for determination of eligibility for special education. Students develop the skills necessary to administer and interpret assessment tools commonly used by early intervention staff and early childhood special education teachers. Under the supervision of the district mentor, students review early support and services records and/or school records, gather information, observe an evaluation team meeting, consult with district evaluators and review a variety of assessment tools and evaluation reports for young children through age 8. Students participate in preparing an assessment plan, administering chosen assessment tools, and writing assessment reports. Emphasis is placed on working with team members in the evaluation process.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 763G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 805 - Collaboration, Consultation and Teaming In Early Childhood & Early Childhood Special Education

Credits: 4

In this course, students research and evaluate family, community and professional partnerships which support the growth and development of children with disabilities. The specific roles and responsibilities of each contributing partner will be explored and analyzed. Students, using knowledge acquired in areas of collaboration, consultation and teaming, construct service delivery models to support young children with diverse needs and their families.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 766G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 806 - IFSP, IEP, and Transition Plans, Birth to Age 8

Credits: 2

This clinical course focuses on the components and processes involved in the legal aspects and development of Individual Family Service Plans (IFSP) and Individualized Education Programs (IEPs). Under the supervision of a district mentor, Students review school records; observe IFSP/IEP team meetings; consult with district evaluators, student and parents; analyze previously written IFSPs/IEPs and progress reports; and develop the skills necessary to prepare IFSPs/IEPs inclusive of transition plans and/or services. The culminating activities of the course include the development of an IFSP and an IEP, and a research paper which addresses the legal/ethical considerations and implications in the development of IFSPs and IEPs.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 767G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 807 - Behavior Interventions for Young Children

Credits: 4

In this clinical course, students examine basic principles and components of life skills that children need as foundation for the development of positive social skills, e.g., attachment, affiliation, self-regulation, initiative, problem-solving, and respect. The student develops and implements a variety of activities and lesson plans to teach young children these critical life skills. Student develop strategies to be used with young children receiving early intervention services and/or to motivate young children in their preschool programs/classrooms by facilitating the development of positive peer relationships, addressing emotional needs, and minimizing disruptions resulting in increased learning. The student documents the use of individual activities and/or classroom strategies in a professional portfolio.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 768G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 808 - Science, Technology, Engineering, and Mathematics in Early Childhood and Early Child Spec. Ed. 0-8

Credits: 4

In this clinical course, students focus on STEM content, effective practice, instructional strategies, materials and curriculum integration, based on standards, inquiry, and connections to the real world. STEM concepts of curiosity, creativity, collaboration and critical thinking are researched and explored. Students will learn about the Scientific Method, as well as the roles of observation, classification, description, experimentation, application and imagination. Students will learn how to use technology and interactive media in the early childhood classroom to support learning. The role of engineering in the curriculum will be investigated, including design of methods and ideas for product development. Students will understand and apply math process standards of problem-solving, reasoning and proof, communication, connection, and representation. The course emphasizes application of principles in order to investigate and create experiences which employ STEM concepts and teaching strategies.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 764SG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 809 - Teaching Language Arts and Literacy in Early Childhood and Early Childhood Specia Education

Credits: 6

In this clinical course, students develop an understanding of language and literacy development from birth through grade three. Topics include the reciprocal connections between speaking and listening, rhythm and rhyme, communication activities, hearing and reading literature, stories, poetry, music, and written expression. Students engage in appropriate literacy interactions, activities, and assessments to meet the literacy needs of a diverse range of children. Students work with parents and care givers, partners in promoting literacy. The key components of reading (e.g. word recognition, fluency, phonological awareness, etc.) identified by the National Reading Panel for this age level are studied in depth. Students apply their knowledge of how young children develop their own reading skills using these key components of the reading process. Students then evaluate the effectiveness of their instruction.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 710AG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 810 - Curriculum, Assessment & Instruction in Early Childhood and Early Childhood Spec Educ. Birth-Age 8

Credits: 4

In this clinical course, students examine, develop, and evaluate developmentally appropriate curriculum and instruction in early childhood special education settings, for young children birth through age 8 (grade 3). Students use district and state curriculum and integrate subjects with one another. Students develop skills to create and advocate for healthy, supportive, respectful, and challenging learning environments for all children.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 765G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 816 - Students with Disabilities

Credits: 4

This course provides an overview of the 13 Individuals with Disabilities Education Act (IDEA) educational disabilities and the opportunity to explore the implications of disability on learning. Students will develop knowledge of specific disabilities including definition, diagnosis, etiology, prevalence, characteristics, adaptive behavior, and systems of support and resources. Students will explore how disability impacts learning and access to the general education curriculum. Students will research and identify teaching strategies, Universal Design for Learning (UDL) strategies, interventions, and educational and assistive technologies to enhance learning and provide equity in the classroom for students with disabilities.

Equivalent(s): EDU 717G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

EDC 817 - Positive Behavior Guidance and Student Engagement

Credits: 4

In this clinical course, students explore the theory of social-emotional development, preventative intervention strategies, and the characteristics of safe and supportive learning communities. Students examine specific strategies for motivating students and promoting positive relationships between colleagues, students, and parents in an effort to enhance learning. Students conduct a functional behavior assessment as they develop a comprehensive perspective on classroom culture through the development of proactive management skills and intervention strategies.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 707G

Grade Mode: Letter Grading

Special Fee: Yes

› [View Course Learning Outcomes](#)

EDC 818 - Transition Planning and Developing IEPs

Credits: 2

This clinical course focuses on the components and processes involved in the development of Individualized Education Program (IEPs). Under the supervision of a supervising practitioner, students review school records, observe IEP team meetings, consult with district evaluators, student and parents, analyze previously written IEPs and progress reports, and develop the skills necessary to prepare IEPs inclusive of transition plans. During the culminating activity of the course, students develop an IEP and transition plan as a vehicle for exploring the legal and ethical considerations and implications in the development, implementation, and evaluation of IEPs.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 706G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

EDC 819 - Using Technology to Teach Social Studies

Credits: 4

Technology is a necessary tool in teaching today's youth. In this clinical course, students focus on developing three broad skills: (1) how to design and teach an integrated social studies unit plan that challenges and assists K-8 students to think deeply, (2) how to incorporate into the plan a wide range of mostly constructivist instructional strategies, and (3) how to integrate a rich array of technology tools and digital educational content into the unit plan. Admission to the teacher certification program required.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 702G

Mutual Exclusion: No credit for students who have taken [EDUC 803M](#).

Grade Mode: Letter Grading

Special Fee: Yes

› [View Course Learning Outcomes](#)

EDC 820 - Instructional Methods, Strategies and Technologies to Meet the Needs of All Students

Credits: 4

In this clinical course, students develop knowledge and expertise using a variety of instructional methods and research-based strategies to improve learning for a diverse, student population facing complex individual learning challenges. Students will research strategy based instruction and meta-cognition to determine its effectiveness in increasing independence, enhancing learning and developing thinking skills. Math will be the content area focus, including: standards based instruction, assessment, unit development and teaching, and technology integration.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 703G

Mutual Exclusion: No credit for students who have taken [EDUC 851A](#), [EDUC 851B](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 821 - Assessment of Students with Disabilities

Credits: 4

This course focuses on the tools and procedures involved in the evaluation and determination of education disabilities. Under the supervision of the district mentor, students review school records, observe an evaluation team meeting, consult with district evaluators, review a variety of assessment tools and evaluation reports, and develop the skills necessary to administer and interpret some of the assessments commonly used by special education teachers. The culminating activity of the course is the development of a formal assessment report.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 705G

Mutual Exclusion: No credit for students who have taken EDUC 939, EDUC 940.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 822 - Strategies for Teaching Science

Credits: 4

This clinical course focuses on learning theories and their application to science instruction. Students examine a variety of instructional strategies through readings, observation and participation in their clinical placements, and determine the appropriateness of each in the learning process. Topics include constructivist learning, differentiated learning, and an in-depth look at how the state and national standards guide science instruction. Additional topics include integrated STEM curricula, the appropriate use of technology, and effective formative, summative and alternative assessment strategies. Students plan, teach and evaluate an integrated/thematic unit with lessons that align with Next Generation Science Standards.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 704G

Mutual Exclusion: No credit for students who have taken [EDUC 803F](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 823 - Teaching Language Arts and Literacy

Credits: 6

In this clinical course, students explore, develop, implement and evaluate a variety of strategies to teach language arts to diverse learners. Students analyze a language arts series in relation to the National Council of Teachers of English standards, and the National Reading Panel's recommendations in each of the following areas: phonemic awareness, phonics, fluency, comprehension of vocabulary and text.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 710G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 824 - Elementary School Mathematics Methods

Credits: 4

This clinical course focuses on learning theories and their application to elementary school mathematics instruction. Students research a variety of instructional strategies through readings, observation and participation in a clinical placement and determine the appropriateness of each in the learning process. Topics include constructivist learning, differentiated learning, and an in-depth look at how the Common Core State Standards in Mathematics guide mathematics instruction. Additional topics include integrated curricula, the appropriate use of technology, and effective formative, summative and alternative assessment strategies. Students plan two 5-lesson mathematics units for two different grade levels, teaching and reflecting on lessons taught in one of the units.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 732G

Mutual Exclusion: No credit for students who have taken [MATH 803](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 831 - Aspects of Mathematics Learning

Credits: 4

This clinical course is designed to provide prospective secondary and middle school teachers with the skills to develop an integrated approach to teaching and learning. It will cover cultural and psychological aspects of learning mathematics, models of instruction and planning, teaching and learning styles, assessment strategies, models and organization and selection of curriculum materials, classroom management, and the role of technology and media within these.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 752G

Mutual Exclusion: No credit for students who have taken [MATH 800](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 832 - Reading and Writing in the Mathematics Content Area

Credits: 4

This clinical course is designed to provide prospective secondary and middle school teachers with the knowledge, skills, and resources necessary to incorporate literacy skills into their mathematics content area plans. Emphasis will be on integrating the teaching of reading, writing, and oral literacy skills from various fields; students will explore and practice the methods and strategies, including testing and measurement assessments necessary to meet the diverse literacy needs of today's students allowing them to become independent students. Teaching and discussing theoretical and practical application of current theories and methods involved in teaching literacy to diverse secondary and middle student population within the contemporary pluralistic classroom, including differentiated learning styles through socioeconomic status, gender, and heritage will be emphasized. Ninety supervised clinical hours are required.

Prerequisite(s): ([EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B- and [EDC 831](#) with a minimum grade of B- or EDU 752G with a minimum grade of B-).

Equivalent(s): EDU 753G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 833 - Middle Level Mathematics Methods

Credits: 4

This clinical course focuses on mathematics learning theories and their application to middle school mathematics instruction. Students examine a variety of instructional strategies through readings, observation and supervised teaching. Topics include constructivist learning, differentiated learning, and an in-depth look at how the state and national standards guide mathematics instruction. Additional topics include integrated curricula, the appropriate use of technology, and effective formative, summative and alternative assessment strategies. Students plan two, 5-lesson mathematics units for two different grade levels, teaching and reflecting on lessons taught in one of the units. Depending on the certification program, a range of fifty to ninety supervised clinical hours are required.

Prerequisite(s): (EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B- and (EDC 832 with a minimum grade of B- or EDU 753G with a minimum grade of B-.

Equivalent(s): EDU 733G

Mutual Exclusion: No credit for students who have taken [MATH 803](#), [MATH 809](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 834 - Upper Level Mathematics Methods

Credits: 4

This clinical course focuses on mathematics learning theories and their application to secondary mathematics instruction. Students examine a variety of instructional strategies through readings, observation and supervised teaching. Topics include constructivist learning, differentiated learning, and an in-depth look at how the state and national standards guide mathematics instruction. Additional topics include integrated curricula, the appropriate use of technology, and effective formative, summative and alternative assessment strategies. Students plan two, 5-lesson mathematics units for two different grade levels, teaching and reflecting on lessons taught in one of the units. Depending on the certification program, a range of fifty to ninety supervised clinical hours are required.

Prerequisite(s): (EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B- and (EDC 832 with a minimum grade of B- or EDU 753G with a minimum grade of B-.

Equivalent(s): EDU 734G

Mutual Exclusion: No credit for students who have taken [MATH 809](#).

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 844 - Teacher as Researcher

Credits: 2

This course will provide students with a foundation of research skills needed to become a teacher researcher. Students will explore ways to identify problems of practice, turn to current research for answers, gather data, find meaning in the data, create courses of action based on data, and communicate the results. Students will be introduced to research methods that are used by educators in today's classrooms, in order to enact change and better their current or future practice. This course is appropriate for those working in the field and those preparing for a variety of positions in education.

Repeat Rule: May be repeated up to unlimited times.

Equivalent(s): EDU 744G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 845 - Natural Selection and Evolution

Credits: 3

In this non-clinical introductory course, students examine the major concepts around the structure and function of organisms and explore the best methodologies to teach these concepts. The major concepts include: DNA's discovery and structure; replication, transcription, and translation; the organizational levels of organisms; how structure relates to function; and feedback loops and homeostasis. The student develops multiple engaging activities and lesson plans to teach middle or high school children details within the major concepts. Students create formative investigations and assessments related to the major concepts as well as satisfy summative assessment requirements.

Equivalent(s): EDU 756G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 846 - Life Sciences Across the Curriculum

Credits: 3

In this non-clinical introductory level course, students examine real-life application of life science phenomena and concepts across the curriculum and how these sciences intersect with chemistry, physics, and earth space science. The student uses laboratory

techniques to explain and solve problems and develops multiple engaging activities and lesson plans to teach middle or high school children details within the major concepts. Students create formative investigations and assessments related to the major concepts as well as satisfy summative assessment requirements.

Equivalent(s): EDU 757G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 847A - Introductory Clinical Experiences in the Life Sciences

Credits: 1

In this introductory level clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver introductory level lessons that include appropriate activities and assessments aligned to a clear and measurable learning objective. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 758AG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 847B - Introductory Clinical Experiences in the Life Sciences

Credits: 1

In this introductory level clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver introductory level lessons that include appropriate activities and assessments aligned to a clear and measurable learning objective. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 758BG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 847C - Introductory Clinical Experiences in the Life Sciences

Credits: 1

In this introductory level clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver introductory level lessons that include appropriate activities and assessments aligned to a clear and measurable learning objective. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 758CG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 847D - Introductory Clinical Experiences in the Life Sciences

Credits: 1

In this introductory level clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver introductory level lessons that include appropriate activities and assessments aligned to a clear and measurable learning objective. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 758DG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 848 - Structure and Function in Life Sciences

Credits: 3

In this non-clinical intermediate course, students examine the major concepts around the structure and function of organisms and explore the best methodologies to teach these concepts. The major concepts include: DNA's discovery and structure; replication, transcription, and translation; the organizational levels of organisms; how structure relates to function; and feedback loops and homeostasis. The student develops multiple engaging activities and lessons.

Equivalent(s): EDU 759G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 849 - Matter and Energy in Organisms and Ecosystems

Credits: 3

In this non-clinical intermediate course, students examine the major concepts around the flow of matter and energy within ecosystems and explore the best methodologies to teach these concepts. The major concepts include: energy production in organisms; cycling of carbon through each sphere; carbon's role in living things; cycling of matter and energy in aerobic and anaerobic conditions; and cycling of matter and energy among organisms and ecosystems. The student develops multiple engaging activities and lesson plans to teach middle or high school children details within the major concepts. Students create formative investigations and assessments related to the major concepts as well as satisfy summative assessment requirements. Students plan an integrated/thematic unit with lessons that align with Next Generation Science Standards.

Equivalent(s): EDU 769G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 850 - Teaching Life Sciences: Ecosystems-Interdependent Relationships

Credits: 3

In this non-clinical intermediate course, students examine the major concepts around interdependencies between organisms within ecosystems and explore the best methodologies to teach these concepts. The major concepts include: natural factors that affect population size; human influence on populations; factors that influence biodiversity; carrying capacity; and the role of group behavior on ecosystems. The student develops multiple engaging activities and lesson plans to teach middle or high school children details within the major concepts. Students create formative investigations and assessments related to the major concepts as well as satisfy summative assessment requirements. Students plan an integrated/thematic unit with lessons that align with Next Generation Science Standards.

Equivalent(s): EDU 776G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 851A - Intermediate Clinical Experiences in Life Sciences

Credits: 1

In this intermediate clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver intermediate level lessons that include higher order thinking, rich academic language, differentiation, and data base instructional decisions. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 777AG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 851B - Intermediate Clinical Experiences in Life Sciences

Credits: 1

In this intermediate clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver intermediate level lessons that include higher order thinking, rich academic language, differentiation, and data base instructional decisions. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 777BG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 851C - Intermediate Clinical Experiences in Life Sciences

Credits: 1

In this intermediate clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver intermediate level lessons that include higher order thinking, rich academic language, differentiation, and data base instructional decisions. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 777CG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 851D - Intermediate Clinical Experiences in Life Sciences

Credits: 1

In this intermediate clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver intermediate level lessons that include higher order thinking, rich academic language, differentiation, and data base instructional decisions. Students' clinical assignments are carried out and assessed in an approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 777DG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 852 - Teaching Life Sciences: Genetics-Inheritance and Variation of Traits

Credits: 3

In this non-clinical advanced course, students examine the major concepts around the genetics and mechanisms of inheritance in organisms and explore the best methodologies to teach these concepts. The major concepts include: mitosis and cell division; DNA and the inheritance of traits; meiosis, mutations and change over time; and the statistics of genetics. The student develops multiple engaging activities and lesson plans to teach middle or high school children details within the major concepts. Students create formative investigations and assessments related to the major concepts as well as satisfy summative assessment requirements. Students plan an integrated/thematic unit with lessons that align with Next Generation Science Standards.

Equivalent(s): EDU 778G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 853 - Math Across the Life Sciences

Credits: 3

In this non-clinical advanced level course, students examine the major concepts of the application and use of math and identification and manipulation of variables in life sciences. The major concepts include: applying mathematical modeling to a variety of concepts; using statistical concepts to model and predict; identifying and manipulating variables. The student may develop multiple engaging activities and lesson plans to teach middle or high school children details within the major concepts. Students create formative investigations and assessments related to the major concepts as well as satisfy summative assessment requirements.

requirements. Students plan an integrated/thematic unit with lessons that align with Next Generation Science Standards.

Equivalent(s): EDU 779G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 854A - Advanced Clinical Experiences in Life Sciences

Credits: 1

In this advanced clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver advanced level lessons that include instructional strategies generated based on student data, scaffolding for unique student needs, varied assessments, and high quality reflections. Students' clinical assignments are carried out and assessed in a approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 798AG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 854B - Advanced Clinical Experiences in Life Sciences

Credits: 1

In this advanced clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver advanced level lessons that include instructional strategies generated based on student data, scaffolding for unique student needs, varied assessments, and high quality reflections. Students' clinical assignments are carried out and assessed in a approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 798BG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 854C - Advanced Clinical Experiences in Life Sciences

Credits: 1

In this advanced clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver advanced level lessons that include instructional strategies generated based on student data, scaffolding for unique student needs, varied assessments, and high quality reflections. Students' clinical assignments are carried out and assessed in a approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 798CG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 854D - Advanced Clinical Experiences in Life Sciences

Credits: 1

In this advanced clinical course, students participate in several formative clinical experience tasks to prepare them for the facilitation of effective 7-12 science lessons. Students use Next Generation Science Standards and prior student evidence to create and deliver advanced level lessons that include instructional strategies generated based on student data, scaffolding for unique student needs, varied assessments, and high quality reflections. Students' clinical assignments are carried out and assessed in a approved science classroom under the supervision of faculty and on-site Supervising Practitioners.

Equivalent(s): EDU 798DG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 855 - Culminating Experience for Life Science

Credits: 2

In this culminating, field-based course, students use their content knowledge and field experience to design and implement a three lesson unit that reflects the full range of experiences based on the standards for certification in Life Sciences for Grade 7-12 and the professional education standards for all teachers. As part of the course, candidates demonstrate completion of all requirements for teacher certification through the Teacher Candidate Assessment of Performance (TCAP).

Equivalent(s): EDU 799G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 858 - Introduction to Digital Learning

Credits: 3

This is an introductory, fast-paced course on the role of the digital learning specialist and the available technology tools to improve teaching and learning. Candidates will formulate a vision for what type of digital learning specialist they will become. Individually and collaboratively, candidates will reduce fear, embrace exploration of technology in all facets and manifestations while building practical technical skills. Candidates will learn to find and evaluate resources, applications, tools and software both for teaching and their own learning. The class emphasizes the development of on-going 'self-propelled' professional development and reflection habits.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 770G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 859 - Curricular Theory of Technological Integration

Credits: 3

Candidates will explore how to effectively use technology with differentiation, rigor, relevance, and engaging learning experience to enhance existing curriculum. Candidates will gain knowledge of digital tools to model, promote, and facilitate experiences that advance learner competency, creativity, and innovation in both face-to-face and virtual environments.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 771G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 860 - Pedagogical Practice and Management of Technological Integration

Credits: 3

Candidates build understandings and practical pedagogical skills/strategies for effective implementation of a constructivist curriculum including management of cooperative learning groups, project-based learning, and inquiry-based learning. Teacher candidates will explore strategies to properly carry out this type of learning and assessment in the classroom setting. Various technological tools and resources will be explored and shared.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 772G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 861 - Meeting the Needs of All Learners Through Technological Integration

Credits: 3

This course investigates the principles of Universal Design for Learning (UDL) as a tool to meet the needs of all learners in the classroom. Candidates explore the UDL framework and examine how designing lessons with the UDL guidelines can improve and optimize learning for all students. Candidates research the use of assistive technologies to allow every student access to the curriculum, as well as determine what assistive technology is appropriate for overcoming barriers to learning.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 773G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 863 - Professionalism, Leadership and Administrative Understandings and Practice for Tech. Integration

Credits: 3

In this course students will be exposed to the current theories in educational leadership, discover and explore their own leadership styles, and develop strategies to promote and participate in the development and implementation of technology to foster excellence to support transformational change throughout the instructional environment.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 774G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 864 - Culminating Teaching Experience: Clinical Synthesis and Implementation of Technological Integration

Credits: 3

In this culminating clinical experience, the candidate will develop and implement a comprehensive instructional project demonstrating full understanding and application of instructional technological integration leadership. Candidates will reflect, revise, self-assess, and evaluate their instruction and leadership based on student learning and positive school change.

Equivalent(s): EDU 775G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 866 - Dynamic Assessment: Complexities of Identification in LD, EBD, and IDD

Credits: 6

Teacher candidates who complete this clinical course gain an understanding of the legal and ethical issues, and the procedures involved in the evaluation and determination of educational disabilities, specific to learning disabilities, emotional/behavioral disorders and intellectual/developmental disabilities. Within the context of their school setting, teacher candidates apply their new knowledge of the use of formal and informal assessments within the on-going context of formative assessments to monitor 12 student progress, and the effectiveness of instructional strategies.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 736G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 867 - Behavioral Supports for Complex Behaviors

Credits: 4

Teacher candidates who complete this clinical course gain an understanding of the legal and ethical programming issues, and the procedures involved in the development, implementation, and evaluation of programs that address complex behaviors for students with significant behavior needs.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 737G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 868 - Advanced Assistive and Educational Technology

Credits: 4

Teacher candidates who complete this clinical course gain an understanding of the legal and ethical issues, and the procedures involved in the use of technology in the education of students with learning disabilities, emotional/behavioral disabilities and intellectual or developmental disabilities. The purpose of this course is twofold, focusing on the use of technology appropriate for all teaching and learning and the use of technology for students with significant learning needs.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 738G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 869 - Advanced Programming for Students with Learning Disabilities

Credits: 4

Teacher candidates who complete this clinical course gain an understanding of the legal and ethical programming issues, and the procedures involved in the development, implementation, and evaluation of programs for students with learning disabilities.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 739G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 870 - Advanced Programming for Emotional/Behavioral Disabilities

Credits: 4

Teacher candidates who complete this clinical course gain an understanding of the legal and ethical programming issues, and the procedures involved in the development, implementation, and evaluation of programs for students with emotional and behavioral disabilities.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 741G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 871 - Advanced Programming for Intellectual and Developmental Disabilities

Credits: 4

Teacher candidates who complete this clinical course gain an understanding of the legal and ethical programming issues, and the procedures involved in the development, implementation, and evaluation of programs for students with intellectual and developmental disabilities.

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 743G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 872 - Advanced Curriculum, Assessment and Instruction for Students with Learning Disabilities

Credits: 4

Teacher candidates who complete this clinical course develop a comprehensive awareness of theories, programs, and effective practices for students with learning disabilities. These practices will focus on prevention and remediation of difficulties in reading, math, writing, social skills, and study skills. This is the culminating teaching experience for the LD endorsement, and requires completion of the Teacher Candidate Assessment of Performance (TCAP).

Prerequisite(s): EDC 800 with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 740G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 873 - Advanced Curriculum, Assessment and Instruction for Emotional/Behavioral Disabilities

Credits: 4

Teacher candidates who complete this clinical course develop a comprehensive understanding of the theories, programs and effective practices for students with emotional/behavioral disabilities. These practices will focus on prevention and remediation difficulties in literacy, mathematics, and science, that include appropriate supports and accommodations and that promote access to, and participation within, the general education curriculum. This is the culminating teaching experience for the EBD endorsement, and requires completion of the Teacher Candidate Assessment of Performance (TCAP).

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B- and [EDC 866](#) with a minimum grade of B- or EDU 736G with a minimum grade of B- and [EDC 867](#) with a minimum grade of B- or EDU 737G with a minimum grade of B- and [EDC 868](#) with a minimum grade of B- or EDU 738G with a minimum grade of B- and [EDC 870](#) with a minimum grade of B- or EDU 741G with a minimum grade of B-.

Equivalent(s): EDU 742G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 874 - Advanced Curriculum, Assessment and Instruction for Intellectual and Developmental Disabilities

Credits: 4

Teacher candidates who complete this clinical course develop a comprehensive awareness of theories, programs, and effective practices for students with intellectual/developmental disabilities. These practices will focus on prevention and remediation of difficulties in literacy, mathematics, and science, that include appropriate supports and accommodations, and that promote access to, and participation within, the general education curriculum. This is the culminating teaching experience for the IDD endorsement, and requires completion of the Teacher Candidate Assessment of Performance (TCAP).

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 745G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 875 - Foundations of Language and Literacy Development

Credits: 4

In this course, students develop a comprehensive personal philosophy of reading/writing instruction. The development of this personal philosophy is based on in-depth research and analysis of this research, and is the foundation for program development implementation and evaluation at both the school and district levels. Additionally, the students develops a personal three-year professional development plan to address areas of needed growth.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 730G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 876 - Reading and Writing Disabilities: Assessment and Instruction

Credits: 4

In this clinical course, students examine, implement and evaluate both traditional and contemporary means of assessing reading/writing strengths and needs, as well as research-based developmental and corrective instruction for struggling readers and writers, kindergarten through grade 12.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 712G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 877 - Content Area Literacy

Credits: 4

In this clinical course, students examine, develop, implement and evaluate a variety of strategies to teach reading and writing in content areas. Additionally, they examine the critical role that all teachers play in developing literacy and thinking.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 713G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 878 - Developing Literate Students, K-12

Credits: 4

This clinical course provides preparation for teaching literacy and critical thinking in the middle and secondary grades. The focus on planning, selecting, and using research-based strategies for reading and writing instruction, assessment, and evaluation of student study skills also are emphasized. This will include application of a wide range of strategies to comprehend, interpret, evaluate, and appreciate a variety of texts. Strategies for teaching linguistically and culturally diverse students will be explored. In addition, state and national standards in reading and language arts will be used to construct units and lessons.

Prerequisite(s): [EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-.

Equivalent(s): EDU 748G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 879 - Role of the Reading and Writing Specialist I - Practicum

Credits: 6

This course is the first of a two semester practicum sequence in which students gain meaningful work experience and apply knowledge from previous coursework. The student works with a school-based literacy team to conduct a needs-assessment, prepares guidelines for selection of materials, develops a 2-year plan consistent with current research, and conducts in-service training. This course follows the K-12 academic calendar.

Prerequisite(s): ([EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B-) and ([EDC 875](#) with a minimum grade of B- or EDU 730G with a minimum grade of B-) and ([EDC 876](#) with a minimum grade of B- or EDU 712G with a minimum grade of B-) and ([EDC 877](#) with a minimum grade of B- or EDU 713G with a minimum grade of B-).

Equivalent(s): EDU 711G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 880 - Role of the Reading and Writing Specialist II - Practicum

Credits: 6

This culminating experience is the second semester of a two course, practicum sequence in which students gain meaningful work experience and apply knowledge from previous coursework. This capstone course builds upon the previous practicum, refines understanding and requires the learner to apply the essential competencies of a reading specialist and to evaluate his or her performance and progress. This course follows the K-12 academic calendar.

Prerequisite(s): ([EDC 800](#) with a minimum grade of B- or EDU 700G with a minimum grade of B- and ([EDC 879](#) with a minimum grade of B- or EDU 711G with a minimum grade of B-).

Equivalent(s): EDU 711AG

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 885 - Culminating Teaching Experience and Seminar

Credits: 4

This clinical course is the culminating experience in the plan of study towards NH teacher certification. The culminating teaching experience meets the state standards for certification. The course gives students an opportunity to be mentored in their field of certification by experienced teachers and to practice the variety of methods and strategies that they have studied in their education program. Students have the opportunity to share their experiences, beliefs and best practices with other students during the culminating experience. Students enrolled in this course may be at different stages of acquiring the 360-400 minimum hours of clinical experience. Full admission to the post-baccalaureate teacher certification program and completion of all program requirements required. This is the final course in the student's plan of study. The student must complete all New Hampshire Department of Education test requirements and receive approval from Field Placement Faculty prior to registering for this course.

Equivalent(s): EDU 750G

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 885B - Culminating Teaching Experience and Seminar for Already Certified Teachers

Credits: 4

This course is the culminating experience in the plan of study toward additional NH teacher certification for already certified teachers and is designed to provide teacher candidates an opportunity to be mentored in the field by expert teachers in their new certification area, and to practice the variety of methods and strategies studied in the teacher preparation program. Teacher candidates enrolled in this course may be at different stages of acquiring the required 80 clinical hours of additional supervised teaching experience for additional certifications. Additionally, teacher candidates will use the Teacher Candidate Assessment of Performance process to develop a final culminating document that demonstrates their proficiency in the areas of contextualization, planning and preparation, instruction, academic language, assessment, and reflection. At least two of these three lessons will be observed by the course instructor/Field Placement Faculty member.

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

EDC 894 - Capstone Project I: Leadership Essentials to Strategically Think, Plan, Implement & Evaluate

Credits: 3

This course is the first of a two term capstone sequence in which graduate candidates gain meaningful experience and apply knowledge from previous coursework. The candidate develops an authentic, critical, participatory action research project to include evaluation of teaching and learning and development of a professional culture to promote student success. Effective teacher are effective communicators and collaborators, supporting engagement, engendering shared responsibility while strategically supporting a shared goal and vision.

Equivalent(s): EDC 892, EDU 807AG

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 895 - Leadership Essentials: Evaluation of Teaching and Learning

Credits: 3

The instructional leader promotes the learning and growth of all students and the success of all staff, cultivating a shared vision, make powerful teaching and learning the central focus of schooling. Candidates will identify the skills and knowledge needed to develop and support a dynamic teaching and learning environment, to include instructional leadership, innovation, 21st century demands, technology integration, data-driven decision-making and support of NH State Reform priorities. The primary focus will be a data-informed assessment and evaluation of curriculum and instruction.

Prerequisite(s): EDC 892 with a minimum grade of B- or [EDC 894](#) with a minimum grade of B-.

Equivalent(s): EDC 890, EDU 803G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 896 - Leadership Essentials to Develop and Support a Professional Culture**Credits:** 3

Effective leaders promote the success for all students by nurturing and sustaining a school culture of reflective practice, high expectations and continuous learning for staff, to include instructional leadership, innovation, 21st century demands, technology integration, data-driven decision-making and support of NH State Reform priorities. The primary focus will be a commitment to high standards, cultural proficiency, communications, continuous learning, shared vision, risk-taking and problem solving.

Prerequisite(s): EDC 892 with a minimum grade of B- or [EDC 894](#) with a minimum grade of B-.

Equivalent(s): EDC 891, EDU 804G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

EDC 897 - Capstone Project II: Leadership Essentials to Strategically Think, Plan, Implement, & Evaluate**Credits:** 3

This course is the second of a two term capstone sequence in which graduate candidates implement an authentic, critical, participatory action research project to include evaluation of teaching and learning and development of a professional culture to promote student success. Effective teacher are effective communicators and collaborators, supporting engagement, engendering shared responsibility while strategically supporting a shared goal and vision.

Prerequisite(s): EDC 892 with a minimum grade of B- or [EDC 894](#) with a minimum grade of B-.

Equivalent(s): EDC 893, EDU 807BG

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Education (EDUC)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

EDUC 801 - Human Development & Learning: Cultural Perspectives

Credits: 4

Learning in formal and informal contexts and cultural aspects of learning and development with an emphasis on childhood and adolescence. Theories of learning including behaviorism, constructivism, sociocultural, and design perspectives. Topics include research and varied cultural perspectives on intelligence, motivation, identity and the self, concept learning and knowledge, noncognitive aspects of learning, social and emotional learning, deficit thinking and social justice perspectives, design-based perspectives on educational innovation, and assessment.

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 803C - Classroom Management: Creating Positive Learning Environments

Credits: 4

This course is designed to help prospective and current teachers create and maintain caring, respectful classroom communities which learners feel safe, valued, cared for, valued, and empowered. The course includes a strong emphasis on developing knowledge about the culture and backgrounds of children and families in order to establish positive interactions within the classroom community. The course addresses the challenges and opportunities in creating community in the increasingly diverse student populations in US schools. We will consider what it means to be culturally responsive in order to establish a classroom in which all students can succeed academically and socially.

Grade Mode: Letter Grading

EDUC 803D - Social Studies Methods for Middle and High School Teachers

Credits: 4

The social studies theory and methods course begins with an overview of the varied and, at times, competing goals and visions of the profession. Students examine these goals and their underlying rationales, and then develop their own philosophy of social studies teaching and learning. Students also examine state and national scope and sequence frameworks for the social studies, as well as the language arts Common Core standards. A variety of classroom strategies and methods are explored during the remainder of the course, including unit design, leading class discussions, how to approach controversial issues, teaching concepts and generalizations, increasing student engagement and empathy with the past, incorporating technology and the arts, management and discipline, and formats for assessment and grading.

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 803F - Teaching Elementary School Science

Credits: 4

This course is designed to increase pre-service teachers' pedagogical content knowledge and enthusiasm with respect to teaching science at the elementary level. Throughout this course, students will familiarize themselves with reform-based approaches to elementary science instruction through inquiry, readings, and class discussions. Science will be explored not only as an important element of elementary education, but also as a means by which to support a diverse class of elementary students in literacy and mathematics learning.

Mutual Exclusion: No credit for students who have taken [EDC 822](#).

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 803M - Teaching Elementary Social Studies

Credits: 4

Social Studies Methods explores practical teaching models, techniques of implementation, and relationships to curricula in elementary classroom instruction. The New Hampshire Social Studies Frameworks and Common Core Curriculum Standards for instruction are identified and implemented in creating lesson plans for a mini unit.

Mutual Exclusion: No credit for students who have taken [EDC 819](#).

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 806 - Teaching & Learning Literacy in the Elementary Classroom

Credits: 4

Methods in reading and writing instruction, including current theories, practices and materials for teaching, learning and assessment. Course includes a weekly practicum in an elementary classroom and satisfies reading/language arts requirement for prospective elementary teachers in the elementary or P-3 certification programs.

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 807 - Teaching Reading through the Content Areas

Credits: 2

Approaches and methods for teaching reading through content materials; coursework includes practical applications through development of instructional strategies and materials. Required for candidates seeking licensure in art, biology, chemistry, earth science, general science, home economics, physical education, physics, or social studies.

Grade Mode: Letter Grading

EDUC 808 - Literacy Assessment for Elementary Classroom Teachers

Credits: 4

This is the first of a 2 course sequence for students earning an M.Ed. in Elementary Education, and is taken during the internship year. The course aims to prepare teachers to better understand individual readers in elementary classrooms in order to provide effective supports. The course integrates research and practical applications for elementary literacy assessments. Interns have the opportunity to apply their learning with students in their internship classrooms.

Co-requisite: EDUC 900

Prerequisite(s): [EDUC 806](#) with a minimum grade of B-.

Grade Mode: Letter Grading

EDUC 809 - Supporting Readers in Elementary Classrooms

Credits: 4

This course is the second of a 2-course sequence for students earning an M.Ed. in Elementary Education, and is taken during the internship year. The course prepares teachers to better understand individual readers in elementary classrooms in order to provide effective supports. The course integrates research and practical applications for elementary literacy intervention strategies. Interns have the opportunity to apply their learning through one-on-one tutoring with students in their internship site.

Co-requisite: EDUC 901

Prerequisite(s): [EDUC 806](#) with a minimum grade of B- and [EDUC 808](#) with a minimum grade of B-.

Grade Mode: Letter Grading

EDUC 810 - Navigating Difficult Dialogue

Credits: 4

This course is designed to support navigating the inevitable 'difficult dialogues' we encounter in schools (and life). This course emphasizes practicing basic counseling skills and deeper listening skills to facilitate effective dialogue and outcomes in a variety of settings. Teachers and administration in schools, managers in the workplace, business leaders in organizations, leaders in communities, and other educators in various fields will find this course useful in their professional work with individuals and groups.

Grade Mode: Letter Grading

EDUC 812 - Teaching Multilingual Learners

Credits: 4

This course is for people interested in teaching in schools and/or community agencies serving multilingual populations. Topics include: theories of first and second language acquisition, translanguaging, language policies and laws, strategies for teaching academic content to emerging bilinguals in mainstream classroom, creating classroom/school cultures that invite all students in learning, and the role of advocacy and professional collaboration in linguistically diverse public schools. In addition to designing and exploring a variety of teaching activities and techniques, students conduct a rich collection of field assignments including interviewing bi-/multilingual adults; visiting community agencies; and collaboratively designing community engagement activities.

Grade Mode: Letter Grading

EDUC 818 - Critical Social Justice in and Beyond Education

Credits: 4

Students will become familiar with key concepts and principles of critical theory, critical pedagogy, and social justice education so that they may use this body of work to inform their teaching, leadership, and scholarship. We will examine the role of a) schools in providing equity of educational access and outcomes, b) teacher agency to change unjust conditions, and c) micro experiences within schools and the macro layers of context (i.e., history, politics economics, culture).

Grade Mode: Letter Grading

EDUC 820 - Educational Technology

Credits: 4

Educators with any experience level will develop the skills and mindset to find and use technology tools that can enhance student learning. Assignments and online discussions focus on foundational educational technology topics, including ethical and social justice considerations, best practices, and national technology standards. Assignments are completed using each week's tech tool category, such as presentations, image/video editing, and website creation. Participants will curate educational technology tools that fit their preferences and needs. This class will include the focus on facilitating remote learning.

Grade Mode: Letter Grading

EDUC 834 - Critical Perspectives on Children's Literature

Credits: 4

Interpretive and critical study of literature and nonfiction texts written for elementary and middle school readers. Applications of children's literature in educational settings.

Grade Mode: Letter Grading

EDUC 839 - Assessment and Individualized Educational Planning in Special and Inclusive Education

Credits: 4

This course is intended to develop beginning inclusive and special educators' abilities in (a) assessing learners and learning environments, (b) designing, implementing, and evaluating the effectiveness of instruction through the use of individualized educational plans, and (c) implementing high-leverage practices in the areas of collaboration, assessment, and social/emotional/behavioral supports. Provides a focus on federal and state legal and procedural mandates.

Equivalent(s): EDUC 939

Grade Mode: Letter Grading

EDUC 840 - Methods for Supporting Students in Special Education Using Intensive Interventions

Credits: 4

This course is designed to prepare educators to develop, implement, and assess the efficacy of evidence-based interventions for children and youth with intensive learning and behavioral needs. Topics addressed include the analysis of characteristics of learners and learning environments, and the subsequent design of individualized educational interventions in the areas of receptive and expressive language and literacy, mathematics, content-area academics and functional social/behavioral skills.

Equivalent(s): EDUC 940

Grade Mode: Letter Grading

EDUC 850 - Introduction to Disability in Inclusive Schools and Communities

Credits: 4

A life span perspective of the social, psychological, and physical characteristics of individuals with exceptionalities including intellectual, sensory, motor, health, and communication impairments. Includes implications for educational and human service delivery.

Grade Mode: Letter Grading

EDUC 851A - Inclusive Elementary Education: Literacies and Learning for Diverse Learners**Credits:** 4

This course examines the role and responsibility of the elementary educator as an advocate for, and educator of, students with diverse learning needs. Methods and structure to enable educators to understand, engage, and respond to the challenges presented within an academically diverse classroom are addressed. Special focus is given to research and applications for facilitating emergent literacies and social, emotional and behavioral development.

Mutual Exclusion: No credit for students who have taken [EDC 820](#).

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 851B - Methods of Inclusive Secondary Education: Literacies, Learning, and Transitions**Credits:** 4

This course examines the role and responsibility of the secondary educator as an advocate for, and educator of students with diverse learning needs. Methods and structures to enable educators to understand, engage, and respond to the challenges presented within an academically diverse classroom are addressed. Special focus is given to research and applications for developing literacy, knowledge and competence within the content areas, and for facilitating post secondary transitions.

Mutual Exclusion: No credit for students who have taken [EDC 820](#).

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 856 - Advocating for Diverse and Inclusive Family-School-Community Partnerships**Credits:** 4

The course is to examine the socio-cultural circumstances surrounding racially, culturally and linguistically diverse (RCLD) families raising children with disabilities, address the implications of the Individuals with Disabilities Education Act (IDEA) and Every Student Succeeds Act (ESSA) for families and professionals, discuss issues regarding families' experience during the special education process, assess family strengths and coping styles, and develop knowledge and skills to advocate for diverse and inclusive family-school-community partnerships.

Grade Mode: Letter Grading

EDUC 860 - Introduction to Young Children with Special Needs**Credits:** 4

The needs of children (birth to eight years) with developmental problems or who are at risk for disabilities. Strengths and special needs of such children; causes, identification, and treatment; current legislation; parent and family concerns; program models.

Grade Mode: Letter Grading

EDUC 861 - Designing Curriculum for Inclusive, Equitable Settings for Young Children (birth-8)**Credits:** 4

This course focuses on designing curriculum for inclusive and equitable settings for young children, birth through age 8. Classroom applications for constructivist theory in the areas of curriculum planning and implementation; issues of equity and diversity in curriculum and assessment; overview of research and theory related to teaching and learning of specific content areas, with emphasis on integrated approach to early childhood curriculum. Stresses the reciprocal nature of student-teacher relationship in the inclusive and equitable settings.

Grade Mode: Letter Grading

EDUC 881 - Introduction to Statistics: Inquiry, Analysis, and Decision Making**Credits:** 4

An applied statistics course that covers introductory level approaches to examining quantitative information. Students spend

about half of class time in the computer lab analyzing real data from the behavioral and social sciences. An emphasis is placed on the role of statistics in making empirically-based policy decisions.

Grade Mode: Letter Grading

EDUC 882 - Introduction to Research Methods

Credits: 4

This course provides an introduction to research methods in education and the social sciences. Issues from a wide variety of perspectives on research are covered, including the formal procedures employed by experimental psychologists, qualitative perspectives, and techniques used by researchers involved in exploratory investigations in schools and other real-life settings. The design and implementation of research studies is contextualized in current educational and social science issues.

Grade Mode: Letter Grading

EDUC 884 - Educators as Researchers

Credits: 4

With the guidance and support of the instructor, program participants will select an issue in education to explore in detail. They will articulate question(s) for inquiry, conduct a literature review related to their question(s), design and undertake their research study, and report their findings. Program participants will present their work within the context of the course. This course should be taken towards the end of your studies.

Equivalent(s): EDUC 984

Grade Mode: Letter Grading

EDUC 900A - Internship and Seminar in Teaching

Credits: 2-6

A two semester, full-time, supervised internship consisting of less-than-full-time teaching responsibility in selected educational settings and programs. Weekly seminars and occasional workshops held concurrently with internship.

Prerequisite(s): EDUC 706 with a minimum grade of D- or EDUC 806 with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 900B - Internship and Seminar in Early Childhood Education

Credits: 3 or 4

A two semester, supervised internship with a bi-weekly seminar. Admission by Application.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 900C - Internship and Seminar in Special Education

Credits: 3 or 6

A two semester, supervised internship with a weekly seminar. Admission by application.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 901A - Internship and Seminar in Teaching

Credits: 2-6

A two semester, full-time, supervised internship consisting of less-than-full-time teaching responsibility in selected educational settings and programs. Weekly seminars and occasional workshops held concurrently with internship.

Prerequisite(s): EDUC 706 with a minimum grade of D- or EDUC 806 with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 901B - Internship and Seminar in Early Childhood Education

Credits: 3 or 4

A two semester, supervised internship with a bi-weekly seminar. Admission by Application.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 901C - Internship and Seminar in Special Education

Credits: 3 or 6

A two semester, supervised internship with a weekly seminar. Admission by application.

Mutual Exclusion: No credit for students who have taken [EDC 803](#).

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 902 - Doctoral Pro-seminar

Credits: 4

Introduces students to the range of scholarly inquiry undertaken in doctoral programs. Students develop a broad understanding educational studies and analyze various research paradigms in terms of assumptions, methods, and outcomes. Coursework includes developing a proposal. Matriculated doctoral students only.

Grade Mode: Letter Grading

EDUC 904 - Qualitative Inquiry in Research

Credits: 4

Course will offer a theoretical background for conducting qualitative inquiry in social science research and practical experience in the design of research studies. Efforts focus on understanding how the type or tradition of qualitative inquiry shapes study design across conceptualization and research question formation phases as well as preliminary considerations about evidence. Critical perspectives in qualitative inquiry also explored. Through comparative analysis of different qualitative traditions, students will be prepared to make informed decisions about what approaches to use in their studies and why they are using them.

Grade Mode: Letter Grading

EDUC 905 - Critical Inquiry in Education

Credits: 4

Designed for advanced students to study philosophical methods needed for critical inquiry in education. Primary emphasis on practical mastery of: the construction and assessment of cogent argumentation; identification of common fallacies in reasoning; conceptual analysis; the appraisal of definitions, slogans, and metaphors in educational thought; and the disentangling of conceptual, factual, and normative claims associated with practical educational issues. Investigation of the difference between critique and criticism.

Grade Mode: Letter Grading

EDUC 906 - The Literature Review in Educational Research: Interdisciplinary Perspectives

Credits: 4

This course introduces graduate students to the rhetorical and analytic skills necessary for writing a well-structured, soundly presented literature review. This course covers systematic topics selection, research analysis, how to limit your research topic and focus your literature search, how to appraise your sources, negotiate the range of books, periodicals and reports you collect about your study, and writing, revising and editing strategies. Upon completing the course, students will have produced a literature review using a minimum of 30 self-selected research articles, books and digital resources. The course is appropriate for master's and doctoral students who are writing course papers, dissertations or theses.

Grade Mode: Letter Grading

EDUC 935A - Seminar and Practicum in Teaching

Credits: 4

For new graduate students admitted to the M.Ed. or M.A.T. program in the Department of Education. In-school experiences to develop introductory skills in observation and teaching. On-site seminars for analysis and evaluation. Assessment and advising related to teaching as a career. Prerequisite for further work toward a teacher licensure. Minimum of 7 hours a week, plus travel time, required.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

EDUC 951 - Laws and Regulations in Special and Inclusive Education**Credits:** 4

Articulation and analysis of current federal and state laws affecting students with disabilities in public schools. Focus on Section 504, the IDEA, and the ADA, as well as relevant case law. The role of constitutional and ethical issues that inform policy and practice will be addressed.

Grade Mode: Letter Grading**EDUC 956 - Developing Positive Behavior Supports to Ensure Success for All Learners****Credits:** 4

Behavioral challenges are the most frequent reason students with significant disabilities are excluded from inclusive settings in schools and communities. This course will provide a baseline knowledge of the 3-tiered MTSS-B framework, including the key features, how services and supports are implemented for all students in the school, and specific interventions for students who show risk of developing an emotional or behavioral disorder (Tier II), and development of strategies to support students who experience challenging behavior and individualized interventions for students with significant impairment (Tier III). This course provides knowledge in behavior as communication, utilization of functional assessments, and development of strategies to support students who experience challenging behavior.

Grade Mode: Letter Grading**EDUC 958 - Analysis of Teaching and Learning****Credits:** 4

Examination of and reflection on the nature of teaching will serve as the basis for analysis. A variety of strategies for analysis of teaching will be explored and implemented. Student-initiated inquiry into specific aspects of teaching will provide practical application of course material.

Grade Mode: Letter Grading**EDUC 959 - Issues in Education****Credits:** 4

Emphasizes the development of understandings, dispositions, and skills necessary to effectively participate in P-12 reform discussion and decision-making. The course focuses on foundational issues related to a) the legitimacy of public education, b) accountability-based national reform efforts, and c) the goals and content of school curricula. This on-line course is required for the M.Ed. in Educational Studies or elective for other degrees.

Grade Mode: Letter Grading**EDUC 960 - Curriculum Development****Credits:** 4

Students learn how to develop the curriculum for schools and school districts. The course builds skills and infuses an understanding of the role that curriculum development plays. It explores how current curricular issues influence the development of curriculum.

Grade Mode: Letter Grading**EDUC 962 - Educational Finance and Business Management****Credits:** 4

Principles of financing education, budgetary procedures, computer simulations, and business management. Analysis of N.H. school funding system. Handling practical school finance problems is part of the project work.

Grade Mode: Letter Grading**EDUC 964 - Human Resources in Education****Credits:** 4

Problems arising from the communications process. Implications of group problem-solving processes. Interpersonal relations among group dynamics among students, faculty, staff, administration, and the community. Application of theories.

Grade Mode: Letter Grading**EDUC 965 - Educational Supervision and Evaluation**

Credits: 4

Theoretical foundations and practical applications of supervisory and instructional practices and procedures; consideration of observation instruments and techniques. Teacher evaluation and supervision reviewed. Each student conducts a field supervisic project. Teaching experience required.

Grade Mode: Letter Grading

EDUC 967 - School Law**Credits:** 4

Relationship of law to public education. Emphasis on federal constitution, New Hampshire statutes, and case law related to publ interests served by elementary and secondary education. Special topics: church-state relationship, due process, desegregation, teacher employment, discrimination, negotiations, student rights, tort liability.

Grade Mode: Letter Grading

EDUC 968 - Collective Bargaining in Public Education**Credits:** 4

An examination of collective bargaining as practiced by school boards, administrators, and teacher organizations. Consideration given to collective bargaining statutes, case law, employee relations boards, unit determinations, exclusive representation, unior security provisions, scope of bargaining, good faith, grievance procedures, bargaining strategies, strikes, public interest, mediation, fact finding, arbitration, and the administration of the negotiated contract.

Grade Mode: Letter Grading

EDUC 970 - Foundations for Leadership in Higher Education**Credits:** 4

Seminar for master's and doctoral level students in education and related fields. Focus on the organization, structure, function, and dynamics of institutions of higher education, and the corollary roles and responsibilities of leaders in academic and student affairs. Intended for those currently in or planning to enter into leadership roles in a college or university.

Grade Mode: Letter Grading

EDUC 973 - Policy, Politics, and Planning in Education**Credits:** 4

Policy systems and fundamental values shaping the development and enactment of education policy at the federal, state, and local levels.

Grade Mode: Letter Grading

EDUC 974 - Educational Administrative Internship**Credits:** 4

This course is a clinically-based internship for students enrolled in a variety of graduate programs including masters, education specialist, doctorate, and educational credential programs. Students can intern in educational settings including schools, school/districts, educational agencies, centers, and in a higher education. Supervision is provided by university faculty and a clinical administrator or other appropriate official from the internship site.

Grade Mode: Graduate Credit/Fail grading

EDUC 975 - Advanced Professional Education Project**Credits:** 4

This course is clinically based. The student will work with an educational institution (e.g., school, school district, higher educatio or agency (e.g., Department of Education, educational center, higher education) with a clinical administrator/appropriate educat and a university supervisor. The project will address an educational institution's problem of practice, serve as a pilot study, or consist of an action research project.

Grade Mode: Graduate Credit/Fail grading

EDUC 976 - Policy and Governance in Higher Education**Credits:** 4

Seminar for master's and doctoral level students in Education and related fields. Examination of federal and state policies and

regulations affecting two-year and four-year colleges and universities, and governance practices necessary to achieve institution mission. Consideration of rationales for public oversight and financing of higher education, controversial topics (e.g., affirmative action, accreditation, proprietary institutions, distance learning), and strategies for effective shared governance are included.

Grade Mode: Letter Grading

EDUC 977 - Leadership: The District Level Administrator

Credits: 4

Examines the school superintendency and other district level positions of leadership that comprise the administrative team, focusing on the complexity of the current role and relationships, the critical issues facing school leaders, and the skills necessary for success as an educational leader in today's climate. Students analyze contemporary issues of school governance and examine problems of practice to understand the role of school superintendent and other district level administrators from a theoretical, political, and contemporary perspective.

Grade Mode: Letter Grading

EDUC 978 - Applied Regression Analysis in Educational Research

Credits: 4

This course introduces students to simple and multiple regression analysis, specifically as the methods are applied to research questions in educational research. Students learn about the linear regression model and its assumptions, how to use SPSS to fit the model to data, and how to interpret results. Students will also learn how to: evaluate the tenability of the model's assumptions; conduct thoughtful model building; model the effects of categorical predictors and statistical interactions; and handle multi-collinearity. The use of statistical techniques are modeled in class and then students apply these new techniques to datasets of educational relevance from a variety of sources, including educational surveys, observational studies, and randomized experiments. Students learn how to interpret the outcomes of their analyses thoughtfully and meaningfully and are asked to communicate these interpretations clearly and concisely in writing.

Prerequisite(s): [EDUC 881](#) with a minimum grade of B-.

Grade Mode: Letter Grading

EDUC 979 - Applied Multilevel Modeling

Credits: 4

This applied course in multilevel modeling is designed for graduate students in education and the social sciences who are interested in conducting statistical analysis to answer questions about (1) contextual effects on individual outcomes, and (2) individual change over time. Topics addressed include exploratory analyses of multilevel data, conditional and unconditional models, fixed and random effects, model assumptions, model fit, non-linear change, discontinuous change, time-varying predictors, unequally spaced measurement occasions, and three-level multilevel models.

Prerequisite(s): [EDUC 978](#) with a minimum grade of B-.

Grade Mode: Letter Grading

EDUC 981 - Quantitative Inquiry: Methods and Techniques of Educational Research

Credits: 4

Conceptual aspects and practical realities of the research process applied to problems in education and human service disciplines. Develops skills necessary to use, as well as conduct, research.

Grade Mode: Letter Grading

EDUC 982 - Qualitative Fieldwork & Data Analysis

Credits: 4

This course provides guidance and fieldwork opportunities for students to apply principles and strategies for qualitative fieldwork and data analysis. It focuses on how qualitative researchers generate, use, and represent data to generate ideas and build theory.

Prerequisite(s): [EDUC 904](#) with a minimum grade of B-.

Grade Mode: Letter Grading

EDUC 986 - Philosophy of Education

Credits: 4

Seminar in comparative analysis of educational theories and the philosophical foundations upon which they are based.

Application of theoretical criteria for evaluating educational practices and for developing one's own philosophy of education.

Grade Mode: Letter Grading

EDUC 991 - Curriculum Theory I

Credits: 4

This course focuses on the historical, cultural, and political dimensions of curriculum theory in the United States and Canada. An emphasis is placed on the underlying philosophical perspectives that inform the field of curriculum theory, including, but not limited to feminist theory, critical race theory, queer, and post-colonial theory.

Grade Mode: Letter Grading

EDUC 995 - Independent Study

Credits: 1-4

Opportunity for intensive investigation of a special problem or issue in the field of education.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

EDUC 998 - Special Topics

Credits: 1-4

Study of a particular theoretical, methodological, or policy issue. May be offered off campus as professional development.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

Special Fee: Yes

EDUC 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Electrical & Computer Engineering (ECE)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ECE 812 - Advanced Digital Systems Design and Verification

Credits: 4

This course will introduce standard on-chip communication networks for digital systems, off-chip wired/wireless communication protocols and the implementation of standard I/O interfaces. This course will also teach the advanced FPGA architecture, design flow, and debugging methods, and reinforce students' prototyping skills on standalone FPGAs and cloud FPGAs. Modern digital design and optimization techniques will be presented and examined, as well. Reliability and security issues in digital system design will be emphasized in this course.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

ECE 814 - Introduction to Digital Signal Processing

Credits: 4

Introduction to digital signal processing theory and practice, including coverage of discrete time signals and systems, frequency domain transforms and practical spectral analysis, digital filter terminology and design, and sampling and reconstruction of continuous time signals. Laboratory component providing an introduction to DSP design tools and algorithm implementation. Lab.

Grade Mode: Letter Grading

ECE 815 - Introduction to VLSI

Credits: 4

Principles of VLSI (Very Large Scale Integration) systems at the physical level. CMOS circuit and logic design, CAD tools, CMOS system case studies. Students exercise the whole development cycle of a VLSI chip: design and layout with the up-to-date commercial EDA tools. An IA (continuous grading) grade is given at the end of semester I.

Grade Mode: Letter Grading

ECE 817 - Introduction to Digital Image Processing

Credits: 4

Digital image representation; elements of digital processing systems; multidimensional sampling and quantization; image perception by humans, image transformations including the Fourier, the Walsh, and the Hough Transforms; image enhancement techniques including image smoothing, sharpening, histogram equalization, and pseudo color processing; image restoration fundamentals; image compression techniques, image segmentation and use of descriptors for image representation and classification. Lab.

Grade Mode: Letter Grading

ECE 857 - Fundamentals of Communication Systems

Credits: 4

Spectra of deterministic and random signals, baseband and bandpass digital and analog signaling techniques, transmitter and receiver architectures, performing analysis of digital and analog signaling in additive noise channels, carrier and symbol timing synchronization methods. Lab.

Grade Mode: Letter Grading

ECE 872 - Control Systems

Credits: 4

Development of advanced control system design concepts such as Nyquist analysis, lead-lag compensation; state feedback;

parameter sensitivity; controllability; observability; introduction to non-linear and modern control. Includes interactive computer aided design and real-time digital control. (Also offered as [ME 872](#).) Lab.

Equivalent(s): [ME 872](#)

Grade Mode: Letter Grading

ECE 875 - Applications of Integrated Circuits

Credits: 4

Design and construction of linear and nonlinear electronic circuits using existing integrated circuits. Limitations and use of operational amplifiers. Laboratory course in practical applications of non-digital integrated circuit devices. Lab.

Grade Mode: Letter Grading

ECE 884 - Biomedical Instrumentation

Credits: 4

Principles of physiological and biological instrumentation design including transducers, signal conditioning, recording equipment and patient safety. Laboratory includes the design and use of instrumentation for monitoring of electrocardiogram, electromyogram, electroencephalogram, pulse, and temperature. Current research topics, such as biotelemetry, ultrasonic diagnosis, and computer applications. Lab.

Grade Mode: Letter Grading

ECE 896 - Special Topics in Electrical or Computer Engineering

Credits: 1-4

New or specialized courses and/or independent study. Some sections may use credit/fail grading.

Grade Mode: Letter Grading

ECE 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

ECE 900 - Research and Development From Concept to Communication

Credits: 4

The course will introduce students to the general tools of scientific research and technical communication, including topics on: 1. how to conduct research (and development), and general tools for formulating research questions and hypotheses; 2. how to effectively communicate in writing and in oral presentations, both for proposals and for reports on completed technical work.

Grade Mode: Letter Grading

ECE 910 - Graduate Seminar

Credits: 1

Graduate seminars presented by UNH faculty, graduate students and external speakers. Topics include new research ideas and results in areas relevant to electrical and computer engineering.

Grade Mode: Graduate Credit/Fail grading

ECE 915 - Advanced Active Circuits

Credits: 3

Investigation of devices and techniques used in advanced circuit design using discrete solid-state devices and integrated circuits. Oscillators, phase-lock systems, low noise techniques, etc.

Grade Mode: Letter Grading

ECE 920 - Wireless Communication Systems

Credits: 3

Principles of wireless communication systems including analysis of radio wave propagation and modeling, large scale and small

scale signal fading, cellular communication architectures, multi-access systems, advanced modulation techniques, signal diversity systems, multiple antenna communications, cognitive radio, and software defined radio.

Grade Mode: Letter Grading

ECE 924 - Ubiquitous Computing

Credits: 3

Ubiquitous computing, or ubicomp, explores embedded, interconnected computing devices that are part of everyday objects and activities. This course takes an interdisciplinary look at the ubiquitous computing through the review of recent research literature. Topics include the visions of ubicomp and some of its applications, software and hardware for ubicomp, human-computer interaction, context awareness, privacy, and security. Students undertake a ubicomp research project inspired by the literature review.

Grade Mode: Letter Grading

ECE 925 - Biosensors: Fundamentals and Applications

Credits: 3

An in-depth and quantitative view of device design and performance analysis. An overview of the current state of the art to enable continuation into advanced biosensor work and design. Topics emphasize biomedical, bioprocessing, environmental, food safety and bio-security applications. College level general chemistry, calculus, differential equations, and linear algebra required prior to taking this course.

Grade Mode: Letter Grading

ECE 941 - Digital Signal Processing

Credits: 3

Discrete-time stochastic signals, signal modeling, parameter estimation, optimal filtering and decision making, with application adaptive filters, echo cancellation, channel equalization and parametric spectral estimation. Requires prior coursework in discrete time LTI systems, analysis and design of recursive and non-recursive linear digital filters, and Fourier based spectral estimation.

Grade Mode: Letter Grading

ECE 952 - Advanced Control Systems II

Credits: 3

Special topics in control theory: continuous and discrete systems; optimal control systems, including calculus of variations, maximum principle, dynamic programming, Weiner and Kalman filtering techniques, stochastic systems, and adaptive control systems.

Equivalent(s): ME 952

Grade Mode: Letter Grading

ECE 960 - Computer Architecture

Credits: 3

Advanced topics in computer organization. Parallel and pipeline processing, associative and stack computers, microprogramming, virtual memory, current topics.

Grade Mode: Letter Grading

ECE 992 - Advanced Topics

Credits: 1-4

Special course covering advanced topics in electrical and computer engineering. Refer to section description for details about the covered topics. Course may be repeated, but not in duplicate subjects.

Grade Mode: Letter Grading

ECE 998 - Independent Study

Credits: 1-3

Independent theoretical and/or experimental investigation of an electrical engineering problem under the guidance of a faculty member.

Grade Mode: Letter Grading

ECE 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

English (ENGL)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ENGL 800 - Studies in Literature

Credits: 4

Students in the MAT, MEd, and MST programs, as well as non-degree students, can register for graduate course work in English under this number. The precise topics and focus of each section vary. Topics include Old English Literature, Medieval Literature, 16th century, 17th century, 18th century, English Romantic Period, Victorian Period, 20th and 21st Century, Drama, Novel, Poetry Fiction, Nonfiction, A Literary Problem, Literature of the Renaissance, Postcolonial Literature, 20th to 21st Century American Literature. Barring duplication of subject, may be repeated for credit. Note: Students in the MA and PhD programs in English may not take English 800 for credit toward their degrees. English 800 will only be offered on the Manchester campus.

Grade Mode: Letter Grading

ENGL 804 - Advanced Nonfiction Writing

Credits: 4

This workshop embraces all forms of narrative nonfiction, including essays, memoir, literary journalism, and travel writing. Students write multiple pieces that serve as the heart of class discussion. In addition, the class discusses elements of craft and a myriad of selected readings that reflect the genre's range. May be repeated for credit with approval of the MFA director.

Repeat Rule: May be repeated for a maximum of 24 credits.

Grade Mode: Letter Grading

ENGL 805 - Advanced Poetry Workshop

Credits: 4

Workshop discussion of advanced writing problems and submitted poems. Individual conferences with instructor. Knowledge of writing poetry required. May be repeated for credit with the approval of the department chairperson.

Grade Mode: Letter Grading

ENGL 806 - The Art of Research for Creative Writers

Credits: 4

Many writers think that the heart of creative nonfiction is style, but in truth, the genre's soul is in its content. This course covers tools such as intimate reporting, periodicals, the Internet, and first-hand observation to research people, places, issues, and history. The skills learned will serve graduate students of all kinds of writing, from fiction to academic. Permission of instructor required.

Grade Mode: Letter Grading

ENGL 807 - Fiction: Form and Technique

Credits: 4

A writer's view of the forms, techniques, and theories of fiction. The novels, short stories, and works of criticism studied vary, depending on the instructor.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

ENGL 808 - Nonfiction: Form and Technique

Credits: 4

A writer's view of contemporary nonfiction, emphasizing the choices the writer faces in the process of research and writing.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

ENGL 809 - Poetry: Form and Technique**Credits:** 4

A writer's view of the problems, traditions, and structures of poetry.

Repeat Rule: May be repeated for a maximum of 12 credits.**Grade Mode:** Letter Grading**ENGL 810 - Teaching Writing: Seminar in English Teaching****Credits:** 1-6

An introduction to various methods of teaching writing. Combines a review of theories, methods, and texts with direct observation of teaching practice.

Grade Mode: Letter Grading**ENGL 812 - Writing the Creative Nonfiction Book****Credits:** 4

In this course, students learn to flesh out an idea for a book of creative nonfiction, which could either be literary journalism - a tale based on reportage - or memoir. Students focus on pulling multiple themes together in a strong narrative. By semester's end, students have written a book proposal and a first chapter. Students are asked to arrive at the first class with a topic researched enough to begin the book process. Permission of instructor required.

Repeat Rule: May be repeated for a maximum of 8 credits.**Grade Mode:** Letter Grading**ENGL 815 - Teaching English as a Second Language: Theory and Methods****Credits:** 4

A course on the linguistic, psychological, and sociological theories that inform our understanding of language acquisition and current best practices in the teaching of ESOL. Provides an overview of first and second language acquisition, bilingualism, learning individual differences (e.g. age, motivation, aptitude, learning strategies), and sociocultural contexts of ESL teaching and learning.

Grade Mode: Letter Grading**ENGL 816 - Curriculum, Materials and Assessment in English as a Second Language****Credits:** 4

A hands-on approach to developing curriculum and course material for teaching English as a Second Language. Students work on lesson plan development (needs analysis, objective writing, task sequencing, assessment of proficiency and objectives). Conduct ESL classroom observations, and engage in teaching demonstrations.

Grade Mode: Letter Grading**ENGL 818 - Morphology****Credits:** 4

Morphology is the study of word formation and the mental lexicon. This course explores processes of derivation, compounding and inflection that allow us to form new words. Students will become proficient in analyzing word formation processes in English and other languages, including deploying terminology used by morphologists. Students will learn and practice the conversation of "writing like a linguist".

Grade Mode: Letter Grading**ENGL 819 - Sociolinguistics Survey****Credits:** 4

How language varies according to the characteristics of its speakers: age, sex, ethnicity, attitude, time, and class. Quantitative analysis methods; relationship to theoretical linguistics. Focus is on English, but some other languages are examined. Introductory to linguistics required prior to registering for this course.

Grade Mode: Letter Grading**ENGL 827 - Issues in Second Language and Multilingual Literacy****Credits:** 4

Study of various issues in second language and multilingual literacy and writing theory, research, instruction and administration

Topics include, but are not limited to, the characteristics and needs of multilingual learners, L2 reading-writing interfaces, sociocultural influences on L2 literacy development, multilingual literacy instruction, and placement for emergent bilinguals. Writing intensive.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

ENGL 828 - Language and Gender

Credits: 4

This course will explore a variety of topics around the theme of language and gender, including the relationship between gender, language and power; the linguistic marking of gender; how people use language to construct and perform their gender; how gender intersects with other facets of identity, including sexuality and race and ethnicity.

Prerequisite(s): ENGL 405 with a minimum grade of D- or LING 405 with a minimum grade of D- or WS 401 with a minimum grade of D- or WS 405 with a minimum grade of D-.

Grade Mode: Letter Grading

ENGL 829 - Spec Top/Composition Studies

Credits: 4

Advanced course on a topic chosen by the instructor. Precise topics and methods of each section vary. Possible topics include: alternative discourses and rhetorics; contrastive rhetoric; electronic discourse and digital rhetoric; women's rhetorics and femininist pedagogies; Montaigne and the essay tradition; theories of literacy; theories of persuasive writing; theories of transactional writing; and written discourse analysis. Barring duplication of subject, may be repeated for credit. For details see the course descriptions available in the English Department.

Grade Mode: Letter Grading

ENGL 852 - History of the English Language

Credits: 4

Overview of the evolution of the English language from Proto-Indo-European until the present day. Topics to be covered include general introduction to language change, the relationship between language and literary style, the impact of technology on language, and the state of English in the world today.

Grade Mode: Letter Grading

ENGL 879 - Linguistic Field Methods

Credits: 4

Devoted to the study, with use of an informant, of some non-Indo-European language that is unfamiliar to both the students and the instructor at the beginning of the class. The primary aim of the course is to give students a practical introduction to linguistic analysis without the support of a text. Theoretical concepts are introduced as needed.

Grade Mode: Letter Grading

ENGL 889 - Special Topics in English Teaching

Credits: 4

Advanced theories and practices course on English Teaching. Topics such as A) Teaching Young Adult Literature, C) Teaching English in Diverse Contexts, D) Teaching Drama, N) Teaching Nonfiction, R) English Teachers as Researchers, and T) Alternate Literacies and Teaching Technologies. Barring duplication of subject, course may be repeated for credit. For details see course descriptions available in the English department.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

ENGL 890 - Special Topics in Linguistics

Credits: 4

An advanced course on a topic to be chosen by the instructor. Inquire at the English department office for a full course description each time the course is offered. Topics such as word formation, dialectology, linguistic theory and language acquisition, language and culture, cross-disciplinary studies relating to linguistics. Barring duplication of subject, may be repeated for credit. (Not offered every year.)

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

ENGL 891 - English Grammar

Credits: 4

An introduction to the terminology and major concepts in English grammar. Covers descriptive vs. prescriptive grammar, parts of speech, phrase structure, clause types, and basic sentence patterns. Useful for pre-service teachers seeking to acquire the background knowledge needed to make informed decisions about the teaching of English grammar.

Grade Mode: Letter Grading

ENGL 892 - Teaching Literature and Literacy: Seminar in English Teaching

Credits: 4

This course introduces theories and practices of teaching literature and literacy, including teaching reading and writing as well as teaching literary analysis at the secondary level. Students also learn to plan lessons, choose texts, and create learning activities for speaking, listening, and viewing in grade five through twelve. The course is designed for students who are interested in teaching a possible career.

Grade Mode: Letter Grading

ENGL 893 - Phonetics and Phonology

Credits: 4

The sounds and sound systems of English in the context of linguistic theory: comparisons of English to other languages. A basic linguistic course required prior to taking this course.

Grade Mode: Letter Grading

ENGL 894 - Syntax

Credits: 4

The relationship of grammar and meaning as viewed from the standpoint of modern linguistic theory. Emphasis on the syntax and semantics of English, with special attention to the construction of arguments for or against particular analyses. A basic linguistic course required prior to taking this course.

Grade Mode: Letter Grading

ENGL 897 - Special Studies in Literature

Credits: 4

A) Old English Literature; B) Medieval Literature; C) 16th Century; D) 17th Century; E) 18th Century; F) English Romantic Period; G) Victorian Period; H) 20th Century; I) Drama; J) Novel; K) Poetry; L) Nonfiction; M) American Literature; N) A Literary Problem; O) Literature of the Renaissance. The precise topics and methods of each section vary. Barring duplication of subject, may be repeated for credit. For details, see the course descriptions available in the English department.

Grade Mode: Letter Grading

ENGL 898 - Special Studies in Creative Writing

Credits: 4

Courses offered under this number focus on topics within creative writing, such as poetic influences, the short story form, and writing the novel. The precise topics and methods of each section vary. Barring duplication of subject, course may be repeated for credit. For details, see the course descriptions available in the English Department.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

ENGL 899 - Master of Fine Arts in Writing Thesis

Credits: 1-8

Eight credits required, that can be taken in any combination during the student's academic coursework. IA (Continuous grading)

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Graduate Credit/Fail grading

ENGL 901 - Advanced Writing of Fiction**Credits:** 4

Workshop discussion of advanced writing problems and readings of students' fiction. Individual conferences with instructor. May be repeated for credit with the approval of the department chairperson.

Grade Mode: Letter Grading**ENGL 910 - Practicum in Teaching College Composition****Credits:** 6

Seminar focuses on composition practical and theoretical issues of significance to the teaching writing to first-year students. A mentorship component creates opportunities for close supervision and support by experienced teachers in the writing program. Open only to teachers in the First-year Writing program.

Grade Mode: Letter Grading**ENGL 911 - Writing for Teachers****Credits:** 2-6

Opportunity for teachers of composition in K-12 settings to work intensively on their writing, to read as writers, and to discover principles appropriate to the writing genre they are teaching. Because of its special focus, this course may not be applied to the M.A. in English Studies/M.F.A. option. Topics may vary.

Repeat Rule: May be repeated for a maximum of 6 credits. May be repeated up to 3 times.**Grade Mode:** Letter Grading

> [View Course Learning Outcomes](#)

ENGL 912 - Historical and Theoretical Studies in Rhetoric**Credits:** 4

The rhetorical tradition in Western culture, with a special focus on three critical periods: the classical period (Aristotle, Cicero, Quintillian), the eighteenth century (Blair and Campbell), and the modern era (Burke, Booth, Perelman, Ong, Weaver).

Grade Mode: Letter Grading**ENGL 913 - Theory and Practice of Composition****Credits:** 4

Examination of major theoretical and pedagogical works in the field of composition. To include works on the writing process, writing development, response to writing, and other topics.

Grade Mode: Letter Grading**ENGL 914 - Special Topics in Composition and Rhetoric****Credits:** 4

Topics chosen by instructor may include: A) Political, Philosophical, and Ethical Issues in Composition; B) Gender and Writing; C) Cognition and Composition; and D) Ethnographics of Literacy. May be repeated for credit, barring duplication of topic.

Grade Mode: Letter Grading**ENGL 916 - History of Composition****Credits:** 4

Composition teaching and theory in American colleges and academics from the 18th century to the present.

Grade Mode: Letter Grading**ENGL 918 - Research Methods in Composition****Credits:** 4

Overview of major research approaches including historical, case study, ethnographic, and textual; special emphasis on research design.

Grade Mode: Letter Grading**ENGL 919 - Teaching the Writing Process**

Credits: 2-6

Focus both on the writing of the participants and on the teaching of writing in grades K-12. Special attention is given to strategies for prewriting, revision, evaluation, and conducting writing conferences. Course is offered through the NH Literacy Institutes.

Repeat Rule: May be repeated for a maximum of 6 credits. May be repeated up to 2 times.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

ENGL 920 - Issues in Teaching English and the Language Arts**Credits:** 1-6

Special topics in the teaching of English and the language arts. Inquire at the English department to see what topics in the teaching of reading, writing, literature, or language arts may be scheduled. Open only to graduate students with a professional interest in teaching or to practicing teachers. 1-6 credits depending on the specific course.

Grade Mode: Letter Grading

ENGL 921 - Special Topics in Teacher Leadership in Literacy and Writing**Credits:** 2-6

This special topics course is designed to equip literacy/language arts teachers with the advanced knowledge, skills, and tools to become effective leaders within their schools/communities. Through readings, exploration, practicum and/or research, and discussions, participants develop various leadership qualities. Special Topics may focus on the following (1) advocating for student literacy and writing, (2) fostering a positive school culture for literacy and writing, (3) building writing centers or WAC initiatives, (4) explorations and collaborations for broader literacy impacts, or (5) teachers contributing and conducting research for the overall improvement of literacy and language arts education. This course is for practicing K-12 teachers with licensure and experience in any area. Interested teachers must seek approval from the Program Coordinator of the NH Literacy Institutes to register.

Repeat Rule: May be repeated for a maximum of 9 credits. May be repeated up to 3 times.

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

ENGL 922 - Advanced Topics in Literacy Instruction**Credits:** 1-6

Specialized study of literacy topics that may include: A) Nature Journaling; B) Gender and Literacy; C) Digital Storytelling; D) Multigenre Writing; E) Assessment; F) Capstone Project; and G) Literacy Problem.

Grade Mode: Letter Grading

ENGL 924 - Professional Preparation**Credits:** 2

This 2-credit course, offered in alternate years, is designed primarily to help doctoral students prepare to enter the profession. It takes up such topics as writing a resume or curriculum vitae, presenting a conference paper, submitting an article, applying for a job, and interviewing.

Grade Mode: Graduate Credit/Fail grading

ENGL 925 - Graduate Study of Literature**Credits:** 4

Techniques, resources, and purposes of literary study: close reading; practical criticism; critical theories and their values; pertinence of intellectual and historical backgrounds. Approaches applied to a specific area of literary study, which varies from year to year.

Grade Mode: Letter Grading

ENGL 938 - Seminar: Studies in 20th Century American Literature**Credits:** 4

Seminar: Studies in 20th Century American Literature. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

ENGL 974 - Seminar: Studies in 20th Century British Literature**Credits:** 4

Seminar: Studies in 20th Century British Literature. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**ENGL 981 - Seminar: Studies in Post-Colonial Literatures in English****Credits:** 4

Seminar: Studies in Post-Colonial Literatures in English. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**ENGL 995 - Independent Study****Credits:** 1-8

To be elected only with permission of the director of graduate studies and of the supervising faculty member.

Grade Mode: Letter Grading**ENGL 996 - Reading and Research****Credits:** 2-8

Reading and Research.

Grade Mode: Graduate Credit/Fail grading**ENGL 998 - Master's Paper****Credits:** 4

Master's Paper. IA (Continuous grading).

Grade Mode: Graduate Credit/Fail grading**ENGL 999 - Doctoral Research****Credits:** 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading**Special Fee:** Yes

Environmental & Resource Economics (EREC)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Genetics (GEN)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

GEN 804 - Microbial Genetics and Genomics

Credits: 5

Study of heritable information in bacteria, their viruses, and model Eukaryotic microbes and fundamentals of bacterial genomics. Topics will include genetics of bacteriophages and bacteria; genome maintenance, mutation and evolution especially in reference to evolution of pathogens; mechanisms of gene transfer, gene regulation and adaptive responses; analysis of gene expression including by using the latest genomic tools; use of genomic data, including concepts and strategies of genome sequencing and annotation as well as metagenomics approaches for understanding diversity. Practical laboratory training in microbial genetics and genomics. Special emphasis on recombinant DNA techniques, nucleotide sequencing methods, and bioinformatics analysis to dissect and analyze gene function and genome structural features as practical tools for careers in biotechnology. Original research projects will include opportunities to work with bacteria, phages, and yeast.

Grade Mode: Letter Grading

Special Fee: Yes

› [View Course Learning Outcomes](#)

GEN 805 - Population Genetics

Credits: 3

Exploration of the forces (mutation, selection, random drift, inbreeding, assortative mating) affecting the frequency and distribution of genetic variation in natural populations. Quantifying the structure of populations. Methods of analysis for theoretical and practical applications. One semester of genetics and one semester of statistics recommended.

Equivalent(s): ZOOL 805

Grade Mode: Letter Grading

GEN 806 - Human Genetics

Credits: 4

Genetic basis of human traits and diseases including both traditional methods of diagnosis and contemporary molecular genetic approaches stemming from the human genome project. Case studies exemplify common practices in human genetic counseling and integrate the scientific basis of diagnosis with the special ethical implications of human genetic analysis. One semester of genetics recommended.

Equivalent(s): ANSC 806

Grade Mode: Letter Grading

GEN 811 - Genomics and Bioinformatics

Credits: 0 or 4

Methods, applications, and implications of genomics-the analysis of whole genomes. Microbial, plant and animal genomics are addressed. Medical, ethical and legal implications of genomic data. Computer lab provides exposure and experience in a range of bioinformatics approaches used in genome analysis. One semester of genetics recommended. Computer lab.

Equivalent(s): BCHM 811, MICR 811

Grade Mode: Letter Grading

GEN 812 - Programming for Bioinformatics

Credits: 5

Development of programming skills that enable life science students to ask fundamental biological questions that require computers to automate repetitive tasks and handle query results efficiently. Topics include: computer values of important parameters of biological sequence data; pattern search and motif discovery scripts; accessing, querying, manipulating, retrieving, parsing, analyzing, and saving data from local and remote databases. One semester of bioinformatics and one semester of genetics.

recommended. Computer Lab.

Grade Mode: Letter Grading

GEN 813 - Microbial Ecology and Evolution

Credits: 4

Evolutionary and ecological forces that generate the tremendous diversity of microbial life on Earth with emphasis on viruses, archaea and bacteria. Functional roles of microorganisms, their population dynamics and interactions, and their mechanisms of evolutionary change in a variety of environmental settings, including natural communities and laboratory microcosms.

Introductory microbiology and microbiology lab and one semester of genetics recommended.

Equivalent(s): MICR 813

Grade Mode: Letter Grading

GEN 815 - Molecular Evolution

Credits: 4

Rates and patterns of evolutionary change in biomolecules. Forces affecting the size and structure of genomes. Molecular mechanisms of organismal evolution. Emphasizes integrating evidence from biochemistry, molecular genetics and organismal studies. Methods for reconstructing phylogeny from molecular sequences. One semester of genetics and one semester of statistics recommended. Computer lab.

Equivalent(s): ZOOL 815

Grade Mode: Letter Grading

GEN 817 - Molecular Microbiology

Credits: 5

Fundamental physiological and metabolic processes of archaea bacteria and fungi with a strong emphasis on prokaryotes. Literature-based course with lab. Topics include regulation and coordination of microbial metabolism, bacterial cell cycle, global control of gene expression, signal transduction, and microbial cell differentiation. Introductory microbiology and microbiology lab and one semester of genetics recommended. Lab.

Equivalent(s): MICR 817

Grade Mode: Letter Grading

Special Fee: Yes

GEN 821 - Comparative Genomics

Credits: 4

Explores the central questions and themes in contemporary comparative genomics, including genome biology, phylogenomics, human origins, population genomics, and ecological genomics. Provides the conceptual framework required to evaluate new work in this fast-changing field. One semester of genetics recommended.

Grade Mode: Letter Grading

GEN 825 - Population Genetics Lab

Credits: 2

Hands-on approach to exploration of evolutionary forces affecting the frequency and distribution of genetic variation in natural populations. Wet lab techniques include DNA extraction, restriction enzyme digestion, PCR, DNA fragment size-selection.

Computational skills include high-throughput sequencing data control, identifying allelic variants, and generation of population genetic summary statistics. One semester of genetics and one semester of statistics recommended.

Co-requisite: [GEN 805](#)

Grade Mode: Letter Grading

Special Fee: Yes

GEN 871 - Molecular Genetics

Credits: 4

Structure, organization, replication, dynamics, and expression of genetic information in eukaryotes. Focus on molecular genetic and epigenetic mechanisms of gene expression and its control; molecular genetic control of cell division and differentiation during development. One semester of genetics recommended.

Equivalent(s): BCHM 871
Grade Mode: Letter Grading

GEN 872 - Evolutionary Genetics of Plants

Credits: 4

Explores diverse aspects of plant genetic change in nature and under human influence. Emphasis will be placed on the unique aspects of plants such as polyploidy and distinctive mating systems.

Equivalent(s): PBIO 872

Grade Mode: Letter Grading

Geospatial Science (GSS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

GSS 800 - Elements of Geospatial Science

Credits: 4

This on-line course lays the foundation for Geospatial Science (GSS) thinking by exploring the definition, methods, data types, data sources, software, and equipment used within the field of GSS. The importance and structure of the regional GSS industry is discussed with emphasis on how GSS is used across multiple disciplines. Course includes some guest lectures from industry professionals. Lectures and tests are conducted on-line. Students are required to download and install some software and data to complete assignments.

Grade Mode: Letter Grading

GSS 805 - Applied Geographic Information Systems

Credits: 4

This course teaches concepts and applied techniques of Geographic Information System technologies to solve real world Geospatial Science problems across multiple disciplines. Technical topics covered include geospatial data collection, management, analysis, scripting, visualization, and 3D mapping. Student hands-on-lab and independent exercises use the latest version of the world's most popular professional GIS software, ArcGIS Pro. Development and implementation of independent projects are completed by students to forward their professional, academic, or research interests.

Grade Mode: Letter Grading

GSS 827 - Applied Drone Remote Sensing

Credits: 2

Within this course, students will learn concepts and applied methods of Unoccupied Aerial Vehicle (UAV) drone operations for remote sensing across multiple disciplines. Concepts to be covered include the types, costs, and uses of various UAVs and UAV sensor systems for scientific remote sensing. Learned skills will include flight operations, aerial data collection, image registration, data processing, image classification, data analysis, and visualization. Students will utilize class-provided, hands-on UAVs and software to complete daily exercises and labs. Final project reports will be turned in on the last day of class.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

GSS 996 - Geospatial Science Independent Study

Credits: 1-4

May include research project, fieldwork or a relevant internship where students will build or apply GIS, Remote Sensing, GPS, or other Geospatial technologies. To be elected only with permission of program coordinator and with qualified supervision.

Grade Mode: Letter Grading

Special Fee: Yes

Global Conflict and Human Security (GCHS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

GCHS 810 - Conflict & Human Security

Credits: 3

Examines patterns and trends of armed conflict, especially terrorism, insurgency and civil war in the 21st century. Reviews conditions that are likely to lead to war and the myriad ways conflict affects the economy, political system, and cultural norms of society. Explores how civil wars end, key elements of effective peace processes, and the conditions under which mass violence is likely to resume. Examines conflict prevention strategies such as: preventing and countering violent extremism (P/CVE), disarmament, demobilization and reintegration (DDR) of combatants, and reform of police and military forces (security sector reform/SSR). Case studies on countries in Asia, Middle East, Africa and Latin America.

Grade Mode: Letter Grading

GCHS 820 - Global Governance

Credits: 3

An introduction to the concepts and theories of global governance. Examines the role governments, non-governmental organizations, institutions, civil society, and other actors play in the development and implementation of international law and policies. Focuses on the global institutional infrastructure for foreign aid, humanitarian relief, development programs, peacebuilding, and human rights advocacy. Explores how multilateral organizations, non-governmental organizations and other actors promote human security and sustainable development in countries with weak governments.

Grade Mode: Letter Grading

GCHS 830 - International Development & Human Security

Credits: 3

Introduces international development policy and practice. Explores the interrelatedness of the United Nations' distinct human security domains (economic, food, health, environmental, personal, community, and political security), and reviews their connections to the UN Sustainable Development Goals (e.g., zero hunger, peace, justice and strong institutions). Examines the strategies used by humanitarian and development organizations to enhance people's well-being in fragile states and conflict zones. Topics include: ethics of humanitarianism; how to create effective programs to alleviate poverty, tackle corruption and empower women and girls. Case studies on countries in Asia, Middle East, Africa and Latin America.

Grade Mode: Letter Grading

GCHS 840 - Sustainable Development: Gender-Environment Nexus

Credits: 3

The United Nations' 2030 Agenda for Sustainable Development provides an overarching set of goals to enhance fundamental well-being for all. Sustainable Development Goals (SDGs) are mutually reinforcing; for example, environmental sustainability impacts gender equality/women's empowerment and vice versa. This course examines environment-related SDGs through a gender lens. Topics include but are not limited to: SDG 2 (zero hunger), SDG 12 (responsible consumption and production), SDG 13 (climate change).

Grade Mode: Letter Grading

GCHS 850 - Peace and Human Security in the Post-Atrocity State

Credits: 3

Introduces theoretical and practical frameworks for understanding various stages of conflict with a focus on conflict transformation and peacebuilding in the post-atrocity state. Through the use of historical and contemporary case studies, explores practices of conflict transformation and security issues caused by regime change, state-sanctioned violence, civil war and conflict and/or genocide. Topics include mediation, negotiation, facilitation and adjudication; methods of conflict prevention; the development and current state of transitional and restorative justice mechanisms; and the international community's role in

peacebuilding and peacekeeping.

Grade Mode: Letter Grading

GCHS 860 - Research Methods

Credits: 3

Active learning course that introduces the concepts and elements of the research process. Explores quantitative and qualitative methods of data collection (i.e., surveys, focus groups, etc.) and data analysis. Topics include research design, sampling, measurement, reliability and validity, and ethical responsibilities of researchers.

Grade Mode: Letter Grading

GCHS 870 - Statistics & Data Analysis

Credits: 3

Provides an overview of how to use statistical data analysis techniques to explore problems and answer questions related to pub management. Students learn to design quantitative research projects and collect, analyze, and interpret data using descriptive and inferential statistical techniques.

Grade Mode: Letter Grading

GCHS 880 - Project Design

Credits: 3

Provides an understanding of the essential aspects of development projects and the elements that contribute to sound project identification and design. Experiential learning opportunities to acquire and practice basic and advanced skills and techniques involved in the conceptualization and planning of development projects. Foundation course for monitoring and evaluation (M&E)

Grade Mode: Letter Grading

GCHS 890 - Project Management

Credits: 3

Monitoring & Evaluation II: provides in-class and hands-on knowledge and skills in a variety of social research techniques in order to [1] validate, verify and finalize the project's problem analysis, [2] construct the project logic model, [3] lay out the positive and negative factors that influence the project, and, if applicable, [4] commence the implementation of the project.

Grade Mode: Letter Grading

GCHS 898 - Capstone: Non-Thesis

Credits: 3

The culminating activity of the Global Conflict and Human Security program. Provides opportunities to demonstrate and build on the knowledge and skills acquired throughout the GCHS program. Students work with a faculty mentor(s) to complete and evaluate projects begun in a previous term. Students present their findings and evaluative assessments of their projects.

Grade Mode: Letter Grading

Graduate School (GRAD)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

GRAD 800 - Continuing Enrollment

Credits: 0

All continuing graduate students who are not enrolled for course credits, thesis credits, Doctoral Research (999) or Master's Continuing Research ([GRAD 900](#)), and are not in residence, are required to register for [GRAD 800](#) each semester of the academic year (or each summer for students in MATH M.S.T., and English M.S.T. and College Teaching M.S.T. programs). Students registered for [GRAD 800](#) are considered part-time. Not graded.

Grade Mode: Not graded

Special Fee: Yes

GRAD 834 - Fundamentals of Citizen and Community Science

Credits: 3

This course introduces the emerging field of citizen science, including community science, exploring theories and applications in natural, physical, and social science fields. Students will develop competencies related to project design and implementation. The course will focus on best practices for effective projects and teams and include topics such as volunteer engagement, methods for data sharing, and issues of social justice in citizen science.

Grade Mode: Letter Grading

GRAD 844 - Fundamentals of Stakeholder and Community Engagement in Natural Resource Management

Credits: 3

Management of natural resources requires the effective involvement of stakeholder and community groups that often have differing perspectives on the path ahead. This course provides a foundation for students from various disciplines to develop a fundamental understanding of the theory and practice of stakeholder and community engagement in natural resource management across a range of ecosystem and governance scales (with a focus on the US Northeast). Students will explore various case studies and track topics of interest throughout the course.

Grade Mode: Letter Grading

GRAD 891 - National Science Foundation Graduate Research Fellowship Preparation

Credits: 0

This course is designed to enable students to receive information, guidance, and support in applying for the National Science Foundation (NSF) Graduate Research Fellowship program (GRFP). Students will become familiar with the NSF, its mission, and the selection criteria for this fellowship. Through independent work and collaborative exercises, students will strengthen writing skills and develop a strong application.

Grade Mode: Graduate Credit/Fail grading

GRAD 900 - Master's Continuing Research

Credits: 0

Master's Continuing Research ([GRAD 900](#)) is for Master's students who are in residence and need to be full time but have already completed all course requirements, have previously registered for the maximum number of thesis or project credits. As this grants full-time status, students are also responsible for the full time mandatory fees. Effective Fall 2020, [GRAD 900](#) may be taken only once. However, students who need to repeat this registration may do so with permission. Not Graded.

Grade Mode: Not graded

Special Fee: Yes

GRAD 930 - Ethics in Research and Scholarship

Credits: 2 or 3

Individual, professional, institutional, and social issues related to the ethical conduct of research and scholarship. Uses case studies to demonstrate the application of pertinent regulations, policies, and guidelines.

Grade Mode: Graduate Credit/Fail grading

GRAD 950 - Issues in College Teaching

Credits: 2

Issues faced within the classroom including evaluation methods, classroom climate and diversity, instructional approaches, teaching and learning resources, and student behavior. Case studies.

Equivalent(s): GRAD 940

Grade Mode: Graduate Credit/Fail grading

GRAD 951 - Teaching with Writing

Credits: 2

Examination of the issues, principles, and practices of using writing to enhance learning. Appropriate for all fields and disciplines. Participants design and field test assignments. Seminar requires field work and independent research.

Grade Mode: Graduate Credit/Fail grading

GRAD 961 - Cognition, Teaching, and Learning

Credits: 2

Cognitive theories and their application to classroom instruction. Examination of historical relation between cognition and education as well as current application of cognitive theory in the learning process. Cognitive skills involved in the learning process. Teaching strategies that enhance the use of cognitive skills and improve learning and teaching effectiveness.

Grade Mode: Letter Grading

GRAD 965 - Classroom Research and Assessment Methods

Credits: 2

Examination of methods used in classroom assessment and classroom research. The focus is on the improvement of teaching and learning in a teacher's own classroom. Research project is required.

Grade Mode: Letter Grading

GRAD 970 - Special Topics in College Teaching

Credits: 2-4

Formal courses in college teaching: A) field studies; B) disciplinary studies, C-Z other.

Repeat Rule: May be repeated for a maximum of 10 credits.

Grade Mode: Letter Grading

GRAD 995 - Independent Study in College Teaching

Credits: 1-4

Faculty supervised independent studies in college teaching.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

GRAD 998 - College Teaching Portfolio

Credits: 1

An integrative experience for the cognate in college teaching, culminating in an electronic teaching portfolio submitted to the Center for Excellence in Teaching and Learning.

Grade Mode: Letter Grading

Health & Human Services (HHS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HHS 810 - Introduction to Telehealth

Credits: 3

This course focuses on the ever-changing landscape of telehealth through the lens of various health disciplines. Students will explore topics such as the digital divide, telepresence, ethics, telehealth technology, and current practices in telehealth. In addition to completing weekly modules that span a variety of key telehealth topics, students will work collaboratively at a distance to create a multi-media project focused on a telehealth topic of interest.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HHS 898 - Special Topics

Credits: 1-8

Special Topics. Special fee on some topics.

Grade Mode: Letter Grading

Special Fee: Yes

Health Care (HLTC) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HLTC 800 - Health Care Delivery and Innovations

Credits: 3

The course examines the political, legal, economic and fiscal components that impact and influence health care delivery systems. A focus within the course will be on developing and managing innovations that improve the value of health care. Management challenges and barriers to implementing change within the system will also be examined.

Equivalent(s): HLTC 800G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HLTC 801 - Health Care Financial Management

Credits: 3

This course provides a critical introduction to the financial structure and challenges of health care finance. The student will learn the impact of current changes in health care and the need for clinical and financial integration. Content includes information specific to revenue cycles, billing compliance, charity care, bad debt and payers (private and government). The student will understand the unique budgeting processes and financial reporting requirements of health care organizations. The course discusses the interprofessional roles in the day to day financial operations. High level communication skills in finance to engage dialogue with stakeholders will be required.

Equivalent(s): HLTC 801G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HLTC 802 - Advocacy and Health Policy

Credits: 3

This course requires the student to employ analytical skills to evaluate the impact of institutional, regulatory and political policies on financial and health outcomes. Interprofessional health care roles will be introduced and integrated into decision-making and advocacy in health care. Issues specific to health insurance, socioeconomic challenges and barriers to health care will be included. The student will examine the impact of emerging regulations, organizational and political change to health care quality and cost.

Equivalent(s): HLTC 802G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HLTC 810 - Health Care Quality and Safety

Credits: 3

This course provides an in-depth analysis of the quality and safety priorities in the current health care environments. Students will contrast the strengths and weaknesses of current quality improvement models including aspects related to efficiency, accuracy, and timeliness as well as being ethical and culturally responsible. The master's student will engage in the promotion of high level communications and advocacy that are necessary for quality and safety initiatives. The course includes the impact of regulatory organizations in health care quality. The student will be prepared to plan, implement and evaluate the results of a quality improvement and specifically address the improvements to health care outcomes.

Equivalent(s): HLTC 810G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HLTC 811 - Health Care Technology and Informatics

Credits: 3

This course provides students with the opportunity to ethically manage data, information, knowledge, and technology. Students will focus upon the development and quality of data-driven outcomes. Students will critique and utilize research and evidence from data to inform decisions that impact the health care outcomes. In addition, the student will analyze emerging health care technologies as they are applied to environments, safety, cost and improvement of health. Ethics and privacy are emphasized in the evaluation of technology in health care.

Equivalent(s): HLTC 811G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HLTC 850 - Health Care Management Integrative Capstone**Credits:** 3

This integrative course is the culminating course in the Master of Science in Health Care Management. All other required coursework must have been completed prior to receiving approval to register for this course. Students during the capstone experience will integrate health care management competencies, and acquired knowledge and skills that combine health care perspectives, theories, skills, and tools in an applied format. Final products include a comprehensive project that incorporates strategic and organizational components designed specific to health care systems. After documenting the above, students will discuss and defend their project orally.

Equivalent(s): HLTC 850G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Health Data Science (HDS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HDS 801 - The U.S. Healthcare System

Credits: 3

Focuses on the organization, financing, and delivery of healthcare in the U.S. Contrasts the private and public sectors and examines the effects of market competition and government regulation. Examines the ways that medical providers are paid, and explores the major issues currently facing physicians, hospitals, and the pharmaceutical industry. Discusses several potential small-scale and large-scale reforms to the healthcare system and evaluates their likely effects on healthcare spending, quality of care, and access to care.

Equivalent(s): [ADMN 801](#)

Grade Mode: Letter Grading

HDS 802 - Programming in Healthcare Environments

Credits: 3

This course covers using Python as a programming language to write, implement, and design programs that are relevant to various aspects of programming in a health setting. After completion of this course, students should be comfortable with the basic data structures in Python and R (including arrays, dictionaries, and dataframes), conditional logic and iterators, writing Python and R functions, and using Python libraries to read external data and perform data manipulations and data analysis.

Grade Mode: Letter Grading

HDS 803 - Translation of Health Data

Credits: 3

This course will give you the skills you need to leverage data to reveal valuable insights and advance your career. This course teaches you the visualization skills necessary to be effective Data Storytellers which helps engage your audience in a story about the data. This course focuses on concepts as well as hands-on experience of presenting data from initial concepts to final presentation by creating meaningful displays of quantitative and qualitative data to facilitate peer/managerial decision making.

Prerequisite(s): [HDS 801](#) with a minimum grade of B-.

Grade Mode: Letter Grading

HDS 804 - Health Data Systems

Credits: 3

In this course, students will learn the landscape of data used in healthcare settings, engage in active case applications and case studies, and propose a decision support system improvement. It examines modern decision support systems, types of applications, both mobile and web based, enterprise versus cloud-based systems. Specifically examined will be the Electronic Health Record (EHR) and other clinical and administrative information systems. Also examined will be interoperability and regulatory requirements.

Prerequisite(s): [HDS 801](#) with a minimum grade of B-.

Grade Mode: Letter Grading

HDS 805 - Applied Machine Learning in Healthcare

Credits: 3

This course covers the foundations of machine learning in healthcare systems including algorithms related to classification and regression prediction in supervised setting, clustering and dimension reduction in an unsupervised setting. Topics include data preprocessing and classification techniques such as logistic regression, support vector machines, KNN, Naïve Bayes', ensemble methods such as random forests, boosted trees, XGBoost, dimension reduction techniques such as principal components analysis, t-distributed stochastic neighborhood embedding, ISOMAP, locally linear embedding, UMAP, multidimensional scaling.

Prerequisite(s): HDS 800 with a minimum grade of B- and [HDS 801](#) with a minimum grade of B- and [HDS 802](#) with a minimum

grade of B-.

Grade Mode: Letter Grading

HDS 806 - Qualitative Inquiry in Health Outcomes Research

Credits: 3

This course underscores the scope and application of qualitative research methodology for conducting basic, applied and transformative research to develop and elucidate outcomes pertaining to public and population health interventions. Emphasis will be given on social determinants of health and human behavioral mechanisms influencing the effectiveness of health interventions.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HDS 807 - Unstructured Health Data

Credits: 3

This course covers the essential unstructured data formats, storage platforms and methods of retrieving and analyzing such data the healthcare system. Specifically, the course will cover electronics health records, patient health portals, telemedicine videos, ICU sensor data, genomic data, biomedical literature, social media data, biomedical image data and physician notes.

Prerequisite(s): [HDS 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

HDS 808 - The Successful Healthcare Project

Credits: 3

This course supports the design and initiation of the Practicum Health Data Science project required for completion of the Master of Health Data Science program. Students may elect to enroll in this course before beginning the practicum or concurrently with the practicum. The course covers definition of a high value research topic, development of a project plan and project launch. Students will complete key project milestones including negotiation of a project charter, development of an approved analysis plan, and demonstrate access to required data.

Prerequisite(s): HDS 800 with a minimum grade of B- and [HDS 801](#) with a minimum grade of B- and [HDS 802](#) with a minimum grade of B- and [HDS 803](#) with a minimum grade of B-.

Grade Mode: Letter Grading

HDS 890 - HDS Independent Study

Credits: 3-6

This course will be designed by the student and the instructor. Course topics and deliverables will be established together and approved by the supervising faculty. Credit hours (not to exceed 6-credit hours) will be determined by the supervising faculty based on the size and scope of the student's intended project.

Grade Mode: Letter Grading

Health Management & Policy (HMP)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HMP 933 - Quality and Process Improvement in Healthcare

Credits: 3

This course introduces analytics tools to improve healthcare quality and processes. Topics include quality measures and indicators, project and change management, six sigma components, and lean. A majority of the course will focus on using data relevant tools, and techniques for each of the six-sigma phases: Define, Measure, Analyze, Improve, and Control (DMAIC). Define and measure phases start with a review of probability and distribution rules and various descriptive analytics tools. These phase also include development and application of process maps, flow charts, Pareto charts, relationship matrix, and written procedures. Analyze phase includes hypothesis testing and design of experiments. Improve and control phases include root cause analysis, statistical process control, and lean tools.

Equivalent(s): NURS 933

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

History (HIST)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HIST 800 - Advanced Explorations

Credits: 1-4

Advanced explorations in one of the fields listed below: A) American History, B) European History, C) World History, D) Ancient History. Barring duplication of subject, may be repeated.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

HIST 803 - European Conquest of North America

Credits: 4

European Conquest of America explores many of the major issues relating to the creation and development of colonial North America. We will focus particularly on the extraordinary heterogeneous mixture of peoples who lived in North America and the Caribbean, and on the complexity and consequences of their interactions. Throughout the semester we will continually evaluate arguments among historians about whether or not it makes sense to understand the colonial period in terms of a conquest, or whether Native Americans retained enough power and resistance throughout the colonial period to make such an interpretation inaccurate.

Grade Mode: Letter Grading

HIST 806 - History of the Early Republic

Credits: 4

Explorations in the histories of people and institutions that transformed the new United States from a coastal republic of largely independent freeholders to a transcontinental democracy increasingly driven by class. Topics include slavery, the family, reform movements, and the formulations of national identity.

Grade Mode: Letter Grading

HIST 811 - Civil War Era

Credits: 4

A survey of the period from the presidency of Andrew Jackson to the end of the Reconstruction, focusing on the causes, course, and consequences of the Civil War. Topics include slavery in the Old South, antebellum reform movements, creation and breakdown of the Second Party System, social and economic (as well as military) events during the war, and major development during Reconstruction after the war.

Grade Mode: Letter Grading

HIST 812 - Emergence of Industrial America

Credits: 4

Investigates the economic transformation of 19th-century America from a rural, agricultural to an urban, industrial society. Explores the sweeping economic changes, focusing on such topics as changes in work and leisure, westward expansion and its effects on Native Americans, shifts in gender roles, growth of a consumer culture, rise of labor unions and populism, immigration movements for reform and regulation, growth of American imperialism, and intellectual developments.

Grade Mode: Letter Grading

HIST 813 - American Ways of War

Credits: 4

"Is there an American way of war?" This commonly asked question will be the focal point of the course. To answer that we will study the interactions of both war and society in the United States from the Civil War onwards, addressing such issues as the causes, courses, diplomacy, homefront, legacy, and the art of the great and small wars.

Grade Mode: Letter Grading**HIST 815 - The Rise of Modern United States, 1900-1945****Credits:** 4

By 1900, the United States had emerged as the world's leading industrial power and leading destination for millions of immigrants and had begun to become a major player in world affairs. Americans enjoyed unprecedented prosperity and became eager consumers of new inventions and popular culture: cars, radios, jazz records, and the "motion pictures." But they also experienced the worst depression the country had ever known and struggled to make sense of a world that went to war twice within a generation. Women, African Americans, immigrants - all struggled to carve out their place in the new political order. By World War II, the United States assumed many of its "modern" characteristics. Using novels, movies, photographs, sporting events, political speeches and political debates, we will explore both the domestic and the international aspects of the development of modern U.S.

Grade Mode: Letter Grading**HIST 818 - American Environmental History****Credits:** 4

This course examines how nature has been a factor in American history and how Americans have wrestled with the concepts of nature and culture. Topics include industrialization, evolution, conservationism, environmentalism, and environmental diplomacy.

Grade Mode: Letter Grading**HIST 819 - Foreign Relations of the United States****Credits:** 4

The history of American diplomacy from the colonial era to the present, with the dividing point at 1900. The focus will be on both the foreign and domestic influences that shaped American diplomacy.

Grade Mode: Letter Grading**HIST 820 - Foreign Relations of the United States****Credits:** 4

The history of American diplomacy from the colonial era to the present, with the dividing point at 1900. The focus will be on both the foreign and domestic influences that shaped American diplomacy.

Grade Mode: Letter Grading**HIST 821 - History of American Thought****Credits:** 4

This course introduces the subfields of American intellectual and cultural history by assessing the ideas of some of the brightest minds that thought about life on the land we know of as the United States of America before the middle of the nineteenth century. This course surveys more than two centuries of thinkers and their connection to America's plural and evolving popular culture. Ultimately, this course seeks to answer the question: What is the history of American thought?.

Grade Mode: Letter Grading**HIST 832 - Topics in Latin American History****Credits:** 4

Topics vary (see department listing for current semester). Seminar involves reading, discussion, and research on literature and documents related to the selected topic. It provides students with the opportunity to do research under close direction.

Grade Mode: Letter Grading**HIST 833 - Medieval England 800-1300****Credits:** 4

The purpose of this course is to provide students with an opportunity to gain an in-depth understanding of the history of medieval England from the beginning of the period of consolidation under the Wessex dynasty in the ninth-century through the end of the thirteenth century. In addition to obtaining a large corpus of information through the reading of significant monographs dealing with England during this period, students will be challenged to develop the critical analytical skills necessary for the thorough

understanding and practice of historical methodologies, with a particular focus on the practice of historical method in writing medieval history. Finally, students will be given the opportunity to improve their communication skills through extensive class discussions dealing with the scholarly works read for this course, and in writing assignments.

Grade Mode: Letter Grading

HIST 840 - Holy War in the Holy Land: The Medieval Crusades

Credits: 4

Survey of medieval military expeditions organized by Christians to secure the Holy Land during the 12th and 13th centuries. Topics considered include the formulation of a "just war" theory, political, intellectual, religious, and military interactions between Christians, Jews, and Muslims; the Crusader State of Jerusalem; and the histories of individual crusades.

Grade Mode: Letter Grading

HIST 841 - Europe After the Black Death

Credits: 4

Explores the dramatic changes that characterized Western Europe as it rebounded in the fifteenth through the seventeenth centuries from the ravages of the Black Death of 1348. Examines the social, political, and artistic developments in late medieval and Renaissance Italy before "crossing the Alps" to trace the expansion of Renaissance culture in Northern Europe. Topics covered in the course include the humanist movement, new patterns of social organization, the revival of classical antiquity in the arts, architecture, religion and political theory, the effects on European society of the encounter with the "New World," shifting roles for men and women in early modern European societies, and religious war and conflict.

Grade Mode: Letter Grading

HIST 842 - Saints, Sinners, and Heretics: Europe in the Age of Religious Reform

Credits: 4

Examines the history of Western Christendom from roughly 1400 to 1600, a period of tumultuous religious change throughout Europe. We begin in the Middle Ages where the seeds of religious division were sown. We then tackle Martin Luther's challenge to the Catholic church, trace the diffusion of his message throughout Europe, and address the Catholic response to the evangelizing movements that he inspired. Finally we investigate some of the regional varieties of Protestantism that developed in the latter half of the sixteenth century with a particular focus on Switzerland, Germany, England, Scotland, France, and the Netherlands.

Grade Mode: Letter Grading

HIST 854 - Topics in History of Science

Credits: 4

Study of a selected topic in the history of European science since the Renaissance.

Grade Mode: Letter Grading

HIST 856 - Twentieth Century Europe

Credits: 4

The Twentieth Century began with European nations at the apex of their global power. It ended with their world dominance in ruins. Two World Wars, the rise of Nazism, and communist revolutions had left Europe in the shadow of the United States. Examining European history from the birth of the automobile to the fall of the Berlin Wall, we explore the political, social and cultural forces that made the twentieth century the bloodiest epoch in world history.

Grade Mode: Letter Grading

HIST 865 - Themes in Women's History

Credits: 4

In-depth examination of a selected topic in women's history, such as women and health, women in modern European political theory, comparative history of women and revolution. See "Time and Room Schedule" or department for specific topic. May be repeated for credit with permission of instructor.

Grade Mode: Letter Grading

HIST 871 - Museum Studies

Credits: 4

Introduction to theory, methods, and practice of museum studies. Examination of various museum functions, as well as historical controversies. May be repeated with departmental approval.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

HIST 872 - Studies in Regional Material Culture

Credits: 4

An introduction to the theory and methodology of material culture, that is, the study of history through the analysis of buildings, human-created landscapes, and artifacts made and used in the United States, particularly in New England. May be repeated for credit with the permission of the graduate director.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

HIST 873 - Early History of Ancient Greece

Credits: 4

Greek history from the Minoan and Mycenaean eras through the Persian Wars of the early fifth century. Emphasis on original sources including the Homeric epics, Plutarch, Sappho, and Herodotus. Examination of the distinctive developments of political systems in Sparta, Athens, as well as issues of colonization, diplomacy, religion, and culture. Through discussion of types of available evidence and their integration into historical understanding.

Grade Mode: Letter Grading

HIST 874 - Historiography

Credits: 4

Analysis of ancient and modern historians. (Not offered every year.)

Grade Mode: Letter Grading

HIST 875 - Historical Methods

Credits: 4

Introduction to contemporary historical methods. Required of all entering Ph.D. candidates; open to undergraduates with permission.

Equivalent(s): HIST 870

Grade Mode: Letter Grading

HIST 876 - Topics in Ancient Greek History

Credits: 4

Advanced historical study of a particular period or theme in ancient Greek history. May be repeated barring duplication of subject.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

HIST 877 - History of Ancient Rome

Credits: 4

Covers pre-Roman Italy, the Etruscans, and the foundation of the Republic. Rome's expansion through the Punic Wars, and relations with the Hellenistic kingdoms. Disintegration and final collapse of the Republic. Includes discussion of Roman art, engineering, and political theory. Emphasis on Latin sources in philosophy, history, and literature.

Grade Mode: Letter Grading

HIST 878 - Roman Empire

Credits: 4

Collapse of the Roman Republic and creation of the Augustan principate through the division of the empire, with discussion of the fall of Rome in the west, and the eastern empire through Justinian. Discussion of Roman art, literature, philosophy, religious developments such as the proliferation of mystery religions and the rise of Christianity.

Grade Mode: Letter Grading

HIST 890 - Seminar: Historical Expl**Credits:** 4

Seminar in one of the fields listed below: A) American History, B) Atlantic History, C) Canadian History, D) Latin American History, Medieval History, F) History, G) History of Islam, H) Ancient History, I) East Asian History, J) African History, K) Middle Eastern History, L) Historiography, M) Russian History, N) World History, O) British History, P) New Hampshire History, Q) Historical Methodology, R) Irish History, S) History of Science, T) Maritime History, U) Museum. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Equivalent(s):** HIST 801**Grade Mode:** Letter Grading**HIST 895 - Tutorial Reading and Research****Credits:** 1-6

A) Early American History; B) American National History; C) Canada; D) Latin America; E) Medieval History; F) Early Modern Europe; G) Ancient History; I) East Asia; J) Near East and Africa; K) European Historiography; L) American Historiography; M) Russia; N) World History; O) English History; P) New Hampshire History; Q) Historical Methodology; R) Irish History; S) History of Science; T) Maritime; U) Museum Studies.

Repeat Rule: May be repeated for a maximum of 12 credits.**Grade Mode:** Letter Grading**HIST 897 - Colloquium****Credits:** 4

Selected topics in American, European, and non-Western history. Required of history majors. Students must elect section in the department office at the time of registration.

Grade Mode: Letter Grading**HIST 898 - Internship in Museum Studies****Credits:** 4

Supervised position with a museum, historical society, archive, or other history related site.

Repeat Rule: May be repeated for a maximum of 16 credits. May be repeated up to 4 times.**Grade Mode:** Letter Grading**HIST 899 - Master's Thesis****Credits:** 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Graduate Credit/Fail grading**HIST 939 - Readings in Early American History****Credits:** 3

Introduces the chief themes and issues in the secondary literature of early American history from European settlement through the Early Republic. Students write a series of short analytical papers. Expected of all graduate students preparing a field in Early America. Permission required for those not enrolled in History Graduate Program.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Letter Grading**HIST 940 - Readings in Modern American History****Credits:** 3

An introduction to major historians and historiographical issues in the history of the U.S. since 1820. Intended to serve as a foundation for research in the field and as preparation for graduate examinations. Permission required for those not enrolled in History Graduate Program.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Letter Grading

HIST 949 - Colloquium in United States History**Credits:** 3

Topics include 1) Early American Society; 2) Early American Culture; 3) Revolutionary Period; 4) 19th Century; 5) 20th Century. Focuses on existing historical literature on a given topic, such as American slavery. Students normally read extensively, discuss major issues and the literature in class meetings, and write essays that examine the literature critically.

Grade Mode: Letter Grading**HIST 952 - Colloquium in Comparative History****Credits:** 3

Intensive reading in comparative studies of U.S. history. Compares the experience of the United States and that of some other area or nation. For example, comparing legal history of Britain and the U.S.; the impact of colonization on native peoples in North and South America; the nature of slavery in the U.S., the Caribbean, and Brazil; or the experience of women in Europe and America. Topics vary and may be repeated with permission.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Letter Grading**HIST 970 - Graduate Seminar in Teaching History****Credits:** 1

Introduction of fundamental issues in the teaching of history at the college level. Topics include basic pedagogical issues, such as leading effective discussions, evaluating students' work, and lesson planning, and also concerns related to history teaching, e.g., developing students' historical consciousness, use of media, and so forth. Required of all entering Ph.D. students and applicable to the Cognate in College Teaching. Course to be taken in the Fall and then repeated in Spring for a total of two credits.

Equivalent(s): GRAD 981**Grade Mode:** Graduate Credit/Fail grading**HIST 971 - Professionalization for Historians****Credits:** 2

This proseminar will introduce History graduate students (PhD and MA) to professional opportunities and expectations central to professional success. Topics and assignments explore making the most out of graduate school, demonstrating progress, presenting research to others, submitting research for publication, preparing for the job search, professional networking, and life after finding a job.

Grade Mode: Graduate Credit/Fail grading**HIST 981 - Doctoral Research Seminar in American History****Credits:** 3

Students will write a lengthy research paper in any aspect of US History. The course will also include professional preparation assignments. May be repeated with a different topic.

Repeat Rule: May be repeated for a maximum of 12 credits. May be repeated up to 4 times.**Equivalent(s):** HIST 989, HIST 990**Grade Mode:** Letter Grading**HIST 989 - Research Seminar in Early American History****Credits:** 3

Students will write a lengthy research paper in any aspect of early US history, to 1877. The course will also include professional preparation assignments. May be repeated with a different topic.

Repeat Rule: May be repeated for a maximum of 6 credits.**Equivalent(s):** HIST 981**Grade Mode:** Letter Grading**HIST 990 - Research Seminar in Modern American History****Credits:** 3

Students write a lengthy research paper in any aspect of modern US history, roughly 1865 to the present. The course also includes professional preparation assignments. May be repeated with a different topic. Permission required for those not enrolled in Histc

Graduate Program.

Repeat Rule: May be repeated for a maximum of 6 credits.

Equivalent(s): [HIST 981](#)

Grade Mode: Letter Grading

HIST 995 - Tutorial Reading and Research

Credits: 1-6

A) Early American History; B) American National History; C) Canada; D) Latin America; E) Medieval History; F) Early Modern Europe; G) Modern European History; H) Ancient History; I) East Asia; J) Near East and Africa; K) European Historiography; L) American Historiography; M) Russia; N) World History; O) English History; P) New Hampshire History; Q) Historical Methodology; R) Irish History; S) History of Science; T) Maritime; U) Museum Studies.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

HIST 997 - Directed Readings in Early American History

Credits: 1-6

Directed readings in Early American History. Supervised readings for students preparing for the Ph.D. examinations in Early American History.

Grade Mode: Graduate Credit/Fail grading

HIST 998 - Directed Readings in Modern United States History

Credits: 1-6

Supervised readings for students preparing for Ph.D. examinations in Modern U.S. History.

Grade Mode: Graduate Credit/Fail grading

HIST 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Homeland Security (HLS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Human Development & Family Studies (HDFS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HDFS 834 - Curriculum for Young Children

Credits: 4

This course focuses on the design, implementation, and evaluation of developmentally-appropriate activities in a classroom of young children. This course takes the stance that curriculum is not simply activities or plans, but a product of societal, school, and classroom culture as influenced by particular views of development.

Equivalent(s): FS 834

Grade Mode: Letter Grading

HDFS 841 - Marital and Family Therapy

Credits: 4

This course provides an introduction to the theory and practice of marital and family therapy; major approaches to be examined include strategic, trans-generational, structural, experiential/humanistic, and behavioral.

Equivalent(s): FS 841

Grade Mode: Letter Grading

HDFS 843 - Families, Schools, and Community

Credits: 4

This course takes an ecological approach to emphasize the critical value of effective family-school-community partnerships in enhancing the education of young children. Models of family-school-community partnerships are explored. Practical knowledge regarding the experiences of those from diverse backgrounds to best prepare students to interact with, and support, all children and families is highlighted. Students actively engage within the community to build bridges between families, schools, and the greater community.

Equivalent(s): FS 843

Grade Mode: Letter Grading

HDFS 846 - Human Sexuality

Credits: 4

This course addresses the biological, psychological, and cultural aspects of human sexuality and gender across the lifespan. Opinions, attitudes, and values affecting societal responses to sexual issues are explored in relation to scientific research and theory. Students will be better prepared to deal with sexual issues in their personal and professional lives.

Equivalent(s): FS 846

Grade Mode: Letter Grading

HDFS 857 - Race, Class, Gender, and Families

Credits: 4

This course explores the intersection of race, class, and gender in family life in the US. Theory, research, and other relevant literature is used to examine the variety of family configurations in our society today and the diverse experiences that individuals and families have as the result of existing social, political, and economic institutions.

Equivalent(s): FS 857

Grade Mode: Letter Grading

HDFS 871 - Observation and Assessment of Young Children

Credits: 4

A comprehensive view of various observation techniques for determining children's strengths and emerging skills. Exploration of issues regarding the use of formal assessments and testing with young children, retention and transitional placements, and the

parent's role in testing. Permission. (Fall semester only.)

Equivalent(s): FS 871

Grade Mode: Letter Grading

HDFS 876 - Children, Adolescents and the Law

Credits: 4

This course is designed to familiarize students with the specialized laws and legal systems that govern children, adolescents and families. Discussion will focus on society's efforts to balance competing interests and goals. The course provides the chance to explore laws and processes that affect children and adolescents as they interact with the court system, their caregivers, families and society at large.

Equivalent(s): FS 876

Grade Mode: Letter Grading

HDFS 894 - Families and the Law

Credits: 4

This course explores statutory law, case law and the judicial processes that affect families as members interact with each other a society. Students will become familiarized with the family court system and its role in regulating the family.

Equivalent(s): FS 894

Grade Mode: Letter Grading

HDFS 895 - Advanced Independent Study

Credits: 1-6

This course is designed for students in the HDFS graduate program to undertake advanced study in child development, adolescence development, or lifespan development in consultation with an HDFS faculty member. The result of the study is to be a significant written product of a quality. A learner/sponsor contract will be required.

Grade Mode: Letter Grading

HDFS 897 - Special Topics

Credits: 1-4

Focused examination of a particular theoretical, methodological, or policy issue.

Repeat Rule: May be repeated for a maximum of 8 credits.

Equivalent(s): FS 897

Grade Mode: Letter Grading

HDFS 898 - Marriage and Family Therapy Practicum

Credits: 1-8

Clinical experience under direct faculty supervision. Trainees develop competency in treating individuals in the context of their families and larger systems. May be repeated.

Equivalent(s): FS 898

Grade Mode: Letter Grading

Special Fee: Yes

HDFS 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 10 credits.

Equivalent(s): FS 899

Grade Mode: Graduate Credit/Fail grading

HDFS 911 - Graduate Internship

Credits: 2-8

Advanced, supervised graduate internship in a professional setting related to Family, Child, or Adolescent Development.

Repeat Rule: May be repeated for a maximum of 8 credits.

Equivalent(s): FS 911**Grade Mode:** Graduate Credit/Fail grading

HDFS 930 - Play Therapy

Credits: 4

This course introduces students to the theories and concepts behind play therapy, integrating foundational principles of child development to provide a comprehensive understanding of developmentally appropriate methods for working with children both individually and within the family context (Program Goal 3; SLO #4). The course aims to equip students with the skills to integrate play therapy techniques into existing frameworks of family therapy (Program Goal 1; SLO #1), while also deepening their understanding of child developmental stages and how these impact therapeutic approaches (Program Goal 2; SLO #2). Additionally, students will learn effective strategies for intervening in parenting issues and for articulating and applying intervention techniques and theoretical models within their practice (Program Goal 4; SLO #5; Program Goal 5; SLO #7).

Equivalent(s): FS 930**Grade Mode:** Letter Grading> [View Course Learning Outcomes](#)

HDFS 942 - Advanced Systems of Marital and Family Therapy

Credits: 4

This course provides a critical analysis and integration of selected systems of marital and family therapy.

Prerequisite(s): [HDFS 841](#) with a minimum grade of B-.**Equivalent(s):** FS 942**Grade Mode:** Letter Grading

HDFS 945 - Family Therapy Practice I

Credits: 4

This course is designed to develop beginning practice skills in structural, strategic, systematic family therapies; and assessment and treatment skills necessary to manage specialized problems (e.g., divorce, remarriage, substance abuse, suicidal behavior) encountered in practice.

Equivalent(s): FS 945**Grade Mode:** Letter Grading

HDFS 946 - Critical Problems in Family Life

Credits: 4

This course provides an evaluation of the needs and resources of families with critical problems; maturational and situational sources of stress influencing the contemporary family; students demonstrate mastery of theoretical concepts by developing self-help strategies to be used by families experiencing stress.

Equivalent(s): FS 946**Grade Mode:** Letter Grading

HDFS 947 - Family Therapy Practice II

Credits: 4

This course is designed to develop advanced skills in integrating structural, strategic, and systematic family therapies; sensitivity to gender differences and cultural diversity; and assessment and treatment skills necessary to manage specialized problems (e.g., physical, emotional, and sexual abuse; sexual dysfunction) encountered in practice.

Equivalent(s): FS 947**Grade Mode:** Letter Grading

HDFS 952 - Clinical Interventions in Couples Therapy

Credits: 4

This course explores interventions that target problems faced by couples at various ages and stages of their relationship. The focus will be on developing and implementing effective strategies for enhancing attachments as well as approaches for improving communication and problem-solving skills in Couples Therapy. The format will be interactive with illustrative demonstration. Majors to include: HDFS: Marriage and Family Therapy and Social Work.

Equivalent(s): FS 952

Grade Mode: Letter Grading

HDFS 954 - Sex Therapy

Credits: 4

This course begins preparing graduate student therapists to address sexual topics with clients. Using a foundation grounded in the physiology, psychology, and sociology of human sexual development, this course explores problems in sexual interaction and treatment options available through sex therapy, focusing on the integration of sex therapy with couples therapy. Students are encouraged to examine their own attitudes, values, and beliefs regarding sexuality, and will deconstruct "sexual dysfunction".

Equivalent(s): FS 954

Grade Mode: Letter Grading

HDFS 991 - Professional Issues for Family Specialists

Credits: 4

This course provides an exploration of major ethical, legal, and professional issues facing those working in the areas of marriage and family therapy and child and adolescent development. Focus on ethical decision making, values clarification, and development of professional identity.

Equivalent(s): FS 991

Grade Mode: Letter Grading

HDFS 993 - Theoretical Approaches to Human Development and Family Studies

Credits: 4

This course provides an in-depth understanding and appreciation of the most significant classic and emerging theoretical frameworks concerning the family and family dynamics. The application of each theory to work in the areas of marriage and family therapy and child and adolescent development will be examined in depth.

Equivalent(s): FS 993

Grade Mode: Letter Grading

HDFS 994 - Research Seminar

Credits: 4

This course is a graduate-level introduction to research methods in the social sciences with an emphasis on the fields of Human Development and Family Studies and Marriage and Family Therapy. This course is designed to help students conceptualize and write about research, understand and generate practice-relevant research, gain the foundation for research competency, and understand the research process.

Equivalent(s): FS 994

Grade Mode: Letter Grading

Human Resource Management (HRM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HRM 805 - Managing Human Resources in a Global Economy

Credits: 3

This course focuses on the strategic aspect of human resource management (HRM). The course provides an overview of the role of HRM in contributing to employee and organizational performance. Given that strategic HRM is more proactive and systemic in nature, the course will examine the core aspects of HR and how HR strategies can impact organizational outcomes such as increased performance, enhanced customer and employee satisfaction, and enhanced shareholder value. The course will include theories and practices in many different areas of human resource management including talent management, organizational culture, employee engagement, performance management, work, and job design, training, compensation, HR metrics, and labor relations. The course examines the global environment and the impact on HR strategies.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HRM 810 - Business Acumen: Role of HR in Business

Credits: 3

This course focuses on the overview of the business and the role of the human resources function. The course addresses major business concepts, including finance, marketing, operations and management. When HR professionals develop a deep understanding of how a business operates and effectively communicate with leadership, they can make a substantial impact on organizational outcomes. This skill set enables them to contribute to strategies that enhance organizational outcomes and strengthen the organization's competitive edge. In this course, you will learn how to align HR practices with the organization's goals, values, and mission. By doing so, you'll gain the confidence to take proactive steps, drive meaningful change, and build trust with senior leadership, positioning yourself as a valuable strategic partner within the organization.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HRM 815 - Employment Law and Ethics

Credits: 3

This course emphasizes a global business perspective to familiarize students with legal, ethical, and cultural issues. It covers U.S. employment laws while also introducing students to fundamental legal frameworks operating within the global economy. The course aims to raise awareness of the influence of local cultural traditions on global business practices. Topics may include comparative corporate governance structures, bribery and corruption in international markets, human rights concerns, diverse legal compliance systems, corporate responses to global poverty, environmental responsibilities, and the challenges companies face when navigating conflicting ethical demands between their home country and the cultural norms of host countries.

Prerequisite(s): [HRM 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HRM 820 - Recruitment and Selection

Credits: 3

In this course, students will design, build, implement, and evaluate the tools and practices needed to align strategic recruitment and selection practices with organizational outcomes. Emphasis includes methods to identify, attract, and compete for talent that align with organizational objectives and competitive goals. Key topics include strategic staffing, the legal context of staffing, job analysis, forecasting and planning, selection methods, and evaluation methods.

Prerequisite(s): [HRM 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HRM 821 - Strategic Rewards and Performance Management

Credits: 3

This course focuses on the role of strategic rewards in organizations and the strategies for developing and implementing effective performance management systems. Topics include elements of compensation models, legislation impacting compensation practices, equity and market factors, pay delivery systems, job analysis methods, job evaluation techniques, strategic planning, compensation and incentive plan design, pay-for-performance, market survey techniques, and the impact of compensation practices on productivity, morale and profits. In addition, the course will address strategies, practices, and ongoing issues in the management of employee performance, developing employee potential, supporting professional growth, and career development in organizations.

Prerequisite(s): [HRM 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HRM 822 - Talent Management and Development

Credits: 3

This course focuses on human resource practices that maintain an organization's competitive edge by increasing employee capability and performance. Processes include needs analysis, training design and delivery, coaching/mentoring, and other experiences that affect employee performance. Focus includes the role of human resource development as a business function, assessment techniques to identify large scale and individual training needs, successful transfer of training to the workplace, and evaluation techniques to measure organizational efficiency.

Prerequisite(s): [HRM 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HRM 830 - HR Technology and People Analytics

Credits: 3

This course focuses on the core concepts of HR metrics and methods essential for conducting HR analytics including identifying the types of problems HR analytics can solve, analyzing and interpreting HR data, assessing the validity of those analyses, and effectively communicating analytical and statistical results to influence decision-making. The primary emphasis is on practical application and solving real-world problems. The course will include integration of HR technology as ways to capture, analyze, and integrate data for decision-making.

Prerequisite(s): [HRM 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

HRM 850 - Integrative Capstone: HR Strategy

Credits: 3

As a culminating experience of the HR Graduate Program, this course provides the student with an opportunity to develop a comprehensive human capital strategic plan within an organization to increase organizational performance, morale, and other defined organizational outcomes. Projects are expected to link HR strategies to organizational strategies, develop individual competence, and facilitate organizational leadership through HR practices. A comprehensive account of legal, ethical, and privacy implications is required.

Prerequisite(s): [HRM 805](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Human Services (HMSV) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HMSV 800 - Principles of Human Service Management

Credits: 3

This course examines the key concepts of human services management and provides a broad overview of the history, purpose, theory, and current trends in the human services field. Students study various issues that impact the management of human services and gain an understanding of the role of the human services manager. An emphasis is placed on examining social system ethics, and skills related to human service delivery to individuals, groups, families, organizations, communities, and society in diverse practice settings.

Equivalent(s): HMSV 800G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HMSV 803 - Administration of Human Service Organizations

Credits: 3

This course explores the knowledge, theory, and skills in the administrative aspects of the human service delivery system. Issues of supervision, management, and development of paid and volunteer staff will be addressed. The concepts of coalition building, legislative advocacy and community organizing, and funding will also be introduced. The differences and similarities between the administration of public organizations and non-profit organizations will also be reviewed.

Equivalent(s): HMSV 803G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HMSV 805 - Ethical and Legal Practices in Human Services

Credits: 3

This course explores the concepts related to ethical competence in decision-making, policymaking, and ensuring the rights and wellbeing of clients and staff. It further examines current laws and regulations that dictate codes of ethics and levels of professionalism. Ethical dilemmas faced by leaders and their impact on the organization and the broader community are investigated through case studies and critical thinking through dialogue.

Equivalent(s): HMSV 805G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HMSV 807 - Nonprofit Advocacy in Human Services Administration

Credits: 3

This course guides participants in understanding advocacy nonprofit organizations and their management. Topics include motivations for starting nonprofit organizations as well as theories and strategies to balance the unique needs of nonprofits with market economies. This course covers considerations for staffing and volunteer management, funding sources, asset management, program evaluation, and leadership structures as elements of identifying qualities of successful nonprofit organizations at various stages of development. Projects may include interviewing, building a nonprofit business plan, and presentations. An emphasis is placed on relationship building with partnerships with funding sources and government.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

HMSV 850 - Human Services Administration Integrative Capstone

Credits: 3

This integrative course is the culminating experience for the Master of Science in Human Services Administration degree. All other required coursework must have been completed prior to receiving approval to register for this course. This course builds on the knowledge and skills learned through the degree program allowing the student to demonstrate competency in translating theory into practice. The course combines traditional coursework with a field-based experience, providing direct exposure to the field of human services administration. Final products include a comprehensive project to demonstrate mastery of professional practice. After documenting the above, students will discuss and defend their project orally.

Equivalent(s): HMSV 850G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Instructional Studies (INST) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Integrated Applied Mathematics (IAM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

IAM 830 - Graduate Ordinary Differential Equations

Credits: 3

Course is a graduate-level course on ordinary differential equations. It is designed to be accessible to first-year graduate students from math, science or engineering backgrounds who have had a first undergraduate course in differential equations, along with standard calculus sequence. The course is designed to begin with an intensive review of undergraduate differential equations and then will proceed to handle more advanced concepts, starting with multi-dimensional coupled systems of ordinary differential equations, exponential matrix solutions, using coordinate transformations for conversion to standard forms, nonlinear systems and transform-based solutions, using coordinate transformations for conversion to standard forms, nonlinear systems and transform-based techniques. The course will have an interdisciplinary and applied style and will cover the following topics: Interreview of undergraduate differential equations, Power Series and Fourier Series solutions, Multi-dimensional D.E.s, eigenvectors and Jordan forms, Numerical Methods, Nonlinear D.E.s Dynamical Systems and Chaos.

Grade Mode: Letter Grading

IAM 851 - Introduction to High-Performance Computing

Credits: 3

Course gives an introduction to select areas of high-performance computing, providing a basis for writing and working with high performance simulation codes. The three main topics are: 1) basic software engineering, 2) high-performance and parallel programming, and 3) performance analysis and modeling. Additional topics may include heterogeneous architectures like GPUs and data analysis/visualization. Working knowledge of a compiled programming language (C, C++ or Fortran) is required prior to taking this course.

Grade Mode: Letter Grading

IAM 932 - Graduate Partial Differential Equations

Credits: 3

Graduate level introduction to the analysis of linear and nonlinear partial differential equations. topics include: separation of variables, Fourier series, weak and strong solutions, eigenfunction expansions, the Sturm-Liouville problem, Green's functions and fundamental solutions, method of characteristics, and conservation laws. A solid foundation in Ordinary Differential Equations and Linear Algebra is required prior to taking this course.

Grade Mode: Letter Grading

IAM 933 - Applied Functional Analysis

Credits: 3

Introduction to rigorous mathematical analysis from the perspective of applications. Topics include: metric and normed spaces; convergence; completeness; continuity; Lebesgue measure theory; convergence theorems; Banach, Hilbert, L_p, and Sobolev spaces; orthogonality, bases, and projections; Sturm-Liouville theory; spectral theory; distributions; and weak solutions.

Applications including to differential and integral equations, are presented throughout. Knowledge of real analysis is required, one graduate level introductory courses in mathematical physics or applied mathematics should be taken prior to taking this course.

Grade Mode: Letter Grading

IAM 940 - Asymptotic and Perturbation Methods

Credits: 3

Introduction to the asymptotic analysis of linear and nonlinear algebraic equations, ODEs, and PDEs and the asymptotic approximation of integrals arising as transform solutions to ODEs/PDEs. Topics include: algebraic equations and dominant balance; asymptotic approximations; complex variable theory and the asymptotic evaluation of integrals via Laplace's method, stationary phase, and steepest descents; the method of matched asymptotic expansions (boundary-layer theory), coordinate

straining, multiple scales, averaging, homogenization theory, and WKBJ analysis for singularly perturbed ODEs and PDEs.

Grade Mode: Letter Grading

IAM 950 - Spatiotemporal and Turbulent Dynamics

Credits: 3

Advanced graduate course on the dynamics of spatiotemporal patterns in nonlinear time-dependent partial differential equations. Topics include bifurcations and symmetry, equilibria, traveling waves, periodic orbits of nonlinear ordinary and partial differential equations, and unstable coherent structures in turbulence. Example systems include 1d and 2d Swift-Hohenberg equations, the Kuramoto-Sivashinsky equation, Rayleigh-Bénard convection, and Navier-Stokes dynamics in plane Couette and pipe flows.

Grade Mode: Letter Grading

IAM 961 - Numerical Analysis I: Numerical Linear Algebra

Credits: 3

Introduction to numerical analysis and computational methods for linear systems. Topics include: IEEE floating point arithmetic; vector norms and induced norms; conditioning; projectors; LU decompositions; pivoting; Cholesky factorization; QR decompositions; Gram-Schmidt orthogonalization; Householder triangularization; Singular Value decompositions; least squares problems; stability; eigenvalue problems; power iterations; QR algorithm; Krylov methods; Arnoldi iteration; GMRES; Lanczos iteration; Conjugate gradient algorithms; and Preconditioning. Knowledge of computer programming and linear algebra is required prior to taking this course.

Grade Mode: Letter Grading

IAM 962 - Numerical Partial Differential Equations

Credits: 3

Numerical analysis applied to partial differential equations. Initial topics include the implementation of finite difference and spectral methods applied to the heat equation, wave equation, Burger's equation, and other model equations. The remainder of the course treats numerical analysis, starting with a brief review of function spaces. The primary topics include approximation theory for Sobolov spaces, projection operators, completeness, convergence, and error estimates.

Grade Mode: Letter Grading

IAM 995 - IAM Special Topics

Credits: 1-4

Investigations of graduate-level problems or topics in Integrated Applied Mathematics. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

IAM 998 - Independent Study/Reading Course

Credits: 1-4

Independent investigation of graduate-level problems or topics in Integrated Applied Mathematics under the guidance of a faculty member. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

IAM 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Intercollege (INCO)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

INCO 889 - Study Abroad Experience Short

Credits: 0

For graduate students enrolling in short term study abroad experiences in Fall and Spring semesters. Also for graduate students enrolling in January term and Summer Session study abroad experiences.

Grade Mode: Not graded

Special Fee: Yes

Interdisciplinary Studies (IDIS) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

IDIS 805 - Evidence-Based Decision-Making

Credits: 3

This course will guide students as they develop the necessary skills to identify, access, and incorporate the best available evidence using valid and reliable sources to make informed decisions. Students will explore the process of developing knowledge, innovation, and quality improvement principles of evidence-based decision-making. Ethical standards for protecting human subjects are integrated throughout the course.

Equivalent(s): IDIS 805G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Justice Studies (JUST)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

JUST 801 - Graduate Seminar in Justice Studies

Credits: 4

Seminar on advanced material in which the instructor has specialized knowledge through research and study. Topics may include the death penalty, terrorism, psychology of the jury, immigration, history of the law. Content of specific sections will vary by section of the course. Course may be repeated for different topics.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

JUST 802 - Law and Society

Credits: 4

Provides students with a graduate level review of the law and society field. Interdisciplinary study of the relationship between law and society. Topics include how society shapes legal decision-making and dispute resolution, law as social control and as social change, and legal ideologies and legal consciousness.

Grade Mode: Letter Grading

JUST 803 - Professionalism in Justice Studies

Credits: 1

This course introduces Master's of Arts students in Justice Studies to the expectations, tools and opportunities central to their success. It provides the fundamentals to being effective research and teaching assistants. It also Justice Studies Master's of Arts students in developing the tools necessary to be successful candidates in positions throughout justice-related fields. Finally, it provides opportunities for them to interact with academics and professionals in justice studies. May be repeated barring duplication of subject.

Grade Mode: Graduate Credit/Fail grading

JUST 805 - Quantitative Research Methods

Credits: 4

Introduction to the major quantitative methods used by criminologists and justice researchers. Focuses on methods which illuminate causes of crime and justice. Covers all aspects of the research process including conceptualization, design, sampling, data analysis, and dissemination of results. Does not assume prior statistical knowledge.

Grade Mode: Letter Grading

JUST 807 - Applied Research Methods

Credits: 4

This is the second course in the Justice Studies graduate program sequence on research methods and it focuses on how to conduct applied research in the Justice Studies field including how to use quantitative methods in more applied settings and specific research tools frequently used in applied settings (e.g. qualitative methods and program evaluation). Students will work on a class research project as well as their own individual projects.

Grade Mode: Letter Grading

JUST 830 - Theories of Justice

Credits: 4

The idea of justice is central to social, political, and legal theory. Considerations of justice are appealed to in assessing the legitimacy of governments, the fair distributions of goods and opportunities both with nation-states and globally, and to address specific social concerns such as racial or gender discrimination or access to health care. Course examines both historical sources and contemporary debates about the nature of justice.

Grade Mode: Letter Grading

JUST 850 - Capstone Preparation: Internship/Thesis

Credits: 4

Experience in research and/or a variety of justice settings including courts, law enforcement and victim services. Includes weekly seminar.

Grade Mode: Letter Grading

JUST 865 - Special Topics

Credits: 4

New or specialized courses are presented under this listing. Staff present material not normally covered by the course offerings.

Cross-listed courses. May be repeated but not duplicate content.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

JUST 895 - Reading and Research

Credits: 1-4

A) Criminology; B) Law and Society; C) Law and Psychology; D) Philosophy of Law; E) Courts. The students does independent work under the supervision of a faculty member. The student may plan (1) broad reading in an area; (2) intensive investigation of a special problem; or 3) empirical testing on a particular question. May be taken for 1-4 credits. This course is by permission only and requires a signed agreement/proposal prior to registration.

Repeat Rule: May be repeated for a maximum of 8 credits. May be repeated up to 1 time.

Grade Mode: Letter Grading

JUST 897 - Culminating Project

Credits: 4

Students conduct a project related to their internship under the supervision of a faculty member. Projects might include an evaluation of a community policing program, interviews with battered women in a shelter, or a survey of corporal punishment.

Grade Mode: Graduate Credit/Fail grading

JUST 899 - Masters Thesis

Credits: 1-8

Students conduct a masters thesis under the supervision of three graduate faculty members. Thesis projects might include an intervention study to reduce delinquency, a study of immigration law in the 1920s, or a survey of hate crimes.

Repeat Rule: May be repeated for a maximum of 8 credits. May be repeated up to 1 time.

Grade Mode: Graduate Credit/Fail grading

Kinesiology (KIN)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

KIN 802 - Health Content and Youth Risk Behaviors

Credits: 4

This course explores topics related to adolescent health, well-being, and risk behaviors that are relevant in the health education classroom today. Grounded in health behavior theories and behavior change, students explore ten dimensions of wellness: Cultural, Emotional, Environmental, Financial, Intellectual, Occupational, Physical, Sexual, Social, and Spiritual. Students develop a content base for teaching Standard 1 (Core Concepts) of the National Health Education Standards and better understand how health behaviors affect individual health and health instructions.

Grade Mode: Letter Grading

KIN 804 - Electrocardiography

Credits: 4

This course is designed to provide students exposure regarding basic interpretation and identification of electrocardiograms (ECGs). Included in this is detailed heart anatomy, coronary circulation, cardiac conduction system, electrocardiogram development, and all aspects pertaining to normal and abnormal ECGs.

Grade Mode: Letter Grading

KIN 805 - Topics in Applied Physiology

Credits: 4

Advanced exercise physiology course dealing with topics both current and relevant to exercise science majors. Includes: genetics environmental influences, immune system, detraining and over-training, epidemiology, ergogenic aids and the influence of age and gender.

Grade Mode: Letter Grading

KIN 806 - Neurology

Credits: 4

A detailed study of the development, morphology, internal configuration, physiology, histology, function, and pathology of the human nervous system. Labs consist of clinical case studies, brain dissections, and videos/slides to enhance the understanding of material. Prereq: human anatomy and physiology. Lab.

Co-requisite: [KIN 807](#)

Grade Mode: Letter Grading

KIN 807 - Neurology Lab

Credits: 2

Basic histology, neuroanatomy and neurophysiology of the human nervous system. Use of brain specimens, videos and pathologic case studies to elucidate cell structure, sensory and motor systems, and spinal cord, brainstem, and cortical organization and anatomy. ZOOL 507 - ZOOL 508 or [COMM 521](#) or equivalent required prior to taking this course.

Co-requisite: [KIN 806](#)

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

KIN 812 - Health Education Practicum

Credits: 4

The purpose of this practicum is to provide students with an opportunity to observe, develop, and teach in a health education classroom. Students are required to accumulate 60 hours of teaching experience in the schools over the course of the semester. Weekly seminars will integrate field experience with content knowledge in health, nutrition and physical activity.

Prerequisite(s): HPE 648 with a minimum grade of D-.

Grade Mode: Letter Grading

KIN 820 - Science and Practice of Strength Training

Credits: 4

Designed to provide graduate students exposure to the knowledge and practical experience necessary for establishing strength development programs in a variety of populations, including healthy, athletic, and higher risk individuals. Program design, core lifting techniques, physiological adaptations, and organization and administration of programs are highlighted. Includes fundamentals regarding the selection of programs and equipment, spotting techniques, as well as ways to assess strength and power in humans without expensive equipment.

Grade Mode: Letter Grading

KIN 822 - Applied Biomechanics

Credits: 4

This course provides students with a background in the fundamental biomechanical principles that describe and govern human movement. Topics of the course include friction, linear and angular motion, tissue material properties, conservation of energy, work and power, fluid mechanics, stability and center of gravity, mechanics of injury, walking and running gait analysis. These topics are taught through the lens of modern biomechanical analyses including dynamometry, electromyography, accelerometry, and optical motion analysis.

Grade Mode: Letter Grading

KIN 824 - Exercise Metabolism: Acute and Chronic Adaptations

Credits: 4

An overview of the metabolic processes that occur during exercise and metabolic changes that occur as a result of exercise training. Topics covered include glycogenolysis and glycolysis in muscle, cellular oxidation of pyruvate, lipid metabolism, metabolism of proteins and amino acids, neural and endocrine control of metabolism, and fatigue during muscular exercise.

Grade Mode: Letter Grading

KIN 840 - Athletic Administration

Credits: 4

Introduces basic management components and processes used in the successful administration of school and college athletic programs. Topics include planning, organizing, and managing sports programs, personnel and policies; game scheduling; finances and facilities; equipment and event management; student services; and key legal issues.

Grade Mode: Letter Grading

KIN 841 - Social Issues in Contemporary Sports

Credits: 4

An investigation into interrelationships among sport, culture, and society in an attempt to understand better the role and function of sport in contemporary society. Broad overview of selected socio-cultural factors that influence participation and result from participation in sports.

Grade Mode: Letter Grading

KIN 842 - Advanced Assessment in Adapted Physical Activity

Credits: 4

This course provides students a experience to work with children with disabilities in physical activity and physical education settings. A blend of lectures (online and in-person) and practicum experiences in local schools will provide students the opportunity to learn how to apply adapted physical activity best practices and research to school contexts through class discussion, readings, and written assignments. This course provides an opportunity for refinement and continued development of teacher skills and practices for working with students with disabilities. A primary focus will be on assessment, planning, and implementation of physical education and physical activity programming for students with disabilities. In addition, a focus on how these assessments impact the individualized education program (IEP) will be emphasized.

Grade Mode: Letter Grading

KIN 848 - Skill Development and Assessment in Health Education**Credits:** 4

Preparing students to face health challenges of the 21st century requires teaching health education in ways that increases individual health literacy and self-efficacy to lead a health-enhancing life. Teaching students the necessary skills is not enough, we must also assess student learning in authentic and meaningful ways that measure growth and levels of skill proficiency. Using the Performance Indicators of the National Health Education Standards as a guide, we will explore how to teach health education in a skills-based way and to develop formative & summative assessments that measure student learning & resulting proficiency. We will discuss strategies to develop health literate individuals who have the capacity & competence to make health-enhancing choices across the lifespan. Coursework includes readings, in-class work time, & development of tools you can use in your classroom.

Grade Mode: Letter Grading**KIN 864 - Advanced Sport Marketing****Credits:** 4

An advanced course covering sport marketing, which includes a review of key sport marketing terms/concepts, in-depth experience writing as a sport marketer, and practical experience acting as a sport marketer. This course will instruct students how to complete all aspects of an in-depth marketing plan. This is an undergraduate/graduate dual student course.

Grade Mode: Letter Grading**KIN 865 - Advanced Topics in Coaching****Credits:** 4

This course goes beyond the basic principles of coaching and addresses advanced topics in coaching (talent identification, talent development) from both the science and the art of coaching technique and strategies. This course is structured as an upper division course in Sports Studies. Content includes topics related to the development of the field of coaching. The class makes extensive use of case studies and analysis of practical coaching situations for the betterment of coach development. This course combines lecture, small group discussion and practical application of material.

Prerequisite(s): SPST 565 with a minimum grade of D-.**Grade Mode:** Letter Grading**KIN 870 - Research Methods in Kinesiology****Credits:** 4

The focus of this course will be the process of conducting research, starting with the development of the research question and working through issues associated with methodology, data collection, analysis, and interpretation. The course will examine research traditions commonly employed in investigations in exercise science, health sciences, health and physical education, and sport management and leadership: group comparison designs, historical research, and behavioral analysis (single subject design). The goal of this course is to prepare students to conduct research and understand the components of the process.

Equivalent(s): KIN 901**Grade Mode:** Letter Grading

> [View Course Learning Outcomes](#)

KIN 880 - Psychological Factors in Sport**Credits:** 4

Factors of outstanding athletic achievement; psychological variables in competition; the actions and interactions of sport, spectator, and athlete. Special attention to directed to strategies for coaches, teachers, and athletic trainers to utilize sport psychology in their professional practice. Introduction to Psychology required prior to taking this course.

Grade Mode: Letter Grading**KIN 881 - Introduction to Adapted Physical Education****Credits:** 4

This course covers an understanding of the skills to adeptly execute diverse physical activity programs tailored to the specific needs of individuals with disabilities within K-12 school settings. This course begins with an understanding of the term disability followed by the legal mandates that define school policy and student placement. Throughout the course an overview of disability will be analyzed with readings that include an analysis of the social medical models designed to challenge the social constructionist perspective.

of disability and orientations for practice. Classroom time will also include direct teaching of individuals with disabilities in physical activity settings.

Grade Mode: Letter Grading

KIN 894 - Cardiopulmonary Pathologies

Credits: 4

Lecture study of the anatomy, physiology, and pathophysiology of the cardiac, vascular, and pulmonary systems. Particular emphasis on the study of cardiovascular function in diseased and stressed states. Clinical assessment of the cardiopulmonary patient. Course offering includes the addition of teaching experiences and real-patient case study assignments to better prepare the graduate student through increased application of knowledge and experiences to real-world situations.

Grade Mode: Letter Grading

KIN 895 - Advanced Studies

Credits: 2-4

Independent study problems.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

KIN 896 - Advanced Research in Exercise Science

Credits: 3 or 6

Students design and conduct original research that culminates in a paper of publishable quality. Completion of either this course or [KIN 899](#) satisfies the department's research requirement for the master's degree. May be taken for 3 credits per semester in each of two semesters or 6 credits in one semester. IA (continuous grading).

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

KIN 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

KIN 902 - Colloquium

Credits: 1-2

Seminar format with readings, discussions, laboratory tutorials, and presentations of current research topics. A) exercise science B) outdoor education; C) special physical education; D) sport studies.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Graduate Credit/Fail grading

KIN 950 - Internship

Credits: 2-4

Experiential learning in a setting appropriate to the student's objectives. A 4-credit internship requires a minimum of 200 hours experience. Fewer credits require proportionally fewer hours. A) Exercise Science. Clinical work, normally in a hospital or laboratory setting, involving exercise physiology, graded exercise testing, exercise prescription, and/or cardiac rehabilitation. Must have completed all required coursework except thesis. B) Special Physical Education C) Sport Studies.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

KIN 993 - Teaching Practicum

Credits: 2

Students work with a faculty mentor to investigate, observe, and practice teaching methods using current pedagogical and

assessment methods and theories. Includes use of various instructional technologies as tools to enhance the teaching/learning process. Designed for graduate students who wish to gain experience teaching at the collegiate level in KIN fields upon completion of the Master's or Ph.D. degree.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

Languages, Literatures & Cultures (LLC)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

LLC 891 - Methods of Foreign Language Teaching

Credits: 3

Objectives, methods and techniques in teaching foreign languages from elementary grades through college. Discussion, demonstration, preparation of instructional materials, micro-teaching of the language skills, including developments in computer aided instruction.

Equivalent(s): SPAN 891

Grade Mode: Letter Grading

Leadership (LD) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

LD 804 - Leading Teams

Credits: 3

Leadership is the process of motivating people to achieve project goals, usually in a dotted-line organizational setting. The success or failure of the project, and by extension the manager, is dependent upon the manager's ability to assess the team as a whole, (strengths and weaknesses), and to then apply that analysis to the individual team members. Within the course, students will survey and discuss multiple methodologies used to evaluate teams. We will analyze how organizational dynamics and structure impact the manager, limit or increase their power, and their ability to perform their job.

Equivalent(s): LD 804G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

LD 806 - Fundraising and Resource Development

Credits: 3

Fundraising is the act of soliciting contributions or pledges. Development refers to nurturing and building relationships over time between donors/philanthropists and organizations. The purpose of this course is to differentiate between fundraising, grant writing, and development strategies in organizations. This course will review ethics and transparency within fundraising, technology to facilitate resource development, social and business trends, and organizational adaptation.

Equivalent(s): LD 806G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

LD 810 - Change Management and Communication

Credits: 3

This course provides students with an understanding of the principles of assessing change, managing change and the communication tools necessary to implement change effectively. Issues regarding client satisfaction, vendor satisfaction, morale and relationships will be explored. The effective manager must possess skills in adaptability to ensure that projects are responsive to changing conditions. This course develops a thorough understanding of strategic change within organizations.

Equivalent(s): LD 810G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

LD 820 - Cultivating Your Leadership Capabilities

Credits: 3

In this course the student is introduced a variety of unique perspectives about leadership, which are drawn from different traditions in the literature, and from which the student selects to develop his or her own model of leadership. An action-based learning approach is conducted by each student to connect personal experiences with the theoretical construct.

Equivalent(s): LD 820G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

LD 821 - Ethical Decision-Making

Credits: 3

The course focuses on the conflicts which arise when an individual's ethics are counter to the organization's practices. An historical review of various leader's actions taken and consequences faced when confronted with an ethical dilemma is conducted. Each

student assesses their ethical framework in context to an effective leadership model.

Equivalent(s): LD 821G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

LD 823 - Emergence of a Strategic Leader

Credits: 3

This course focuses on the strategy making process. Strategic leaders must consider multiple aspects when developing a strategic approach. Strategic leaders must evaluate the external and internal environment to determine the right course of action. Students investigate core concepts of strategy-making to aid in their development of a strategic mindset.

Equivalent(s): LD 823G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

LD 825 - Volunteer Leadership

Credits: 3

Volunteers are increasingly important in the United States. Not only do financially strapped organizations use volunteers to enhance their capacity, but policy-makers and community leaders see volunteering as a vehicle to improve communities and solve public problems. This course covers topics of volunteer administration -planning, marketing, recruitment, screening and selection, training, supervision, evaluation and recognition. Students will gain an understanding of how the demographic of today's volunteers is changing, how best to deploy the talents of multi-generational volunteers, and understand how to provide a structured objective framework to be accomplished by the volunteer corps. Legal issues surrounding the use of volunteers and designing effective volunteer policies are also discussed.

Equivalent(s): LD 825G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

LD 827 - Leading and Governing Nonprofit Organizations

Credits: 3

This course guides participants in understanding nonprofit organizations and their management. Topics include motivations for starting nonprofit organizations as well as theories and strategies to balance the unique needs of nonprofits within market economies. This course covers considerations for staffing and volunteer management, funding sources, asset management, program evaluation and leadership structures as elements of identifying qualities of successful nonprofit organizations at various stages of development. Projects may include interviewing, building a nonprofit business plan, and presentations.

Equivalent(s): LD 827G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

LD 831 - Conflict Management & Negotiation

Credits: 3

Students will be introduced to different perspectives on conflict management and negotiation. Conflict will be explored in different contexts, including but not limited to intergroup conflict, cross-cultural conflict, and interpersonal conflict. An emphasis will be placed on interpersonal conflict. The course will utilize an applied approach by identifying effective strategies to manage conflict and negotiation, and provide appropriate methodologies for implementation.

Equivalent(s): LD 831G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

LD 832 - Building Diverse & Multicultural Organizations

Credits: 3

Successful leaders must learn to integrate different viewpoints to enhance creative problem solving, leadership ability and organizational effectiveness. This course will provide an overview of cultural diversity and multiculturalism in today's

organizations. Students will be exposed to key concepts, models and issues of diversity in the organization and global society. The ethical and legal implications of managing cultures and diversity will be examined.

Equivalent(s): LD 832G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

LD 850 - Leadership Integrative Capstone

Credits: 3

This integrative course is the final course in the Master of Science in Leadership. All other required coursework must have been completed prior to receiving approval to register for this course. The focus of the course is on defining and researching a leadership issue or problem. The applied research provides the opportunity to utilize strategy, research skills, analytical tools and models, as well as decision sciences with a culminating research project that can be of strategic benefit to the student and/or a current organization. After documenting the above, students will discuss and defend their project orally.

Equivalent(s): LD 850G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Liberal Studies (LS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

LS 895 - Independent Study

Credits: 1-6

Independent study for graduate students in LS as part of their concentration.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

LS 896 - Independent Study

Credits: 1-6

See description for [LS 895](#).

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

LS 898 - Master's Project

Credits: 1-6

For LS students to work out a final project consistent with concentration and interests.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

LS 899 - Master's Thesis

Credits: 1-6

For LS students to work out a final thesis consistent with their concentration and interests.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

Life Sciences & Agriculture (LSA)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Management (MGMT) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MGMT 805 - Organizational Behavior

Credits: 3

This course reviews the fundamental concepts of organizational behavior in the context of an increasingly diverse and evolving society. The study of organizations encompasses several key knowledge areas essential to today's managers and leaders: Social diversity, perceptions and behaviors, culture, team and group dynamics, conflict and negotiation, decision-making, motivational factors, communication methods, change management, and organizational design and structure. Through various modes of engagement, these areas are analyzed to better understand and identify the influential components of organizational behavior as they relate to effectiveness and sustainability.

Equivalent(s): MGMT 805G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MGMT 815 - Financial Management for Nonprofit Organizations

Credits: 3

Nonprofit management is becoming a recognized specialty, and there are a growing number of individuals and entities specializing in nonprofit financial management as well. With this growth in numbers comes a comparable growth in the demand for sophisticated management. No longer is it enough just for one's financial records to be in order; one must be able to demonstrate good financial systems to meet all the other rising demands on today's nonprofit.

Equivalent(s): MGMT 815G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MGMT 830 - Strategic Planning and Financial Management

Credits: 3

This course focuses on advanced principles and techniques for managing an IT department from the perspective of strategic planning, governance, policy, financial management, and investment planning/valuation. Through practical exercises and case studies, students will apply strategy and finance concepts to specific IT needs in an organization. Emphasis will be placed on anticipating and responding to risks, trends, and future needs.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Marine Sciences (MARI)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MARI 801 - Coastal Resource Management and Policy Seminar

Credits: 1

Graduate students, faculty and invited presenters will discuss current topics in coastal science, management, and policy, including federal, tribal, state, and municipal policy developments, new scientific findings that might inform management, citizen and community science developments, stakeholder engagement, etc. Primarily focused on SMSOE Graduate Certificate enrollees, this one credit seminar is open to others as space allows. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Graduate Credit/Fail grading

MARI 802 - Arctic Research Methods I

Credits: 4

This course exposes students to tools and techniques for understanding how changing seasonality impacts cold regions and the Arctic. Training includes building and deploying environmental sensors, downloading and visualizing data, and analyzing patterns of seasonal change across data sets. Course will include regional field trips as well as emphasize the need for reciprocal research with local and Indigenous community partners.

Grade Mode: Letter Grading

MARI 805 - Introduction to Coastal and Marine Policy: Understanding US Ocean, Coastal, and Great Lakes Policy

Credits: 3

Effective management of human activities in ocean, coastal and Great Lakes areas is critical to our future. This course provides a foundation for students from various backgrounds to understand US marine policy and how it relates to their future careers in research, policy, law, or management. While focused on US marine policy, the course also provides international context, including the UN Law of the Sea and other related conventions on pollution, fisheries, and resource protection.

Grade Mode: Letter Grading

MARI 895 - Special Topics

Credits: 1-4

New or specialized topics not normally covered in regular course offerings.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

MARI 901 - Resource Management and Policy Practicum

Credits: 1

This course serves as the capstone experience for those enrolled in Graduate Certificates offered by the Marine School. Students apply knowledge developed through certificate related coursework to a student-designed experiential project developed in consultation with certificate program faculty and where possible conducted in partnership with a natural resource management related organization. May be repeated barring duplication of subject.

Grade Mode: Graduate Credit/Fail grading

MARI 902 - Arctic Research Methods II

Credits: 3

This course will build on Arctic Research Methods I, training students in methods needed to conduct Arctic convergence research projects. Techniques will include ground-based and remote sensing measurements of snow, ice, soil, vegetation, and built infrastructure. Students will also learn communication and education approaches necessary to facilitate collaboration between

Arctic communities and researchers.

Grade Mode: Letter Grading

MARI 995 - Special Topics

Credits: 1-4

Investigations of graduate level problems or topics in marine science and ocean engineering.

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

Marine, Estuarine and Freshwater Biology (MEFB)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MEFB 817 - Lake Ecology

Credits: 4

Introduction to the ecology of freshwater systems with emphasis on lakes. Origins of lakes and the effects of watersheds on lake chemistry and nutrient cycling are explored. Other topics include the impact of human disturbances on productivity and aquatic food webs and methods used for the management and restoration of lakes. Comparisons are made of the structure and function of lake ecosystems found in temperate, tropical and arctic regions.

Equivalent(s): PBIO 817, ZOOL 817

Grade Mode: Letter Grading

MEFB 847 - Aquatic Plants in Restoration/Management

Credits: 4

A field-intensive class focusing upon freshwater and marine vascular plants with an emphasis on species commonly associated with ecological restoration, the identification and conservation of rare species, and the adaptations and management of invasive species of aquatic habitats in New England. Field trips emphasize the flora of various wetland habitats, including open water and vegetated fresh water wetlands, as well as coastal and estuarine habitats. Lectures and readings examine the current trends in research and management focusing upon specific taxa and pertinent facets of their taxonomy, physiology, and natural history.

Equivalent(s): PBIO 847

Grade Mode: Letter Grading

Special Fee: Yes

Marketing (MKT) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MKT 805 - Marketing for Nonprofits

Credits: 3

The course explores the use of traditional and nontraditional channels to promote nonprofits to an array of actual and potential audiences for a variety of purposes. Most nonprofit organizations must be visible to the public in order to fulfill their missions. Nonprofit leaders must know how to promote their organizations to current and potential supporters, the broader public, and the mass media. Topics include program and organizational branding, targeting respective audiences, preparing materials for greater effect, applying social media as appropriate.

Equivalent(s): MKTG 805G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Materials Science (MS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MS 895 - Special Topics

Credits: 2-4

New or specialized courses and/or independent study. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

MS 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

MS 900 - Seminar

Credits: 1

Topics of interest to graduate students and faculty; reports of research ideas, progress, and results; lectures by outside speakers.

Continuing course: instructor may assign IA (continuous grading) grade at the end of one semester.

Repeat Rule: May be repeated for a maximum of 2 credits.

Grade Mode: Letter Grading

MS 960 - Thermodynamics and Kinetics of Materials I

Credits: 3

Classical and statistical thermodynamics are used to establish the conditions of equilibrium for simple and multi-component, heterogeneous materials. Additionally, the thermodynamics of phase diagrams, miscibility, interfaces, and defects are explored. Examples and problems apply these concepts to various types of materials, including metals, ceramics, and polymers.

Grade Mode: Letter Grading

MS 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Mathematics & Statistics (MATH)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MATH 800 - Introduction to Mathematics Education

Credits: 3

General background information about mathematics education, such as theories of learning and teaching mathematics, mathematics curricula, classroom management, and techniques for the teaching and learning of mathematics that are common all levels of mathematics education K-12. Two semesters of calculus and experience working in schools.

Mutual Exclusion: No credit for students who have taken [EDC 831](#).

Grade Mode: Letter Grading

MATH 801 - Exploring Mathematics for Teachers I

Credits: 3

Provides prospective elementary teachers with the opportunity to explore and master concepts involving number systems and operations, data analysis and probability. Additional topics may include geometry, measurement, and algebraic thinking. Mathematical reasoning, problem solving, and the use of appropriate manipulatives and technology are integrated throughout the course. Readings, class discussions, and assignments focus on mathematics content as well as applicable theories of learning, curriculum resources, and state and national recommendations. The course models instructional techniques that can be adapted to the elementary curricula. Credit offered only to M.Ed. and M.A.T., certificate students, and in-service teachers. (Not offered for credit if credit is received for MATH 821 or MATH 823.)

Prerequisite(s): [EDUC 500](#) with a minimum grade of D- or EDUC 935 with a minimum grade of B-.

Equivalent(s): MATH 821

Grade Mode: Letter Grading

MATH 803 - Teaching of Mathematics in Grades K-6

Credits: 3

Methods of teaching mathematics at the elementary school level; uses of technology, manipulatives, models, and diagrams; developing unit and lesson plans; assessment ; instructional formats; teaching reading and writing in mathematics.

Prerequisite(s): [MATH 801](#) with a minimum grade of B-.

Mutual Exclusion: No credit for students who have taken [EDC 824](#), [EDC 833](#).

Grade Mode: Letter Grading

MATH 805 - Introduction to Mathematics and Statistics Teaching

Credits: 1

This course introduces new graduate teaching assistants in mathematics and statistics to teaching in mathematics and statistics. Topics include group facilitation, active learning, grading, diversity and inclusion in the classroom, goal setting, classroom management, time management, designing rich mathematical tasks, and research on student learning.

Repeat Rule: May be repeated for a maximum of 2 credits.

Grade Mode: Graduate Credit/Fail grading

MATH 809 - Teaching of Mathematics in Grades 6-12

Credits: 3

Methods of teaching mathematics at the middle and high school levels; uses of technology, manipulatives, models, and diagrams; developing unit and lesson plans; assessment; instructional formats; teaching reading and writing in mathematics.

Prerequisite(s): [MATH 800](#) with a minimum grade of B-.

Mutual Exclusion: No credit for students who have taken [EDC 833](#), [EDC 834](#).

Grade Mode: Letter Grading

MATH 831 - Mathematics for Geodesy**Credits:** 3

A survey of topics from undergraduate mathematics designed for graduate students in engineering and science interested in applications to geodesy and Earth Sciences. Topics include essential elements from analytic geometry, geometry of surfaces, linear algebra and statistics, Fourier analysis, discrete Fourier transforms and software, filtering applications to tidal data.

Prerequisite(s): ([MATH 645](#) with a minimum grade of D- or MATH 645H with a minimum grade of D- or MATH 762 with a minimum grade of D- or MATH 862 with a minimum grade of B-).

Grade Mode: Letter Grading

MATH 832 - Introduction to the R Software**Credits:** 1

This course provides a basic introduction to the open-sources statistical software R for students who have never used this software or have never formally learned the basics of it. Topics include: Numeric calculations, simple and advanced graphics, object management and work-flow, RStudio, user-contributed packages, basic programming, writing of functions, statistical modeling and related graphs, distributed computing, reproducible research and document production via markup language.

Equivalent(s): MATH 859

Grade Mode: Graduate Credit/Fail grading

MATH 834 - Statistical Computing**Credits:** 3

This is a course on statistics-oriented programming and common computational methodologies used in statistics. Students will learn principles and techniques of sample-splitting, cross-validation, simulation, bootstrap, and optimization, and how to implement them in R. The students will gain experience of reading/modifying, writing and debugging code, and how to speed up computation.

Prerequisite(s): ([MATH 835](#) with a minimum grade of B- or [MATH 838](#) with a minimum grade of B- or [MATH 839](#) with a minimum grade of B-).

Grade Mode: Letter Grading

MATH 835 - Statistical Methods for Research**Credits:** 3

This course provides a solid grounding in modern applications of statistics to a wide range of disciplines by providing an overview of the fundamental concepts of statistical inference and analysis, including t-tests and confidence intervals. Additional topics include: ANOVA, multiple linear regression, analysis of cross classified categorical data, logistic regression, nonparametric statistics and data mining using CART. The use of statistical software, such as JMP, S PLUS, or R, is fully integrated into the course.

Grade Mode: Letter Grading

MATH 836 - Advanced Statistical Modeling**Credits:** 3

This is a course on statistical models behind normal linear model. Topics covered in this course include generalized linear model, linear mixed model, generalized additive model, generalized linear mixed model, generalized additive mixed model, and smoothing methods if time allows.

Prerequisite(s): ([MATH 835](#) with a minimum grade of B- or [MATH 839](#) with a minimum grade of B-).

Grade Mode: Letter Grading

MATH 837 - Statistical Methods for Quality Improvement and Design**Credits:** 3

Six Sigma is a popular, data-focused methodology used worldwide by organizations to achieve continuous improvement of their existing processes, products and services or to design new ones. This course provides a thorough introduction to the Six Sigma principles, methods, and applications for continuous improvement (DMAIC process) and an overview of Design for Six Sigma (DFSS). Both manufacturing and non-manufacturing (transactional Six Sigma) applications will be included. Emphasis is placed on the use of case studies to motivate the use of, as well as the proper application of, the Six Sigma methodology. Formal Six Sigma Green Belt certification from UNH may be attained by successfully completing TECH 696. Students must have completed a calculus-based introductory statistics course.

Grade Mode: Letter Grading

MATH 838 - Data Mining and Predictive Analytics**Credits:** 3

An introduction to supervised and unsupervised methods for exploring large data sets and developing predictive models. Unsupervised methods include: market basket analysis, principal components, clustering, and variables clustering. Important statistical and machine learning methods (supervised learning) include: Classification and Regression Trees (CART), Random Forests, Neural Nets, Support Vector Machines, Logistic Regression and Penalized Regression. Additional topics focus on metamodeling, validation strategies, bagging and boosting to improve prediction or classification, and ensemble prediction from set of diverse models. Required case studies and projects provide students with experience in applying these techniques and strategies. The course necessarily involves the use of statistical software and programming languages. Students must have completed a calculus-based introductory statistics course.

Grade Mode: Letter Grading**MATH 839 - Applied Regression Analysis****Credits:** 3

Statistical methods for the analysis of relationships between response and input variables: simple linear regression, multiple regression analysis, residual analysis, model selection, multi-collinearity, nonlinear curve fitting, categorical predictors, introduction to analysis of variance, analysis of covariance, examination of validity of underlying assumptions, logistic regression analysis. Emphasizes real applications with use of statistical software. Students must have completed an introductory statistics course.

Grade Mode: Letter Grading**MATH 840 - Design of Experiments I****Credits:** 3

First course in design of experiments with applications to quality improvement in industrial manufacturing, engineering research and development, or research in physical and biological sciences. Experimental factor identification, statistical analysis and modeling of experimental results, randomization and blocking, full factorial designs, random and mixed effects models, replicates and sub-sampling strategies, fractional factorial designs, response surface methods, mixture designs, and screening designs. Focuses on various treatment structures for designed experimentation and the associated statistical analyses. Use of statistical software. Students must have completed an introductory statistics course.

Grade Mode: Letter Grading**MATH 841 - Survival Analysis****Credits:** 3

Explorations of models and data-analytic methods used in medical, biological, and reliability studies. Event-time data, censored data, reliability models and methods, Kaplan-Meier estimator, proportional hazards, Poisson models, loglinear models. The use of statistical software, such as SAS, JMP, or R, is fully integrated into the course. (Offered in alternate years.)

Prerequisite(s): [MATH 839](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**MATH 843 - Time Series Analysis****Credits:** 3

An introduction to univariate time series models and associated methods of data analysis and inference in the time domain and frequency domain. Topics include: Auto regressive (AR), moving average (MA), ARMA and ARIMA processes, stationary and non-stationary processes, seasonal ARIMA processes, auto-correlation and partial auto-correlation functions, identification of models, estimation of parameters, diagnostic checking of fitted models, forecasting, spectral density function, periodogram and discrete Fourier transform, linear filters, parametric spectral estimation, dynamic Fourier analysis. Additional topics may include wavelet and long memory processes (FARIMA) and GARCH Models. The use of statistical software, such as JMP, or R, is fully integrated into the course. Offered in alternate years in the spring.

Prerequisite(s): ([MATH 835](#) with a minimum grade of B- or [MATH 839](#) with a minimum grade of B-).**Grade Mode:** Letter Grading**MATH 844 - Design of Experiments II****Credits:** 3

Second course in design of experiments, with applications in quality improvement and industrial manufacturing, engineering

research and development, research in physical and biological sciences. Covers experimental design strategies and issues that are often encountered in practice complete and incomplete blocking, partially balanced incomplete blocking (PBiB), partial confounding, intra and inter block information, split plotting and strip plotting, repeated measures, crossover designs, Latin squares and rectangles, Youden squares, crossed and nested treatment structures, variance components, mixed effects models, analysis of covariance, optimizations, space filling designs, and modern screening design strategies.

Prerequisite(s): [MATH 840](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 845 - Foundations of Applied Mathematics I

Credits: 3

An introduction to Partial Differential Equations (PDEs) and associated mathematical methods and the analytical foundation for applied mathematics. Topics include: PDE classification, superposition, separation of variables, orthonormal functions, completeness, convergence, Fourier Series, Sturm-Liouville eigenvalue problems, and eigenfunctions. Methods are introduced for the analysis and solution of boundary value problems, in particular, the Heat, Wave, and Laplace equations. Students are required to have a mastery of differential equations and ordinary differential equations.

Grade Mode: Letter Grading

MATH 847 - Introduction to Nonlinear Dynamics and Chaos

Credits: 3

An introduction to the mathematics of chaos and nonlinear dynamics. Topics include: linear and nonlinear systems of ordinary differential equations; discrete maps; chaos; phase plane analysis; bifurcations; and computer simulations. Students taking this course are required to have some background in elementary differential equations, linear algebra, and multidimensional calculus. (Not offered every year.)

Grade Mode: Letter Grading

MATH 853 - Introduction to Numerical Methods

Credits: 3

Introduction to mathematical algorithms and methods of approximation. A wide survey of approximation methods are examined including, but not limited to, polynomial interpolation, root finding, numerical integration, approximation of differential equations, and techniques used in conjunction with linear systems. Included in each case is a study of the accuracy and stability of a given technique, as well as its efficiency and complexity. It is assumed that the student is familiar and comfortable with programming a high-level computer language. (Also offered as [CS 853](#)).

Grade Mode: Letter Grading

MATH 855 - Probability with Applications

Credits: 3

Introduces the theory, methods, and applications of randomness and random processes. Probability concepts, random variable, expectation, discrete and continuous probability distributions, joint distributions, conditional distributions; moment-generating functions, convergence of random variables.

Grade Mode: Letter Grading

MATH 856 - Principles of Statistical Inference

Credits: 3

Introduces the basic principles and methods of statistical estimation and model fitting. One- and two-sample procedures, consistency and efficiency, likelihood methods, confidence regions, significance testing, Bayesian inference, nonparametric and re-sampling methods, decision theory.

Prerequisite(s): [MATH 855](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 857 - Mathematical Optimization for Applications

Credits: 3

This course introduces the foundations of mathematical optimization and reinforces them via applications. The content includes convex optimization, first and second-order methods, constrained problems, duality, linear and quadratic programming, as well

discrete and non-convex optimization. Applications will focus on machine learning methods but also include problems from engineering and operations research. Students are required to have a mastery of Calculus II and programming proficiency in MATLAB, R, Java, C, Python, or equivalent.

Equivalent(s): CS 857

Grade Mode: Letter Grading

MATH 861 - Abstract Algebra

Credits: 3

This course establishes the axiomatic framework that underlies number systems and similar mathematical structures, investigating basic properties of groups, rings, fields and their homomorphisms.

Grade Mode: Letter Grading

MATH 863 - Abstract Algebra II

Credits: 3

This course extends the investigations of [MATH 861](#) into more specialized situations related to old and new problems in mathematics, such as the nature of solutions of polynomial equations. It presents advanced properties of groups, rings, fields and their applications.

Prerequisite(s): [MATH 861](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 865 - Introduction to Commutative Algebra and Algebraic Geometry

Credits: 3

Methods of determining solution sets of polynomial systems; affine varieties and their ideals; the 'algebra-geometry correspondence'; theory and applications of Grobner bases.

Grade Mode: Letter Grading

MATH 867 - One-Dimensional Real Analysis

Credits: 3

Theory of limits, continuity, differentiability, integrability.

Grade Mode: Letter Grading

MATH 868 - Real Analysis II

Credits: 3

Theory of integration; series; power series and uniform convergence of power series.

Grade Mode: Letter Grading

MATH 869 - Introduction to Differential Geometry

Credits: 3

Introduction to the study of the geometric properties of curves and surfaces in 3-dimensional space.

Grade Mode: Letter Grading

MATH 870 - Foundations of Number Theory

Credits: 3

Factorization and prime numbers, arithmetic functions, congruences, reciprocity laws, quadratic forms, Diophantine equations, computational number theory. Offered in alternate years.

Grade Mode: Letter Grading

MATH 872 - Combinatorics

Credits: 3

Graph theory (including planar graphs, graph coloring, Hamiltonian circuits, trees); counting principles (including permutations, combinations, pigeonhole principle, inclusion-exclusion principle); and related topics.

Grade Mode: Letter Grading

MATH 883 - Set Theory**Credits:** 3

Axiomatic set theory, including its history, Zermelo-Fraenkel axioms, ordinal and cardinal numbers, consistency, independence, and undecidability. (Not offered every year.)

Grade Mode: Letter Grading**MATH 884 - Topology****Credits:** 3

Open sets, closure, base, and continuous functions. Connectedness, compactness, separation axioms, and metrizability.

Prerequisite(s): ([MATH 767](#) with a minimum grade of D- or [MATH 867](#) with a minimum grade of B-).

Grade Mode: Letter Grading**MATH 888 - Complex Analysis****Credits:** 3

Complex functions, sequences, limits, differentiability and Cauchy-Riemann equations, elementary functions, Cauchy's theorem and formula, Taylor's and Laurent's series, residues, conformal mapping.

Prerequisite(s): [MATH 867](#) with a minimum grade of B-.

Grade Mode: Letter Grading**MATH 896 - Topics in Mathematics and Statistics****Credits:** 1-4

New or specialized courses not covered in regular course offerings.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading**MATH 898 - Master's Project****Credits:** 1-6

Master's Project.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading**MATH 905 - Euclidean and non-Euclidean Geometries from a Synthetic Perspective****Credits:** 3

An axiomatic development of geometry, beginning with finite geometries; emphasis is given to the fundamental concepts of Euclidean and non-Euclidean geometries from a synthetic perspective.

Grade Mode: Letter Grading**MATH 915 - Algebraic Structures****Credits:** 3

An exploration of the structural similarities between and among seemingly disparate number systems, beginning with counting numbers, and progressing to integers, the rational numbers, the real numbers, and the complex numbers; and leading to a discussion of polynomials as an integer analogue and to fields as polynomial "quotients" through the basic concepts of splitting fields and Galois Theory.

Grade Mode: Letter Grading**MATH 916 - Theory of Numbers for Teachers****Credits:** 3

Divisibility and primes; congruences; quadratic reciprocity; number theoretic functions; Diophantine equations; perfect and amicable numbers.

Grade Mode: Letter Grading**MATH 918 - Analysis of Real Numbers**

Credits: 3

An introduction to the fundamental concepts in real analysis that provide the mathematical foundation for calculus. Content focuses on properties of sequences and series; properties of functions, including continuity, the derivative and the Riemann integral.

Grade Mode: Letter Grading

MATH 925 - Problem Solving Seminar**Credits:** 3

A study of variety of problem solving strategies and techniques in the context of solving mathematical problems. Problems will emphasize the connections between the core areas of algebra, geometry and analysis. Other mathematical topics may be included. Typically taken in conjunction with the Concluding Experience Problem Set.

Grade Mode: Graduate Credit/Fail grading

MATH 928 - Selected Topics in Mathematics for Teachers**Credits:** 1-3

New or specialized topics not covered in the regular course offerings. May be repeated for credit barring duplication of topic.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

MATH 929 - Directed Reading**Credits:** 1-3

A directed reading project on a selected topic in mathematics or mathematics education, planned in collaboration with a faculty member.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

MATH 931 - Mathematical Physics**Credits:** 3

Complex variables, differential equations, asymptotic methods, integral transforms, special functions, linear vector spaces and matrices, Green's functions, and additional topics selected from integral equations, variational methods, numerical methods, tensor analysis, and group theory. Students are required to have a mastery of differential equations; linear algebra; multidimensional calculus.

Equivalent(s): PHYS 931

Grade Mode: Letter Grading

MATH 945 - Advanced Theory of Statistics I**Credits:** 3

Introduction to the theory and practice of statistical modeling and inference. Basic multivariate analysis: covariance and expectation, multivariate-normal and non-central chi-squared distributions, linear and quadratic forms. Basic inequalities for probabilities and expectations: Markov, Chebyshev, Jensen, and Cauchy-Schwartz. Basic decision theory, sufficiency, minimal sufficiency, ancillarity and completeness, Point estimation: method of moments, maximum likelihood, Bayesian procedures, likelihood procedures and information inequalities. Measures of performance, notions of optimality, and construction of optimal procedures in simple situations. Convergence in distribution and in probability.

Prerequisite(s): MATH 856 with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 946 - Advanced Theory of Statistics II**Credits:** 3

Asymptotic statistical inference: consistency, asymptotic normality and efficiency. Hypothesis testing: Neyman-Pearson lemma, uniformly most powerful test, generalized likelihood ratio tests, Chi squared goodness-of-fit tests, Wald tests and related confidence intervals, pivotal quantities, optimality properties. Modern likelihood methods (quasi, pseudo and composite). Algorithmic inference: Gibbs sampling, bootstrapping, simultaneous inferences in high-dimensional data and functional data. Nonparametric and semiparametric estimation methods, asymptotic estimation theory and large sample tests.

Prerequisite(s): [MATH 945](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 951 - Algebra I

Credits: 3

Groups and their homomorphisms, products and sums, structure of groups; rings and their homomorphisms, ideals, factorization properties.

Prerequisite(s): [MATH 861](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 952 - Algebra II

Credits: 3

Field extensions; Galois theory; module theory.

Prerequisite(s): [MATH 951](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 953 - Analysis I

Credits: 3

Measurable spaces and functions, measures, Lebesgue integrals, convergence theorems.

Prerequisite(s): [MATH 867](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 954 - Analysis II

Credits: 3

Cauchy theory and local properties of analytic functions, Riemann mapping theorem, representation theorems, harmonic functions.

Prerequisite(s): [MATH 888](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 955 - Topology I

Credits: 3

Subspace, product, and quotient topologies; embedding; separation and countability axioms; connectedness; compactness and compactifications; paracompactness, metrization, and metric completions.

Prerequisite(s): [MATH 884](#) with a minimum grade of B-.

Grade Mode: Letter Grading

MATH 958 - Foundations of Math Education

Credits: 1

Topics include: major issues and trends in mathematics education research, the profession and infrastructure of mathematics education, theoretical perspectives, cultural and historical aspects of mathematics education, and the research-practice interface. Examples span the K-16 spectrum.

Grade Mode: Letter Grading

MATH 959 - Introduction to Research Design in STEM Education

Credits: 3

This course provides an overview of research design including preliminary considerations that go into selecting a qualitative, quantitative, or mixed methods design. Topics include the definition of the various approaches, developing research questions and/or hypotheses, reviewing the literature, understanding the use of theory, anticipating ethical issues, and developing writing strategies.

Grade Mode: Letter Grading

MATH 961 - Topics in Algebra I

Credits: 3

An introduction to topics chosen from algebra and number theory. May be repeated barring duplication of subject.

Prerequisite(s): MATH 951 with a minimum grade of B- and MATH 952 with a minimum grade of B-.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

MATH 966 - Topics in Algebraic Topology I**Credits:** 3

An introduction to topics in algebraic topology.

Prerequisite(s): MATH 956 with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

MATH 968 - Topics in Mathematics Education I**Credits:** 3

A) The Teaching and Learning of Mathematics; B) Curriculum and History in Mathematics Education. Topics selected from: epistemologies of knowledge applied to mathematics; theories of learning and teaching mathematics; theoretical perspectives in research; mathematics education research programs K-16; research methods for studying mathematics teaching, learning, and curricula; theoretical frameworks for curriculum development, implementation of new curricula, and research on curricula; historical perspectives of research in mathematics education; the evolution and history of K-16 mathematics curricula both in United States and internationally. Versions A and B offered alternately.

Prerequisite(s): MATH 958 with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

MATH 973 - Topics in Operator Theory**Credits:** 3

Selected topics in operator theory.

Prerequisite(s): MATH 863 with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

MATH 978 - Topics in Mathematics Education II**Credits:** 1-3

An exploration of an area of research in mathematics education.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

MATH 979 - Research Topics in Statistics**Credits:** 3

An exploration of the main statistical issues and computational methods associated with research problems from such areas as survival analysis, reliability, latitudinal data, categorical data, spatio-temporal data, and industrial processes. Student term projects require: literature searches, presentation, use of modern statistical software, and written reports. May be repeated barring duplication of topic.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

MATH 997 - Statistics Seminar**Credits:** 1

A seminar of weekly and bi-weekly meetings organized by the statistics Ph.D. students with supervision by a statistics faculty member. Informal presentations of faculty members, students, and outside guest presenters; also discussion of topics that are of mutual interest to its participants. Dissertation proposal presentations. Seminar presentations are open to the greater public. Statistics Ph.D. students are required to enroll for at least 3 semesters. Attendance is mandatory by those students who are

enrolled in the seminar. Credits do not count towards the Master's degree.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

MATH 998 - Reading Courses

Credits: 1-6

A) Algebra; B) Analysis; C) Operator Theory; D) Geometry; E) General Topology; F) Algebraic Topology; G) Applied Mathematics; H) Mathematics Education; I) Probability and Statistics.

Grade Mode: Letter Grading

MATH 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Mathematics (MTH) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MTH 801 - Probability and Statistics

Credits: 4

In this course students study topics in data analysis including descriptive and inferential statistics, probability, odds and fair games, probability distributions, normal distributions, and estimation. Among the topics are numerical and graphical summaries for one and two variables, linear regression and correlation, confidence intervals and tests concerning means, sampling and experimentation, basic probability, confidence intervals, hypothesis testing, sampling distributions, two-sample t-tests for mean chi-squared tests, regress and correlation, and possible other topics. A standards statistical software package is used throughout the course to support the course format that includes: hands-on activities; computer-based simulations; creating and implementing student developed investigations; and actual secondary and middle school mathematics classroom activities. Throughout the course students are given opportunities to relate the mathematical concepts studied in this course to the mathematical concepts they will be teaching. Successful completion of PreCalculus required.

Equivalent(s): MATH 703G

Mutual Exclusion: No credit for students who have taken MATH 823.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

MTH 802 - Mathematical Proof for Educators

Credits: 4

This course introduces students to the language and methods used to create and write mathematical proofs and solve problems. Methods of proof will include: direct, contrapositive, contradiction, and induction. Methods of problem solving will be based on Polya's four steps for solving problems. Students will learn about and utilize the many functions of proof including: verification, explanation, communication, discovery, justification, and inquiry. The course will also explore the relationship between problem solving and the process of proving. Students will explore fundamental abstract concepts in mathematics chosen from the following areas: functions and relations, set theory, number theory, and logic, Euclidian and non-Euclidian geometry, algebra, mathematical reasoning, proof, and problem solving. Connections to middle and secondary school mathematics curriculum emphasized. Students enrolled in this course at the 700 level will meet additional academic requirements including an applied project. Pre-calculus required prior to taking this course.

Equivalent(s): MATH 700G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

MTH 803 - Number Systems

Credits: 4

This course examines the structure and properties of mathematics while focusing on the development of mental mathematics strategies and problem solving skills. Topics include sets, functions, applications of rational numbers, integers, fractions, decimal percentages, and number theory. Appropriate grade level techniques are utilized to investigate algorithms, probability and statistics, counting techniques, scientific notation, complex numbers, exponents, geometry, and measurement. Students will also investigate ratios, proportion, data analysis, patterns, and the connections to algebra and geometry topics in the context of the 5-12 grades mathematics curriculum. Successful completion of PreCalculus required prior to taking this course.

Equivalent(s): MATH 701G

Mutual Exclusion: No credit for students who have taken MATH 821.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

MTH 804 - Geometric Structures for Teachers

Credits: 4

This course will examine concepts in Euclidean and non-Euclidean geometries. Course topics include area and volume, two- and three-dimensional perspective, congruence and similarity, properties of and relationships among geometric shapes and structures. Students will investigate graphing, vectors, motion and symmetry. Students engage in course concepts through proof problem solving, dynamic geometric software, and through activities used in secondary and middle school mathematics. Throughout the course students will be given opportunities to relate the mathematical concepts studied to the mathematical concepts they will be teaching. Successful completion of PreCalculus required prior to taking this course.

Equivalent(s): MATH 702G

Mutual Exclusion: No credit for students who have taken MATH 822.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MTH 805 - Calculus I

Credits: 4

The first semester of a calculus sequence dealing with applications and modeling of the differential and integral calculus. Course will focus on functions and their graphs, limits, continuity, differentiation, integration, the derivative and its uses in optimization and mathematical modeling, as well as the Fundamental Theorem. Throughout the course students will be given opportunities to relate the mathematical concepts studied to the mathematical concepts they will be teaching. Graphing calculators are used throughout the course to explore and represent concepts. Students enrolled in this course at the 700 level will meet additional academic requirements including an applied project. Pre-calculus required prior to taking this course.

Equivalent(s): MATH 706G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MTH 806 - History of Mathematics

Credits: 4

This course addresses the historical development of major themes in mathematics, including calculation, numbers, geometry, algebra, infinity, and formalism in various civilizations ranging from the antiquity of Babylonia and Egypt through classical Greece the Middle and Far East, and on to modern Europe. The course emphasizes how earlier civilizations influenced or failed to influence later ones and how the concepts evolved in these various civilizations.

Prerequisite(s): [MTH 805](#) with a minimum grade of B- or MATH 706G with a minimum grade of B-.

Equivalent(s): MATH 708G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MTH 807 - Calculus II

Credits: 4

This course is the second semester of a calculus sequence dealing with applications of differential and multivariable calculus. Topics include the calculus of transcendental functions, applications of integration, some differential equations, sequences and series, differentiation and integration of trigonometric functions multidimensional calculus with applications, and an introduction to multivariable calculus. Throughout the course students are given opportunities to relate the mathematical concepts studied to the mathematical concepts they will be teaching. Graphing calculators are used throughout the course to explore and represent concepts.

Prerequisite(s): [MTH 805](#) with a minimum grade of B- or MATH 706G with a minimum grade of B-.

Equivalent(s): MATH 707G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MTH 808 - Discrete Mathematics

Credits: 4

This course is designed to introduce students to discrete and abstract mathematical topics. Topics include propositional and predicate logic; elementary set theory; introduction to proof techniques including mathematical induction; sets, relations, functions, and relations; recurrence relations, graph theory, as well as the properties of groups, rings, and fields. Students study

number systems, mathematical induction, algorithms and complex number systems, matrix manipulation, combinatorics, graph theory, and finite differences. Course activities are based on secondary and middle school mathematics curricula. This course considers the basic objects of mathematics through real-world examples and the methods used to elucidate their properties.

Prerequisite(s): MTH 805 with a minimum grade of B- or MATH 706G with a minimum grade of B-.

Equivalent(s): MATH 705G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MTH 809 - Topics in Linear and Abstract Algebra

Credits: 4

This course will examine concepts in algebra including: Patterns and functions, arithmetic sequences, geometric sequences, arithmetic and algebra of the integers, least common multiple and greatest common divisor, inequalities, modular arithmetic an systems of numbers, properties of groups and fields, the field of complex numbers, polynomial arithmetic and algebra, linear equations. Course will develop the mathematical structures, algebraic properties, and applications of matrices, determinants, vectors, vector spaces, systems of linear equations, and linear transformations. Students will engage with these concepts through exploration, analysis, proof, and problem solving based on activities used in secondary and middle school mathematics.

Throughout the course students will be given opportunities to relate the mathematical concepts studied to the mathematical concepts they will be teaching. Students enrolled in this course at the 700 level will meet additional academic requirements including an applied project.

Prerequisite(s): (MTH 802 with a minimum grade of B- or MATH 700G with a minimum grade of B- and (MTH 807 with a minimum grade of B- or MATH 707G with a minimum grade of B-.

Equivalent(s): MATH 704G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

MTH 810 - Algebra Theory for Teachers

Credits: 4

This course will examine concepts in Algebra including patterns, functions, arithmetic sequences, geometric sequences, arithmetic and algebra of the integers, least common multiple and greatest common division, inequalities, basic properties of groups and fields, and polynomial arithmetic and algebra. Throughout the course students will be given opportunities to relate the mathematical concepts studied to the mathematical concepts they will be teaching.

Prerequisite(s): (MTH 802 with a minimum grade of B- or MATH 700G with a minimum grade of B- and (MTH 805 with a minimum grade of B- or MATH 706G with a minimum grade of B-.

Equivalent(s): MATH 709G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Mechanical Engineering (ME)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ME 806 - Renewable Energy: Physical and Engineering Principles

Credits: 3

The goal of this course is to become "fluent in energy" and to learn about the engineering fundamentals of renewable energy technologies. The course begins by giving an overview of U.S. energy usage and sources, as well as history and trends. Various renewable energy topics are then introduced and discussed. Where applicable, topics are discussed in detail from a fluid and thermal sciences point of view. Guest lectures and a field trip may be included. This course is open to all engineering graduate students. Prior coursework in thermodynamics and fluid dynamics required.

Grade Mode: Letter Grading

ME 807 - Analytical Fluid Dynamics

Credits: 4

Kinematics of flow; constitutive relationships; development of the Navier-Stokes equations; vorticity theorems; potential flow. Prior coursework in fluid dynamics required.

Grade Mode: Letter Grading

ME 809 - Computational Fluid Dynamics

Credits: 3

Conservation of mass, momentum, and energy, discretization and discretization schemes, boundary and initial conditions, turbulence and turbulence models, two-equation models, CFD software such as OpenFOAM, best practice guidelines for CFD. This class incorporates the use and creation of Open Educational Resources (OER)

Grade Mode: Letter Grading

ME 812 - Waves in Fluids

Credits: 3

Linear and nonlinear dynamics of hyperbolic and dispersive wave systems with application to acoustic waves, surface and internal gravity waves, Rossby waves, and capillary waves. Key physical concepts include wave-generation mechanisms, wavelength and amplitude dispersion, group velocity and energy propagation, steady streaming, and mode interactions. Prior coursework in fluid dynamics required.

Grade Mode: Letter Grading

ME 817 - Marine Robotics and Applications

Credits: 3

This course covers (lecture/lab format) the broad spectrum of marine vehicles and applications, as well as what is involved in designing and building robotic vehicles for specific missions. Course topics include: marine applications, sensors for marine environments, vehicle subsystems, ocean and open water environment, dynamic modeling and control, and design/fabrication/testing. Various invited speakers (both scientists and engineers) provide learning modules on various marine robotic related topics. Graduate students will be assigned extra project work. Prior coursework in systems modeling, simulation and control required.

Equivalent(s): [OE 817](#)

Grade Mode: Letter Grading

ME 826 - Fracture Mechanics

Credits: 4

The goal is to acquaint the student with understanding of the basic principles behind the derivation of the most common linear and non-linear fracture mechanical equations. The aim is also to gain knowledge in analytical predictions of the failure of

materials and become familiar with the ongoing fracture mechanical research. The motivation for this course is that many practical problems in mechanical engineering, manufacturing and materials science have to do with material deformation and failure. Prior coursework in mechanics of materials and introductory materials science required.

Grade Mode: Letter Grading

ME 827 - Advanced Mechanics of Solids

Credits: 4

Stress, strain, stress-strain relations, anisotropic behavior, introduction to elasticity, plane stress/strain, bending and torsion of members with general cross-sections, introduction to thin plates and shells, energy methods. Prior coursework in mechanics of materials required.

Grade Mode: Letter Grading

ME 842 - Materials Processing in Manufacturing

Credits: 4

Description and analysis of major material shaping processes in modern manufacturing. Casting: fluid flow and heat transfer, solidification, casting processes, properties of cast components and geometric capabilities. Forming: plasticity and formability, bulk and sheet metal forming processes, properties of formed components and geometric capabilities. Machining: cutting forces and tool wear, machining processes, properties of machined components and geometric capabilities. Overview of some non-conventional processes. Lab demonstrations. Prior coursework in mechanics of materials and introductory materials science required.

Grade Mode: Letter Grading

ME 843 - Satellite Systems, Dynamics, and Control

Credits: 3

General satellite systems with emphasis on spacecraft dynamics and control. Course topics include general satellite information such as types of satellites, missions, and orbits, as well as satellite subsystems. Basic spacecraft dynamics and orbital mechanics topics are covered. Advanced topics will include attitude and orbit estimation, and automatic attitude control. Prior coursework in systems modeling, simulation and control required.

Grade Mode: Letter Grading

ME 872 - Control Systems

Credits: 4

Development of advanced control systems design concepts such as Nyquist analysis; lead-lag compensation; state feedback; parameter sensitivity; controllability; observability; introduction to nonlinear and modern control. Includes interactive computer aided design and real-time digital control. Lab.

Equivalent(s): ECE 872, EE 872

Grade Mode: Letter Grading

ME 877 - Computer Aided Engineering

Credits: 4

In this course, modules of Solid Works (beyond its basic solid modeling capabilities) and other software is used to demonstrate how computer based tools can be used in engineering practice, in particular design analysis and optimization. Emphasis placed on using knowledge from past engineering courses to obtain theoretical calculations to compare with the results from the computer software package. Prior coursework in strength of materials and fluid dynamics required.

Equivalent(s): EE 877

Grade Mode: Letter Grading

ME 886 - Introduction to Finite Element Analysis

Credits: 4

Topics include basic matrix theory, potential energy approach, direct stiffness method, calculus of variations, development of finite element theory, and modeling techniques. Applications in solid mechanics, heat transfer, fluids, and electromagnetic devices, via both commercially available codes and student written codes. Prior coursework in mechanics of materials and heat transfer required. Lab.

Grade Mode: Letter Grading**Special Fee:** Yes**ME 895 - Special Topics****Credits:** 1-4

New or specialized courses and/or independent study. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**ME 899 - Master's Thesis****Credits:** 1-8

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 8 credits.**Grade Mode:** Graduate Credit/Fail grading**ME 909 - Viscous Flow****Credits:** 3

Exact solutions of the Navier-Stokes equations; laminar boundary layers; wakes and jets; Stoke's flow; stability of parallel flows a boundary layers; transition to turbulence. Prior coursework in analytic fluid dynamics required.

Grade Mode: Letter Grading**ME 922 - Continuum Mechanics****Credits:** 4

Cartesian tensors. Lagrangian and Eulerian description of a continuum. The material time derivative. Deformation gradient. Displacement and rotation. Strain tensors. Rates of deformation. Conservation of mass. Momentum balance equations. Cauchy and Piola-Kirchhoff stress tensors. Balance of energy: stress power, rate of work, and internal energy. Entropy and the second law of thermodynamics. Constitutive equations for elasticity and plasticity. Newtonian and non-Newtonian fluids. Inviscid and visco flow. Naiver-Stokes equations. Ideal and rotational flows.

Grade Mode: Letter Grading**ME 927 - Theory of Plasticity****Credits:** 4

Analysis of stress and deformation in inelastic solids; general development of stress invariants, variational principles, constitutive relations, and yield and loading functions. Special emphasis on ideal plasticity, strain-hardening, creep, limit analysis, and limit design.

Grade Mode: Letter Grading**ME 944 - Nonlinear Control Systems****Credits:** 4

Analysis and design of nonlinear control systems from the classical and modern viewpoints are discussed. Liapunov's stability theory; phase space methods; linearization techniques; simulation; frequency response methods; generalized describing functions; transient analysis utilizing functional analysis; and decoupling of multivariable systems. Prior coursework in control systems required.

Equivalent(s): ECE 944, EE 944**Grade Mode:** Letter Grading**ME 951 - Advanced Control Systems I****Credits:** 3

State-space representation of multivariable systems; analysis using state transition matrix. Controllability and observability; pole placement using state and output feedback; Luenberger observers. Introduction to computer-controlled systems (sampling, discrete state representation, hybrid systems); nonlinear analysis (Liapunov, Popov, describing function). Prior coursework in control systems required.

Equivalent(s): ECE 951, EE 951

Grade Mode: Letter Grading

ME 986 - Advanced Finite Element Analysis

Credits: 4

Topics include introduction to dynamics, treatment of nonlinear material behavior, and plate and shell element technology. Emphasis given to problems in solid mechanics and heat transfer. Prior coursework in finite element analysis required.

Grade Mode: Letter Grading

ME 992 - Master's Project

Credits: 4

The student works with a faculty member during one or two semesters on a well-defined research and/or original design problem. A written report and seminar are presented. IA (continuous grading).

Repeat Rule: May be repeated up to 1 time.

Grade Mode: Graduate Credit/Fail grading

ME 995 - Graduate Special Topics

Credits: 1-4

Investigations of graduate-level problems or topics in mechanical engineering.

Grade Mode: Letter Grading

ME 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Microbiology (MICR)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MICR 805 - Immunology

Credits: 3

An introduction to the fundamental mechanisms of immune function. Topics include the cells and organs of the immune system, humoral and cellular immune responses, the generation of immune cells, and how immune cells fight various infectious pathogens. One semester of cell biology recommended.

Grade Mode: Letter Grading

MICR 806 - Virology

Credits: 3

Principles of animal and selected plant and bacterial virology in relation to infection and disease. Emphasizes the molecular biology of viruses, viral replication, isolation, propagation, assay, pathogenesis, diagnosis, detection, epidemiology, and control. Completion of introductory microbiology and lab recommended prior to taking this course.

Grade Mode: Letter Grading

MICR 808 - Virology Laboratory

Credits: 2

Principles of animal and selected plant and bacterial virology in relation to infection and disease. Emphasizes the molecular biology of viruses, viral replication, isolation, propagation, assay, pathogenesis, diagnosis, detection, epidemiology, and control.

Grade Mode: Letter Grading

Special Fee: Yes

MICR 815 - Immunology Laboratory

Credits: 2

This applied immunology laboratory course highlights both historic and current methodologies important for elucidation and diagnosis of immune function. Techniques used to study phagocytosis, antibody production, immunodiffusion, and T-cell function will be introduced. Applications of the antibody technologies to other scientific disciplines (ELISA, immunofluorescence microscopy, immunoblotting, etc.) will also be covered. Introductory microbiology and microbiology lab recommended.

Co-requisite: MICR 805

Grade Mode: Letter Grading

Special Fee: Yes

MICR 835 - Molecular and Cellular Parasitology

Credits: 4

Parasites continue to present a major challenge to public health. Despite their significant impact on human health, many aspects of the molecular and cellular biology of these diverse organisms remain unknown. This course explores the latest research on these fascinating organisms through analysis and discussion of original research papers focusing on three major human parasite families. Introductory microbiology and microbiology lab and one semester of genetics and one semester of parasitology recommended.

Grade Mode: Letter Grading

Molecular, Cellular and Biomedical Science (MCBS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MCBS 801 - Introduction to Careers in Biotechnology

Credits: 1

Overview of careers in the biotechnology and biopharmaceutical industries. Professional development activities include defining career goals, preparing a professional resume and cover letter to prospective employers, identification of potential internship opportunities, and networking. The course will also include an overview of the types of positions available within the biotechnology/biopharma sector, presentations by biotechnology career professionals, and presentations by UNH faculty whose research disciplines are relevant to the field of biotechnology and biopharmaceutics.

Repeat Rule: May be repeated for a maximum of 2 credits.

Grade Mode: Graduate Credit/Fail grading

MCBS 895 - Special Topics

Credits: 1-4

Special topics course.

Repeat Rule: May be repeated for a maximum of 16 credits. May be repeated up to 3 times.

Grade Mode: Letter Grading

MCBS 899 - Master's Thesis

Credits: 1-10

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 10 credits.

Grade Mode: Graduate Credit/Fail grading

MCBS 901 - Introduction to Research in the Life Sciences

Credits: 2

This two-credit graduate course is designed to acquaint first-year master's and doctoral students with facilities and tools for designing, conducting, and communicating research. Topics include: acquiring proper background information; the art of oral presentation; effective writing; data analysis and graphics using computers; ethics in science; and issues in research.

Grade Mode: Letter Grading

MCBS 905 - Contemporary Topics in Molecular, Cellular and Biomedical Sciences

Credits: 1

Presentation, discussion, and critical evaluation of current research literature in molecular/cellular life sciences and in biomedical sciences. Topics will vary each semester.

Repeat Rule: May be repeated for a maximum of 5 credits.

Grade Mode: Graduate Credit/Fail grading

MCBS 910 - Cell Signaling Networks Across the Kingdoms

Credits: 3

This course is a survey of contemporary problems in microbial, plant, protozoan, and animal cell and biosystems signaling. Topics to be covered include: evolution of extracellular signals, receptor systems, and signal transduction pathways that govern cell proliferation, survival, and development; current technical approaches for discovery and characterization of signal transduction factor networks; corrupted signal transduction in disease; disease control or therapy. Students should have knowledge of cell biology, biochemistry, genetics and/or molecular biology.

Grade Mode: Letter Grading

MCBS 913 - Applied Bioinformatics**Credits:** 3

Genome-enabled biology is the exploration of basic biological questions by combining high-throughput data gathering approaches, such as DNA sequencing, with computational skills in the area of Bioinformatics. Course is designed to provide an opportunity for graduate students in the life sciences to develop sophisticated methods of data analysis by participating in a collaborative project.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Letter Grading**MCBS 995 - Special Topics****Credits:** 1-4

Special topics course.

Repeat Rule: May be repeated for a maximum of 16 credits. May be repeated up to 3 times.**Grade Mode:** Letter Grading**MCBS 997 - Seminar****Credits:** 1

Graduate student and faculty presentations on current topics in the molecular life sciences and biomedical sciences. Graduate students are expected to present one seminar per year and attend all seminars each semester.

Repeat Rule: May be repeated for a maximum of 8 credits.**Grade Mode:** Graduate Credit/Fail grading**MCBS 999 - Doctoral Research****Credits:** 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Music (MUSI)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MUSI 801 - Topics in Music History

Credits: 3

Courses offered under this number feature a variety of topics having to do with music history. Topics in given semesters reflect faculty expertise in teaching and research. For topic examples, see "Courses Taught" on relevant faculty web pages. May be repeated for credit if topics differ.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

MUSI 809 - Music of the Romantic Period

Credits: 3

A survey of Romanticism in music from Beethoven's late period to the end of the 19th century. The works of Schubert, Berlioz, Schumann, Mendelssohn, Chopin, Wagner, Verdi, Brahms, Austrian symphonists, French pre-impressionists, and national styles in European music.

Grade Mode: Letter Grading

MUSI 831 - Advanced Instrumental Conducting

Credits: 2

Physical aspects, equipment of conductor, fundamental gestures and beats, baton techniques. Reading and analysis of full and condensed scores, study of transposition, psychology of rehearsals.

Repeat Rule: May be repeated for a maximum of 12 credits.

Grade Mode: Letter Grading

Special Fee: Yes

MUSI 845 - Graduate Voice

Credits: 1-4

Private instruction in voice. Special fee for non-majors.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

Special Fee: Yes

MUSI 848 - Graduate Cello

Credits: 1-4

Private instruction in cello. Special fee for non-majors.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

Special Fee: Yes

MUSI 855 - Graduate Bassoon

Credits: 1-4

Private instruction in bassoon. Special fee for non-majors.

Repeat Rule: May be repeated for a maximum of 99 credits.

Grade Mode: Letter Grading

Special Fee: Yes

MUSI 865 - Introduction to Bibliography**Credits:** 3

This course is a comprehensive survey of skills and resources fundamental for undertaking research projects in music. Topics include bibliography (a survey of standard reference works, periodicals, monographs, collected editions, and other important sources); research techniques; critical reading, thinking, and writing; oral presentation; and the planning and drafting of a research paper (including methods of citation). A reading knowledge of German, French, and Italian is helpful, but not required.

Grade Mode: Letter Grading**MUSI 869 - Musicology Seminar****Credits:** 3

A seminar course that explores a specialized topic in musicology in depth. Students survey the principal primary and secondary materials for the given topic, present oral presentations related to it, and write an essay showing understanding of the literature and research issues involved. Topics change each time the course is offered.

Repeat Rule: May be repeated for a maximum of 9 credits.**Grade Mode:** Letter Grading**MUSI 875 - Composition****Credits:** 1-4

Construction of phrases, periods, and short compositions following classical models. Problems of text-setting.

Grade Mode: Letter Grading**MUSI 876 - Composition****Credits:** 1-4

Construction of phrases, periods, and short compositions following classical models. Problems of text-setting.

Prerequisite(s): [MUSI 875](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**MUSI 877 - Advanced Composition****Credits:** 1-4

Continuation of [MUSI 876](#). Individual compositional projects. May be repeated for credit.

Prerequisite(s): [MUSI 876](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**MUSI 879 - Reading and Writing Musical Scores****Credits:** 3

This course is designed to assist music majors gain competence and confidence in working with full scores for music ensembles. Course activities will focus on the tasks of score reading and analysis, and the creation of new arrangements for ensembles the student is likely to lead in their professional life. Additionally, various aspects of programming repertoire for performances will be addressed. These skills will be of value to both music education and music performance majors.

Grade Mode: Letter Grading**MUSI 891 - Research Seminar****Credits:** 1-4

Guidance on individual research projects.

Grade Mode: Letter Grading**MUSI 894 - Theory Seminar****Credits:** 3

Study of representative masterworks. Score analysis.

Grade Mode: Letter Grading**MUSI 895 - Special Studies**

Credits: 1-4

A) J.S. Bach; B) Franz Schubert; C) Debussy and Ravel; D) the world of jazz; E) piano literature; F) 19th century French music; G) advanced analysis; H) advanced study in electronic music; I) composition through computer-generated sound; J) woodwind literature; K) brass literature; L) string literature; M) medieval performance practice; N) renaissance performance practice; O) baroque performance practice; P) classical performance practice; Q) 19th century performance practice; R) 20th century performance practice; S) woodwind repair; T) string repair; U) advanced jazz improvisation; V) advanced piano pedagogy; W) advanced accompanying; X) advanced conducting; Y) independent study. May be repeated for credit with permission.

Grade Mode: Letter Grading

Music Education (MUED)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

MUED 841 - Techniques and Methods in Choral Music

Credits: 2

Methods for teaching choral music in 5-12th grade schools, the developing voice, vocal modeling, repertoire selection, choral conducting, rehearsal technique, sequencing and feedback, piano skills for choral rehearsal, in-school fieldwork. This class requires a fieldwork component. Students will conduct rehearsals at Oyster River Middle School 7:00am-7:50am at least once per week for a portion of the semester.

Grade Mode: Letter Grading

MUED 883 - Instrumental Literature and its Performance

Credits: 3

Exploration of representative solo and ensemble music for string, wind, and percussion instruments. Typical literature from each period of music is studied. As much as possible, live performance is included; recordings are used as required. Detailed attention given to interpretation. Project required.

Equivalent(s): MUED 983

Grade Mode: Letter Grading

MUED 891 - Teaching Secondary School Music

Credits: 3

Assembling, managing, and teaching junior/senior high school music curriculum. Academic issues of philosophy, curriculum building, application of learning theories, administration, evaluation, motivation, and classroom management combined with field experience in lesson planning and teaching/rehearsal techniques.

Grade Mode: Letter Grading

MUED 895 - Special Studies

Credits: 1-4

Allows upper-level students to explore individually or in groups areas related to their specific professional interests.

Grade Mode: Letter Grading

National Security Intelligence Analysis (NSIA)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

NSIA 810 - National Security Policy and the Intelligence Community

Credits: 3

This course provides students an introduction to United States national security policy and the role of the intelligence community. Current and historical case studies will highlight the functions and limits of intelligence activities in support of decision makers' policy making and implementation. In this course we survey political, institutional, and cultural challenges confronting analysts as they strive to provide intelligence products relevant to strategic and tactical policy goals.

Grade Mode: Letter Grading

NSIA 820 - Intelligence Analysis

Credits: 3

In this class we define intelligence and focus on analysis. We identify intelligence organizations' relationships with policymakers and the types of intelligence products they produce. Students will learn to identify and create intelligence requirements and the related variables and collection targets. We will explore analytical approaches and develop critical thinking skills. In this class we will define data, the causes of intelligence failures, and identify creativity in intelligence analysis.

Grade Mode: Letter Grading

NSIA 830 - National Security Research Design and Methods

Credits: 3

In this class students explore the differences between academic research and intelligence analysis. We will explore research design and how to select a research approach based on intelligence requirements. You will learn about the ethical conduct of social science research. Building on the framework of intelligence requirements you will learn how to define a research problem and develop related research questions, hypothesis, and design research using appropriate methods.

Grade Mode: Letter Grading

NSIA 840 - National Security Qualitative Research Design and Analysis

Credits: 3

Qualitative research refers to meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of phenomena for study in the natural world. In this class we make linkages to existing research theories and intelligence methodologies. We introduce case study research and design issues.

Grade Mode: Letter Grading

NSIA 850 - Intelligence Analysis Case Studies

Credits: 3

Case study research involves taking a deep dive into a particular event, considering all the elements that played a part in its occurrence to interpret and learn from the experience. In this course we will examine the role of the U.S. Intelligence Community in the emergence, sustainment, and eventual victory of the Solidarity Movement in Poland in the 1980's using a mix of archival and edited works. We will then apply those generalized concepts and lessons to develop an intelligence concept of operations addressing a current national security concern.

Grade Mode: Letter Grading

NSIA 860 - Survey Design and Analysis

Credits: 3

In this course students will learn about surveys research. Questions such as "What is a survey?" and "Why conduct surveys?" will be posed and answered. Students will learn about ethical issues in survey design and methods. Additional topics include survey error, sampling, nonresponse issues, survey data collection strategies, and survey question design and errors.

Grade Mode: Letter Grading

NSIA 870 - National Security Quantitative Research Design and Analysis I

Credits: 3

Quantitative Design and Analysis I introduces students to data and data analysis. The course provides an overview of statistical learning. Students will learn approaches for stating and refining research questions. We will employ the epicycles of analysis approach to conduct exploratory data analysis. Students will learn how to describe data and use appropriate counting techniques. Basic data visualization will be employed using R.

Grade Mode: Letter Grading

NSIA 880 - Analytical Writing and Briefing Seminar

Credits: 3

Students in this course will investigate the cognitive science behind writing and intelligence analysis. Topics include heuristics and chunking, speaking and writing, writing schemes, creativity, analytical writing, organization, presentation, collaboration, editing case studies, presenting technical information, and decision-maker feedback. Case studies on the psychology of political behavior are presented.

Grade Mode: Letter Grading

NSIA 890 - National Security Quantitative Research Design and Analysis II

Credits: 3

In this course students will develop a data science tool kit they may use to investigate research questions. The methodological approaches students will be exposed to include linear regression, classification, resampling methods, linear model selection, tree-based methods, unsupervised learning, and network analysis. Ethical approaches to the use of data science are reviewed in this class.

Grade Mode: Letter Grading

NSIA 895 - Special Topics in Intelligence Studies

Credits: 3

This course includes topics and emerging areas in intelligence studies. Barring duplication of subject the course may be repeated for credit.

Repeat Rule: May be repeated for a maximum of 9 credits. May be repeated up to 3 times.

Grade Mode: Letter Grading

NSIA 896 - Intelligence Analysis Independent Study

Credits: 3

Advanced individual study under the direction of a faculty mentor. Content area to be determined in consultation with faculty mentor.

Repeat Rule: May be repeated for a maximum of 6 credits. May be repeated up to 2 times.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NSIA 898 - Master's Capstone

Credits: 3

The capstone provides the opportunity to demonstrate the students' mastery of program materials, areas of specialization, and professional goals, in a single intelligence product. In cooperation with a core faculty advisor, each student team designs, researches, and implements a project that is comprehensive and demonstrates their competency to perform as an analyst.

Grade Mode: Letter Grading

Natural Resources & Earth Systems Science (NRES)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

NRES 997 - Interdisciplinary Research in Natural Resources and Earth and Environmental Sciences

Credits: 1

This course provides NRESS students opportunities to build a peer network, discuss the nature of interdisciplinary/transdisciplinary research, and read papers from Natural Resources and Earth Systems primary literature. Weekly discussion of topics relevant to interdisciplinary research and careers, along with several guest speakers, are included. The course is facilitated by the NRESS faculty chair, and is required for incoming NRESS students.

Repeat Rule: May be repeated for a maximum of 2 credits.

Grade Mode: Graduate Credit/Fail grading

NRES 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Natural Resources (NR)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

NR 803 - Watershed Water Quality Management

Credits: 4

Principles of land use as they relate to water quality and quantity. Lectures focus on biogeochemical cycles and the watershed approach to land and water resource management. Labs and field trips focus on methods of water sampling and analysis. One year of chemistry is recommended. Lab/field trips.

Equivalent(s): WARM 803

Grade Mode: Letter Grading

Special Fee: Yes

NR 806 - Soil Ecology

Credits: 4

Examines the ecological relationships between soil microorganisms and their biotic and abiotic environment, with emphasis on the role of soil microorganisms in biogeochemical cycling. Specific objectives are to examine the biodiversity present in soil systems, factors controlling microbial community composition and diversity, and linkages between soil microbial communities, soil physical properties, and soil organic matter and nutrient cycling dynamics. Lab.

Equivalent(s): SOIL 806

Grade Mode: Letter Grading

Special Fee: Yes

NR 807 - Environmental Modeling

Credits: 4

Environmental Modeling introduces students to a range of key mathematical and computer modeling concepts and the ways they can be used to address important scientific questions. The course is divided into four topical sections: Population and Community Ecology, Hydrology, Biogeochemistry, and Ecosystems. In each section, modeling concepts and skills are presented together with environmental information to emphasize the linkage between quantitative methods and relevant scientific results.

Equivalent(s): EOS 807

Grade Mode: Letter Grading

NR 808 - Environmental Economics

Credits: 4

Environmental pollution, the market economy, and optimal resource allocation; alternative control procedures; levels of environmental protection and public policy; property right issues.

Equivalent(s): RECO 808

Grade Mode: Letter Grading

NR 820 - International Environmental Politics and Policies for the 21st Century

Credits: 4

Students examine policies for managing human activities to sustain the health of regional ecosystems and planetary life-support systems. Selected problems of the international commons (oceans, marine resources, atmosphere, migratory species); global and regional carrying capacity (population, resource consumption), internationally shared ecosystems (trans-boundary watersheds, water-bodies, tropical forests); and the relevant international institutions and politics for policy formation, conflict resolution, and implementation. Using a policy-analytic framework, students develop case studies to assess international policies and institutional arrangements to achieve the objectives of Agenda 21--Earth Summit Strategy to Save the Planet.

Equivalent(s): EC 820

Grade Mode: Letter Grading

NR 824 - Resolving Environmental Conflicts

Credits: 4

Theories and practices of environmental dispute settlement. Roles of public, non-governmental and governmental organizations. Effectiveness of public participation initiatives in influencing public policy decisions and/or resolving environmental conflicts. Alternative approaches to consensus (policy dialogues, joint problem solving; strategic planning; negotiation, mediation) as well as litigation. Specific cases are critiqued and evaluated; conflict resolution skills are developed. Students observe and/or participate in ongoing local decision processes. Lab.

Equivalent(s): EC 824

Grade Mode: Letter Grading

Special Fee: Yes

NR 829 - Silviculture

Credits: 4

The science and art of establishing, growing, and tending forests to meet multiple objectives. Basics of forest stand dynamics applied to the problems of timber management, wildlife habitat, water quality, and carbon sequestration.

Grade Mode: Letter Grading

Special Fee: Yes

NR 830 - Terrestrial Ecosystems

Credits: 4

Processes controlling the energy, water, and nutrient dynamics of terrestrial ecosystems; concepts of study at the ecosystem level controls on primary production, transpiration, decomposition, herbivory; links to Earth-system science, acid deposition, agriculture.

Equivalent(s): EOS 830

Grade Mode: Letter Grading

NR 831 - Agriculture and Environmental Change: Challenges and Solutions

Credits: 4

Agriculture is the foundation of civilization, providing the food, fuel and fiber needed to sustain a growing human population. From the original land clearing to today, agriculture has profoundly impacted the environment and is now recognized as a major contributor to soil and water degradation and climate change. At the same time, climate change and other large-scale environmental changes are forcing adaptation of agricultural practices. This course examines interactions between agricultural systems and global environmental processes, including climate change, carbon cycling, nitrogen pollution and water resources. Students will develop an in-depth understanding of how agricultural practices contribute to environmental changes from local to global scales and the underlying biogeochemical drivers of change. We will evaluate frameworks like agroecology, regenerative agriculture, agroforestry, and climate-smart agriculture for their potential to mitigate environmental impacts. Students will learn to apply interdisciplinary thinking to develop solutions that balance crop productivity and environmental sustainability in a changing world. The course emphasizes biogeochemical understanding across spatial and temporal scales and couples to agroecosystem management frameworks to consider solutions.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NR 834 - Tropical Ecology

Credits: 4

This course introduces students to the ecology of different tropical ecosystems, and involves students in analyzing and interpreting ecological field data and remotely sensed data. An important emphasis is to understand patterns and processes across scales - from individual plants to ecosystems and landscapes. The course also addresses important global issues in the tropics, including climate change, land use change, diverse ecosystem services, and sustainable resource management. Completion of a general ecology course is required prior to taking this course.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NR 840 - Inventory and Monitoring of Ecological Communities

Credits: 4

Provides an introduction to the major concepts associated with monitoring change in ecological communities. Students develop an appreciation for such issues as: identification of appropriate baselines for comparison; use of indicator species; the tools used to inventory common, rare, and secretive species; how trend data are analyzed; and the implications of failing to detect an indicator species. Restricted to senior wildlife majors others by permission. Lab.

Grade Mode: Letter Grading

Special Fee: Yes

NR 843 - Addressing Arctic Challenges I

Credits: 4

Students will gain knowledge on the effect of climate change on Arctic environmental, social, and built systems, and apply transdisciplinary approaches to addressing arctic challenges. This course employs inquiry-based, peer-to-peer, and self-driven approaches. Students will tackle a research project, including in-depth data analysis in R, with the aim of contributing new knowledge in the form of a proposal, peer-reviewed publication, policy brief, outreach product, or other.

Grade Mode: Letter Grading

NR 844 - Biogeochemistry

Credits: 4

Examines the influence of biological and physical processes on elemental cycling and geochemical transformations from the molecular to the global scale, involving microorganisms, higher plants and animals and whole ecosystems; factors that regulate element cycles including soils, climate, disturbance and human activities; interactions among the biosphere, hydrosphere, lithosphere, and atmosphere; transformations of C, N, S, and trace elements.

Equivalent(s): EOS 813, EOS 844

Grade Mode: Letter Grading

NR 845 - Forest Management

Credits: 4

Forest land ownership; management objectives; forest inventory regulation and policy; forest administration; professional responsibilities and opportunities. Restricted to Natural Resources majors. Lab.

Equivalent(s): FOR 845

Grade Mode: Letter Grading

Special Fee: Yes

NR 849 - Forest Inventory and Modeling

Credits: 4

Applied sampling and statistical techniques for assessing current forest conditions and predicting future growth, yield, and structure. Topics include plot and point sampling, ecological inventory, and evaluation of site quality and stand density.

Grade Mode: Letter Grading

Special Fee: Yes

NR 851 - Aquatic Ecosystems

Credits: 4

Energy flow and nutrient cycling in streams, rivers and lakes, with an emphasis on understanding the control of primary productivity, decomposition and community structure by both hydrologic and biotic drivers. Role of aquatic ecosystems in carbon and nitrogen budgets at watershed, regional, and global scales. Impacts of environmental changes such as global climate change and suburbanization on aquatic ecosystems. Lab.

Grade Mode: Letter Grading

NR 857 - Remote Sensing of the Environment

Credits: 4

Practical and conceptual presentation of the use of remote sensing and other geospatial technologies for mapping and monitoring the environment. This course begins with the use of aerial photographs (photogrammetry, and photo interpretation) and includes measures of photo scale and area, parallax and stereo viewing, object heights, flight planning, photo geometry, the

electromagnetic spectrum, camera systems and vegetation/land cover mapping. The course concludes with an introduction to other geospatial technologies including digital image analysis, global positioning (GPS), and geographic information systems (GIS). Conceptual lectures are augmented with practical homework assignments and hands-on lab exercises. Lab.

Grade Mode: Letter Grading

Special Fee: Yes

NR 859 - Digital Image Processing for Natural Resources

Credits: 4

Introduction to digital remote sensing, including multispectral scanners (Landsat and SPOT) radar, and thermal imagery. Hands-on image processing including filtering, image display, ratios, classification, registration, and accuracy assessment. GIS as it applies to image processing. Discussion of practical applications. Use of ERDAS image-processing software. Knowledge of PCs required.

Prerequisite(s): [NR 857](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NR 860 - Geographic Information Systems in Natural Resources

Credits: 4

This course in geographic information systems (GIS), covers advanced theory, concepts, and applications of GIS for natural resource and related disciplines. Discussion of database structures, data sources, spatial data manipulation/analysis/modeling, data quality and assessment. Students conduct a project of their design exploring aspects of GIS most useful to them. Lecture emphasizes concepts and applications through a text and selected peer-reviewed articles. Lab uses the latest version of ArcGIS software and provides hands-on experience.

Prerequisite(s): [NR 658](#) with a minimum grade of D-.

Grade Mode: Letter Grading

NR 861 - Environmental Soil Chemistry

Credits: 4

Chemical transformations in soils are the basis for soil fertility and plant productivity in natural and managed ecosystems, and also influence key ecosystem processes including soil organic matter turnover and soil-atmosphere exchange of trace gases. This class will explore soil chemistry processes and transformations related to soil nutrient cycling, plant nutrient acquisition, and other critical environmental services.

Grade Mode: Letter Grading

NR 881 - Agroforestry

Credits: 4

This course introduces students to the principles and practice of agroforestry—the integration of trees with crops and/or livestock to provide multiple benefits. Students gain knowledge of Indigenous and modern agroforestry systems, their global distribution and characteristics, the scientific principles underlying interactions between trees, crops, and livestock, and their management to optimize benefits. Students explore the potential for agroforestry to serve as a climate-smart, sustainable strategy for enhancing food production and ecosystem services, and gain practical field experience in designing agroforestry systems appropriate for New England.

Grade Mode: Letter Grading

Special Fee: Yes

> [View Course Learning Outcomes](#)

NR 882 - Forest Health

Credits: 4

Forests cover over 30% of the land surface of the Earth and are incredibly important ecologically, economically, and to the health of the planet. While forests show great capacity to withstand disturbance, these ecosystems are increasingly threatened worldwide by climate change, native and introduced insects and disease, poor management practices, land clearing, drought, fire, and pollution. This course offers an overview of the dominant threats to forests, their causes and consequences, and options for monitoring, management, and mitigation.

Grade Mode: Letter Grading

Special Fee: Yes

NR 887 - Advanced Topics in Sustainable Energy**Credits:** 4

This course will engage students in advanced topics in sustainable energy. Course reviews basic structure of our energy system, energy markets and economics, and the environmental, economic and technological of our energy landscape. Focus will be on electricity and building use with introductions to the transportation system. Students will gain the knowledge to evaluate innovations in technology, policy and financing necessary to implement sustainable energy goals from conservation and efficiency to renewables and energy storage.

Grade Mode: Letter Grading**Special Fee:** Yes**NR 899 - Master's Thesis****Credits:** 1-10

Master's Thesis. Usually 6 credits, but up to 10 credits when the problem warrants.

Repeat Rule: May be repeated for a maximum of 10 credits.**Grade Mode:** Graduate Credit/Fail grading**NR 900 - Teaching Assistantship Practicum****Credits:** 0

This course covers best practices, norms, and expectations in performing the duties of a teaching assistant. Strategies for effective grading, communication with students and instructors, and institutional policies are explored and reinforced.

Grade Mode: Graduate Credit/Fail grading**NR 903 - Approach to Research****Credits:** 2

Provides incoming graduate students with an overview of the scientific method, peer review, and various research approaches and methods. Ethics, institutional and individual responsibilities, and effective communication are also addressed in a seminar and discussion format.

Grade Mode: Graduate Credit/Fail grading**NR 905 - Grant Writing****Credits:** 2

The ability to secure financial support for research and outreach activities is becoming increasingly important. This course is intended for graduate and post-graduate level students who need to write proposals for their graduate work or to gain external funding from government agencies. Students will gain in-depth understanding of the proposal writing process through class discussions, insights shared by UNH faculty, and by writing a research proposal following the entire process.

Equivalent(s): SOIL 905, WARM 905**Grade Mode:** Graduate Credit/Fail grading**NR 909 - Analysis of Ecological Communities and Complex Data****Credits:** 4

This course introduces you to a suite of tools appropriate for analyzing and interpreting multivariate data arising from agroecological (and other ecological) research. In this course we cover a variety of multivariate analyses, including clustering, ordination (principal components analysis, nonmetric multidimensional scaling, correspondence analysis), group comparisons (multi-response permutation procedures, PerMANOVA, indicator species analysis, discriminant analysis, mantel test), and other hypothesis-driven techniques, including structural equation modeling.

Grade Mode: Letter Grading**NR 911 - Natural and Environmental Resource Management****Credits:** 4

Fundamental economic, aesthetic, and ethical principles involved in the management of natural resources. Ways to apply these principles in the formulation and evaluation of resource management policies, including the management of specific renewable resources, soils, water, forests, and wildlife. (Offered every other year.)

Equivalent(s): RAM 911

Grade Mode: Letter Grading

NR 913 - Hierarchical Modeling in Ecology

Credits: 4

This course uses modern Bayesian statistical modeling approaches to analyze ecological data, with an emphasis on applied hierarchical models. These models will be used to examine ecological systems and related topics including: population and community dynamics, experimental design, spatial patterns, species abundance and diversity, community organization, metapopulations, and landscape processes. To be successful in the course students should have taken a course in statistics and have working knowledge of the R programming language.

Grade Mode: Letter Grading

NR 914 - Data Analysis for Natural Resources and Ecology

Credits: 4

Principles and practices of data analysis, with application to experimental and observational studies. Topics include study design, exploration of data, principles of statistical inference, statistical hypothesis testing, and approaches to model selection.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NR 947 - Ecosystem Science: Theory, Practice, and Management Applications for Sustainability

Credits: 4

This course is designed for graduate students to explore in detail the fundamental principles and practical application of ecosystem science. Emphasis will be placed on understanding historical context as well as the most recent peer-reviewed literature. Writing assignments will emphasize local, regional, and international applications of ecosystem science to address environmental sustainability.

Grade Mode: Letter Grading

NR 965 - Community Ecology

Credits: 4

This course investigates how community properties -- species richness, and abundance distribution -- are influenced by evolutionary history, landscape phenomena such as dispersal and migration, and local factors such as the physical environment disturbance, competition, predation, and positive interactions. Mechanistic models of community dynamics, including successional theory, are discussed. The influence of species diversity on ecosystem function is discussed, and all aspects of the course are related to conservation science.

Equivalent(s): NR 865

Grade Mode: Letter Grading

NR 977 - Just Maps: Cartographies of Environmental Justice

Credits: 4

Maps are ubiquitous. We carry them in our pockets, hang them on walls. We use maps to orient ourselves and rely on them to make meaning of social-environmental information. But whose space and time to maps employ? How do maps construct knowledge and to what social and political ends? What power dynamics do maps reflect and how do they become powerful themselves? This course explores such questions with focus on environmental in/justice. Completion of a GIS/Mapping course required prior to taking this course.

Grade Mode: Letter Grading

NR 993 - Natural and Environmental Resources Seminar

Credits: 2

Presentation and discussion of recent research, literature, and policy problems in the natural and social sciences influencing resource use.

Grade Mode: Graduate Credit/Fail grading

NR 995 - Investigations

Credits: 1-4

Investigations in Natural Resources may include topics in environmental conservation, forestry, soil science, water resources, and wildlife management.

Grade Mode: Letter Grading

NR 996 - Natural Resource Education**Credits:** 2

Responsibilities include set-up, teaching, and grading of one lab section per week or equivalent lecture experience. Meets the teaching requirement for M.S. degree students.

Grade Mode: Graduate Credit/Fail grading

NR 998 - Directed Research**Credits:** 1-4

Student designs and conducts original research that culminates in a paper of publishable quality. Alternative to [NR 899](#) for those choosing non-thesis degree option. IA (continuous grading).

Repeat Rule: May be repeated for a maximum of 4 credits.

Grade Mode: Graduate Credit/Fail grading

Nursing (NUR) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

NUR 802 - Translating and Integrating Research into Nursing Practice

Credits: 3

This course provides the foundations for master's level nursing practice to advance nursing practice. The student is required to integrate theory, evidence, clinical judgment and research to improve population health outcomes. Evidence-based practice is applied to the role of the master's level nurse and will examine the ethical implications of research and translational scholarship. The student must be able to articulate how evidence is the basis for practice decisions and include the credibility and relevance of the sources. Practice guidelines will be discussed and their impact on health outcomes.

Equivalent(s): NUR 802G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 812 - Interprofessional Collaboration for Population Health

Credits: 3

This course discusses the value of interprofessional teams to develop and evaluate preventative interventions to improve population health. The role of the nurse within these teams are viewed in terms of advocacy, value and leadership. The course requires the student to utilize effective communication techniques to engage and lead these teams. The student will utilize data sources and evidence-based practice to develop culturally relevant and linguistically appropriate health education strategies.

Equivalent(s): NUR 812G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 817 - Advanced Health Assessment for Nurse Educators

Credits: 2

This course builds upon the nurses' prior knowledge of health assessment to focus on the advanced application of this knowledge in clinical and didactic settings. The course will include comprehensive and focused data collection culminating in a differential diagnosis. An overview of appropriate protocols for performing health screening and interpreting diagnostic data is a critical focus. The advanced practice nurse educator must demonstrate these advanced skills.

Equivalent(s): NUR 817G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 820 - Advanced Pathopharmacology for Nurse Educators

Credits: 4

This course builds upon the nurse's prior knowledge of pathophysiology and pharmacology to focus on advanced application of this knowledge in clinical settings. The course will address physiological and biological manifestations to include adaptive and maladaptive changes that occur in diseases. Advanced concepts in pharmacology are presented to provide the nurse a foundation for managing population health and within the role of a nurse educator.

Prerequisite(s): [NUR 817](#) with a minimum grade of B- or NUR 817G with a minimum grade of B-.

Equivalent(s): NUR 820G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 825 - Foundational Skills for Nurse Educators

Credits: 3

This course explores the process of teaching and learning in nursing education. The role of the nurse educator is examined along with relevant theories of adult learning and the process of curricular development in nursing. The role of the advanced practice nurse educator is emphasized specific to the competencies associated with teaching, scholarship, and service.

Prerequisite(s): NUR 817 with a minimum grade of B- or NUR 817G with a minimum grade of B-.

Equivalent(s): NUR 825G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 830 - Curriculum Development, Teaching Methods and Integrating Technology in Nursing Education

Credits: 3

Teaching strategies based on theory and evidence are the foundation of nursing education. Students are expected to consider the unique teaching environments in nursing specific to the diverse needs of the students in the development of curriculum and provision of quality education. Utilization of current technologies to enhance the teaching learning process is required.

Prerequisite(s): NUR 825 with a minimum grade of B- or NUR 825G with a minimum grade of B-.

Equivalent(s): NUR 830G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 833 - Assessment and Evaluation in Nursing Education

Credits: 3

The student will engage in the process of assessment and evaluation in nursing education, and explore the role of the nurse educator in program evaluation. Students will be asked to critically evaluate current trends in nursing education including competence assessment and evaluation methods.

Prerequisite(s): NUR 825 with a minimum grade of B- or NUR 825G with a minimum grade of B-.

Equivalent(s): NUR 833G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 850 - Integrated Clinical Capstone for Nursing Leaders

Credits: 6

This integrative clinical capstone is the final course in the Master of Science in Nursing Health Care Leadership program. All other required coursework must have been completed prior to receiving approval to register for this course. Students in this course will have the opportunity to apply the principles learned in the entire program of study and will demonstrate competence by integrating and applying those skills to a real-world scenario. The course culminates in a project focused on enhancing nursing practice by improving population health outcomes. Student will be required to verbally present and defend their project and achieved outcomes.

Equivalent(s): NUR 850G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

NUR 851 - Integrated Capstone Practicum in Nursing Education

Credits: 6

This practicum experience requires the advanced level registered nurse to actively engage in a clinical or academic education setting. The student will integrate prior learning in the program to demonstrate competencies required of an advanced practice registered nurse. Specific opportunities for application of the NLN Core Competencies for Nurse Educators is the focus of this course. Current RN licensure and clinical clearance is required for this course.

Equivalent(s): NUR 851G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Nursing (NURS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

NURS 801 - Health Policy and Nursing Practice

Credits: 3

This course provides a comprehensive view of the nature and functions of health care services from a systems perspective and explores the role of nursing and other health professionals. Students examine the interaction and effect of social, political, economic, ethical, professional, legal, and technological forces on health care systems. The course emphasizes the analysis of emerging issues that have an impact on the health care system and nursing. Students process their role as nursing advocates.

Equivalent(s): NURS 806, NURS 901

Grade Mode: Letter Grading

Special Fee: Yes

NURS 807 - Pathophysiology and Pharmacology

Credits: 4

Theory course focuses on concepts of human pathophysiology and pharmacology relevant to professional nursing practice. Physiologic response and manifestations of alterations in normal body functioning are analyzed. Pharmacological agents used for these alterations are examined. Application of concepts across the lifespan are incorporated through the discussion of pathophysiology and pharmacology. Provides the foundation for the clinical decision-making and management of care. In addition, learners are introduced to the professional nurse's responsibility for educating clients about basic pathophysiology and pharmacology issues. Nursing majors only.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 811 - Clinical Reasoning Through Simulation

Credits: 2

The course further develops and refines critical thinking skills by student participation in increasingly complex simulated clinical scenarios and de-briefings. Students prepare for the care of patients in a simulated environment, using the nursing process, to demonstrate the effective delivery of planned patient care.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 812 - Advanced Pharmacology and Therapeutics

Credits: 3

Apply the concepts of pharmacology including pharmacotherapies, pharmacodynamics, and pharmacokinetics necessary for advanced level nursing education across the lifespan.

Equivalent(s): NURS 907, NURS 912

Grade Mode: Letter Grading

NURS 813 - Health Assessment and Clinical Nursing Theory

Credits: 0 or 4

This course is designed to provide the student with evidence-based knowledge related to acquiring the psychomotor and assessment skills required for the safe delivery of nursing care to the adult client. Students develop foundational skills applicable to achieving program outcomes. The focus of the course will be on developing beginning health assessment, and clinical nursing skills while implementing critical thinking, and application of the nursing process, highlighting fundamental nursing concepts as they pertain to providing and improving client care.

Co-requisite: [NURS 813C](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 813C - Health Assessment and Clinical Nursing

Credits: 2

Care of the adult clinical is designed to provide the student with the opportunities to apply the nursing process and clinical judgment within an acute care setting to clients with commonly occurring disease states and those undergoing surgery. The experience focuses on the application of knowledge and skills, evidence-based practice, clinical judgment and relationship-centered care.

Co-requisite: [NURS 813](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 814 - Advanced Health Assessment Across the Lifespan

Credits: 3

This course includes knowledge to complete a comprehensive history and health examination on individuals across the lifespan incorporates assessing wellness, screening, and chief complaint.

Equivalent(s): NURS 909, NURS 914

Grade Mode: Letter Grading

Special Fee: Yes

NURS 815 - Leadership, Role, and Collaboration

Credits: 3

Focuses on theories and principles of leadership, interprofessional collaboration, change management and systems thinking to improve outcomes. Students gain a historical perspective of the expanded roles of nursing as well as the evolution of advanced practice nursing.

Equivalent(s): [NURS 915](#), NURS 925

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

NURS 816 - Health Promotion Theory and Population Health

Credits: 3

Provides theoretical foundation and a framework for examining health promotion, population health, health equity and the implementation of community-based interventions. Using current data to improve outcomes. Students develop and evaluate evidence-based population health programs to empower community action.

Equivalent(s): NURS 916, NURS 944

Grade Mode: Letter Grading

NURS 818 - Foundations of Evidence Based Practice

Credits: 3

Provides a broad overview of evidence-based practice for advanced level nursing education.

Equivalent(s): NURS 918, [NURS 968](#)

Grade Mode: Letter Grading

NURS 820 - Advanced Physiology and Pathophysiology Across the Lifespan

Credits: 3

Integrate an advanced understanding of concepts in human physiology and pathophysiology as a foundation for the advanced level nursing education.

Equivalent(s): [NURS 908](#), NURS 913

Grade Mode: Letter Grading

Special Fee: Yes

NURS 822 - Chronic Disease Management

Credits: 3

Theory course that explores concepts and foundations relevant to the chronic illness experience as defined as individual/family perceptions, beliefs, attitudes and response to disease. Analysis of biophysical and psychological function on patient engagement, decision-making processes and ethical considerations of care will be explored. The course emphasizes concepts of self-care, patient agency, informed decision making and problem solving to achieve patient centered care.

Equivalent(s): NURS 825

Grade Mode: Letter Grading

NURS 826 - Caring for People with Severe and Persistent Mental Illness**Credits:** 2

This theory course is designed to provide an understanding of the neurobiological and psycho-social concepts of mental health and illness, factors influencing human behavior and interaction, current somatotherapies, and the role of the psychiatric nurse as a part of the interdisciplinary team. Previous course knowledge and communication skills provide a theoretical foundation in explaining, guiding, and predicting nursing action.

Co-requisite: [NURS 826C](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 826C - Caring for People with Severe and Persistent Mental Illness Clinical**Credits:** 2

This clinical course provides students with the opportunity to participate in collaborative and interdependent health care relationships with professional and paraprofessional mental health partners. A special focus is placed on the integration of personal knowledge. Therapeutic use of self, and professional communication skills inherent in nurse-client relationships.

Grade Mode: Letter Grading

NURS 827 - Managing Acute and Complex Care of Individuals**Credits:** 4

In this theory course students develop the knowledge base to refine their clinical judgment and decision-making skills in care of individuals from diverse populations with acute, critical, and chronic illnesses. Focuses on illness management, health restoration and risk reduction in prototypic health care problems. Focuses on nurses' ability to use leadership skills and concepts of care collaboration with clients, families, peers, and members of the health care team to maximize client outcomes. Care experiences primarily center on the acute care environment.

Co-requisite: [NURS 827C](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 827C - Managing Acute and Complex Care of Individuals Clinical**Credits:** 2

In this clinical course students demonstrate the ability to apply knowledge to refine clinical judgment and decision-making skills while caring for individuals from diverse populations with acute, critical, and chronic illnesses. Focuses on illness management, health restoration, and risk reduction in prototypic health care problems. Focuses on nurses' ability to use leadership skills and concepts of care collaboration with clients, families, peers, and members of the health care team to maximize client outcomes. Care experiences primarily center on the acute care environment.

Co-requisite: [NURS 827](#)

Grade Mode: Letter Grading

NURS 831 - Childbearing and Childrearing Families**Credits:** 2

This course offers students an opportunity to develop necessary knowledge, attitudes and skills required for the provision of safe care to developing families and their children, from an antenatal care through adolescence. This course focuses upon patient and family centered care, normal physiological human development, client advocacy and the provision of therapeutic, reflective nursing practice to support families along a wellness-illness continuum.

Co-requisite: [NURS 831C](#)

Equivalent(s): NURS 830

Grade Mode: Letter Grading**Special Fee:** Yes

NURS 831C - Childbearing and Childrearing Families Clinical

Credits: 2

This clinical course focuses on the provision of health care for individuals within the context of the family during the childbearing and childrearing period. Healthy transitions and physical alterations are examined. This course integrates clinical opportunities in a variety of settings for the development of the advanced nurse generalist role.

Co-requisite: [NURS 831](#)**Equivalent(s):** NURS 830C**Grade Mode:** Letter Grading**Special Fee:** Yes

NURS 835 - Leadership in Healthcare

Credits: 3

This course uses leadership as a guide for analyzing and attaining positive organizational health care outcomes. Careful consideration is given to the complex challenges of achieving quality care delivery and quality health outcomes for aggregates in an ever-changing, complex environment. Course content includes health systems analysis, shaping care delivery, and resource management. Course fosters student integration of knowledge in preparation for clinical nursing leadership responsibilities.

Equivalent(s): NURS 925**Grade Mode:** Letter Grading

NURS 844 - Population Health

Credits: 3

Students examine the theoretical and empirical basis for health promotion and risk reduction assessment and interventions to improve population health outcomes. Health promotion and risk reduction are examined within an ecological perspective, including critical social, political, racial/ethnic, cultural and economic environments. Epidemiological and biostatistical approaches are used to analyze population data to identify and analyze the determinants of health, health promotion and risk reduction strategies, and to evaluate the distribution of health conditions.

Equivalent(s): NURS 944**Grade Mode:** Letter Grading**Special Fee:** Yes

NURS 850 - Foundations in Acute Care

Credits: 3

The first theoretical course preparing the student for the Adult-Gerontologic Acute Care Nurse Practitioner (AGACNP) role. The foundations of practice will explore the AGACNP role and transition, clinical documentation, and clinical practice. Clinical focus will include the topics of sepsis, shock, and cardiovascular emergencies. Didactic learning will occur through asynchronous learning consisting of multimedia, discussion boards, and case studies. This course may be taken with [NURS 851: Foundations in Acute Care Clinical Practicum](#).

Grade Mode: Letter Grading**Special Fee:** Yes

NURS 851 - Foundations in Acute Care Clinical Practicum

Credits: 3

This clinical practicum course accompanies the Adult-Gerontology Acute Care Nurse Practitioner didactic courses and will highlight experimental learning. Students will need to complete a minimum 150 precepted clinical hours. Additional requirements include entering clinical documentation and hours into the electronic clinical log system. Students will continue to formulate clinical knowledge and problem solving using foundational courses of advanced pathophysiology, physical assessment, and pharmacology, in conjunction with didactic content.

Prerequisite(s): [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 816](#) with a minimum grade of B- and [NURS 818](#) with a minimum grade of B- and [NURS 820](#) with a minimum grade of B- and [NURS 910](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

NURS 852 - Adult-Gerontology Acute Care Nurse Practitioner I

Credits: 3

The second theoretical course for the preparation of the adult-gerontological acute care nurse practitioner. Clinical knowledge will focus upon cardiovascular and cardiothoracic diagnoses, diagnostics, and therapeutics in the adult and older adult. Course will also explore palliative care, end of life, and pronouncement. This course is to be taken in tandem with a AGACNP Clinical Practicum (I-IV).

Prerequisite(s): [NURS 850](#) with a minimum grade of B.

Grade Mode: Letter Grading

NURS 853 - Adult-Gerontology Acute Care Nurse Practitioner I Clinical Practicum

Credits: 3

This clinical practicum course accompanies the Adult-Gerontology Acute Care Nurse Practitioner didactic course and will highlight experimental learning. Students will need to complete a minimum of 150 precepted clinical hours. Additional requirements include entering clinical documentation and hours into the electronic clinical log system. Students will continue to formulate clinical knowledge and problem-solving using foundational courses of advanced pathophysiology, physical assessment, and pharmacology in conjunction with didactic content.

Prerequisite(s): [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 816](#) with a minimum grade of B- and [NURS 818](#) with a minimum grade of B- and [NURS 820](#) with a minimum grade of B- and [NURS 910](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 850](#) with a minimum grade of B- and [NURS 851](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

NURS 854 - Adult-Gerontology Acute Care Nurse Practitioner II

Credits: 3

The third theoretical course for the preparation of the adult-gerontological acute care nurse practitioner. This course will focus on pulmonary, immune and hematopoietic disorders, diseases, and therapeutics. Additional focus on standards of care in airway management and respiratory support. This course is to be taken in tandem with a AGACNP Clinical Practicum (I-IV). Will also include simulation activity pertaining to airway and ventilator management. Course should be taken with [NURS 853](#) or [NURS 855](#) or [NURS 857](#).

Prerequisite(s): [NURS 850](#) with a minimum grade of B and [NURS 851](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 855 - Adult-Gerontology Acute Care Nurse Practitioner II Clinical Practicum

Credits: 3

This clinical practicum course accompanies the Adult-Gerontology Acute Care Nurse Practitioner didactic course and will highlight experimental learning. Students will need to complete a minimum of 150 precepted clinical hours. Additional requirements include entering clinical documentation and hours into the electronic clinical log system. Students will continue to formulate clinical knowledge and problem-solving using foundational courses of advanced pathophysiology, physical assessment, and pharmacology in conjunction with didactic content.

Prerequisite(s): [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 816](#) with a minimum grade of B- and [NURS 818](#) with a minimum grade of B- and [NURS 820](#) with a minimum grade of B- and [NURS 910](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 850](#) with a minimum grade of B- and [NURS 851](#) with a minimum grade of B- and [NURS 852](#) with a minimum grade of B- and [NURS 853](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

NURS 856 - Adult-Gerontology Acute Care Nurse Practitioner III

Credits: 3

The fourth theoretical course with a focus on HEENT, neurology and associated trauma, psychosocial and behavioral disorders, and care pertaining to the musculoskeletal and integumentary systems. Additional emphasis will be placed on the healthcare

system/care continuum and discharge planning. Course should be taken with [NURS 853](#) or [NURS 855](#) or [NURS 857](#).

Prerequisite(s): [NURS 850](#) with a minimum grade of B and [NURS 852](#) with a minimum grade of B and [NURS 854](#) with a minimum grade of B and [NURS 851](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 857 - Adult-Gerontology Acute Care Nurse Practitioner III Clinical Practicum

Credits: 3

This clinical practicum course accompanies the Adult-Gerontology Acute Care Nurse Practitioner didactic course and will highlight experimental learning. Students will need to complete a minimum of 150 precepted clinical hours. Additional requirements include entering clinical documentation and hours into the electronic clinical log system. Students will continue to formulate clinical knowledge and problem-solving using foundational courses of advanced pathophysiology, physical assessment, and pharmacology in conjunction with didactic content.

Prerequisite(s): [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 816](#) with a minimum grade of B- and [NURS 818](#) with a minimum grade of B- and [NURS 820](#) with a minimum grade of B- and [NURS 910](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 850](#) with a minimum grade of B- and [NURS 851](#) with a minimum grade of B- and [NURS 852](#) with a minimum grade of B- and [NURS 853](#) with a minimum grade of B- and [NURS 854](#) with a minimum grade of B- and [NURS 855](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

NURS 858 - Adult-Gerontology Acute Care Nurse Practitioner IV

Credits: 3

The fifth and final theoretical course for the preparation of the adult-gerontological acute care nurse practitioner. Clinical practice knowledge will focus upon endocrine, gastrointestinal, genitourinary, and nephrological disorders. Additional focus on quality improvement and evidence-based practice. Course should be taken with [NURS 853](#) or [NURS 855](#) or [NURS 857](#) or [NURS 859](#).

Prerequisite(s): [NURS 850](#) with a minimum grade of B and [NURS 852](#) with a minimum grade of B and [NURS 856](#) with a minimum grade of B and [NURS 851](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 859 - Adult-Gerontology Acute Care Nurse Practitioner IV Clinical Practicum

Credits: 3

This clinical practicum course accompanies the Adult-Gerontology Acute Care Nurse Practitioner didactic course and will highlight experimental learning. Students will need to complete a minimum of 150 precepted clinical hours. Additional requirements include entering clinical documentation and hours into Electronic Logging System. Students will continue to formulate clinical knowledge and problem-solving using foundational courses of advanced pathophysiology, physical assessment, and pharmacology in conjunction with didactic content.

Prerequisite(s): [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 816](#) with a minimum grade of B- and [NURS 818](#) with a minimum grade of B- and [NURS 820](#) with a minimum grade of B- and [NURS 910](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 850](#) with a minimum grade of B- and [NURS 851](#) with a minimum grade of B- and [NURS 852](#) with a minimum grade of B- and [NURS 853](#) with a minimum grade of B- and [NURS 854](#) with a minimum grade of B- and [NURS 855](#) with a minimum grade of B- and [NURS 856](#) with a minimum grade of B- and [NURS 857](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

> [View Course Learning Outcomes](#)

NURS 894 - Special Topics

Credits: 1-4

Formal course given on selected topics or special interest subjects. Several topics may be taught in one year or semester. May be repeated. Special fee on some sections.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 902 - Advanced Physical Assessment

Credits: 2

This course focuses on providing the student with the knowledge and skills to perform a comprehensive health assessment. Emphasis is placed on physical, psychosocial, and cultural assessment necessary to perform a high quality health history, review of systems, and head-to-toe comprehensive physical exam for clinical decision making that can be communicated in both written and oral form to members of the multi-disciplinary health care team. The course builds on knowledge of anatomy, physiology, and pathophysiology.

Equivalent(s): NURS 909

Grade Mode: Letter Grading

Special Fee: Yes

NURS 908 - Advanced Physiology & Pathophysiology Across the Lifespan**Credits:** 3

Provides an advanced understanding of concepts in human physiology and pathophysiology as a foundation for the advanced nursing practice role. Concepts related to biological sciences including cell biology, tumor biology, immunology, genetics, and pathology will be presented. The focus of this course is on principles, theories, and current research related to physiological and pathophysiological system alterations across the lifespan.

Equivalent(s): [NURS 820](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 910 - Genomics & Ethics**Credits:** 3

This course focuses on application of principles of genetics and genomics. The impact and challenges of genomics on health and outcomes, quality and safety of patient care are explored.

Prerequisite(s): NURS 912 with a minimum grade of B- and NURS 913 with a minimum grade of B- and NURS 914 with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 911 - Diagnosis & Management - Diagnostic Reasoning**Credits:** 3

This course emphasizes acquiring and analyzing relevant data to develop a comprehensive assessment for advanced practice nursing encompassing metacognition, clinical reasoning, differential diagnosis, and diagnostic error.

Prerequisite(s): (NURS 912 with a minimum grade of B- or [NURS 812](#) with a minimum grade of B-) and (NURS 913 with a minimum grade of B- or [NURS 820](#) with a minimum grade of B-) and (NURS 914 with a minimum grade of B- or [NURS 814](#) with a minimum grade of B-).

Grade Mode: Letter Grading

Special Fee: Yes

NURS 915 - Leadership, Role & Collaboration**Credits:** 3

Focuses on theories and principles of leadership, interprofessional collaboration, change management and systems thinking to improve outcomes. Students gain a historical perspective of the expanded roles of nursing as well as the evolution of advanced practice nursing.

Grade Mode: Letter Grading

NURS 917 - Biostats and Epidemiology**Credits:** 3

Application and interpretation of statistical and epidemiological techniques appropriate for health sciences. Prepares students to think quantitatively and assess data critically. Examines principles of statistical inference and their application to the analysis and interpretation for answering practice questions. Students gain experience in interpreting quantitative data.

Grade Mode: Letter Grading

NURS 920 - FNP Health Management I - Didactic

Credits: 3

This course focuses on a patient centered comprehensive assessment, differential diagnosis, diagnostic reasoning, and plan of care of wellness, acute, and chronic conditions for the adult and geriatric populations.

Prerequisite(s): [NURS 820](#) with a minimum grade of B- and [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 921 - FNP Health Management I - Clinical

Credits: 4

This supervised clinical experience in the primary care management of patients includes biopsychosocial assessment, history taking, physical exam, development of differential diagnoses and evidence-based care. A preventative and wellness focused perspective is utilized for integration into practice. (250 clinical hours).

Grade Mode: Letter Grading

Special Fee: Yes

NURS 922 - FNP Health Management II - Didactic

Credits: 3

In this course a family centered comprehensive assessment, differential diagnosis, diagnostic reasoning, and plan of care of wellness, acute, and chronic conditions from infant to adolescence.

Prerequisite(s): [NURS 820](#) with a minimum grade of B- and [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 920](#) with a minimum grade of B- and [NURS 921](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

NURS 923 - FNP Health Management II - Clinical

Credits: 4

A supervised clinical experience in the primary care management of the child and adolescent with a preventative and wellness focused perspective including biopsychosocial assessment, history taking, physical exam, development of differential diagnoses and evidence-based care. (250 clinical hours).

Prerequisite(s): [NURS 820](#) with a minimum grade of B- and [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 920](#) with a minimum grade of B- and [NURS 921](#) with a minimum grade of B- and [NURS 922](#) (may be taken concurrently) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 924 - FNP Health Management III - Didactic

Credits: 3

This course focuses on diagnostic reasoning and decision making of women's health and complex health population based on theory, evidence, ethics, and equity.

Prerequisite(s): [NURS 820](#) with a minimum grade of B- and [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 920](#) with a minimum grade of B- and [NURS 921](#) with a minimum grade of B- and [NURS 922](#) with a minimum grade of B- and [NURS 923](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 926 - Clinical Nursing Leadership Scholarly Project I

Credits: 3

This course focuses on the integration of systems thinking when engaged in clinical nursing leadership. Emphasizes the development of the clinical nurse leader role at the micro-system level and with an aggregate focus (e.g., long term care; community/public health agencies; ambulatory care clinics; health centers; schools; and acute care settings). Online discussions focus student reflection on leadership experiences and emerging issues in health care delivery systems. Min 167 clinical hours.

Grade Mode: Graduate Credit/Fail grading

NURS 927 - Clinical Nursing Leadership Scholarly Project II**Credits:** 3

This course focuses on the integration of systems thinking when engaged in clinical nursing leadership. Emphasizes the development of the clinical nurse leader role at the micro-system level and with an aggregate focus (e.g., long term care; community/public health agencies; ambulatory care clinics; health centers; schools; and acute care settings). Online discussions focus student reflection on leadership experiences and emerging issues in health care delivery systems. A minimum of 167 hours expected.

Grade Mode: Graduate Credit/Fail grading**NURS 928 - Clinical Nursing Leadership Scholarly Project III****Credits:** 3

This course requires students to complete a scholarly project that defines and/or implements strategies that will address/resolve substantive nursing practice issue that impacts the quality and safety of patients. As the capstone course for the clinical nurse leader nursing track, the students are required to complete and present this scholarship project under the direction of course faculty and/or a masters-prepared preceptor in the clinical agency. A minimum 167 clinical hours is expected for a total of a minimum 500 clinical hours required for eligibility for ANCC Clinical Nurse Leader Certification.

Grade Mode: Graduate Credit/Fail grading**NURS 935 - FNP Health Management I - Didactic****Credits:** 3

Emphasis on thorough assessment, physical and mental health exam, differential diagnosis, diagnostic reasoning and plan of care for individual common conditions with a focus on wellness. Apply behavior change theory to improve health and ethical principles to care of patients. Role development toward independent practice.

Prerequisite(s): [NURS 911](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**Special Fee:** Yes**NURS 936 - FNP Health Management I - Clinical****Credits:** 3

Clinical practice preceptorship with faculty oversight to develop physical and mental health exam, differential diagnosis, diagnostic reasoning and plan of care for individuals with common conditions. Integration of behavior and wellness theory into practice, wellness, and prevention. Seek out clinical experience for prevention and common illness. Practice with respect and dignity.

Prerequisite(s): [NURS 935](#) with a minimum grade of B-.**Grade Mode:** Graduate Credit/Fail grading**Special Fee:** Yes**NURS 937 - Primary Care of Families II****Credits:** 3

Lecture/discussion course covering the primary care management of children across the health-illness continuum, including assessment and management of common acute and chronic clinical problems. A developmental perspective is taken to examine child-health evaluation and maintenance from infancy through adolescence.

Co-requisite: [NURS 938](#)**Prerequisite(s):** [NURS 935](#) with a minimum grade of B- and [NURS 936](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**Special Fee:** Yes**NURS 938 - Primary Care of Families II Practicum****Credits:** 3

Supervised clinical experience in the primary care management of the child and adolescent, including assessment and management of common acute and chronic clinical problems. A family-centered developmental perspective is taken to provide child-health services from infancy through adolescence. Nursing care, family, and rehabilitation issues related to various health problems are investigated in practice.

Co-requisite: [NURS 937](#)

Prerequisite(s): [NURS 935](#) with a minimum grade of B- and [NURS 936](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 939 - Seminar and Practicum in the Primary Care of Families III

Credits: 6

Final integrative clinical course that allows for intensive application of primary care knowledge and skills in practice. Seminar allows for in-depth analysis of various clinical problems, scope of practice and professional role issues. This course provides students the opportunity to develop objectives for their own learning experiences in order to complete their individual achievement of the family nurse practitioner expected outcomes. Course provides the opportunity for extensive clinical experience under the guidance of a preceptor.

Prerequisite(s): [NURS 937](#) with a minimum grade of B- and [NURS 938](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 940 - FNP Health Management III - Clinical

Credits: 4

This is a supervised clinical experience in women's health and complex patients synthesizing evidence-based practice and technologies to improve community and population health outcomes (250 clinical hours).

Prerequisite(s): [NURS 820](#) with a minimum grade of B- and [NURS 812](#) with a minimum grade of B- and [NURS 814](#) with a minimum grade of B- and [NURS 911](#) with a minimum grade of B- and [NURS 920](#) with a minimum grade of B- and [NURS 921](#) with a minimum grade of B- and [NURS 922](#) with a minimum grade of B- and [NURS 923](#) with a minimum grade of B- and [NURS 924](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 943 - Fundamentals of Quality Improvement & Safety in Healthcare

Credits: 3

This course introduces the fundamentals of quality improvement and safety at the microsystem level while learning applied clinical microsystem theory.

Equivalent(s): [NURS 953](#)

Grade Mode: Letter Grading

NURS 952 - Clinical Nursing Leadership

Credits: 2

This seminar course focuses on the integration of systems thinking when engaged in clinical nursing leadership. Emphasizes the development of the clinical nurse leader role at the micro-system level and with an aggregate focus (e.g., long term care; community/public health agencies; ambulatory care clinics; health centers; schools; and acute care settings). Seminars focus student reflection on leadership experiences and emerging issues in health care delivery systems.

Co-requisite: [NURS 952C](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 952C - Clinical Nursing Leadership Clinical

Credits: 6

This clinical course focuses on the integration of systems thinking when engaging in clinical nursing leadership and the application of systems theory in analyzing dynamic health systems. This course immerses the student in a clinical microsystem to facilitate the development of the clinical nurse leader role with an aggregate focus (e.g., long term care, community/public health agencies; ambulatory care clinics; health centers; schools; and acute care settings).

Co-requisite: [NURS 952](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 953 - Promoting Quality Management**Credits:** 3

This course focuses on frameworks for the collection and analysis of quality data. Students are introduced to the creation and execution of action plans for quality improvement at the microsystem level. Changing processes, structures and outcomes using date are emphasized.

Grade Mode: Letter Grading**Special Fee:** Yes**NURS 955 - Evidence Based Nursing Scholarly Project I****Credits:** 3-12

Students acquire the specialty knowledge and skills required in the area of their master's study. Students work with their faculty mentor to propose performance competencies, learning activities, settings, and resource persons for this supervised practicum. Practicum must include a minimum of 112 hours of supervised practice. May be repeated. Must hold RN license in state of practicum.

Grade Mode: Graduate Credit/Fail grading**Special Fee:** Yes**NURS 956 - Evidence Based Nursing Scholarly Project II****Credits:** 3

This course requires students to focus on nursing practice issues and to work as individuals or groups to develop solutions. As the capstone course for the evidence-based nursing track, the students are required to complete this scholarship project under the direction of a faculty member. Must hold RN license in state of project.

Prerequisite(s): NURS 955 with a minimum grade of B-.**Grade Mode:** Graduate Credit/Fail grading**NURS 958 - Clinical Nurse Leader Capstone****Credits:** 6

This 6 credit capstone (200 hour) course requires students to complete a scholarly project that defines and/or implements strategies that will address/resolve a substantive nursing practice issue that impacts the quality and safety of patients. As the capstone course for the clinical nurse leader nursing track, the students are required to complete and present this scholarship project under the direction of course faculty and masters-prepared preceptor in the clinical agency. Prereq: majors only, all previous nursing courses in the CNL track.

Grade Mode: Graduate Credit/Fail grading**Special Fee:** Yes**NURS 960 - Healthcare Finance Management****Credits:** 3

This course explores healthcare finance from the perspective of managing healthcare services. Students develop the knowledge and understanding of financial principles to make decisions in the current economic state of healthcare delivery. Sound fiscal responsibilities are taught within the context of legal and ethical considerations, and students learn to examine financial statements, balance sheets, and cash flow statements in order to make administrative decisions regarding operations and resource allocation.

Grade Mode: Letter Grading**NURS 964 - Information Systems and Technology Improvement****Credits:** 3

Focuses on nursing informatics knowledge and skills needed to assess, evaluate, and optimize health information systems/technology to support communication, the delivery of high-quality care, and improvement of population health. Emphasis on health care technology design and implementation that addresses industry-specific requirements and the integration of data and systems.

Grade Mode: Letter Grading**NURS 966 - Creative Leadership: Embracing Disruption and Innovation**

Credits: 3

Leaders in healthcare must possess dynamic skills that enable them to guide their organizations and teams through tough times change. This course will address innovation strategy, creativity and complexity as well as a traditional focus on personal leadership development. Students will learn how to approach issues that arise in the workplace, evaluate strategic challenges in healthcare and self-assess personal leadership skills. Tools will be used to develop solutions specific to challenges facing healthcare leaders today.

Grade Mode: Letter Grading

NURS 967 - Evidence Based Practice Methods**Credits:** 3

Application and evaluation of clinical evidence to drive practice decisions that result in high quality care and are cost effective.

Identify a problem, plan change to improve a process or outcome, or develop innovative solutions related to health care delivery

Prerequisite(s): [NURS 968](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 968 - Foundations of Evidence Based Practice**Credits:** 3

Provides a broad overview of evidence-based advanced practice nursing. Philosophical, conceptual, and theoretical perspective as well as research methods are examined. Explore the application knowledge to inform, evaluate, and translate evidence for practice.

Grade Mode: Letter Grading

NURS 969 - Health Systems Policy, Economics & Financial Planning**Credits:** 3

Provides a comprehensive, systems thinking approach to include policy, economics and financial principles to promote high quality the health care delivery to individual, populations and communities. Focuses on healthcare issues and advocacy, which influence patient centered policy development and implementation.

Grade Mode: Letter Grading

NURS 970 - Clinical Practicum for Advanced Practice Nurse**Credits:** 2

This clinical practicum is designed to provide the student with the opportunity to implement the role of the advanced practice nurse while under the supervision of other health care professionals in practice. Student will focus on clinical application of knowledge in a self-designed practicum. Student may complete up to 250 clinical practicum hours in this course, and may repeat this course one time.

Repeat Rule: May be repeated for a maximum of 4 credits.

Grade Mode: Graduate Credit/Fail grading

NURS 973 - Quality & Safety**Credits:** 3

Explores the theoretical foundations and application of quality improvement methods, tools and strategies needed to increase organizational effectiveness. Focuses on measurement and accountability in health care delivery systems through the examination and analysis of data, structures, processes, and outcomes. Prepares students to lead and practice in organizations that advance high reliability principles, patient safety, interprofessional teamwork, and continuous learning.

Grade Mode: Letter Grading

NURS 977 - Neurobiology of Mental Disorders Across the Lifespan**Credits:** 2

This course builds on the advanced provider's knowledge of anatomy, physiology, and pathophysiology, focusing on major mental disorders across the lifespan. Disorders are examined including various factors such as developmental, genetic, injury, trauma, infection, degeneration, and substance use disorders. Complex networks necessary for maintaining homeostasis within the brain and between the brain and body are examined in relation to these disorders.

Grade Mode: Letter Grading

NURS 978 - Psychopharmacology of Mental Health Disorders Across the Lifespan I**Credits:** 2

This course provides an overview of the principles and best practices for using psychopharmacology to treat mental disorders across the lifespan. Clinical uses, neuropharmacological mechanisms, risks, benefits, and outcomes of commonly used psychotropic drugs in the context of a comprehensive treatment plan will be explored. This course requires critical thinking and problem-solving skills to apply psychopharmacologic principles for treating chronic and acute clinical conditions across the lifespan. Part 1 of a 2- part course.

Co-requisite: [NURS 991](#)**Prerequisite(s):** [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**NURS 979 - Psychopharmacology of Mental Health Disorders Across the Lifespan II****Credits:** 2

This course provides an overview of the principles and best practices for using psychopharmacology to treat mental disorders across the lifespan. Clinical uses, neuropharmacological mechanisms, risks, benefits, and outcomes of commonly used psychotropic drugs in the context of a comprehensive treatment plan will be explored. This course requires critical thinking and problem-solving skills to apply psychopharmacologic principles for treating chronic and acute clinical conditions across the lifespan. Part 2 of a 2- part course.

Co-requisite: [NURS 992](#)**Prerequisite(s):** [NURS 978](#) with a minimum grade of B- and [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B- and [NURS 991](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**NURS 980 - Doctoral Scholarly Project I****Credits:** 3

This course focuses on models and methods of translating evidence into practice, including synthesis of evidence, program planning and evaluation, and preparation of an evidence-based research proposal. Students lay the foundation for their DNP Scholarly Project and may begin their 500 required clinical hours.

Grade Mode: Graduate Credit/Fail grading**NURS 981 - Doctoral Scholarly Project II****Credits:** 3

This course encourages further exploration and analysis of the selected client, population, and/or system. Students use their own evidence-based analysis and data from either clinical practice and/or epidemiological studies to guide the design and implementation of the practice dissertation including human subjects review, intervention and analysis. The course includes a clinical practice immersion in the DNP role.

Prerequisite(s): [NURS 980](#) with a minimum grade of B-.**Grade Mode:** Graduate Credit/Fail grading**NURS 982 - Doctoral Scholarly Project III****Credits:** 3

This final course focuses on interpretation and presentation of findings of the DNP Project and a clinical immersion. Students identify additional goals and activities to meet the minimum requirement of 500 practicum hours.

Prerequisite(s): [NURS 981](#) with a minimum grade of B-.**Grade Mode:** Graduate Credit/Fail grading**Special Fee:** Yes**NURS 983 - Foundations of Psychiatric-Mental Health Practice and Assessment****Credits:** 3

This course provides an introduction to standardized bio-psycho-social data collecting tools and psychiatric rating scales will provide structure for the assessment/interview process. Students will further their development and progression of mental disorders with an overview of the classification system in the DSM 5 and introduction of medical/psychiatric disorders. The culmination of these activities is designed to foster critical thinking and help students develop a broader view of mental disorder formulation.

Co-requisite: [NURS 977](#)

Grade Mode: Letter Grading

Special Fee: Yes

NURS 986 - Psychiatric-Mental Health Nurse Practitioner Practicum I

Credits: 2

This course provides students an opportunity to synthesize and apply psychotherapeutic theories and concepts as they develop interview and assessment skills. (Minimum of 150 clinical hours and successful navigation of course competencies).

Co-requisite: [NURS 990](#)

Prerequisite(s): [NURS 978](#) with a minimum grade of B- and [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B- and [NURS 979](#) with a minimum grade of B- and [NURS 991](#) with a minimum grade of B- and [NURS 992](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 987 - Psychiatric-Mental Health Nurse Practitioner Practicum II

Credits: 3

This course provides the student with knowledge and skills to perform advanced clinical differential diagnoses and management of individuals with mental disorders across the lifespan reinforcing knowledge of the diagnostic criteria of the DSM-5 and application of psychopharmaceutical and treatment planning skills. (Minimum of 200 clinical hours and successful navigation of course competencies).

Prerequisite(s): [NURS 978](#) with a minimum grade of B- and [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B- and [NURS 979](#) with a minimum grade of B- and [NURS 991](#) with a minimum grade of B- and [NURS 992](#) with a minimum grade of B- and [NURS 990](#) with a minimum grade of B- and [NURS 986](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 988 - Psychiatric-Mental Health Nurse Practitioner Practicum III

Credits: 3

This course will provide an opportunity to apply and synthesize psychiatric principles and policies with targeted information on management of complicated care and crisis management. Course will continue to build on previously attained competencies from clinical and didactic coursework (Minimum of 200 clinical hours and successful navigation of course competencies).

Prerequisite(s): [NURS 978](#) with a minimum grade of B- and [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B- and [NURS 979](#) with a minimum grade of B- and [NURS 991](#) with a minimum grade of B- and [NURS 992](#) with a minimum grade of B- and [NURS 990](#) with a minimum grade of B- and [NURS 986](#) with a minimum grade of B- and [NURS 987](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 989 - Psychiatric-Mental Health Nurse Practitioner Practicum IV

Credits: 3

This course provides the student with knowledge and skills to synthesize all advanced KSA's for patients with mental disorders across the lifespan to include knowledge of the diagnostic criteria of the DSM-5, application of psychopharmaceutical skills, and therapeutic modalities ensuring evidenced based practice, optimal outcomes, and adherence to ethical guidelines. It will assist the novice PMHNP with bridge to practice competencies. (Minimum of 200 clinical hours and successful navigation of course competencies).

Prerequisite(s): [NURS 978](#) with a minimum grade of B- and [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B- and [NURS 979](#) with a minimum grade of B- and [NURS 991](#) with a minimum grade of B- and [NURS 992](#) with a minimum grade of B- and [NURS 990](#) with a minimum grade of B- and [NURS 986](#) with a minimum grade of B- and [NURS 987](#) with a minimum grade of B- and [NURS 988](#) with a minimum grade of B-.

Grade Mode: Letter Grading

Special Fee: Yes

NURS 990 - Mental Health & Special Populations

Credits: 3

This course will enhance the student's understanding of addiction medicine and the effects of trauma from a microscopic, mesoscopic, macroscopic, and generational perspective. By weaving elements of basic science, assessment, and diagnosis, students will learn to understand and manage these disorders by integrated knowledge to propose evidenced based approaches for treatment. Special attention will focus on co-occurring disease processes and treatment approaches.

Grade Mode: Letter Grading

NURS 991 - Diagnosis & Management of Mental Health Disorders Across the Lifespan I**Credits:** 3

The advanced provider will develop knowledge, skills, and competencies to perform advanced clinical impressions, diagnostic differential diagnosis, and management of individuals with mental disorders across the lifespan. By using evidence-based research, bio-psychosocial formulations and best practice, students will acquire knowledge of the diagnostic criteria of the DSM. Students will also focus on the foundational elements and strategies used to care for individuals with mental health disorders using psychotherapeutic modalities. Part 1 of a 2-part course.

Prerequisite(s): [NURS 983](#) with a minimum grade of B- and [NURS 977](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 992 - Diagnosis & Management of Mental Health Disorders Across the Lifespan II**Credits:** 3

The advanced provider will develop knowledge, skills, and competencies to perform advanced clinical impressions, diagnostic differential diagnosis, and management of individuals with mental disorders across the lifespan. By using evidence-based research, bio-psychosocial formulations and best practice, students will acquire knowledge of the diagnostic criteria of the DSM. Students will also focus on the foundational elements and strategies used to care for individuals with mental health disorders using psychotherapeutic modalities. Part 2 of a 2-part course.

Prerequisite(s): [NURS 977](#) with a minimum grade of B- and [NURS 983](#) with a minimum grade of B- and [NURS 978](#) with a minimum grade of B- and [NURS 991](#) with a minimum grade of B-.

Grade Mode: Letter Grading

NURS 996 - Independent Study**Credits:** 1-3

Opportunity for study and/or practice in an area of choice. Objectives are developed by students and must be approved by faculty. May be repeated.

Grade Mode: Letter Grading

NURS 999 - Doctoral Scholarly Project Completion**Credits:** 0

The purpose of this course is to provide DNP students with the support and resources necessary to complete their scholarly project when course work has been completed but they have not completed the project phase.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Nutrition (NUTR)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

NUTR 800 - Career Development in Dietetics

Credits: 2

Preparation for applying to dietetic internship programs and/or graduate school. Topics include writing resumes and personal statements, interviewing, professional skills, and navigating the online internship application.

Grade Mode: Letter Grading

NUTR 804 - Managerial Skills in Dietetics

Credits: 4

Emphasis on the basic principles of managing in dietetic fields such as clinical, community, and food service operations is the focus of course content. This includes personnel management, in-service and on-the-job training, effective leadership, decision making, assessing employee motivation, productivity and competence, and financial management. Graduate students are expected to analyze, synthesize, and evaluate course content at a deeper level. Graduate level assignments are designed to provide additional rigor and will require advanced critical thinking skills.

Grade Mode: Letter Grading

NUTR 809 - Nutritional Epidemiology

Credits: 4

This course introduces basic concepts and methods in key areas of nutritional epidemiology, and discusses practical considerations related to designing, analyzing, and evaluating population-based nutrition studies. Research methods used in nutritional epidemiology will be taught to provide students with the ability to critically evaluate the nutritional epidemiological evidence. Learning will be enhanced by practical experiences in the collection, management, and analysis of nutritional epidemiological data during lab and in-class activities.

Prerequisite(s): [NUTR 400](#) with a minimum grade of D- and ([PSYC 402](#) with a minimum grade of D- or [SOC 502](#) with a minimum grade of D- or [BIOL 528](#) with a minimum grade of D-).

Grade Mode: Letter Grading

NUTR 810 - Advanced Diabetes Care

Credits: 2

Advanced Diabetes Care is a 2-credit course designed to build on foundational knowledge of diabetes care and education. During the semester, students will explore the pathophysiology of diabetes as well as modern medications and technology used to improve blood sugar management. Students will apply their knowledge of diabetes and nutrition to interpret data and deliver effective, compassionate care.

Prerequisite(s): [NUTR 400](#) with a minimum grade of D- and [BMS 507](#) with a minimum grade of D- and [BMS 508](#) with a minimum grade of D-.

Grade Mode: Letter Grading

Special Fee: Yes

NUTR 815 - Advanced Sports Nutrition

Credits: 4

The focus of the course is placed on the application of evidence-based knowledge to sport-specific scenarios. Insight and skills gained in this course will expand students' abilities in assisting and recommending proper nutritional strategies for athletes during training and competition. Additionally, this discusses strategies to combat common issues athletes may encounter, such as injuries, illness, eating disorders, and gastrointestinal discomfort.

Grade Mode: Letter Grading

NUTR 820 - Community Nutrition**Credits:** 4

Identification of causes of complex public health nutrition problems (such as food insecurity and escalating obesity rates) and cost-effective community-based interventions required to solve them. Provides skills and tools needed to assess design and evaluate community nutrition and wellness interventions.

Prerequisite(s): NUTR 400 with a minimum grade of D-.**Grade Mode:** Letter Grading**NUTR 829 - Dietetics: Intro to Dietetics Principle and Practice****Credits:** 2

Dietetics professionals are engaged in multiple arenas that demand familiarity with community food access, public health, food system challenges and health care practices. Resources and strategies to identify reliable sources of information, critical thinking skills, professional development and professional standards of behavior will be considered throughout the course. Simulation and extensive practicum-based training are critical components of this course as students prepare for extensive practicum placement in food service, community and clinical care settings.

Repeat Rule: May be repeated up to 1 time.**Grade Mode:** Letter Grading**Special Fee:** Yes**NUTR 830 - From Seed to Sea: Examining Sustainable Food Systems****Credits:** 4

Integration of diverse human and natural system interactions in a seminar-based course to understand issues in food system sustainability. Examination of food system structure and function from coupled human and natural systems prospective. Current and topical issues of food and agriculture include: exploration of using natural resources to meet growing population demands; conflicting views on meeting food and nutrition requirements; impacts of increased stress on natural resources; inequities and discrimination in the food system; impact on dietary guidelines on the environment. Introductory nutrition course required.

Grade Mode: Letter Grading**NUTR 831 - Dietetics: Clinical Theory and Practice****Credits:** 10

Integration of clinical theory and practice in dietetics care. Bi-weekly seminars, on-line assignments and supplemental readings provide a mechanism to examine the nutritional basis of diet and disease relationships and consider appropriate nutritional interventions. Clinical rotations (500-600 hours) provide the opportunity to explore the application of nutritional science principles and practices within inpatient and outpatient environments. Staff responsibility, coupled with an in-depth case study presentation of a current patient with multiple nutrition risk factors, serves as the capstone practicum project.

Prerequisite(s): NUTR 829 with a minimum grade of B- or NUTR 832 with a minimum grade of B-.**Grade Mode:** Letter Grading**Special Fee:** Yes**NUTR 832 - Dietetics: Food Service and Community****Credits:** 10

Pre-professional work experiences with continued examination and application of theory and practice in the dietetic profession. Concepts include foodservice management topics such as facility and human resources management, translation of nutrition into foods/menus, procurement, distribution and service within delivery systems, and food safety and sanitation. Community nutrition topics include nutrition screening and assessment, nutrition counseling and education, food security and sustainability, program development and evaluation, as well as exploration of health promotion and disease prevention theory and application.

Assignments and supplemental reading reinforce practicum experiences. Practicum experience (500-600 hours) is integrated into the course design.

Grade Mode: Letter Grading**Special Fee:** Yes**NUTR 836 - Sustainable Food Systems and Culinary Arts Practicum****Credits:** 3

The Sustainable Food Systems and Culinary Arts experience is designed to provide both theoretical and practical information through

builds upon core values of population and planetary health. Students will use a food systems lens to review food costs, evaluate food access and food security, consider the role of culture and place in food selection and conduct nutrient analysis. They will expand their culinary skills, while integrating knowledge of local, organic and sustainable food concepts.

Grade Mode: Letter Grading

Special Fee: Yes

NUTR 840 - Nutrition for Children with Special Needs

Credits: 4

Understand the nutrition concerns and care of children with special health needs and the need for medical nutrition therapy. Insight and skills gained in this course will expand students' abilities in assessing and recommending proper nutritional strategies for children affected by a variety of medical conditions. Specifics of the nutrition care process for these conditions will be examined. Introductory nutrition course and enrollment in graduate program required prior to taking this course.

Grade Mode: Letter Grading

NUTR 850 - Nutritional Biochemistry

Credits: 4

Digestion, absorption, transport, and utilization of food nutrients. Role of macro- and micro-nutrients as substrates and catalysts in metabolic pathways, and the role of these pathways in maintaining human health at the cellular, organ and whole-body levels. Two semesters anatomy and physiology; one semester biochemistry required.

Equivalent(s): ANSC 850

Grade Mode: Letter Grading

NUTR 851 - Nutritional Biochemistry of Micronutrients

Credits: 4

Investigation of the nutritional and biochemical aspects of micronutrient metabolism. All essential vitamins and minerals, as well as some phytonutrients and quasi-nutrients are explored in depth. Nutrients are examined for their molecular, cellular, and metabolic and biomedical functions, as well as the biochemical and clinical consequences of their deficiency or excess.

Prerequisite(s): NUTR 850 with a minimum grade of B-.

Grade Mode: Letter Grading

NUTR 855 - Concepts and Controversies in Weight Management

Credits: 4

Overview of the risk factors associated with obesity; evidence-based recommendations for assessment and treatment of obesity. Counseling skills important to successful weight management and non-diet approaches are also explored.

Equivalent(s): NUTR 856

Grade Mode: Letter Grading

NUTR 860 - Behavioral Nutrition and Counseling

Credits: 4

Apply current theories and techniques of counseling appropriate to nutrition. Emphasis on effective communication, client-centered counseling methods, motivational interviewing, behavior change, and factors affecting nutritional intake. Nutrition psychology and principles of group counseling/facilitation will also be explored.

Grade Mode: Letter Grading

NUTR 873 - Clinical Nutrition

Credits: 4

Principles and mechanisms of disease that result in altered nutrient requirements in humans. One semester introductory nutrition course and enrollment in graduate program required prior to taking this course.

Equivalent(s): ANSC 873

Grade Mode: Letter Grading

NUTR 875 - Practical Applications in Medical Nutrition Therapy

Credits: 4

Combination of lecture and supervised practical experience in medical nutrition therapy in a New England hospital. Emphasizes nutritional counseling, assessment, and instruction of patients with nutrition-related disorders.

Equivalent(s): ANSC 875

Grade Mode: Letter Grading

NUTR 876 - Advanced Pathophysiology and Clinical Care

Credits: 4

Designed to integrate scientific principles and clinical knowledge with emphasis on clinical decision-making related to providing optimal nutrition care. Course will emphasize understanding the pathophysiology of diseases and mastery of their nutritional implications and interventions. Students build and expand on knowledge and emphasize applications into their clinical care process. Active participation in lecture discussions and lab simulation is an integral part of class.

Prerequisite(s): (NUTR 773 with a minimum grade of D- or NUTR 873 with a minimum grade of B-) and (NUTR 775 with a minimum grade of D- or NUTR 875 with a minimum grade of B-) and (NUTR 750 with a minimum grade of D- or NUTR 850 with a minimum grade of B-).

Grade Mode: Letter Grading

Special Fee: Yes

NUTR 880 - Critical Issues in Nutrition

Credits: 4

Critical review and analysis of controversial topics in nutrition; emphasis on developing oral and written communications skills and critical thinking skills.

Prerequisite(s): NUTR 873 with a minimum grade of B-.

Equivalent(s): ANSC 880

Grade Mode: Letter Grading

NUTR 895 - Investigations

Credits: 1-4

Investigations.

Grade Mode: Letter Grading

NUTR 899 - Master's Thesis

Credits: 1-6

Graduate students must enroll for a total of 6 credits for this course. Students may enroll in 1-6 credits per semester.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

NUTR 927 - Nutrition and Gut Microbes in Human Health

Credits: 4

This course explores the role of nutrition and the gut microbiota in underlying biochemical, metabolic, and immunological processes of chronic and infectious diseases. The course first provides an overview of organs, systems, metabolic processes, and their modulation by nutrients and the gut microbiota, with a focus on human health. The second half of the course covers the mechanistic links between nutrition, the gut microbiota, and chronic and infectious diseases, where students have an opportunity to apply the concepts learned in the first half of the course. To be successful in this course students will need to have taken courses in biochemistry, nutrition, or nutritional biochemistry, or have instructor permission.

Grade Mode: Letter Grading

NUTR 960 - Research Methods in Nutritional Science I

Credits: 4

Course is designed to provide students with an understanding of research methods, terminology, and improved ability to be consumers of research literature, and the skills necessary to conduct applied nutrition research studies (e.g. writing a research proposal, interpreting research results and critically evaluating research), as well as communicate scientific information (research presentation). Students will gain experience with data collection methodologies relevant to human nutrition.

Grade Mode: Letter Grading

NUTR 961 - Research Methods in Nutritional Science II**Credits:** 4

Course is designed to provide students with an understanding of research methods, terminology, and improved ability to be consumers of research literature, and the skills necessary to conduct applied nutrition research studies (e.g. writing a research proposal, interpreting research results and critically evaluating research), as well as communicate scientific information (research presentation). Students will gain experience with data collection methodologies relevant to human nutrition.

Prerequisite(s): NUTR 960 with a minimum grade of B-.**Grade Mode:** Letter Grading

Occupational Therapy (OT)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

OT 810 - OT Practice and Professional Roles

Credits: 3

Students are introduced to foundation knowledge, values and philosophy of occupational therapy practice. Students learn skills apply professional behaviors and skills required to be ethical practitioners. They learn about various practice settings and system within which occupational therapists practice to prepare them to begin to make decisions regarding their fieldwork site selector. They are introduced to models of OT practice.

Grade Mode: Letter Grading

Special Fee: Yes

OT 815 - Introduction to Group Process: Theory and Application

Credits: 2

This course provides a theoretical foundation of group process in occupational therapy practice across practice settings. It explores several group theory perspectives and applies them to OT practice considering multiple group models, group leadership concepts, group process, therapeutic use of self, and contexts/environments. Students will learn to articulate core principles of group process and identify the role of occupational therapy practitioners in using groups as an intervention method and/or service delivery model.

Grade Mode: Letter Grading

OT 830 - Assistive Technology for Enhancing Occupational Performance

Credits: 3

This course provides instruction on how occupational therapy practitioners use and apply assistive technology in the context of client evaluation and intervention, to improve quality of life and functional capacities. Students learn and apply clinical reasoning skills related to the selection, procurement, modification and training in the use of assistive technology solutions.

Co-requisite: [OT 830L](#)

Grade Mode: Letter Grading

OT 830L - Assistive Technology for Enhancing Occupational Performance Lab

Credits: 1

Co-Requisite Laboratory for [OT 730/830](#) Assistive Technology for Enhancing Occupational Performance. Students are provided hands-on learning experiences regarding the fabrication, identification, adaptation and training in the use of assistive technology for individuals with functional problems associated with disability or impairment. OT evaluation and interventions related to the application of assistive technology are addressed.

Co-requisite: [OT 830](#)

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

OT 831 - Introduction to Assistive Technology Principles

Credits: 2

This course presents an overview of the various assistive technology service delivery models, assessments tools, legislation, funding, and assistive technology across the lifespan.

Grade Mode: Letter Grading

OT 832 - Introduction to AT Design and Fabrication

Credits: 2

This course provides an overview of assistive technology (AT) service delivery models and begins to teach students how to design

and fabricate AT solutions. Students will develop skills in fabrication tool use inclusive of 3-D printing. Interactive learning will occur throughout the semester and students will be provided a materials and tools kit to ensure access and skill development. Students will demonstrate skill acquisition for AT design, fabrication and consumer training through video and photo submission and within interprofessional discussions with peers.

Grade Mode: Letter Grading

Special Fee: Yes

OT 833 - Assistive Technology for Physical Access I: Electronic Technologies

Credits: 2

This course focuses on switch and computer access solutions; programming switch interfaces for computers and iPads; alternative mice and keyboards; switch access recipes; iPad mounting solutions; electronic aids for daily living, voice controlled solutions for the phone, computer, and activation of household appliances. Students will learn how to make, modify, and mount various switches and electronic devices. Intensive hands-on AT exploration will be completed on campus or virtual evidence provided will be accepted.

Grade Mode: Letter Grading

OT 834 - Assistive Technology for Physical Access II: Mobility, Seating, and Transportation

Credits: 2

This course focuses on assistive technology solutions to maximize independence at home, in the community, and on the job for individuals who experience physical disabilities. Students will acquire skills in conducting accessibility assessments. Topics explored include wheelchair seating and mobility; ergonomic hand tools; independent living aids; ramps and lifts; vehicle modifications; and modifications for canes, crutches, walkers, and wheelchairs. Intensive hands-on AT exploration will be completed on campus or virtual evidence provided will be accepted.

Grade Mode: Letter Grading

OT 835 - Assistive Technology for Communication and Cognition

Credits: 2

This course focuses on alternative and augmentative communication devices and devices that benefit individuals who experience cognitive impairments. This course explores assistive technology solutions for note taking, devices and apps for self-regulation, organization, and reminders. Students will learn how to conduct cognitive demand analysis for devices and apps to help users select appropriate accommodations and assistive technology solutions. Intensive hands-on AT exploration will be completed on campus or virtual evidence provided will be accepted.

Grade Mode: Letter Grading

OT 836 - Assistive Technology for Vision and Hearing

Credits: 2

This course focuses on assistive technology for blind and low vision; deaf and hard of hearing; and deaf/blindness. Students will use an assortment of magnification devices; amplification systems; and assistive listening devices as well as learn how to create a variety of approaches to accommodate for vision and hearing impairments. Intensive hands-on AT exploration will be completed on campus or virtual evidence provided will be accepted.

Grade Mode: Letter Grading

OT 841 - Human Occupation

Credits: 3

This course introduces students to the broad concept of occupation by exploring ways people acquire skills for occupational performance. Students develop an understanding of the relations between health and occupation, disability and occupation, and explore how humans find meaning in their lives, through occupational engagement. This course is writing intensive.

Grade Mode: Letter Grading

OT 844 - Fieldwork and Professionalism - Level 1

Credits: 1

This course prepares students to enter level 1 fieldwork with confidence and working knowledge of expectations for a full-time two-week level 1 fieldwork experience.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

OT 845 - Administration and Management for Occupational Therapy Practice

Credits: 3

This course aims to increase the student's understanding of systems of practice, and to business fundamentals associated with occupational therapy service delivery. Specific topics covered include and analysis of practice settings, reimbursement, supervision of professional and non-professional staff, program evaluation methods, ethics, OT management practices, marketin health policy including medicare, Human Rights and Education Legislation, and the impact of policy decisions for the delivery of OT services. OT and OT Asst Tech Certificate majors only.

Grade Mode: Letter Grading

OT 846 - Fieldwork and Professionalism-Level II

Credits: 1

This course is designed to deepen understanding of professionalism needed for success on Level II fieldwork. We will explore role changes that accompany leaving the academic world and entering the larger realm of professional practice. Students analyze factors that contribute to successful professional development and ethical practice. Students use the results of their analyses to plan their individual transition to fieldwork and entry-level practice.

Prerequisite(s): ([OT 744](#) with a minimum grade of D- or [OT 844](#) with a minimum grade of B-) and ([OT 792](#) with a minimum grade D- or [OT 892](#) with a minimum grade of B-).

Grade Mode: Letter Grading

OT 850 - Neuro-Occupation: The Relationship Between Occupation and the Brain

Credits: 3

The course explores brain development, neuroplasticity and occupation across the lifespan. Following a contextual review of the neuroanatomy and physiology, the students will explore the mind-body relationship across multiple domains of occupational therapy practice. There are four primary content areas: Applied neurology, nature with nurture: occupational engagement and the development of the brain, the brain, occupation and behavior, and neuroplasticity as the basis for improving motor behavior.

Grade Mode: Letter Grading

OT 851 - Mind Body Systems/Neurologically-based Function and Dysfunction

Credits: 3

Students study most significant occupational-related disorders commonly seen by occupational therapists. A self-directed method is used to examine the perceptual, cognitive, biopsychosocial basis of these disorders. A basic overview of human body-mind systems is provided with an emphasis on pathology, the recognition of symptoms, their causes and the occupational implication of the disorders. The course is a prerequisites for courses in specific occupational therapy assessment and intervention. Neurology is required prior to taking this course.

Grade Mode: Letter Grading

OT 852 - Human Movement and Environmental Effects on Everyday Occupations

Credits: 3

Students will integrate their prerequisite knowledge of occupation. The course will develop skills required for interpretation of biomechanical analysis for creating successful occupational performance for individuals with varied musculoskeletal, cardiac, and respiratory dysfunction. Integration of the occupational therapy clinical reasoning process and the use of occupations as a therapeutic mechanism for change will be emphasized. The analysis of environment as it relates to human movement and participation in desired occupations will be explored.

Co-requisite: [OT 852L](#)

Grade Mode: Letter Grading

Special Fee: Yes

OT 852L - Human Movement and Environmental Effects on Everyday Occupations Lab

Credits: 1

Lab.

Co-requisite: [OT 852](#)

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

OT 853 - Mind Body Systems: Neurologically-based Function and Dysfunction--Pediatric Conditions

Credits: 4

This course is the first course in a two-part sequence that uses a life span approach, drawing on occupational science perspective to study conditions diagnosed during childhood (birth through age 20). The emphasis is on the interaction of the individual (the mind), the body and the psychosocial environment as related to occupational performance. Students will work in pairs to examine selected disorders, and will further develop their presentation skills. This course is a prerequisite for courses in occupational therapy assessment and intervention in pediatric practice.

Prerequisite(s): [KIN 706](#) with a minimum grade of D-.

Grade Mode: Letter Grading

OT 854 - Level II Fieldwork, I

Credits: 8

This course is a 12-week, full-time internship that takes place after completion of the first graduate year, either in the summer or the fall. Level II fieldwork provides students with opportunities to: experience in-depth delivery of occupational therapy services to clients; focus on the application of purposeful and meaningful occupation and/or research, administration and management of occupational therapy services. Level II fieldwork is designed to promote clinical reasoning and reflective practice, to transmit values and beliefs that promote ethical practice and to develop professionalism and competence as career responsibilities.

Grade Mode: Graduate Credit/Fail grading

OT 855 - Level II Fieldwork Discussion

Credits: 1

[OT 855](#) Level II Fieldwork, I, online discussion is a co-requisite course that accompanies [OT 854](#) and [OT 856](#): Level II Fieldwork. Students respond to instructor-led discussion prompts as well as to postings of their classmates. The online discussion provides the opportunity for students to relate fieldwork experiential learning to all areas of UNH coursework including: mind-body systems, health-and-human systems of care; assessment; intervention; documentation; evidence-based practice; client-centered and occupation-centered practice; and application of research to practice. Students engage in on-going discussion about professional identity and the transition from student to professional as they describe and discuss fieldwork challenges and successes across a variety of practice settings.

Grade Mode: Graduate Credit/Fail grading

OT 856 - Level II Fieldwork, II

Credits: 8

This course is the second 12-week, full-time internship. It takes place after two semesters in the second graduate year. [OT 856](#) provides students with opportunities to evaluate, develop and implement in-depth delivery of occupational therapy services in population-based practice and to focus on research and/or administration and management of occupational therapy services.

Grade Mode: Graduate Credit/Fail grading

OT 857 - Mind Body Systems: Neurologically-based Function and Dysfunction--Adult Conditions

Credits: 4

This course is the second course in a two-part course sequence that uses a life span approach, drawing on occupational science perspectives to study conditions typically diagnosed during adulthood (ages 21 and up). The emphasis is on the interaction of the individual (the mind), the body and the psychosocial environment as related to occupational performance. Students will work in pairs to examine selected disorders, and will further develop their presentation skills. This course is a prerequisite for courses in occupational therapy assessment and intervention for adults.

Prerequisite(s): [KIN 706](#) with a minimum grade of D- and (OT 753 with a minimum grade of D- or [OT 853](#) with a minimum grade of B-).

Grade Mode: Letter Grading

OT 860 - Psychosocial Evaluation and Intervention**Credits:** 3

Examines the evaluation of psychosocial and psycho-emotional areas of occupational performance and the planning and implementation of occupation-based interventions across domains of practice and client populations. Course addresses developing a client's occupational profile, narrative reasoning and therapeutic use of self, behavioral change, illness representation, and adjustment to chronic disorders. A specific focus of the course is evaluation of and intervention for clients' presenting with mental health disorders. Open to OT majors only.

Co-requisite: [OT 860L, OT 860R](#)**Grade Mode:** Letter Grading**OT 860L - Psychosocial Evaluation and Intervention Lab****Credits:** 1

This is the co-requisite lab for [OT 860](#). Lab provides hands-on experiences regarding the evaluation and intervention of psychological and psycho-emotional areas of occupational performance. Course focuses on the evaluation and intervention for clients presenting with mental health disorders and also addresses narrative reasoning, therapeutic use of self, behavioral change, illness representation and adjustment to chronic disorders.

Co-requisite: [OT 860](#)**Grade Mode:** Graduate Credit/Fail grading**Special Fee:** Yes**OT 860R - Psychosocial Evaluation & Intervention Recitation****Credits:** 0

Psychosocial Evaluation and Intervention Recitation provides additional hands-on and experiential learning opportunities in an established community program for all students enrolled in [OT 860](#). This recitation allows students the opportunity to develop the skills needed to work in mental/behavioral health settings.

Co-requisite: [OT 860](#)**Grade Mode:** Graduate Credit/Fail grading**OT 862 - OT Evaluation and Intervention for Children****Credits:** 3

Students will gain foundation knowledge of OT evaluation intervention process. Students apply the clinical reasoning process for the evaluation and treatment of children with various conditions, and across age groups. Students learn common assessment tools used by occupational therapists, and how to select and critique evaluation methods. Select cases will be used for the application of knowledge, interventions, and frames of reference used with children.

Co-requisite: [OT 862L, OT 862R](#)**Grade Mode:** Letter Grading**Special Fee:** Yes**OT 862L - OT Evaluation and Intervention for Children - Lab****Credits:** 1

This is the corequisite lab for [OT 862](#), Evaluation and Intervention for Children. Students develop technical skills in administering evaluation tools, methods and procedures, in making clinical decisions about intervention planning and implementation. Students learn, practice and demonstrate many intervention techniques used with children, and complete a number of clinical case studies.

Co-requisite: [OT 862, OT 862R](#)**Grade Mode:** Graduate Credit/Fail grading**Special Fee:** Yes**OT 862R - OT Evaluation and Intervention for Children Recitation****Credits:** 0

Students hone their professional reasoning abilities and sharpen their observation skills as they provide developmentally appropriate activities with children.

Co-requisite: [OT 862, OT 862L](#)**Grade Mode:** Graduate Credit/Fail grading

OT 863 - Occupational Therapy Intervention for Adults**Credits:** 3

Students gain foundation knowledge of the OT evaluation and intervention process with adults with neurological and orthopedic conditions. Students apply the clinical reasoning process to clinical practice with adults with various types of medical conditions. Students learn about common assessment tools available to occupational therapists for adults, where, when, and how to apply them. Students develop technical skills in administering selected evaluation tools, in integrating assessment data, and demonstrate clinical decisions about intervention planning and implementation. Selected cases are used for application of knowledge, and the course covers the application of common intervention strategies used by occupational therapists with adult

Co-requisite: [OT 863L](#)**Grade Mode:** Letter Grading**Special Fee:** Yes**OT 863L - Occupational Therapy Evaluation and Intervention for Adults - Lab****Credits:** 1

Students develop technical skills in administering selected evaluation tools, in integrating assessment data, and demonstrate clinical decisions about intervention planning and implementation.

Co-requisite: [OT 863](#)**Grade Mode:** Graduate Credit/Fail grading**OT 863R - Adult Evaluation and Intervention Recitation****Credits:** 0

Adult Evaluation and Intervention Recitation provides additional hands-on and reflective discussion for acquiring skills needed for acute care/hospital in-patient settings.

Co-requisite: [OT 863](#)**Grade Mode:** Not graded**OT 865 - Occupational Therapy Practice and Professional Reasoning****Credits:** 3

Develops professional reasoning by building upon level II fieldwork experiences. Students develop a population-based intervention plan, explore occupational therapy in an emerging or specialized practice setting, and implement a plan for continuing professional development. Students prepare for their OT board certification examination, and complete a culminating capstone experience.

Grade Mode: Letter Grading**OT 871 - Enabling Participation in Community Groups****Credits:** 2

Students will learn about a community organization partnership, the people served by the organization, and principles of conducting therapeutic groups within the organization. Emphasis of content includes group process, clinical documentation, intervention planning and OT services with adults with cognitive impairments.

Co-requisite: [OT 871L](#)**Grade Mode:** Letter Grading**Special Fee:** Yes**OT 871L - Enabling Participation in Community Groups Lab****Credits:** 2

Students will work in an organization, learn about the people served by this organization and conduct therapeutic groups. This lab serves as a Level I Fieldwork placement.

Co-requisite: [OT 871](#)**Grade Mode:** Graduate Credit/Fail grading**Special Fee:** Yes**OT 875 - Leadership in Occupational Therapy Systems of Practice****Credits:** 3

Students will integrate concepts, principles, and strategies that are fundamental to the provision of occupational therapy service in the changing U.S. health care system. This course links system management, reimbursement mechanisms, and public policy found in occupational therapy practice settings to the populations served. Knowledge of leadership, management, ethics and marketing principles that are necessary for success in today's health care industry are emphasized.

Grade Mode: Letter Grading

OT 881 - Introduction to Research and Evidence-Based Practice

Credits: 3

This course introduces students to basic principles of scientific inquiry that contribute to OT evaluation and intervention evidence base. Students will explore quantitative, qualitative and mixed research methods and will learn the fundamental steps in conducting research such as formulating research questions and identifying appropriate research designs, instruments for measurement and outcomes. Students will have hands-on experience in identifying a research topic, reviewing the literature, retrieving, reading and synthesizing research articles.

Grade Mode: Letter Grading

OT 882 - Research Methods and Application

Credits: 3

The course provides students an in depth understanding of quantitative, qualitative, and mixed methods designs. The students will learn the necessary knowledge and skills required to critically appraise research evidence. Emphasis will be given to various analytical approaches used to examine qualitative/quantitative evidence, such as understanding differences between experimental and quasi-experimental study designs. Students will work in teams to identify a research topic, review and appraise pertinent evidence, identify and describe gaps in existing knowledge. Students will further use this information to develop a research proposal that addresses the identified gaps.

Prerequisite(s): OT 781 with a minimum grade of D- or OT 881 with a minimum grade of B-.

Grade Mode: Letter Grading

OT 883 - Engagement in Research

Credits: 3

Students engage in activities of systematic inquiry and research under the mentorship of a research-active faculty mentor. Students gain experience with aspects of the research process, which may include conducting a literature review, developing a research proposal, data collection, data analysis, writing a research paper, and the presentation of research findings. Students also apply ethics for the use of human participation in research, and learn about funding avenues for different areas of research.

Prerequisite(s): (OT 781 with a minimum grade of D- and OT 782 with a minimum grade of D-) or (OT 881 with a minimum grade B- and OT 882 with a minimum grade of B-).

Grade Mode: Letter Grading

OT 886 - Engagement in Research

Credits: 3

Students engage in activities of systematic inquiry and research under the mentorship of a research-active faculty mentor. Students gain experience with aspects of the research process, which may include conducting a literature review, developing a research proposal, data collection, data analysis, writing a research paper, and the presentation of research findings. Students also apply ethics for the use of human participation in research, and learn about funding avenues for different areas of research. OT Asst Tech Certificate majors only.

Grade Mode: Letter Grading

OT 887 - Upper Extremity Rehabilitation and Orthotic Fabrication

Credits: 4

This graduate course is designated to expose students to the specialized area of upper extremity rehabilitation including a detailed, working knowledge of hand anatomy, biomechanics, kinesiology, surgical techniques, and orthotic fabrication in order effectively treat upper extremity clinical problems. Students also learn about the common diagnoses seen in upper extremity rehabilitation, critically analyze treatment protocols, and precautions for these common diagnoses, and develop orthotic fabrication and other evaluation and intervention techniques for this population.

Prerequisite(s): (OT 752 with a minimum grade of B or OT 852 with a minimum grade of B) and (OT 763 with a minimum grade of B or OT 863 with a minimum grade of B).

Grade Mode: Letter Grading**Special Fee:** Yes**OT 889 - Using iPads to Support Children with Disabilities****Credits:** 2

The iPad is changing the way we teach and learn. This technology embraces Universal design principles (UDL) and enables children with significant disabilities to learn in ways never thought possible five years ago. It is a tool for delivering multimedia content and embraces the use of Multi modal learning. This technology finally levels the playing field to support all students including students with disabilities.

Grade Mode: Letter Grading**OT 890 - Occupational Therapy and Sensory Integration****Credits:** 4

This course presents, integrates and applies Ayres sensory integration (SI) theory in the context of occupational therapy for children. Content related to the theoretical constructs upon which sensory integration functions is emphasized. Current views related to sensory processing disorders, diagnostic considerations, patterns of sensory integration dysfunction, and SI deficits commonly associated with disorders such as autism and attention disorders are covered. Intervention planning and implementation are covered through video case studies, and observation and analysis of occupational therapy sessions using SI strategies. Students apply their understanding of normal and abnormal child development, and clinical reasoning skills for providing OT services for children with sensory integration problems in clinical, early intervention and school-based settings.

Prerequisite(s): OT 862 with a minimum grade of B- and OT 862L with a minimum grade of B-.**Grade Mode:** Letter Grading**OT 892 - Level I Fieldwork****Credits:** 1

During a two-week fieldwork, students observe an occupational therapist and participate in the planning and implementation of the occupational therapy evaluation and intervention process for a client. The Level I Fieldwork placement is scheduled between fall and spring of their first graduate year.

Grade Mode: Graduate Credit/Fail grading**OT 893 - Special Topics****Credits:** 2-4

Formal courses given on selected topics or special interest subjects. Work may be directed in one of the following areas: A) Administration; B) Clinical Education; C) Pediatrics; D) Physical Disabilities; E) Mental Health; F) Gerontology/Geriatrics; G) School-based Practice, and others. Special fee on some topics.

Repeat Rule: May be repeated for a maximum of 12 credits.**Grade Mode:** Letter Grading**Special Fee:** Yes**OT 895 - Readings and Research in Occupational Therapy****Credits:** 1-6

Independent work under the guidance of an instructor. Work may be directed in one of the following areas: A) Administration; B) Clinical Education; C) Pediatrics; D) Physical Disabilities; E) Mental Health; F) Gerontology/Geriatrics; G) School-based Practice, and others.

Repeat Rule: May be repeated for a maximum of 8 credits.**Grade Mode:** Letter Grading**OT 901 - Introduction to Capstone****Credits:** 2

This is the first course in a three-part doctoral capstone course series (OT 901, OT 902, OT 903) that introduces students to the doctoral capstone experience and project. Students will gain an understanding of the overall purpose and expectations of the doctoral capstone, identify an area of focus for their individual capstone, and begin planning for their doctoral capstone. Students will develop initial ideas for capstone experiences including potential sites or partners for their experience.

Grade Mode: Letter Grading

OT 902 - Capstone Preparation

Credits: 3

The purpose of this course is to operationalize capstone ideas and timelines through program planning. Students will utilize various methods to create and complete a needs assessment that supports the implementation of their doctoral capstone experience. Students will build on the knowledge gleaned throughout the OTD curriculum to plan for their culminating capstone experience in one of eight areas: clinical skills, research skills, administration, leadership, program development and evaluation, advocacy, education, and policy development.

Prerequisite(s): [OT 901](#) with a minimum grade of B-.

Grade Mode: Letter Grading

OT 903 - Capstone: Project Implementation, Evaluation and Dissemination

Credits: 12

The purpose of this course is to demonstrate leadership and scholarship by implementing and evaluating a capstone project that reflects an identified area of need related to occupational therapy practice. Students further synthesize outcomes of their project by demonstrating their understanding of advanced occupational therapy concepts and by disseminating the findings/outcomes from the capstone project as occupational therapy scholars. The experience is guided by learning contract that includes individualized specific objectives, plans for supervision or mentoring, and responsibilities of the student, mentor at the project site, and faculty supervisor (course instructor). The Capstone experience must be a minimum of 14 weeks and a minimum of 32 hours per week completed on a full time or part-time basis, and it must be consistent with the individualized specific objectives and capstone project proposed in [OT 902](#).

Prerequisite(s): [OT 901](#) with a minimum grade of B- and [OT 902](#) with a minimum grade of B-.

Grade Mode: Graduate Credit/Fail grading

OT 964 - Age Well: Occupational Therapy with Older Adults

Credits: 3

This course is designed to extend the students' knowledge of aging and application of theoretical and practice skills in occupational therapy settings. Lectures on established theories, policies and best practices will be complimented by hands-on learning and focused discussions. Students will plan and implement client centered programming using various approaches, types, and service delivery methods in case-based and simulated scenarios for older adults with various abilities in medical and community-based settings.

Grade Mode: Letter Grading

OT 965 - Occupational Therapy Practice and Professional Reasoning

Credits: 3

This course enables students to reflect, analyze, critique, and build upon their knowledge and experience from level II fieldwork to expand their capacity to provide occupational therapy services to meet individual and population needs in diverse practice settings. Students will consider the profession's history and future to become reflective practitioner to best meet the needs of populations in various settings. A final population-based educational plan will be completed with a designated community partner of need.

Grade Mode: Letter Grading

OT 975 - Leadership in OT Systems of Practice

Credits: 3

Students will integrate concepts, principles, and strategies fundamental to providing OT services in the U.S. health care system and other systems of practice. This course links system management, reimbursement mechanisms, public policy, and population health in OT settings. It focuses on building student knowledge of leadership, management, and ethics that are necessary for success in various OT systems. Students will develop concepts of professional leadership and develop leadership skills that will support them in practice.

Grade Mode: Letter Grading

OT 983 - Engagement in Research

Credits: 3

In this course, students will engage in activities of systematic inquiry and research, under the mentorship of the course instructor. Students will undertake research projects to better understand the process and apply the knowledge gained from their previous research methods courses to complete a research project involving some or all the aspects of research process: a) data collection; b) data analysis; c) writing up the research findings; and d) presentation of research findings.

Prerequisite(s): ([OT 781](#) with a minimum grade of B- and [OT 782](#) with a minimum grade of B-) or ([OT 881](#) with a minimum grade B- and [OT 882](#) with a minimum grade of B-).

Grade Mode: Letter Grading

OT 998 - Recent Advances in Neurological Evaluation and Intervention**Credits:** 3

This course combines didactic in class experiences paired with collaborative opportunities with community partners to explore how current and emerging neurological clinical practice improves occupational performance. Students will synthesize past theoretical and clinical knowledge with current evidence based literature to prepare them for doctoral level clinical practice.

Prerequisite(s): ([OT 752](#) with a minimum grade of D- or [OT 852](#) with a minimum grade of B-) and ([OT 763](#) with a minimum grade D- or [OT 863](#) with a minimum grade of B-).

Grade Mode: Letter Grading

Ocean Engineering (OE)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

OE 817 - Marine Robotics and Applications

Credits: 3

This course covers (lecture/lab format) the broad spectrum of marine vehicles and applications, as well as what is involved in designing and building robotic vehicles for specific missions. Course topics include: marine applications, sensors for marine environments, vehicle subsystems, ocean and open water environment, dynamic modeling and control, and design/fabrication/testing. Various invited speakers (both scientists and engineers) provide learning modules on various marine robotic related topics. Graduate students will be assigned extra project work.

Equivalent(s): [ME 817](#)

Grade Mode: Letter Grading

OE 820 - Design of Recirculating Aquaculture Systems

Credits: 3

The purpose of this course is to provide a practical engineering approach to the design of land-based, recirculating aquaculture systems. The course includes an introductory background on the state of our global seafood industries and the need for sustainable production approaches in fresh, brackish, and saltwater environments with various types of systems presently in use. With a focus on recirculating aquaculture systems, this course will include topics such as environmental chemistry and water quality, stoichiometric analyses, nitrification, the potential of hydrogen, temperature, dissolved oxygen, carbon dioxide, the carbonate cycle and alkalinity. A systems design approach will then be covered to include developing plans for assessing biomass growth, system oxygen consumption and total nitrogen and carbon dioxide production. System design will consider processes associated with tank hydrodynamics, waste settling, solids removal, biofiltration, UV treatment, temperature control, aeration, degassing, pumps, and piping systems. Mass balance approaches through control volumes will be examined. A hands-on, student-led system design project will be required and examined using engineering economic principles such as the time value of money, inflation, taxes, and internal rates of return. The use of computer tools will be necessary. To distinguish [OE 820](#) from the [OE 720](#) level students, homework assignments, exams, and course projects will include additional in-depth components. Graduate students in the class will also be expected to have a suitable background in mathematics, physics, and chemistry commensurate with the UNH courses [MATH 426](#), [PHYS 408](#), and [CHEM 405](#).

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

OE 853 - Ocean Hydrodynamics

Credits: 3

Fundamental concepts of fluid mechanics as applied to the ocean; continuity; Euler and Navier-Stokes equations; Bernoulli equation; stream function, potential function; momentum theorem; turbulence and boundary layers are developed with ocean applications.

Prerequisite(s): [MATH 527](#) with a minimum grade of D- and ([CEE 650](#) with a minimum grade of D- or [ME 608](#) with a minimum grade of D-).

Grade Mode: Letter Grading

OE 854 - Ocean Waves and Tides

Credits: 4

Small amplitude, linear wave theory, standing and propagating waves, wave energy, refraction, diffraction, transformation in shallow water, statistics of random seas, spectral energy density, generating wave time series using the random phase method, forces on structures, Froude scaling of wave tank experiments, nonlinear effects. Description of tides as long waves, equilibrium tide, mathematical modeling including friction, nonlinear effects, and Coriolis forces, tidal analysis, the Great Bay Estuarine System as a case study. Requires knowledge of calculus-based physics and differential equations.

Equivalent(s): EOS 854**Grade Mode:** Letter Grading**OE 857 - Coastal Engineering and Processes****Credits:** 3

Introduction to small-amplitude and finite-amplitude wave theories. Wave forecasting by significant wave method and wave spectrum method. Coastal processes and shoreline protection. Wave forces and wave structure interaction. Introduction to mathematical and physical modeling. Requires knowledge of fluid dynamics.

Grade Mode: Letter Grading**OE 858 - Design of Ocean Structures****Credits:** 3

The foundational information necessary for the design of ocean structures. Topics include floating body, fixed body and moored line hydrostatics; wave forces on small and large bodies; dynamic response of floating bodies; and pile and gravity foundation geotechnics. Requires knowledge of mechanics of materials, fluid mechanics, differential equations, and ocean waves and tides.

Grade Mode: Letter Grading**OE 865 - Underwater Acoustics****Credits:** 3

An introduction to acoustics in the ocean. Fundamental acoustic concepts including the simple harmonic oscillator, waves on strings, and the acoustic wave equation; the sonar equation; sound generation and reception by underwater acoustic transducer and arrays; basics of sound propagation; reflection and scattering from ocean boundaries. Offered every year; satisfies core course requirement in Ocean Engineering. Requires knowledge of differential equations and college physics. Only remote students taking the Graduate Certificate in Acoustics offered by the Center for Acoustics Research and Education (CARE) can take this course remotely; all other students must take this course in person.

Grade Mode: Letter Grading**OE 870 - Geodesy for Ocean Mapping****Credits:** 3

Ocean mapping requires precise positioning and navigation. For this we need to precisely know Earth's shape, gravity field, and orientation in space. Data used for this purpose include satellite-based positioning, gravity measurements, and ground surveys. Reference frames can then be created allowing the integration of geometric observations for the creation of mapping products. One year of calculus and one year of college physics prior to taking this course.

Grade Mode: Letter Grading**OE 871 - Positioning for Ocean Mapping****Credits:** 4

Ocean mapping requires precise positioning and navigation. For this we need to precisely know Earth's shape, gravity field, and orientation in space. Data used for this purpose include satellite-based positioning, gravity measurements, and ground surveys. Reference frames can then be created allowing the integration of geometric observations for the creation of mapping products. This course will focus on this integration of measurements and the uncertainty associated with them.

Prerequisite(s): [OE 770](#) with a minimum grade of D- or [OE 870](#) with a minimum grade of B- or [ESCI 870](#) with a minimum grade of B-.

Equivalent(s): [ESCI 871](#)**Grade Mode:** Letter Grading**OE 874 - Integrated Seabed Mapping Systems****Credits:** 4

Overview of typical applications that involve mapping the sediment-water interface in the ocean and adjacent waters. Emphasis on defining the task-specific resolution and accuracy requirements. Fundamentals of acoustics relevant to seabed mapping. Progressions through typical configurations involving single beam, sidescan, phase differing and multibeam systems. Integration of asynchronous 3D position, orientation and sound speed measurements with sonar-relative acoustic travel times and angles. Analysis of impact offsets, mis-alignments and latency in all integrated sensors.

Equivalent(s): [ESCI 874](#)

Grade Mode: Letter Grading

OE 875 - Advanced Topics in Ocean Mapping

Credits: 4

The second of two courses covering the principles and practices of hydrography and ocean mapping. In this course the following topics are covered: Verification and Field QA/QC; Water Levels (Tides); Mapping Standards; Survey Planning, Execution and Reporting; Terrain Analysis; Optical Remote Sensing; Data Presentation; Seafloor Characterization; Electronic Navigational Chart Hydrography for Nautical Charting; Product Liability and contracts; and the United Nations Convention for the Law of the Sea (UNCLOS).

Prerequisite(s): [OE 874](#) with a minimum grade of B- or [ESCI 874](#) with a minimum grade of B- or [OE 870](#) with a minimum grade of or [ESCI 870](#) with a minimum grade of B- or [ESCI 872](#) with a minimum grade of B-.

Equivalent(s): [ESCI 875](#)

Grade Mode: Letter Grading

OE 892 - Master's Project

Credits: 3

The student works with a faculty member during one or two semesters on a well-defined research and/or original design project. written report and seminar are presented. IA (continuous grading).

Grade Mode: Graduate Credit/Fail grading

OE 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

OE 965 - Advanced Underwater Acoustics

Credits: 3

Focused topics varying from year to year depending on student interests and need. Topics may include one or more of the following: sonar systems engineering; underwater acoustic transducers; volume and surface scattering; underwater acoustic propagation; fisheries acoustics. Spring semester; offered every other year.

Prerequisite(s): [OE 765](#) with a minimum grade of D- or [OE 865](#) with a minimum grade of B-.

Repeat Rule: May be repeated for a maximum of 9 credits. May be repeated up to 2 times.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

OE 972 - Hydrographic Field Course

Credits: 4

A lecture, lab, and field course on the methods and procedures for the acquisition and processing of hydrographic and ocean mapping data. Practical experience in planning and conducting hydrographic surveys. Includes significant time underway (day trips and possible multi-day cruises) aboard survey vessel(s).

Prerequisite(s): [OE 875](#) with a minimum grade of B- and [OE 871](#) with a minimum grade of B-.

Equivalent(s): [ESCI 972](#)

Grade Mode: Letter Grading

OE 990 - Ocean Seminars I

Credits: 1

Various topics, including marine systems design, marine vehicle operation, data collecting and processing, and marine law.

Grade Mode: Graduate Credit/Fail grading

OE 991 - Ocean Seminars II

Credits: 1

Various topics, including marine systems design, marine vehicle operation, data collecting and processing, and marine law.

Grade Mode: Graduate Credit/Fail grading

OE 995 - Graduate Special Topics**Credits: 1-4**

Investigation of graduate-level problems or topics in ocean engineering.

Repeat Rule: May be repeated for a maximum of 16 credits.

Grade Mode: Letter Grading

OE 998 - Independent Study**Credits: 1-4**

Independent theoretical and/or experimental investigation of an ocean engineering problem under the guidance of a faculty member.

Grade Mode: Letter Grading

OE 999 - Doctoral Research**Credits: 0**

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Oceanography (OCE)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

OCE 898 - Directed Research

Credits: 2

Research project on a specified topic in Oceanography, guided by a faculty member. Oceanography M.S. majors only.

Grade Mode: Graduate Credit/Fail grading

OCE 899 - Master's Thesis

Credits: 1-6

Master's thesis research in Oceanography. Oceanography M.S. majors only.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

OCE 999 - Doctoral Research

Credits: 0

Doctoral Research in Oceanography.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Operations Management (OPS) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

OPS 800 - Principles of Operations Management

Credits: 3

The purpose of this elective within the MSPM program is to enable students an opportunity to learn about the functions an operations manager provides and the different purposes of each function. In this course, students will explore the multidisciplinary roles of operations managers including budgetary obligations, performance management, and a variety of objectives to achieve in support of the organization's operational and strategic goals. The course will provide opportunities to integrate functions and processes such as determining resource requirements, risk analyses, and budgets, with similar functions required of an operations manager.

Equivalent(s): OPS 800G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Physics (PHYS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

PHYS 805 - Experimental Physics

Credits: 4

Experiments in nuclear, solid-state, and surface physics. Includes discussion of laboratory techniques, data analysis, and data presentation. Special projects assigned to individual students.

Repeat Rule: May be repeated up to 1 time.

Grade Mode: Letter Grading

PHYS 806 - Introduction to Physics Research and Teaching

Credits: 1

This course introduces new graduate students to both research and teaching. The teaching portion focuses on facilitating group work, problem solving, and deeper student thinking. The research portion focuses on research currently conducted at UNH, library resources, responsible conduct in research, how research differs from coursework, and how research results are presented in the research community.

Grade Mode: Graduate Credit/Fail grading

PHYS 810 - Astrophysics I

Credits: 4

A comprehensive review of modern astrophysics. Topics covered include the celestial sphere, celestial mechanics, the tools of the modern astronomer (including different types of telescopes for studying the electromagnetic radiation from space), stellar spectra, stellar atmospheres, stellar interiors, the formation of stars, stellar evolution, and the stellar graveyard (white dwarfs, neutron stars, and black holes).

Equivalent(s): EOS 810

Grade Mode: Letter Grading

PHYS 812 - Introduction to Space Plasma Physics

Credits: 4

Introduction to the subject of space plasma physics including solar physics, heliospheric physics, magnetospheric physics, and ionospheric physics. The course provides an overview of the basic phenomena and processes (e.g. particle acceleration and transport, shock formation, magnetic structures and reconnection, wave propagation, wave-particle interactions, instabilities), theoretical techniques (e.g. single-particle orbits, kinetic and fluid descriptions), and experimental techniques. (Alternate years only.)

Equivalent(s): EOS 812

Grade Mode: Letter Grading

PHYS 818 - Introduction to Solid-State Physics

Credits: 4

Crystal structure, diffraction, lattice vibrations, electronic and optical properties of metals and semiconductors; selected topics in modern condensed matter physics. Coursework in statistical mechanics and quantum mechanics required. (Normally offered every other year.)

Grade Mode: Letter Grading

PHYS 820 - Nuclear Physics

Credits: 4

Nuclear phenomenology, reactions, models, radiation, interaction of radiation with matter; accelerators; properties and interactions of elementary particles; symmetries and symmetry breaking standard model. Introductory coursework in quantum

mechanics, electricity and magnetism required.

Grade Mode: Letter Grading

PHYS 864 - General Relativity and Cosmology

Credits: 4

Review of special relativity, and the motivation for considering gravity in terms of curvature of space time. Introduction to Riemannian geometry, general relativity and Einstein's equations. Application of general relativity in the study of black holes, gravitational waves, cosmology, as well as recent results on inflation and quantum gravity. (Alternate years only.)

Grade Mode: Letter Grading

PHYS 895 - Independent Study

Credits: 1-8

Individual project under direction of a faculty adviser.

Grade Mode: Letter Grading

PHYS 899 - Master's Thesis

Credits: 1-6

Master's Thesis.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

PHYS 931 - Mathematical Physics

Credits: 3

Complex variables, differential equations, asymptotic methods, integral transforms, special functions, linear vector spaces and matrices, Green's functions, and additional topics selected from integral equations, variational methods, numerical methods, tensor analysis, and group theory.

Equivalent(s): MATH 931

Grade Mode: Letter Grading

PHYS 935 - Statistical Physics

Credits: 3

Review of thermodynamics and kinetic theory, followed by an introduction to classical and quantum statistical mechanics. Microcanonical, canonical, and grande canonical ensembles; ideal Fermi and Bose gases and applications of statistical mechanics to selected physical problems.

Prerequisite(s): PHYS 931 with a minimum grade of B- and PHYS 939 with a minimum grade of B- and PHYS 943 with a minimum grade of B-.

Grade Mode: Letter Grading

PHYS 939 - Classical Mechanics

Credits: 3

Newtonian, Lagrangian, and Hamiltonian formulation of the classical mechanics of particles and rigid bodies. Topics that serve as background for the study of modern physical theories are emphasized.

Grade Mode: Letter Grading

PHYS 941 - Electromagnetic Theory I

Credits: 3

The formulation and detailed application of electromagnetic theory to physical problems. The material covered is at the level of the text by J.D. Jackson, "Classical Electrodynamics".

Grade Mode: Letter Grading

PHYS 942 - Electromagnetic Theory II

Credits: 3

The formulation and detailed application of electromagnetic theory to physical problems. The material covered is at the level of the text by J.D. Jackson, "Classical Electrodynamics".

Grade Mode: Letter Grading

PHYS 943 - Quantum Mechanics I

Credits: 3

Introduces non-relativistic quantum theory, covering wave mechanics, Dirac notation, angular momentum, the use of perturbation theory to calculate atomic energy levels, the interaction of atoms with radiation, and various approaches to calculating the differential scattering cross-section.

Grade Mode: Letter Grading

PHYS 944 - Quantum Mechanics II

Credits: 3

See description for [PHYS 943](#).

Grade Mode: Letter Grading

PHYS 951 - Plasma Physics

Credits: 3

Kinetic theory of plasmas; plasma waves, instabilities, turbulence, diffusion, adiabatic motion of charged particles, nonlinear plasma phenomena. (Normally offered every other year.)

Prerequisite(s): [PHYS 935](#) with a minimum grade of B- and [PHYS 941](#) with a minimum grade of B- and [PHYS 942](#) with a minimum grade of B-.

Grade Mode: Letter Grading

PHYS 953 - Magnetohydrodynamics of the Heliosphere

Credits: 3

Introduction to solar physics, with emphasis on gas dynamics and magnetic fields. Interior structure, the theory of convection, wave motions in the presence of magnetism and gravity, coronal heating theories, steady and nonsteady flows, dynamo theory, and the theory of solar flares and other transient phenomena. Salient observational data are reviewed. (Normally offered every other year.)

Grade Mode: Letter Grading

PHYS 954 - Heliospheric Physics

Credits: 3

The solar wind and its effects on cosmic rays. The basic equations of the solar wind: mass, momentum, angular momentum, and energy balance. Transport processes. Waves, shocks, and instabilities in the solar wind. The basic equations of energetic particle transport. Solar modulation of solar and galactic cosmic rays. Interaction of energetic particles with shock waves. Salient data are reviewed. (Normally offered every other year.) Also offered as EOS 954.

Equivalent(s): EOS 954

Grade Mode: Letter Grading

PHYS 961 - Advanced Quantum Mechanics I

Credits: 3

Relativistic wave equations, propagator theory and Feynman diagrams, quantum theory of radiation, second quantization, introduction to quantum field theory and related topics. (Normally offered every other year.)

Prerequisite(s): [PHYS 939](#) with a minimum grade of B- and [PHYS 944](#) with a minimum grade of B-.

Grade Mode: Letter Grading

PHYS 965 - Advanced Solid-State Physics

Credits: 3

Theory of crystalline metals, semiconductors, and insulators. Selected topics from the following: surfaces, films, quantum dots, clusters, solid-state devices. (Normally offered every other year.)

Prerequisite(s): [PHYS 935](#) with a minimum grade of B- and [PHYS 941](#) with a minimum grade of B- and [PHYS 943](#) with a minimum

grade of B-.

Grade Mode: Letter Grading

PHYS 987 - Magnetospheres

Credits: 3

Introduces plasma of physics of the interaction of solar and stellar winds with planets having internal magnetic fields, most predominately, the Earth. Both MHD and kinetic descriptions of internal and boundary processes of magnetospheres as well as treatment of the interaction with collisional ionospheres. Flow of mass, momentum, and energy, through such systems. (Normal offered every other year.)

Prerequisite(s): [PHYS 951](#) with a minimum grade of B- and PHYS 952 with a minimum grade of B-.

Equivalent(s): EOS 987

Grade Mode: Letter Grading

PHYS 988 - High Energy Astrophysics

Credits: 3

One-semester course on the physical principles underpinning the field of high energy astrophysics. The first part of the course covers the underlying physical concepts, including radiation processes, particle acceleration processes, and accretion physics. The second part of the course includes more detailed discussion of the various astrophysical sources that can generate high energy radiations, including pulsars, X-ray binaries, active galactic nuclei, and gamma-ray bursts. An overview of important aspects of experimental methods is also provided.

Prerequisite(s): [PHYS 810](#) with a minimum grade of B-.

Grade Mode: Letter Grading

PHYS 995 - Special Topics

Credits: 1-3

Any special fields of study not covered by the above courses may be included. Topic choices in previous years: astrophysics; elementary particles; lasers/masers; many-body theory; general relativity and cosmology; group theory; atomic physics; quantum theory of light; nonlinear equations, and chaos. May be repeated barring duplication of subject. (Not offered every year.)

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

PHYS 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Plant Biology (PBIO)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Political Science (POLT)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

POLT 800 - Political Science Pro-Seminar

Credits: 4

Familiarizes students with political science as a profession. Briefly surveys the scope of the discipline in terms of the substantive fields and methodological approaches. Examines the logic of research design and explores diverse methods of inquiry (e.g., archival, experimental, case study, comparative analysis, field study, survey, etc.), including the process of generating a presentable research paper.

Grade Mode: Letter Grading

POLT 801 - Courts and Public Policy

Credits: 4

Impact of judicial decisions on public policy and influences on judicial decision making at the federal, state, and local levels.

Grade Mode: Letter Grading

POLT 805 - Elections in the United States

Credits: 4

Students will study various aspects of elections in the United States while observing and analyzing case studies during a campaign season.

Grade Mode: Letter Grading

POLT 809 - Reforming American Government

Credits: 4

Why is American government designed the way that it is (and how does it change)? Whose interests are protected and whose interests are limited by its design? What do successful reforms tell us about the future of reform?

Grade Mode: Letter Grading

POLT 821 - Feminist Political Theory

Credits: 4

Familiarizes students with trends feminist political thinking; exploring issues of race, ethnicity, class, religion/spirituality, sexual orientation, ability, age as they relate to gender and the development of feminist political theory. Attention is paid to critical thinking and analysis using the paradigm of gender as a prism through which to view our lives and ideas.

Grade Mode: Letter Grading

POLT 840 - States and Societies in the Middle East

Credits: 4

This seminar explores the comparative politics of selected countries and conflicts in the contemporary Middle East and North Africa. We focus on understanding the causes and consequences of popular uprisings, civil wars, and protracted conflicts. The class is taught through discussion, with students taking active, participatory roles. Themes include changing forms of governance, changing practices of warfare, gender and minority rights, economic and environmental problems, protest and activism, state-society relations, and migration and refugees. Students read memoir, journalistic accounts, and theoretical articles in comparative politics to understand important developments. Specific country and issue cases change each year; recent seminars have addressed Israel-Palestine, Syria, Egypt, Iran, and Iraq. Writing, reading, and discussion intensive class. Designed as follow-on course to [POLT 559](#), Comparative Politics of the Middle East, counts as capstone course for the Middle East Minor.

Grade Mode: Letter Grading

POLT 842 - Beyond Bollywood: Politics of India & South Asia**Credits:** 4

India and its neighbors in South Asia - Afghanistan, Pakistan, Bangladesh, and more - are critical to understand. In particular, Pakistan and Afghanistan's complicated relationship with terrorist organizations hold important implications for global stability. This course explores India and the rest of South Asia's domestic politics and their complex relations with each other and the rest of the world. As suggested in the title, some of the course material will include movies and documentaries of and about the region to understand the region through its own eyes.

Grade Mode: Letter Grading**POLT 848 - Food and Wine Politics****Credits:** 4

This course investigates the evolution of wine and food politics over the past few decades. Food and wine politics provides a lens through which to analyze contrasting perspectives on production, markets, quality, consumer preferences, health, and safety. The course draws upon texts from economic history, political economy, economic sociology, and public policy to shed light on the differences and similarities in political and market organization across Europe, the United States, and emerging market economies. The first half of the course will focus on wine politics and the second half of the course will focus on food politics.

Grade Mode: Letter Grading**POLT 851 - Comparative Environmental Politics and Policy****Credits:** 4

Environmental politics and policy across national boundaries and at different levels of governance. Comparisons of the U.S. and European Union environmental policies to build a foundation for comparisons across national boundaries and sub-national authorities. Students improve their understanding of how and why comparative methods are used to gain insight into politics and policymaking. Central concepts and debates addressed include the roles of expertise, sustainability, precautionary principle, the use of market mechanisms in policy, environmental justice, policy devolution and flexibility, environmental performance assessment, NGO roles, activism, and social movements. Using a range of theoretical approaches and historical and contemporary events and case studies, students will evaluate the claims and explanatory power of various concepts and theories. Includes ethical issues emerging from the theory and practice of environmental politics.

Grade Mode: Letter Grading**POLT 860 - Theories of International Relations****Credits:** 4

Theoretical approaches of international politics, international organization, and international political economy with particular emphasis on systems theories, domestic determinants of foreign policy, and theories of decision making.

Grade Mode: Letter Grading**POLT 862 - International Political Economy****Credits:** 4

This course has been designed to introduce advanced undergraduates and graduate students to the current theoretical discussions in international political economy. The course analyzes the development of current international economic regimes, as well as looks at systemic theories (interdependence, hegemonic stability), domestic determinants (bureaucratic, interest group) and decision-making theories (rational choice). By monitoring current economic and political news, students are challenged to apply these ideas to explain the current problems in political economy.

Grade Mode: Letter Grading**POLT 878 - International Organization****Credits:**

This course is about cooperation at the international level. With a focus on international organizations, we examine what roles international institutions (both IGOs and NGOs) play in global governance and their effects in various issue areas. We examine the historical origins, functions, and the international and domestic political forces that impact their effectiveness. The course also considers the role of international organizations on world order including conflict resolution, peacekeeping, development, and human rights.

Grade Mode: Letter Grading

POLT 879 - Technology & War**Credits:** 4

How does weapons technology affect how states fight and the ways in which international politics work? This course considers the relationship between technology and war by considering three key questions: in what context did different weapons develop? have any weapons had a revolutionary effect on war? how have different war strategies changed the conduct of international politics? We will consider the development and effects of weapons including gunpowder, tanks, submarines, nuclear weapons, and drones. Students will leave this course with a greater understanding of the systemic pressures and individual variables that affect technological development and diffusion, and an understanding of how those technologies are used in pursuit of international political goals. Students will also learn how to write a substantial research paper. Every student will leave this class with a 3-5 page writing sample to use for future internship and job applications. As a seminar, this is a writing- and participation-intensive course. Students are expected to complete various types of writing, including weekly discussion posts and multiple types of papers. There is also a significant professionalization component to this course, including an emphasis on proper email communication!

Grade Mode: Letter Grading**POLT 897B - Seminar in American Politics****Credits:** 4

Advanced analysis and individual research.

Grade Mode: Letter Grading**POLT 897C - Seminar in Comparative Politics****Credits:** 4

Advanced analysis focusing on government and politics in foreign nations or regions. Areas of interest may include: constitutional structures, political parties and interest groups, legislatures, bureaucracy, and public policy. Topics address such concerns as: religion and politics, patterns of economic development, ethnic strife, and political leadership.

Grade Mode: Letter Grading**POLT 897E - Seminar in International Politics****Credits:** 4

Advanced analysis focusing on problems of theory and contemporary issues in international politics. Areas of interest may include democratic norms in international relations, NATO expansion and European security, the peace process in the Middle East, etc. S department listings for semester offerings.

Grade Mode: Letter Grading**POLT 898B - Seminar in American Politics****Credits:** 4

Advanced analysis and individual research in the field of American Politics.

Grade Mode: Letter Grading**POLT 899 - Master's Thesis****Credits:** 4

Each student carries out original research that culminates in a master's thesis.

Repeat Rule: May be repeated for a maximum of 8 credits.**Grade Mode:** Graduate Credit/Fail grading**POLT 990 - Internship Capstone****Credits:** 4

Field experience in a governmental or nongovernmental organization at the local, state, national, or international level. Students will consult with a faculty mentor to identify an internship experience, and work with the faculty mentor to complete a culminating project synthesizing the internship experience with their prior academic coursework.

Grade Mode: Letter Grading**POLT 995 - Capstone Research Project**

Credits: 4

A) American Politics; B) Comparative Politics; C) International Politics; D) Political Thought; E) Public Administration; F) Public Policy. The graduate student engages in independent study under the direction of one of the faculty members of the department

Equivalent(s): PA 995

Grade Mode: Letter Grading

POLT 996 - Independent Study**Credits:** 1-4

A) American Politics; B) Comparative Politics; C) International Politics; D) Political Thought; E) Public Administration; F) Public Policy. The graduate student engages in independent study under the direction of one of the Faculty members of the department

Repeat Rule: May be repeated for a maximum of 8 credits. May be repeated up to 1 time.

Grade Mode: Letter Grading

Project Management (PM) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

PM 800 - Introduction to Project Management

Credits: 3

This is a survey course introducing project management as a profession and an academic field of study. It provides the foundation for more advanced project management courses. It is a prerequisite to other courses in the degree program unless permission is granted. The student is introduced to the Project Management Body of Knowledge, (PMBOK Guide), as well as other international standards. Students will examine key tools and methodologies in use to manage large, complex projects and explore how these tools and techniques can be used to assess the project's overall status, its variance from the project plan and evaluate alternative recovery scenarios. Students will be introduced to the roles of project and program managers in today's enterprise and the tradeoffs they make among triple constraints of scope, time and cost.

Equivalent(s): PM 800G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 811 - Project Chartering and Planning

Credits: 3

Studies have shown that nearly 75% of commercial projects are deemed to have not met the expectations of their funding sponsors. As professionals committed to effective project management, how do we change this paradigm? In this course, students start by learning how a project charter refines a project idea in a more concrete project narrative. Students develop a project's work breakdown structure and establish a realistic project schedule and budget. Students conduct project risk identification and assessment sessions to evaluate the overall risk posture of the project. Students will define the communications and change control plans.

Prerequisite(s): PM 800 with a minimum grade of B- or PM 800G with a minimum grade of B-.

Equivalent(s): PM 811G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 813 - Delivering Business Value

Credits: 3

This course provides students insight into the techniques and tools that can be applied to evaluate a project and the project's true status. Students will apply the earned value methodology to determine a project's true status for both schedule and cost in terms of the dollar value of work performed. Students will explore risk management and other techniques used to ensure project success. Within this course, students will have the opportunity to apply the various methods and tools used in a successful project to classroom assignments, in preparation for doing the same within their capstone projects. Students consider how projects can be accomplished within an agile or adaptive project management methodology.

Prerequisite(s): PM 811 with a minimum grade of B- or PM 811G with a minimum grade of B-.

Equivalent(s): PM 813G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 815 - Negotiation, Contracting, and Procurement

Credits: 3

Outsourcing is becoming more and more critical in today's economic environment making it essential that a project manager in the multi-national marketplace have a firm understanding of the negotiating, contracting and procurement environment and potential pitfalls. This course will address the interdependence of the make-or-buy decision-making process and the success of many projects in terms of risk management as well as achieving acceptable financial goals. Students will explore contracting pitfalls by

addressing and proving an understanding of the key factors, regulations, and vocabulary which are critical for the project manager to be able to employ in their business dealings with contracting and legal departments.

Prerequisite(s): [\(PM 800 with a minimum grade of B- or PM 800G with a minimum grade of B-\)](#) and [\(PM 811 with a minimum grade of B- or PM 811G with a minimum grade of B-\)](#) and [\(PM 813 with a minimum grade of B- or PM 813G with a minimum grade of B-\)](#).

Equivalent(s): PM 815G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 817 - Managing Project Portfolios

Credits: 3

This course addresses the processes and techniques used in the strategic management of project portfolios. Students examine the decision-making tools, techniques, and rationale used to reach consensus for funding specific programs and projects and to bring them into the tactical layer for execution. Students will study various objective methodologies, benefit measurement techniques as well as market analytics, competitive analysis, and market driven approaches. Strategic planning and management, and its link to Project Portfolio Management, will also be discussed during this course. Students identify their capstone project and create the associated Proposal/Business Case and Project Charter.

Prerequisite(s): [PM 813 with a minimum grade of B- or PM 813G with a minimum grade of B-](#)

Equivalent(s): PM 817G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 819 - Total Quality Management

Credits: 3

A sound quality management strategy and plan are critical in today's complex business organizations and projects. Students in this course will review the history of quality efforts from Deming, Juran and Crosby in the setting of the original quality efforts, international competition, and the concept of Six-Sigma as initiated by the Motorola Corporation in response to that competitor. The use of the Baldrige Excellence Framework for designing, implementing, and improving project and organizational practices that influence quality will be explored. Students will examine multiple specific process improvement approaches they could apply within their organizational / project quality plans, approaches such as prevention over inspection and continuous improvement of processes.

Equivalent(s): PM 819G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 820 - Introduction to Lean Management

Credits: 1

A knowledge of lean management and how it enhances business operations is required for today's project managers and operational managers. In this introductory course, students will explore the concepts and principles associated with lean management approaches. Through the study of actual lean implementations, students will develop an understanding of the relationship between lean management and agile management.

Equivalent(s): PM 820G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 821 - Introduction to Theory of Constraints

Credits: 2

In this 2-credit introductory course, students will develop an understanding of the concepts and principles associated with the Theory of Constraints and Critical Chain thinking. We will explore the proposition that project managers should focus on those activities that are resource-constrained as opposed to the project's critical path when monitoring project progress. We will analyze case studies that test and extend these ideas in real-world scenarios. Through the review of these case studies, students will develop an understanding of the principles associated with the theory of constraints, critical chain approaches, and how they might be used within project management.

Equivalent(s): PM 821G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 830 - Contemporary Topics in IT Project Management

Credits: 3

This course is designed to challenge IT Project Managers to expand their skills in managing complex IT projects, with a focus on DevOps practices, software development life cycles (SDLCs), AI risk/benefit analysis, and effective requirements management. Emphasis will be placed on how to develop a project life cycle model that fits the needs of the project at hand, drawing from several industry frameworks. Through dialog, case studies, experiential analysis, and practical application scenarios, students will design strategies for continuous integration and delivery in a fast-paced, agile environment.

Prerequisite(s): [PM 800](#) with a minimum grade of B-.

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

PM 850 - Project Management Integrative Capstone

Credits: 3

This integrative capstone is the final course in the Master of Science in Project Management program. All other required coursework must have been completed prior to receiving approval to register for this course. Students in this course will have the opportunity to apply the principles learned in the entire program of study and will demonstrate competence by integrating and applying those skills to a real-world scenario. Students will apply knowledge in a group case study setting while documenting the decision-making process, and will analyze methodologies and rationale for selecting those methodologies in a project log including templates designed and used, case study analytical results, and decision outcome analysis/results.

Equivalent(s): PM 850G

Grade Mode: Letter Grading

> [View Course Learning Outcomes](#)

Psychology (PSYC)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

PSYC 805 - Research Methodology and Statistics I

Credits: 4

A consideration of research techniques and problems of methodology in psychology. The first semester stresses the principles of statistical inference, correlational approaches, and their interrelatedness in design. Topics considered include probability theory linear regression, function-free prediction, the theory underlying statistical inference, parametric and nonparametric tests of significance, and principles of analysis of variance. The second semester extends correlational approach to the techniques and methodology of multiple regression and considers the appropriate use and theoretical bases of complex designs.

Grade Mode: Letter Grading

PSYC 806 - Research Methodology and Statistics II

Credits: 4

A consideration of research techniques and problems of methodology in psychology. The first semester stresses the principles of statistical inference, correlational approaches, and their interrelatedness in design. Topics considered include probability theory linear regression, function-free prediction, the theory underlying statistical inference, parametric and nonparametric tests of significance, and principles of analysis of variance. The second semester extends correlational approach to the techniques and methodology of multiple regression and considers the appropriate use and theoretical bases of complex designs.

Grade Mode: Letter Grading

PSYC 894 - Paper of Publishable Quality (PPQ)

Credits: 4 or 8

Student designs and conducts original research that culminates in a paper of publishable quality. Completion of either this course or [PSYC 899](#) satisfies the department's research requirement for the master's degree. May be taken for 4 credits per semester in each of two semesters or 8 credits in one semester.

Repeat Rule: May be repeated for a maximum of 8 credits. May be repeated up to 1 time.

Equivalent(s): [PSYC 899](#)

Grade Mode: Graduate Credit/Fail grading

PSYC 899 - Master's Thesis

Credits: 4 or 8

Master's Thesis. Four credits per semester in each of two semesters or 8 credits in one semester.

Repeat Rule: May be repeated for a maximum of 8 credits.

Equivalent(s): [PSYC 894](#)

Grade Mode: Graduate Credit/Fail grading

PSYC 901 - Graduate Pro-seminar

Credits: 0

Students and graduate faculty in psychology meet periodically for a mutual exchange on current issues in psychology.

Grade Mode: Graduate Credit/Fail grading

PSYC 902 - Graduate Pro-seminar

Credits: 0

Students and graduate faculty in psychology meet periodically for a mutual exchange on current issues in psychology.

Grade Mode: Graduate Credit/Fail grading

PSYC 904 - First-year Graduate Seminar**Credits:** 4

Coverage of fields of psychology represented in the department's graduate program and taught in the department's introductory psychology course that psychology graduate students teach during their third year in the program. Course is focused on providing common background among students when they enroll in advanced graduate seminars and on assuring they have certain foundational knowledge when they begin to teach the introductory psychology course. Course is required of all first-year psychology graduate students in fall semester. Taught in seminar format. PSYC majors only.

Grade Mode: Letter Grading**PSYC 907 - Research Methods and Statistics III****Credits:** 4

The application of multivariate methods of data analysis in psychological research: multiple regression, analysis of covariance, Hotelling's T2 multivariate analysis of variance, path analysis, discriminant functions, canonical correlation, factor analysis.

Grade Mode: Letter Grading**PSYC 914 - Advanced Seminar in Cognition****Credits:** 4

An in-depth examination of one or more specific topics in cognition including issues in memory, attention, the use and development of language, and cognitive science. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**PSYC 917 - Advanced Seminar in Sensory and Perceptual Processes****Credits:** 4

Comprehensive examination of a specific topic in sensory and perceptual processes.

Grade Mode: Letter Grading**PSYC 945 - Advanced Seminar in Behavioral Analysis****Credits:** 4

Current empirical and theoretical issues in the analysis of behavior.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**PSYC 954 - Advanced Seminar in Social Psychology****Credits:** 4

Intensive coverage of the experimental and theoretical literature in a selected area of basic or applied social psychology. Student participate directly in the conduct of the seminar by means of individual topical discussions, development and/or execution of research designs, and critical assessment of the current state of the topic area under discussion. Illustrative topics: political behavior, para-linguistics and non-verbal communication, ethnic and racial prejudice, and environmental psychology. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**PSYC 982 - Advanced Seminar in Developmental Psychology****Credits:** 4

In-depth analysis of one or several specific topics or issues in developmental psychology. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.**Grade Mode:** Letter Grading**PSYC 991 - Practicum and Seminar in the Teaching of Psychology****Credits:** 6

Practicum offers the student an opportunity to teach introductory psychology under close supervision from the faculty. The

seminar is coordinated with this experience and focuses on both practical and theoretical issues of significance in the teaching/learning process at the college level.

Grade Mode: Letter Grading

PSYC 992 - Practicum and Seminar in the Teaching of Psychology

Credits: 6

Practicum offers the student an opportunity to teach introductory psychology under close supervision from the faculty. The seminar is coordinated with this experience and focuses on both practical and theoretical issues of significance in the teaching/learning process at the college level.

Grade Mode: Letter Grading

PSYC 995 - Reading and Research

Credits: 1-4

A) Cognition/Psycholinguistics; B) Developmental Psychology; C) History and Theory of Psychology; D) Learning and Behavior Analysis; E) Personality/Psychopathology; F) Physiological Psychology; G) Sensation/Perception; H) Social Psychology; I) Statistics/Methodology. As part of the development as an independent scholar, the student is encouraged to plan (1) broad reading in an area; (2) intensive investigation of a special problem; or (3) experimental testing of a particular question. Requires approval of both adviser and faculty member directing project. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

PSYC 999 - Doctoral Research

Credits: 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Public Administration (PA)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

PA 800 - Foundations and Theories of Public Administration

Credits: 3

Introduction to essential aspects of public and non-profit administration. Critical concepts and theoretical bases; operational nature of public and non-profit administration; contributions of key scholars and practitioners to the study and understanding of public and non-profit administration.

Grade Mode: Letter Grading

PA 802 - Grant-writing for Public and Non-profit Sectors

Credits: 3

This class provides students with a comprehensive overview of the process for writing proposals for grant funding. Students will learn to research funding opportunities and write the various sections of a funding proposal. Students will learn the differences in seeking grants from foundation, corporate, and government funders will be explored. In addition to individual projects, the class will work as a group to research, write, and submit a funding proposal for a nonprofit or municipal government program.

Equivalent(s): POLT 802, [RMP 924](#)

Grade Mode: Letter Grading

PA 804 - Policy and Program Evaluation

Credits: 3

Policy and program evaluation of federal, state, and local governmental enterprise; focuses on the politics, practices, and methods of evaluative investigation. Evaluation as a technique for providing rational information for budgetary and policy-making decisions.

Equivalent(s): POLT 804

Grade Mode: Letter Grading

PA 805 - Introduction to Statistical Analysis

Credits: 3

Quantitative research, design and analysis methodology, and techniques for political science and public policy and administrative

Equivalent(s): PA 905

Grade Mode: Letter Grading

PA 808 - Administrative Law

Credits: 3

Examines the legal rules governing regulatory agencies, in the US. Topics include regulatory adjudication and rulemaking, legislative and executive control over administrative agencies, judicial review and public participation. Course examines federal and state levels of government.

Equivalent(s): POLT 808

Grade Mode: Letter Grading

PA 809 - Organization and Management in Public and Non-profit Sectors

Credits: 3

Introduction to key actors, theories, and concepts in the fields of organizational theory and behavior.

Equivalent(s): PA 909

Grade Mode: Letter Grading

PA 812 - Leadership Theory and Practice**Credits:** 3

Exploration of the major theoretical approaches to leadership, including students' and others' leadership skills, styles, roles, and practices. Students will refine their own conceptual and practical approaches to leadership in a variety of settings.

Equivalent(s): POLT 812**Grade Mode:** Letter Grading**PA 813 - Human Resource Management in Public and Non-profit Sectors****Credits:** 3

Examination of the administration, politics, and strategies of effective public human resource management.

Equivalent(s): PA 912**Grade Mode:** Letter Grading**PA 814 - Financial Management and Budgeting in the Public Sector****Credits:** 3

Analysis, goal setting, and strategic planning in a governmental setting, with particular emphasis on budgetary processes as a means for controlling policy effectiveness.

Equivalent(s): PA 914**Grade Mode:** Letter Grading**PA 816 - Public Management Techniques****Credits:** 3

Introduction to analytic decision-making and planning techniques applicable to public sector management.

Equivalent(s): PA 911**Grade Mode:** Letter Grading**PA 818 - Non-Profit Management****Credits:** 3

Introduction to governance and management in the non-profit sector: finance, development, personnel management, strategic planning, and risk management.

Equivalent(s): RMP 912**Grade Mode:** Letter Grading**PA 819 - Managing Conflict and Change in Nonprofit and Public Organizations****Credits:** 3

Change and conflict are inherent in any organization or community and affect personal and group dynamics and effectiveness. This course will explore the sources of conflict through the lenses of the individual, organizations/teams, and communities. We'll look at the influences of power and cultural shifts; changes in resources, organizational structure and leadership, and changes in demographics and group composition, and stakeholder expectations.

Grade Mode: Letter Grading**PA 820 - Strategic Communications for Public and Non-profit Sectors****Credits:** 3

Effective communication reflects the organization's vision, mission, and values and advances organizational objectives. Effective communication reflects a clear understanding of internal and external stakeholders' needs, motivators and interests. The course will explore the elements of communication and effective strategies and tools used in the public and nonprofit sectors to engage, educate, and inform constituents and stakeholders. The result is improved constituent relations, strengthened collaborative relationships, and improved organizational and crisis management.

Grade Mode: Letter Grading**PA 821 - Effective Change Management in Nonprofit and Public Organizations****Credits:** 3

This course explores the growing complexity within nonprofit and public sector organizations and the need for today's leaders to

successfully lead their organization in meeting changing demands. Theory and practice related to change and change management are pursued from a scholar practitioner perspective. Leadership practice as well as the phenomenon of organizational culture provide a lens for pursuing efficacy in change management. Students are provided with an opportunity to apply course material to their professional practice as well as explore skills that will assist them in their future endeavors.

Grade Mode: Letter Grading

PA 897F - Seminar in Public Administration

Credits: 3

Advanced analysis and individual research, including opportunities for direct observation of governmental administration.

Equivalent(s): PA 898F, POLT 897F

Grade Mode: Letter Grading

PA 908A - Capstone in Public Administration

Credits: 3

Capstone in Public Administration; In-Service.

Equivalent(s): POLT 908A

Grade Mode: Letter Grading

Public Health (PHP)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

PHP 900 - Public Health Care Systems

Credits: 3

The focus of this course is on the pattern of services in the United States and on the structure and function of their component parts. It examines the impact on the system of a wide range of external factors including social, political, economic, professional, legal, and technological forces.

Equivalent(s): HMP 960A

Grade Mode: Letter Grading

PHP 901 - Epidemiology

Credits: 3

Exploration of factors underlying the distribution and determinants of states of health in various human populations. Emphasis is placed on investigative techniques, epidemiologic methodology, and disease prevention.

Prerequisite(s): PHP 900 with a minimum grade of B-.

Equivalent(s): HMP 960B

Grade Mode: Letter Grading

PHP 902 - Environmental Health

Credits: 3

This course offers a general introduction to the ecological basis of health and disease. It applies the principles and framework of ecosystems to human health problems associated with environmental hazards, including toxic and infectious agents that contaminate our air, water, food, the work place and other special environments. Links between environmental and occupational health effects will be explored within the public health model. Policy required for regulation and alternative strategies for prevention will be discussed.

Equivalent(s): HMP 960C

Grade Mode: Letter Grading

PHP 903 - Biostatistics

Credits: 3

This course introduces students to the principles of biostatistics. Students learn through classroom instruction, lab instruction and exercises, a variety of statistical methods in public health. Students review measures of central tendency, rates, and standardization, probability, sampling, hypothesis testing, comparisons, and simple, multiple and logistic regression techniques. Unlike other core courses in the MPH Program which are 8 weeks in length, this course is 16 weeks in length.

Equivalent(s): HMP 960D

Grade Mode: Letter Grading

PHP 904 - Social and Behavioral Health

Credits: 3

A graduate level course which provides fundamental concepts of the behavioral sciences as they illuminate public health. Since public health practice is the application of physical, biological and behavioral knowledge to living societies, a firm understanding of human social organization and behavior is essential. Individual and community responses to prevention, identification of symptoms, diagnoses, treatments, chronic ailments and rehabilitation are discussed. In each of these areas, the course explores the interaction between community, family, patient, and health care provider.

Equivalent(s): HMP 960F

Grade Mode: Letter Grading

PHP 905 - Public Health Administration**Credits:** 3

This course focuses on public health managers, organizational culture, management process, management functions and roles, leadership, motivation, communication, and human resource management.

Equivalent(s): HMP 960E**Grade Mode:** Letter Grading**PHP 906 - Public Health Finance and Budgeting****Credits:** 3

This course introduces and develops the financial concepts, financial management and budgeting tools important for managing public health organizations, including utilizing financial statements, basic accounting conventions, the process of developing and managing a programmatic budget, grant submission and management, and resource allocation. Questions, problems, and case studies will be used to reinforce discussions, develop, and utilize problem-solving skills to apply to real world situations. Cannot earn credit if credit received for [PHP 985A](#) Special Topic: Financial Resource Mgt.

Prerequisite(s): [PHP 900](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**PHP 907 - Public Health Policy****Credits:** 3

An analysis of the public policy process, the development of public health policy in the United States, and a discussion of specific public health policy issues with international comparisons. This course begins with an analytical framework for analyzing the American political system and process. It is followed by a general introduction to health policy in the United States with examples of specific policies and programs. Students will be asked to examine specific public health policy in-depth.

Equivalent(s): HMP 960H**Grade Mode:** Letter Grading**PHP 908 - Public Health Ethics****Credits:** 3

This course examines selected ethical issues arising in public health policy and practice and ethical dilemmas faced by public health professionals, practitioners, and researchers. Students analyze competing personal, organizational, professional, and societal interests, values, and responsibilities. Case studies apply different models of ethical decision making and provide MPH students with an added opportunity to explore and clarify their values and those of their colleagues.

Grade Mode: Letter Grading**PHP 912 - Public Health Law and Negotiation****Credits:** 3

This course will provide an overview of legal systems as they relate to public health by addressing the legal basis needed to practice public health, enforce compliance with public health regulations, manage public health programs, and organizations. Core elements will be introduced such as, elements of law, legal practice, reasoning, negotiation, and their applications with public health, i.e., limitation and authority of state governments and agencies in matters affecting the public's health will be discussed.

Prerequisite(s): [PHP 900](#) with a minimum grade of B-.**Grade Mode:** Letter Grading**PHP 922 - Public Health Economics****Credits:** 3

This course gives each student a hands-on opportunity to become familiar with a broad range of health economics issues and analyses. The objective is to help its graduates successfully compete for advancement in careers requiring knowledge of health policy analysis.

Grade Mode: Letter Grading**PHP 924 - Policy and Practice of Community Health Assessment****Credits:** 3

This course explores the process of community health assessment as a tool for bridging the gap between public health and the personal health care system. It provides an historical perspective of using population based measurements as a framework for health improvement initiatives. It examines several community health assessment methodologies and explores the complexity of developing a community-based health assessment.

Grade Mode: Letter Grading

PHP 926 - Evaluation in Public Health

Credits: 3

An introduction to program evaluation as it relates to public health practice and research, primarily in the United States. Public health-specific examples are presented throughout the course. Includes discussion of striking a balance between scientific rigor and the practicalities often faced by program evaluators.

Grade Mode: Letter Grading

PHP 985A - Special Topics in Policy and Management

Credits: 1-3

Study of a special topic in Public Health Policy and Management.

Repeat Rule: May be repeated for a maximum of 3 credits.

Grade Mode: Letter Grading

PHP 990 - Field Study

Credits: 3

This course provides a 16-week long opportunity for students to synthesize, integrate, and apply the skills and competencies they have acquired during enrollment in the MPH Program and apply them to a public health problem or project in a professional public health practice setting. Students are expected to spend a minimum of 40 hours in the organization (not including preparation time) exploring how that organization deals with a particular public health issue and working on a project for that organization. In addition, students present the findings of their work in a poster session following the conclusion of the course. This public health experience is conducted under the direction of a faculty member and a community public health mentor. This class meets one hour prior to the regularly scheduled core and elective courses in the MPH Program.

Grade Mode: Letter Grading

PHP 995 - Independent Study

Credits: 1-3

Directed readings and other activities to explore a specific topic related to public health.

Repeat Rule: May be repeated for a maximum of 3 credits.

Grade Mode: Letter Grading

PHP 998 - Integrating Seminar

Credits: 3

This final course in the MPH curriculum serves as the capstone to the MPH degree and provides the opportunity for students to work in teams, bringing both their individual and joint perspectives and expertise, to address a particular public health problem for a New Hampshire-based public health entity. This course incorporates substantive, analytical, administrative, and policy perspectives. Students make a formal presentation of recommendations at the conclusion of the course. This class meets one hour prior to the regularly scheduled core and elective courses in the MPH Program.

Grade Mode: Letter Grading

Public Policy (PPOL)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

PPOL 806 - Fundamentals of Policy Analysis

Credits: 3

An introduction to public policy analysis and the role of rigorous research in the policymaking process. Fundamentals of the policymaking process; evaluation and design of research to inform policy decisions; effective team work to analyze issues and make policy recommendations; writing and speaking effectively to policymakers; analysis of research briefs and articles to evaluate the validity of their designs, conclusions, and potential use to policymakers.

Equivalent(s): PPOL 906

Grade Mode: Letter Grading

PPOL 810 - Policy Across Borders

Credits: 3

Analysis of what we learn about policy, its outcomes and the research and analysis on which it is based, by comparing policies and outcomes across national borders and other jurisdictions. Students explore how institutional structures affect the influence of scientific and technical data and knowledge across different institutional contexts, and how and why political actors "venue shop" for organizations they deem more likely to afford them the influence and policy-making outcomes they seek.

Grade Mode: Letter Grading

PPOL 812 - Strategies for Policy Impact

Credits: 3

How to develop and implement strategies that drive policy change. Students will learn how to analyze approaches to changing policy and then evaluate the most viable option for specific circumstances. Students will review different influence models, discuss which ones work best in varying situations and identify how influence models connect to policy campaigns. Students will review current campaigns, learn central elements of a successful campaign to change public policy, and create their own campaign plan.

Equivalent(s): PPOL 912

Grade Mode: Letter Grading

PPOL 822 - Media Strategy and Skills

Credits: 3

Designed to equip students with the skills they will need as practitioners to advance public policy goals through the development and execution of responsive communications strategy. Students will gain an understanding of the media landscape and trends in journalism; how to identify media opportunities and target audiences; how to write to successfully communicate to various audiences; and basic skills to prepare for and give effective interviews to communicate policy messages.

Grade Mode: Letter Grading

PPOL 897 - Advanced Special Topics

Credits: 3

Occasional or experimental offerings.

Repeat Rule: May be repeated for a maximum of 6 credits.

Equivalent(s): PPOL 997

Grade Mode: Letter Grading

PPOL 902 - Strategy and Practice of Public Policy

Credits: 3

Introduces students to the real world of United States public policymaking while developing their skills as participants in the policymaking industry. It is structured around a set of case studies of current or recently resolved policy issues as well as a set of

readings addressing how policy is made in general. Each student will pick a policy issue and will be required to produce a full set written work on that issue.

Grade Mode: Letter Grading

PPOL 904 - Economics for Public Policy

Credits: 3

Provides an overview of how economics can be used to analyze and design public policy. Basic analytical skills used in economic modeling, and supplication to specify policy areas and problems. At the end of the course, students will be able to use basic economic models to analyze policy problems. They will also be able to understand how market mechanisms work, when free markets perform well and when government intervention may improve outcomes.

Grade Mode: Letter Grading

PPOL 908 - Quantitative Methods for Policy Research

Credits: 3

Provides an overview of basic quantitative analysis techniques that are common in public policy analysis. Students will be traine to design high quality research and conduct statistical analyses. By the end of the course, students will be able to carry out basic statistical analyses, evaluate the statistical analyses in research reports and journal articles, and communicate clearly the results analyses to both professional and general audiences.

Grade Mode: Letter Grading

PPOL 950 - Washington DC Colloquium

Credits: 3

This intensive January-Term course focuses on practical skill building and experiential learning related to policy-making. The go: are: (i) familiarize students with public policy institutions and career paths across multiple sectors (e.g., government, non-profit organizations, think-tanks, research institutes, organizations that do international work); (ii) connect students to working professionals for networking and career-building opportunities; (iii) provide opportunities to interact with and question Washington, DC professionals, beginning to socialize students as public policy professionals.

Grade Mode: Letter Grading

PPOL 990 - Policy Capstone

Credits: 3

Designed for students to demonstrate the integration of their learning experiences in the program. The final product will be a written report/paper and an oral presentation. Capstone projects will be completed under the direction of faculty mentors and outside experts. The purpose of the capstone is a demonstration of student capabilities and an opportunity to work with expert mentors aimed at enhancing post-graduation employment choices. There will be a capstone forum in which students will presen their work to Carsey MPP faculty and students.

Grade Mode: Letter Grading

PPOL 990A - Policy Capstone Planning

Credits: 1

One credit course to identify and plan for the Policy Capstone. To be taken in the second semester of the first year for full-time students. Topics to be covered in group meetings include description of a research or project prospectus, samples of capstone projects, and responsible conduct of research. Students will complete UNH training offered by the IRB and will learn about the IR approval process. The final product is a prospectus for the capstone project, to be presented in writing and orally to MPP faculty and students.

Grade Mode: Letter Grading

PPOL 996 - Reading and Research

Credits: 3

Independent study under the direction of a Carsey faculty member. Requires approval of the advisor and curriculum committee. May be repeated for credit.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

PPOL 998 - Policy Internship**Credits:** 3

Actual experience in a policy setting. In some cases this will be a credit-bearing internship, supervised by a faculty member who will provide the academic structure to parallel the applied experience. In other cases a policy internship may not be appropriate for academic credit; in such cases the internship experience fulfills the requirement but does not provide credits. Carsey faculty will provide guidance and oversight for these internships as well.

Grade Mode: Graduate Credit/Fail grading**PPOL 998A - Policy Internship****Credits:** 0

Actual experience in a policy setting. 998A is the noncredit internship. The internship experience fulfills the requirement but does not provide credits. Carsey faculty will provide guidance and oversight for these internships as well.

Grade Mode: Graduate Credit/Fail grading

Recreation Management & Policy (RMP)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

RMP 800 - Concepts of Recreation and Leisure

Credits: 3

An overview of historical and philosophical perspectives of the play, recreation, therapeutic recreation, and park and natural resource conservation movements. Students examine recreation leisure and recreation resources in contemporary society, particularly in the context of the development of social capital. Includes leisure values and ideals, the emergence and evolution of "free time" diversity, and public policy implications.

Grade Mode: Letter Grading

RMP 806 - Recreation Administration and Organizational Behavior

Credits: 3

The organization and administration of public, private, and not-for-profit recreation agencies. The primary unit of analysis in this class is the recreation organization and the environment in which it operates. Emphasis is placed on organization, management, marketing, and financing applications, theories, and research.

Grade Mode: Letter Grading

RMP 811 - Recreation Resource Management

Credits: 3

An examination of the supply and demand of natural resources for outdoor recreation uses, with emphasis on relationships between public and private roles and responsibilities. Historical, social, and environmental impacts of outdoor recreation use are discussed. Current principles and techniques of recreation resource planning and management are outlined.

Grade Mode: Letter Grading

RMP 820 - Adaptive Sport Facilitation for Recreation Therapy and Related Professions

Credits: 3

This course takes a strengths-based approach to examining adaptive sports and recreation for recreational therapists and related professions, with a focus on best practices and risk management in community-based settings. This is an experiential learning course, whereby students will learn how to design, plan, and facilitate a variety of adaptive sports for people with disabilities. Students will learn and apply processes for assessing, selecting, and fitting adaptive sports and recreation equipment for individuals with disabilities.

Grade Mode: Letter Grading

RMP 824 - Research, Evaluation, and Data-Driven Decisions

Credits: 3

Emphasizes the understanding and practical application of evaluation concepts and tools within recreation, event, and allied health services. The course will cover the utility and feasibility of evaluation, evaluation planning and design (including quantitative and qualitative research design, methods, and analysis), evaluation management and data collection, analysis and reporting, and decision-making based on evaluation data.

Grade Mode: Letter Grading

RMP 840 - Therapeutic Recreation Service Delivery in Community Settings

Credits: 3

This course provides specialized knowledge and skills related to the practice of Recreational Therapy in a community setting. The course will encourage students to expand their understanding of philosophical constructs, public policy, and professional standards to reflect practice in community settings including schools, municipal recreation organizations, and community health program. Specific facilitation techniques and treatment modalities will be introduced as well as information specific to the

therapeutic process as it is observed in these settings.

Grade Mode: Letter Grading

RMP 868 - Theories and Philosophies of Youth Development

Credits: 3

This course provides students with a foundation in the theories and philosophies associated with the field of youth development. Students will analyze the strengths and limitations of various theories, philosophies, and ideas as they are applied in practice and represented in research studies. Examples include: Ecological systems theory, positive youth development, sociocultural perspectives, risk/protective factors, and developmental assets.

Grade Mode: Letter Grading

RMP 872 - Law and Public Policy in Leisure Services

Credits: 3

Topics including an overview of the nature of law and U.S. legal systems; the law of torts, contracts, civil liberties and rights; risk management and legal research are addressed in the context of recreation services and resources. Public policy and professional advocacy implications are examined as related to legislative and decisional systems.

Grade Mode: Letter Grading

RMP 875 - Entrepreneurial and Commercial Recreation

Credits: 3

Principles of business planning and development as applied to the private sector leisure services industry. Emphasizes knowledge of key commercial leisure services profiles and their intersection with allied professions such as hospitality and tourism. This course is designed to examine commercial recreation from both a macro and micro perspective. This multi-level approach helps prepare students to write a viable business plan for their own commercial recreation enterprise.

Grade Mode: Letter Grading

RMP 876 - Human Dimensions of Natural Environments

Credits: 3

This course draws on research and theories that illuminate the profound connections between nature and human health and wellbeing. Students will explore contemporary philosophical, psychological, and cultural perspectives to understand how both organized and unstructured experiences in the outdoors support human flourishing. Students review research and gain hands-on practice with ideas in the context of outdoor recreation, resource management, education, and other human service fields.

Grade Mode: Letter Grading

RMP 899 - Master's Thesis

Credits: 3

A graduate level statistics and graduate level methods course.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Graduate Credit/Fail grading

RMP 912 - Non-Profit Administration and Leadership

Credits: 3

An overview of the creation, management, and administration of non-profit organizations and businesses. Examines legal requirements for charter and incorporation by state law and Federal guidelines from the Internal Revenue Service. Current trend and issues in non-profit sector business are explored and a survey of the wide diversity of non-profit sector organizations is included. Since a high percentage of recreation agencies are incorporated as non-profit organizations, specific applications are made to the field of leisure and recreation.

Equivalent(s): [PA 818](#)

Grade Mode: Letter Grading

RMP 924 - Fund Development and Grantwriting

Credits: 3

Students develop an understanding of the meaning of philanthropy, its importance in society, and its integral relationship to the

fund development process. The social context for philanthropy, development, and fund raising and the changing practices for non-profit leadership are addressed. Presents and evaluates strategies and communication tools used to support fund development goals. Students develop abilities in grant writing, requesting major donor support, structuring annual giving campaigns, and establishing special events.

Equivalent(s): [PA 802](#), [SW 957](#)

Grade Mode: Letter Grading

RMP 963 - Graduate Field Practicum

Credits: 2

This course is designed to provide RMP graduate students with a supervised, professional field experience in an approved recreation, park, tourism, or health and human service agency. Students will conduct a 100-hour field practicum experience and complete academic assignments.

Grade Mode: Graduate Credit/Fail grading

RMP 964 - Graduate Internship

Credits: 3

Supervised, professional administrative work experience in an approved recreation, park, tourism, or health care agency. Students participate in a 14-week 560-hour internship experience after receiving approval from their academic adviser and the internship coordinator.

Grade Mode: Graduate Credit/Fail grading

RMP 970 - Teaching Practicum

Credits: 3

Students work with a faculty mentor to investigate, observe, and practice teaching methods and learning theory. Includes the various instructional technologies as tools to enhance the teaching/learning process. The Teaching Practicum is designed for students who wish to assume part-time or adjunct University teaching positions upon completion of the Master's degree or who see themselves pursuing a future doctoral degree with higher education as a career goal. May be repeated barring duplication of subject.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Graduate Credit/Fail grading

RMP 980 - Independent Study

Credits: 1-3

Independent Study.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

RMP 992 - Research Methods in Recreation Management and Policy

Credits: 3

This research methods course focuses on the research literature, tools, and methods used in the field of parks, recreation, & leisure studies. The course covers various research and evaluation techniques and methods, including quantitative, qualitative, & mixed methods. Students develop a research proposal, including the need for the study, research questions, review of the literature, research design, and data collection and analysis procedures. The proposal is used as the basis of the student's capstone master thesis or applied research project in the M.S. in RMP program.

Grade Mode: Letter Grading

RMP 995 - Capstone Seminar

Credits: 3

This course provides a culminating capstone experience for students in the Masters of Science Degree (M.S.) in Recreation Management and Policy (RMP). The purpose of the course is to assist students in integrating their knowledge, skills, and abilities from RMP and related coursework, co-curricular experiences, and workplace experiences into the creation of an e-portfolio. The e-portfolio is intended to demonstrate students' mastery of program-level goals and learning objectives as they progress through the RMP graduate curriculum. The e-portfolio also prepares students with professional skills and presentation-ready materials to

assist with the next step in their professional journey. Students orally present their e-portfolio to the RMP graduate cohort and their RMP academic advisor evaluates the e-portfolio using a grading rubric.

Prerequisite(s): [RMP 800](#) with a minimum grade of B-.

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Resource Administration & Management (RAM)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

No courses are currently active in the course inventory for this subject prefix.

Resource Economics (RECO)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

RECO 856 - Rural and Regional Economic Development

Credits: 4

Concepts and methods of delineating regional economies, methods of measuring activity, regional development, and public policies. Emphasis on empirical research studies.

Grade Mode: Letter Grading

Social Work (SW)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

SW 802 - Aging and Society

Credits: 3

This course is designed to formalize students with biological, psychological, and sociological perspectives of aging and social services and policies for older people. This course covers a broad range of theories and contemporary issues in the field of aging. also focuses on the strengths and limitations of existing programs and policies such as Social Security, Medicare, Medicaid, Supplemental Security Income, and other community services. Comparisons to developments in other countries will be made throughout the course to provide a broader context for understanding aging and programs/policies in the U.S.

Grade Mode: Letter Grading

SW 803 - Social Work and Spirituality

Credits: 3

Spirituality has recently begun to emerge as a critical anchor of a holistic approach to social work which views individuals, couples, families, groups, and communities in a bio-psycho- social-spiritual context. This course provides a framework of knowledge, values, skills and experiences for spirituality sensitive social work. Students will develop skills and insight in responding competently and ethically to diverse spiritual and religious perspectives in social work settings. Utilizing psychodynamic and narrative frameworks, this course will address ways of assessing and working with an individual's spiritual belief systems and attending to the ways in which spiritual beliefs and practices provide a window into a client's inner world. Consideration regarding the impact of spiritual and religious systems in relation to diversity (e.g. by gender, social class, ethnicity and culture, and sexual orientation) will be included.

Grade Mode: Letter Grading

SW 804 - Adolescents with Emotional and Behavioral Challenges

Credits: 3

This course focuses on the characteristics and needs of youth with emotional and behavioral challenges based upon socio-cultural and ecological theories, and provides exposure to family- and youth-driven practices and approaches that represent System of Care values and principles.

Grade Mode: Letter Grading

SW 805 - Child and Adolescent Risks and Resiliency: Program, Policy and Practice

Credits: 3

In this course, students apply an anti-oppressive lens in exploring the major social work practices, policies, and programs in the fields of child welfare and child/family services. Students will be introduced to current research related to the impact of trauma across the lifespan, with an emphasis on risk/resiliency factors within the family system. Students will learn how past/current child welfare policy and practice perpetuates social injustice, oppression, and trauma. Alternative approaches to support children and caregivers within the family, home, and community will be emphasized.

Grade Mode: Letter Grading

SW 807 - Child Maltreatment

Credits: 3

This course introduces students to advanced concepts in child welfare with an emphasis on child maltreatment assessment and child protective services. The course addresses emerging assessment practices, data informed child protective service provision, the role of technology in child welfare practice, and workforce development.

Grade Mode: Letter Grading

SW 808 - Mental Health Aspects of Intellectual & Developmental Disabilities

Credits: 3

Students will 1) develop an understanding of the mental health aspects of Intellectual & Developmental Disabilities (IDD), 2) understand the challenges in the diagnosis and treatment of mental health conditions in people with IDD, 3) understand specific clinical presentations as well as treatment and support adaptations for mental health problems in individuals with IDD, 4) gain insight into the application and adaptation of evidence based and evidence informed practices when working with individuals w IDD and co-occurring mental health conditions and their systems of support and 5) understand the role of social work in supporting individuals with IDD and mental health conditions in various practice contexts.

Grade Mode: Letter Grading

SW 809 - First Responders**Credits:** 3

First responders hold a special status in our society. Society looks to first responders to protect our lives, provide for our safety and medical assistance. First responders are not always seen, but we expect them to be there to resolve any crisis. But what impact does this have on the mental health of first responders? This course will look at the role of first responders and the potential mental health impacts of this job. How do first responders navigate these issues and what can we do to help?.

Grade Mode: Letter Grading

SW 810 - SW and the Digital Age**Credits:** 3

This course focuses on the ever-changing landscape of technology as it relates to the Social Work field. Students will explore topics such as telehealth, online communities, assistive technology as well as digital advocacy. Ethical implications of the integration of technology into Social Work will be explored throughout the course. Students will work independently or collaboratively at a distance to create a multi-media project focused on a topic of interest within Digital Social Work.

Grade Mode: Letter Grading

SW 812 - Understanding Developmental Disabilities**Credits:** 3

Analysis of the complex social contexts of people with developmental disabilities. Explores and questions traditional approaches and the current service system. Examines family and community services and resources.

Grade Mode: Letter Grading

SW 813 - School Social Work**Credits:** 3

The course examines the school as a social institution that serves to educate and socialize children into US society and the role of the social worker in the school setting. Readings, activities, and discussions provide practical skills and theory for school social work practice. The course content addresses the history of school social work, integrating social work values into a school setting, systemic needs within school settings, the importance of networking and professional collaboration, and working with diverse at-risk youth and their families. Students also examine the role of social workers in helping students, schools, and families adjust to and cope with trauma, special education needs, and related topics.

Grade Mode: Letter Grading

SW 815 - Affirming Practice with Lesbian, Gay, Bisexual, Transgender, Queer+ People**Credits:** 3

This course addresses the task of clinical practice with lesbian, gay, bisexual, transgender, queer, questioning, asexual, intersex, two-spirit, genderqueer, pansexual, and beyond (LGBTQ+) people on both personal and professional levels for the social worker. The class makes use of personal narratives, as well as theoretical and clinical practice readings. Students are expected to explore and examine their own attitudes, beliefs, and assumptions about LGBTQ+ people.

Grade Mode: Letter Grading

SW 816 - Addiction Assessment**Credits:** 3

This course focuses on the screening, assessment, and diagnosis of addictions and co-occurring disorders. Topics covered include substance use disorders and co-occurring disorders; including clinical evaluation, screening, assessment, barriers to assessment

and differential diagnosis of co-occurring disorders, motivational interviewing, engagement in the assessment process, assessment from a strengths perspective, DSM diagnosis, trauma informed practice, culturally competent counseling, documentation and treatment planning, policy effecting engagement from a town/city, state and national perspective, and service coordination and referral.

Grade Mode: Letter Grading

SW 817 - Understanding Suicide

Credits: 3

The focus of this course is to better understand the public health problem of suicide, with particular emphasis on prevention, intervention and postvention approaches. Students will gain an understanding of suicide epidemiology and underlying theory, as well as risk and protective factors for suicide. In addition, this course will outline public health approaches and evidence-based practices for suicide prevention. Students will develop skills in assessment and management of suicide risk, intervention and treatment techniques with suicidal individuals as well as postvention approaches to dealing with suicide loss.

Grade Mode: Letter Grading

SW 818 - SW & Creative Arts

Credits: 3

This course will focus on the uses and potential uses of many forms of art in social work practice. Students will learn how to apply art forms such as music, theater, literature, art, poetry, movement, and dance into practice through exploring A. self-awareness and personal growth of the professional social worker, B. a strengths approach to practice with individual clients, and C. social awareness and social change. This course will be an advanced generalist elective. Students will have the opportunity to develop art portfolio, completing a new project each week, having the opportunity to reflect personally as well as professionally on the application of these methodologies to practice.

Grade Mode: Letter Grading

SW 819 - Addiction Treatment

Credits: 3

This course focuses on treatment for addictions and co-occurring disorders. Topics covered include: interventions, pharmacological treatment outcomes, treatment with specific populations, trauma informed practice, group practice, working with mandated individuals, cognitive behavioral therapy, barriers to treatment, documentation with an emphasis on treatment planning, resource development, and policy effecting treatment outcomes from a town/city, state and national perspective.

Grade Mode: Letter Grading

SW 820 - Social Welfare Policy I

Credits: 3

The aim of this course is to prepare students to act as informed human service professionals through a better understanding of social problems, social welfare policy, and the American social welfare system. Students are provided with an overview of the origins and development of social welfare policy in the United States, the political processes in our federal and state systems, and the values and ethics which shape our present social welfare system. The course also helps students examine ways they can influence policy formulation while advocating for human rights and social/economic justice.

Grade Mode: Letter Grading

SW 821 - International Social Work

Credits: 3

This course introduces the growing field of international social work. It addresses the impact of globalization on social work practice, provides an overview of the social work profession around the world, and considers current challenges and suggested ways social workers can contribute to solutions. Human rights and globalization are dominant themes underlying international social work and serve as unifying concepts for examining various global issues. The focus of the course is on global social issues with particular attention to human rights, development, racism, status of women and children, climate change, immigrants and refugees, HIV/AIDS, and aging populations. Linkages between international and domestic social work practice are emphasized, making the course relevant to all students and their future practice.

Grade Mode: Letter Grading

SW 824 - Positive Youth Development Through Sport Social Work and Recreation**Credits:** 3

Grounded in critical positive youth development and experiential learning theory, this course focuses on how to promote the healthy youth development through the use of sport, recreation, and adventure-based activities. Students will develop knowledge to enhance their skills related to designing, implementing, facilitating, and evaluating sport-based programming and practices to promote the development of normative life skills (e.g., emotional regulation, social skills, teamwork) and social justice life skills (e.g., antiracism, LGBTQ+ allyship, mental health help-seeking behaviors).

Grade Mode: Letter Grading**SW 830 - Social Work Practice I****Credits:** 3

This course is to introduce students to the basic values, theories, and skills of social work practice. This is accomplished through the use of lectures, discussions, readings, written exercises, and using laboratory and practice sessions. The intent is for students to use the experiential parts of the course (laboratory and interview simulations) to apply the conceptual and theoretical knowledge gained from lectures, class discussions and readings.

Co-requisite: [SW 880](#)**Grade Mode:** Letter Grading**SW 831 - Social Work Practice II: Practice in Small Groups and Community Organizations****Credits:** 3

This course is a continuation of [SW 830](#) and introduces the student to the study of social work intervention and change strategies when working with groups and communities. In addition, the organization is examined as a target for change. The overall process of change including identification of problems, assessment, choice of intervention strategies, evaluation, and termination are considered with groups, organizations, and communities. All processes of change are considered from a community-based, person-in-environment and strengths perspective.

Co-requisite: [SW 881](#)**Grade Mode:** Letter Grading**SW 840 - Implications of Race, Culture, and Oppression for Social Work Practice****Credits:** 3

This foundation course is designed to increase students awareness of historical, social, political, economic and cultural aspects of micro- and macro-level oppression directed at minorities. Course materials focus on insidious societal forces that shape and profoundly alter life experiences of large numbers of people, with special attention to social relationships that promote the welfare of some, while limiting opportunities and choices for others, including racial and ethnic minorities, children, women, the poor, persons with disabilities, GLBTQ individuals, and others. Students consider practice issues in multicultural SW.

Grade Mode: Letter Grading**SW 850 - Human Behavior and the Social Environment I****Credits:** 3

This course will employ multicultural and critical perspectives to understand individuals, families, and their interpersonal and group relationships, life span development, and theories of well-being, stress, coping, and adaptation. This course will emphasize knowledge about individuals and small social systems, including the implications of this knowledge for all domains of social work practice. Students will be introduced to the concepts of risk and protective factors, with relevant examples at the individual and small system levels. Students will also consider the implications of this knowledge for intervening in social problems and supporting rehabilitation once problems have developed. Major components of the course will be concerned with the processes of oppression, privilege, and discrimination, as well as factors that help people and small social systems to change. The knowledge presented will include the interrelationships between smaller and larger social systems, and in particular, how biological factors and the larger social and physical environments shape and influence both individual and family well-being.

Grade Mode: Letter Grading**SW 851 - Human Behavior and the Social Environment II****Credits:** 3

In this course, students learn about human behavior and development within the context of the life cycle from a macro systems perspective. The course examines how complex interactions among various levels of social systems impact individual

development through the lenses of social, racial, economic, and environmental justice. It also explores societal forces that, though often invisible, significantly shape the life experiences of large populations. HSBE II places special emphasis on social relationships that promote the welfare of some while limiting opportunities and choices for others. The semester addresses how class, gender, race, ethnicity, religion, age, sexual orientation, and other aspects of diversity influence the development and behavior of larger systems.

Grade Mode: Letter Grading

SW 860 - Research Methods in Social Work

Credits: 3

Research is the tool by which we build a base of evidence to support our interventions; hence research is an integral part of all social work practice. This course provides an overview of research methodologies used in social work practice, policies, and research, enabling students to become critical consumers and creators of research as it applies to social work practice, programs and policies. Students will explore both qualitative and quantitative research methods, including surveys, interviews, and observational studies. Emphasis will be placed on understanding the ethical considerations, social justice and anti-racist considerations in research design and data collection techniques, and the importance of evidence-based practice. This includes challenging oppressive research designs and participant engagement, building decolonized research strategies.

Grade Mode: Letter Grading

SW 865 - Adventure Therapy: Facilitation and Processing of the Experience

Credits: 3

This class will familiarize students with a variety of active assessment facilitation and processing skills which can be used with clients when engaging in adventure therapy. Students will be given multiple opportunities to practice these skills to gain a better understanding of their own facilitation and processing skills, and how to use adventure activities as a therapeutic tool in the clinical practice. Active participation required. Open to both social work and non-social work graduate students.

Grade Mode: Letter Grading

Special Fee: Yes

SW 870 - Intimate Partner Violence

Credits: 3

This course examines intimate partner violence or domestic violence from its historical roots to the present. In accordance with a historical and contextual approach, we examine theories that explain and describe the phenomenon, research that attempts to define it, as well as social policies, social movements, and intervention from a social work perspective. Intimate partner violence (IPV) also known as domestic violence, cuts across racial, ethnic, and class boundaries and impedes victim's well-being and sociopolitical participation. IPV includes many physical assault, sexual assault, emotional, verbal, and economic abuse and coercive control.

Grade Mode: Letter Grading

SW 871 - Trauma-Informed Practice in School Settings

Credits: 3

This course introduced students to the core concepts that inform evidence-based assessment and intervention for traumatized children, adolescents, adults and their families in school settings. Strength-based practice is highlighted with a focus on the identification of protective and promotive factors that foster resiliency and post-traumatic growth. The course highlights the role of development.

Grade Mode: Letter Grading

SW 880 - Internship I

Credits: 3

This two-semester requirement provides supervised learning and practice within social work programs in a wide range of program settings. Students spend 16 hours per week in an internship placement. Individual internship placements are arranged with each student by the internship coordinator. In order to receive credit, students must satisfactorily complete both [SW 880](#) and [SW 881](#). A concurrent integrative seminar is required. In this weekly seminar, attention is given to the development of generalist social work skills, discussion of social work ethics & values, and the development of appropriate professional relationships. The importance of diversity, equity and inclusion in social work is also addressed. A primary goal is to integrate classroom learning with the internship experience.

Co-requisite: [SW 830](#)

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

SW 881 - Internship II

Credits: 3

This course is a continuation of [SW 880](#), Internship I. Students must satisfactorily complete both internship experience semesters to receive credit for either course. Students spend 16 hours per week in the internship placement begun in [SW 880](#). Individual internship placements are arranged with each student by the internship coordinator. In order to receive credit, students must satisfactorily complete both [SW 880](#) and [SW 881](#). A concurrent integrative seminar is required. In this weekly seminar, attention is given to the continued development of basic social work skills, professional development and ethical decision-making, cultural competence and self-care. A primary goal is to integrate classroom learning with the internship experience.

Co-requisite: [SW 831](#)

Grade Mode: Graduate Credit/Fail grading

SW 885 - Study Abroad

Credits: 3

Students in this course examine the historical development of social welfare in another country including an analysis of the underlying values and attitudes that dictate practice and policy decisions. The course includes agency site visits, lectures, theme readings and visits to important cultural sites. Only open to first and second year MSW students.

Co-requisite: [INCO 889](#)

Grade Mode: Letter Grading

Special Fee: Yes

SW 897 - Special Topics in Social Work and Social Welfare

Credits: 2 or 3

Seminar for graduate students. Topics may include: A) Drugs and Chemical Dependency; B) Intimate Partner Violence C) Social Action in Education Settings D) Social Action in the Dominican Republic. May be repeated for different topics.

Grade Mode: Letter Grading

Special Fee: Yes

SW 900 - Advanced Standing Practice and Internship Seminar

Credits: 3

This seminar, held concurrently with field placement, is designed to orient and prepare advanced standing students for advanced practice and field courses. The general aim of the seminar is to bridge the undergraduate and graduate curriculum and to review foundation year concepts, theories and skills. This review includes a re-examination of the dynamics of the change process and c the strengths perspective. We will consider the skills essential to practice including assessment, contracting, intervention and termination with client systems. We will explore the development of social work identity and of professional relationships with supervisors, colleagues and agencies. A primary focus is on deepening the understanding of social work values and ethics including the development of ethical decision-making skills, empathic connection between worker and client, self-reflection, as well as the recognition of the importance of culturally competent practice.

Grade Mode: Graduate Credit/Fail grading

SW 901 - Internship Continuation

Credits: 0

This course represents the continuation of the online Master of Social Work internship courses ([SW 880](#), [SW 881](#), [SW 982](#), [SW 983](#)) SW students who are registered for one of the four required internship courses are also registered for [SW 901](#) and are considered full-time. The grade for each course is awarded upon completion of the entire two semester internship experience.

Grade Mode: Not graded

SW 926 - Social Welfare Policy II

Credits: 3

This course is an extension of Social Welfare Policy I. Both courses view social welfare policy as the framework in which social welfare services are developed and delivered. That is, policies provide the context for direct practice. Social Welfare Policy II examines

policy analysis as a process with underlying theory and methodology. This process emphasizes political advocacy in the pursuit of human rights, and social and economic justice. The course integrates policy and practice, in part, through student research and analysis of specific social problems and client populations relevant to the student's volunteer, work, and/or field internship experience. Students must have successfully completed the foundation Social Work Policy course.

Grade Mode: Letter Grading

SW 930 - Advanced General Practice III: Clinical Assessment and Intervention

Credits: 3

Advanced generalist practice with individuals, families and groups is the first of the two required advanced practice classes. The major objective of the advanced generalist practice curriculum is to educate practitioners to work towards the restoration and enhancement of human functioning and prevention of maladaptive functioning. This course emphasizes a deepened understanding of the differential treatment process and an expanded knowledge of intervention approaches. The aim of the course is to further deepen knowledge and skills, particularly with a concentration on evidence based practices, interdisciplinary work and ethical practice. Students must have successfully completed the two foundation year practice courses.

Co-requisite: [SW 982](#)

Grade Mode: Letter Grading

SW 931 - Advanced Generalist Practice IV: Community and Administrative Practice

Credits: 3

This macro social work course utilizes foundation year curriculum content to provide an advanced examination of social work practice in larger systems. Students will develop knowledge, values, and skills in areas of community analysis, community organization, community capital, empowerment and the use of power, sustainable communities, evaluation of program and community interventions, organizational development, fundraising, and use of social media. Strategies of cultivation, mobilization and sustaining resources that empower underserved constituent groups will be studied. Course content will be rooted in both historical and current contexts in providing administrative and technological tools to undertake change efforts across organizational and community systems. Class sessions and assignments will provide opportunities to learn skills in community and administrative practice through a variety of teaching methods and tools including book chapters, case studies, journal articles, news articles, documentary films, PowerPoint presentations, and class discussion. The student is expected to be active in the learning process and come to class prepared to engage in meaningful discussions of the material.

Co-requisite: [SW 983](#)

Grade Mode: Letter Grading

SW 952 - Human Behavior and the Social Environment III

Credits: 3

This course is designed to acquaint master's degree students with the epidemiology, classification, and etiology of the major mental illnesses; with a primary objective to develop the student's diagnostic skills in the field of psychopathology. Students will examine historical, structural, and systemic discriminatory and oppressive practices and policies, as well as examine personal bias toward marginalized populations to diagnose from a culturally sensitive standpoint more appropriately. At course conclusion students will have an effective working knowledge of the bio-psycho-social basis of the major mental disorders, the behavioral symptomatology that characterizes them, the use of psychotropic medication in treatment (brief overview), and their classification according to the current DSM system. Students will be able to evaluate symptomology through a critical, anti-oppressive lens.

Grade Mode: Letter Grading

SW 957 - Fund Development and Grantwriting

Credits: 3

This course is designed to introduce students to various fundraising strategies to support nonprofit health and human service organizations. Students are provided with an overview of philanthropy and nonprofit organizations in the United States, effective fundraising and individual donor strategies, and ethical and legal issues related to fundraising. Student use a case-study approach for planning, developing, and writing successful grant proposals to fund health and human services programming.

Grade Mode: Letter Grading

SW 962 - Data Analysis and Statistics

Credits: 3

This course introduces students to statistical techniques and data analysis within the context of social work and human services,

focusing on both descriptive and inferential statistics. Students will learn to critically interpret and analyze statistical data, with particular attention to how biases—both conscious and unconscious—can influence research outcomes. Emphasizing ethical considerations, anti-oppressive research practices, and the promotion of social justice, the course prepares students to conduct research that serves marginalized and oppressed communities. Topics covered include data ethics, probability, hypothesis testing, regression analysis, and more, with SPSS software used for practical data analysis. Through a flipped classroom model, students will engage with online lectures and practice datasets before class, applying their knowledge in hands-on activities, discussions, and projects. Assignments include article critiques, quizzes, and in-depth projects analyzing real-world data. This course equips students to engage in practice- and research-informed social work, contributing to anti-racist, anti-oppressive practice and policy evaluations. Prerequisite: Introductory Social Work Research Methods ([SW 860](#) or equivalent).

Grade Mode: Letter Grading

SW 965 - Program and Practice Evaluation

Credits: 3

A one semester course, basic introduction to evaluation methods in the context of social work practice and social welfare. Students develop and conduct evaluations of practice, programs, and policies. Course provides skills required for practice and program evaluation. Students must have successfully completed Social Work Research one and two.

Grade Mode: Letter Grading

SW 974 - Social Work Supervision

Credits: 3

Prepares students for a supervisory role in human service agencies. Basic principles of administrative, supportive and educational supervision are reviewed and related to the student's own experiences in supervision or as a supervisor.

Grade Mode: Letter Grading

SW 975 - Theory and Practice of Family Therapy

Credits: 3

This course is designed to provide students with an introduction to the theory and practice of family therapy. Major approaches to be examined include structural, strategic, systemic, brief, narrative family therapy, and social constructionism. Students have an opportunity to present cases they are currently working with in their internships and are able to practice family therapy techniques with the use of a team coaching them from behind a one-way mirror.

Grade Mode: Letter Grading

SW 979 - Social Work and the Law

Credits: 3

Social work practitioners routinely encounter and interact with the legal system in their work. The course provides knowledge of and learning about, the differences between the legal and social service networks, the realities of work involving the law, and legal issues, as well as an understanding of those aspects of the legal system most likely to impact clients and their families.

Grade Mode: Letter Grading

SW 982 - Internship III

Credits: 4

This two semester requirement provides advanced practice experience in a wide range of social work settings. Students spend 24 hours per week in an internship agency setting. Individual internship placements are arranged with each student by the internship coordinator. In order to receive course credit, students must satisfactorily complete both semesters ([SW 982](#) and [SW 983](#)). A concurrent integrative seminar is also required. The goal of the weekly seminar is to assist students in conceptualizing and integrating the multiple theoretical issues and practice concepts of course work and the practicum. Students are expected to take major responsibility for the semester, using the instructor as a resource. Topics addressed include: self-awareness and values, an oppressive social work practice, and ethical decision-making. Students must have successfully completed the first internship year and Internship Seminars 1 & 2.

Co-requisite: [SW 930](#)

Grade Mode: Graduate Credit/Fail grading

SW 983 - Internship IV

Credits: 4

This is the second part of the two semester requirement and provides advanced practice experience in a wide range of social work settings. Students spend 24 hours per week in an internship placement. Individual internship placements are arranged with each student by the internship coordinator. In order to receive course credit, students must satisfactorily complete both semesters. A concurrent integrative seminar is also required. The goal of the seminar is to assist students in conceptualizing and integrating the multiple theoretical issues and practice concepts of course work and the practicum. Students are expected to take major responsibility for the semester, using the instructor as a resource. This is part two of the advanced year-long internship course. Students must have successfully completed the first half of internship and Internship Seminar 3.

Co-requisite: [SW 931](#)

Grade Mode: Graduate Credit/Fail grading

SW 992 - Special Projects and Independent Study

Credits: 1-3

Projects, research and reading programs in areas of concentration. Sixty days advance approval of the student's plan of study by adviser and proposed instructor required. 24 credits in social work coursework required.

Repeat Rule: May be repeated for a maximum of 6 credits.

Grade Mode: Letter Grading

Special Fee: Yes

Sociology (SOC)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

SOC 815 - Criminological Theory

Credits: 4

Introduces graduate students and advanced undergraduates to the major theoretical literature in crime and delinquency. Covers both classical and contemporary theory, with empirical assessments of theories, including macro- and micro-level control, strain and learning theories as well as recent developments in biosocial, deterrence, labeling, and critical/feminist theories.

Grade Mode: Letter Grading

SOC 820 - Sociology of Drug Use

Credits: 4

Examines licit and illicit drug use from a sociological perspective. Draws primarily from the sociology of mental health and criminology to explore a variety of drug-related topics including: historical and current U.S. drug trends, dominant theoretical approaches about the initiation into, and continued use of drugs, drug-related crime, therapeutic use of drugs, prevention and treatment of drug problems, and drug-related policies.

Grade Mode: Letter Grading

SOC 825 - Social Demography

Credits: 4

Social demography examines the linkages between changes in the size, composition and distribution of the population and changes in social, environmental, economic and political factors. The course examines demographic methods and the materials and the analytical techniques used by demographers to analyze population redistribution, fertility, work, marriage, migration and mortality. The policy implications of demographic change will be examined with attention to the United States as well as the developed and developing world.

Grade Mode: Letter Grading

SOC 830 - Communities and the Environment

Credits: 4

People and the natural environments in which they live fundamentally structure communities around the globe. Economic change, expanding development, and human migration are transforming social and environmental conditions in both rural and urban settings, altering the identities of many communities as well as their relationships with the natural world. The importance of these emerging social and environmental issues has made them a focus for social science inquiry. This course exposes students to a range of sociological concepts, theories, and research approaches related to the study of communities and environmental issues. Some of the substantive themes that are covered include: population dynamics and environmental change; social capital and social networks; political economy and community development; collective action and social movements; science, technology, and environmental risks; and environmental racism and justice. The principal assignment for the course will be a research project where students investigate a community or environmental issue of their own interest.

Grade Mode: Letter Grading

SOC 840 - Sociology of Mental Health

Credits: 4

Introduces students to different sociological approaches for studying and understanding mental health and illness. Students examine the social distribution of mental illness in the United States and the social-structural factors that help to explain mental health variations. Also addresses issues surrounding mental health treatment, systems, and policies for the mentally ill.

Grade Mode: Letter Grading

SOC 845 - Race, Ethnicity, and Inequality

Credits: 4

Sociological perspectives on race and ethnic relations for graduate and advanced undergraduate students. Topics include the creation of racial and ethnic identities; the nature and extent of segregation; education, employment, and wealth inequalities; and the effects of state policy. Course emphasizes both theoretical and empirical assessments.

Grade Mode: Letter Grading

SOC 873 - Childhood and Social Policy**Credits:** 4

This course will expose students to a variety of sociological perspectives on childhood in American society. Focus will be on the analysis of how social institutions, like the modern American family, school, economic system, justice system and communication media affect children. Assumes a prior understanding of important sociological concepts, critical thinking skills and social science writing ability.

Grade Mode: Letter Grading

SOC 888 - Advanced Medical Sociology**Credits:** 4

This course is intended to provide an in-depth introduction to the major theoretical frameworks of medical sociology and empirical research examining social factors that influence individual's health and illness. We will take a critical approach in our examination of: the distribution of health and illness (by socioeconomic status, sex/gender, and race/ethnicity); medicalization as a social control; and the social construction of health and illness. Most of the learning in this course will take place through shared facilitation of class discussions based on the reading.

Grade Mode: Letter Grading

SOC 899 - Master's Thesis**Credits:** 1-10

Master's Thesis. Students typically complete 6 credits, however, it can be taken up to 10 credits when permitted by the department by petition.

Repeat Rule: May be repeated for a maximum of 10 credits.

Grade Mode: Graduate Credit/Fail grading

SOC 900 - Pro-seminar**Credits:** 2

An introduction to the discipline of sociology and to the graduate program. Topics include writing for professional audiences, publishing, applying for support, TA workshop, writing a thesis or dissertation. Meetings with faculty members throughout the semester.

Grade Mode: Graduate Credit/Fail grading

SOC 901 - Sociological Methods I: Intermediate Social Statistics**Credits:** 4

Application of statistical methods to the analysis of social data, with particular emphasis on multiple regression and related topics.

Grade Mode: Letter Grading

SOC 902 - Sociological Methods II: Research Design**Credits:** 4

Systematic investigation of each step in the design and implementation of sociological research. Selected techniques of data collection and analyses are pursued. Strongly recommend prior course in research methods and social statistics.

Grade Mode: Letter Grading

SOC 903 - Sociological Methods III: Advanced Social Statistics**Credits:** 4

Multivariate statistical methods for the analysis of social data. Topics include problem-solving with multiple regression, categorical-variable models, dynamic models, and others.

Grade Mode: Letter Grading

SOC 905 - Research Practicum**Credits:** 4

This course is designed to help students improve and finalize a research paper for publication. Students will also critique and edit one another's work to develop peer-review skills. Through successive revisions, students are expected to finalize and submit their manuscripts to a scholarly journal at the end of the course. Since students' projects will be at different stages of needed revision, the course schedule and content will remain flexible to accommodate different students' needs.

Prerequisite(s): SOC 901 with a minimum grade of B- and SOC 902 with a minimum grade of B-.

Grade Mode: Letter Grading

SOC 911 - Sociological Theory I**Credits:** 4

The content, presuppositions, and implications of the body of classical sociological theory, exemplifying the full range of sociological inquiry.

Grade Mode: Letter Grading

SOC 921 - Crime and Conflict**Credits:** 4

Serves as the core course for the Crime and Conflict concentration. Theories and patterns of crime; the social origins of violent and nonviolent conflict; the role of social factors in the justice system; alternative forms of crime control and conflict management.

Grade Mode: Letter Grading

SOC 975 - Sociology of the Family**Credits:** 4

Major approaches in the sociological study of families. Individuals in families, family relationships, and families as groups and their interrelationships among these levels. Interactional and systemic properties of marriage, parent-child relations, and extended family relations.

Grade Mode: Letter Grading

SOC 980 - Social Stratification**Credits:**

Introduces students to the core of theoretical, methodological, and substantive issues in social stratification. Readings include classical and contemporary theories of stratification and work exploring the sources and consequences of stratification. Inequalities based on class, race, and gender examined.

Grade Mode: Letter Grading

SOC 995 - Reading and Research**Credits:** 2-8

A student prepared by training and experience to do the independent work under the guidance of an instructor may register.

Students are required to complete 16 graduate hours of sociology prior to taking this course. Hours and credit to be arranged. May be repeated for different topics.

Grade Mode: Letter Grading

SOC 999 - Doctoral Research**Credits:** 0

Doctoral Research.

Grade Mode: Graduate Credit/Fail grading

Special Fee: Yes

Spanish (SPAN)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

SPAN 890 - Topics in Second Language Acquisition/Pedagogy/Methodology

Credits: 3

A) Introduction to Second Language Acquisition, B) Internet Technologies and Second Language Learning. May be taken more than once if no duplication of content.

Grade Mode: Letter Grading

SPAN 897 - Topics in Hispanic Literature and Cultural Studies

Credits: 3

A) Medieval Spanish Literature, B) Spanish Literature of the Renaissance and the Golden Age, C) Spanish Literature of the 18th and 19th Centuries, D) Spanish Literature of the 20th Century (Poetry/Theater/Prose,), E) Contemporary Spanish Literature, F) Spanish Cultural Studies, G) Latin American Literature of the 16th and 17th Centuries, H) Latin American Literature of the 18th and 19th Centuries, I) 20th Century Latin American Literature (Poetry/Theater/Prose), J) Contemporary Latin American Literature, K) Cyberliterature and Cyberspace, L) Transatlantic Studies, M) Spanish and Latin American Philosophy and Essay, N) Indigenous Cultural Expression of the Americas, O) Hispanic Film Studies, P) U.S. Hispanic Cultural Studies, Q) Latin American Cultural Studies, R) Senior Seminar, S) Other. May be taken more than once for credit if no duplication of content.

Grade Mode: Letter Grading

SPAN 898 - Topics in Hispanic Linguistics and Cultural Studies

Credits: 3

A) History of the Spanish Language, B) Study of Spanish Mood and Aspect, C) Sociolinguistics of Spanish, D) Discourse Analysis, E) Politeness and Pragmatics, F) Bilingualism and Spanish in the U.S., G) Spanish Pronouns, H) Regional and Social Variation in Spanish Phonetics, I) Other. May be taken more than once for credit if no duplication of content.

Repeat Rule: May be repeated up to unlimited times.

Grade Mode: Letter Grading

SPAN 995 - Independent Study

Credits: 1-3

Guided individual study with training in bibliography and organization of materials. Topics selected by instructor and student in conference. Barring duplication of content, may be repeated for credit.

Repeat Rule: May be repeated up to 1 time.

Grade Mode: Letter Grading

Supply Chain Management (SCM) CPSO

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

SCM 805 - Supply Chain Management

Credits: 2

In this course, students explore the management and flow of materials in a typical enterprise supply chain, be it within a production facility or the health care industry. Students examine a complete overview of material flow, from internal and external sources, to and from the enterprise, and the impact a global supply chain can have on an organization's success in meeting demands. Topics covered include basic elements of a supply chain, enterprise resource planning (ERP), demand planning, capacity management, and inventory control.

Equivalent(s): SCM 805G

Grade Mode: Letter Grading

› [View Course Learning Outcomes](#)

Technology (TECH)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

TECH 850 - Intellectual Asset Management for Engineers and Scientists

Credits: 3

This course provides an introduction to the most important topic for business in the 21st century--intellectual assets. Students receive an overview in practical, real-world aspects of managing intellectual assets (copyright, patents, trademarks, trade secret etc.). Students taking this course will be exposed to lectures, guest presentations, and case studies aimed at increasing their understanding of intellectual property strategies and related legal issues; technology assessment; technology valuation; licensing issues, strategies and negotiation techniques; business planning and start-up company development; and strategies for attracting investment for new ideas. The instructors and guest speakers for the course are involved in managing, protecting, investing in, or commercializing intellectual property assets in real world settings such as university technology transfer offices, patent law firms, venture capital firms, start-up companies, and related settings.

Grade Mode: Letter Grading

Women's and Gender Studies (WGS)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

WGS 832 - Feminist Theory

Credits: 4

A multidisciplinary introduction to some of the major conversations and methodologies in feminist theory (e.g., materialist feminism, standpoint epistemologies, psychoanalysis, discourses of sexuality and the body, transnational feminism, postcolonialism and decolonization). Critical readings of landmark and more recent feminist texts, and discussion of gender in relation to other categories of analysis including sexuality, race, class, nation, disability and religion.

Equivalent(s): WS 832

Grade Mode: Letter Grading

WGS 895 - Directed Study

Credits: 1-4

Independent study of advanced or specialized topics requiring extensive reading and writing. To be elected only with permission of the Department Chair and of the supervising faculty member.

Repeat Rule: May be repeated for a maximum of 4 credits.

Equivalent(s): [WGS 899](#), WS 895, WS 899

Grade Mode: Letter Grading

WGS 898 - Colloquium in Feminist Studies

Credits: 4

An advanced course on a topic to be chosen by the instructor. Please inquire at the Women's Studies office for a full course description each time the course is offered. Examples include Equality, Privacy and Consent; Queer Theory; Transnational Feminisms; Major Women Writers.

Equivalent(s): WS 898

Grade Mode: Letter Grading

WGS 899 - Directed Study

Credits: 1-4

Directed study for graduate students.

Repeat Rule: May be repeated for a maximum of 4 credits.

Equivalent(s): [WGS 895](#), WS 899

Grade Mode: Letter Grading

Zoology (ZOOL)

Visit the [Course Schedule Search website](#) to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

ZOOL 810 - Sharks and Bony Fishes

Credits: 4

Some fish swimming today are hundreds of years old, whereas others complete their life cycle in two months! This course provides an introduction to the diversity of fishes found across the globe, including elasmobranchs (sharks, skates, and rays) and teleosts (bony fishes). Particular attention will be paid to fishes local to New Hampshire and New England. Students will learn about fish anatomy, physiology, and ecology. Lab. (Offered in alternative years.)

Grade Mode: Letter Grading

Special Fee: Yes

ZOOL 836 - Genes and Behavior

Credits: 4

Genes and behavior examines the genetic underpinnings of animal behavior, and how behavior evolves on a genetic level. The course primarily relies on readings from the primary literature, using examples from laboratory model organisms, animals in the natural habitats, and humans. Topics include aggressiveness, social behavior, personality, parental care, communication, mating behavior, novelty seeking behavior, and foraging. This interdisciplinary course examines these behaviors at multiple levels, including genomics, population genetics, molecular genetics, epigenetics, endocrinology, and neurobiology.

Grade Mode: Letter Grading

ZOOL 895 - Advanced Studies

Credits: 1-4

Independent study in various areas, including but not limited to: animal behavior; departmental biology; ecology; electron microscopy; evolution; genetics; histology; history of biology; invertebrate biology; neurobiology and behavior; physiology; teaching practices; underwater research; vertebrate biology; biological techniques. Course sections for advanced work, individual or group seminar. May include reading, laboratory work, organized seminars, and conferences.

Grade Mode: Letter Grading