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Accounting

AC 201 - Introduction to Accounting and Financial World 3 credits
This course is designed strictly for the non-business major. It is a survey course of accounting and financial concepts, including the basic accounting equation, financial statement structure, financial statement analysis, cost structures (fixed/variable/breakeven analysis/overhead), cost systems, an introduction to basic capital markets, working capital management and present value concepts. Whenever possible, the materials used in this class will use the context of the individual student's major area of study or future professional area of employment. 3 lecture hours

AC 205 - Principles of Accounting-Financial 4 credits
An introduction to accounting principles and theory for the sole proprietorship and corporations. The recording of business transactions through the accounting cycle, from journalizing, posting, adjusting, and closing entries through work papers and preparation of financial statements, is studied. Related topics include: internal control and accounting for cash, accounts receivable, inventories, property and equipment and related depreciation, intangible assets, current liabilities, owner’s equity, and payroll accounting. Ethical business practices and client privacy issues are stressed throughout all phases of the course. 4 lecture hours

AC 206 - Principles of Accounting-Managerial 4 credits
The completion of the study of financial accounting begun in AC 205 and an introduction to and emphasis on managerial accounting. Topics covered include: earnings per share, dividends, bonds payable, the Statement of Cash Flows, the analysis and interpretation of financial statements, the budgeting process and cost accounting concepts. Protection of proprietary information and information security is re-enforced throughout the course. Prerequisite: A grade of “C” or better in AC205. 4 lecture hours

AC 335 - Intermediate Accounting I 3 credits
Building on the foundations of Principles of Accounting the course provides a more in-depth study of accounting theory and practice. Beginning with a brief review of the accounting process, the course delves into the conceptual framework for accounting, the accounting standards setting process, and the hierarchy of accounting pronouncements. The course then explores the components of the financial statement package including such issues as the quality of earnings and the measurement and reporting of unusual, infrequent, and non-operating items; the Statement of Cash flows is also studied in depth. Accounting, reporting, and valuation issues surrounding cash, receivables, inventory and long-term assets are also covered including the impairment of tangible and intangible assets. Prerequisite: A grade of "C" or better in AC205 and AC206. 3 lecture hours

AC 336 - Intermediate Accounting II 3 credits
A continuation of the in-depth study of accounting theory and practice begun in Intermediate Accounting I The course addresses the valuation, accounting, and
reporting of both short and long-term investment securities, current and contingent liabilities, notes and bonds payable, and shareholders’ equity. In addition, the accounting for leases, income taxes, pensions, stock-based compensation, earning per share, and accounting changes are also studied. Prerequisite: AC335 or AC205 and 206 with a grade of "C" or better and permission of the instructor. 3 lecture hours

AC 419 - Taxation I
3 credits
Designed to introduce the student to certain elementary tax concepts: tax rate structure, losses, tax credits, withholding, and computation of the personal income tax. Within the context of the personal income tax, planning considerations will be stressed as well as legal and ethical issues concerning client confidentiality. Prerequisites: AC205 and AC206 with a grade of "C" or better. 3 lecture hours

AC 428 - Auditing
3 credits
A study of the auditing environment, including legal liability and professional ethics begins with the concept of auditing and the auditing profession. Additional topics concerning the audit process, including internal control, evidence, sampling and EDP auditing and specific audit procedures are examined. In addition the nature and types of auditors’ reports are studied. Prerequisites: AC336 or permission of the instructor. 3 lecture hours

AC 441 - Cost Accounting
3 credits
A study of the basic elements of cost accounting concepts and procedures. Emphasis is on how cost data can be used as management tools. Cost behavior and control, cost-volume-profit relationships, job and process costing, activity-based accounting, budgeting and responsibility accounting, flexible budgeting and standards, income effects of alternative costing methods and cost behavior, costs and the decision process, and philosophy and organization of the master budget are analyzed. Prerequisite: AC 206. 3 lecture hours

AC 442 - Advanced Accounting
4 credits
An advanced course emphasizing accounting theory and practical applications in selected areas. Such areas include: partnerships, branches, business combinations, consolidated financial statements, segment reporting, forecasts, multinational companies, bankruptcy, and accounting for governmental units and other non-profit entities. Prerequisite: AC336. 4 lecture hours

AC 450 – Internship in Accounting
3 credits
The internship program is designed for students who want to apply their studies by working in a public accounting firm or in private accounting within a business, industry, or public agency. The student will be required to work closely with a faculty supervisor to develop and implement a structured experience tailored to the career goals of the student. Prerequisites: junior or senior standing and written consent of the department chair and internship committee. 3 lecture hours
Graduate Public Administration

AD 511 - Foundations of Public Administration & Policy 6 credits
This course introduces students to public administration in the United States. The course focuses on governance, inter-governmental relationships, organizational theory, policies, and strategic planning as affected by fiscal constraints, public needs, social change and politics. Students are introduced to the role of leadership, the necessity for professional ethics and accountability, and personal competence. Students also begin the program-long requirement of developing their skills of critical analysis, research, integration of information, and effective writing.

AD 521 – Public Administration Research and Analysis 6 credits
This course reviews major research method designs and their application to policy development and evaluation. Students are also exposed to statistical techniques commonly found in public administration and social science research from the perspective of managerial control and application to evaluation of research design/program evaluation. Particular focus is placed on quality assurance and best-evidence management.

AD 531 - Legal Environment, Human Resources and Org Leadership 6 credits
This course explores three areas of public administration; the legal environment for the public organization, human resources, and organizational leadership. The first part of the course focuses on creating agency authority, public participation, civil liability, employment law, and due process. The second part of the course focuses on selecting and retaining quality employees and managers, evaluations, coaching and training. The third part of the course focuses on strategic leadership, organizational analysis and culture, managing conflict, and organizational vision and change.

GJ 551 – Law Enforcement Administration 6 credits
This course examines law enforcement best practices, police leadership, workforce development, accountability, internal affairs, productivity, and managing special units. Students will also study the role of community policy, community policing, restorative justice programs, crime prevention, and the role of technology, integrated justice systems, and information system security.

GJ 552 – Corrections Administration 6 credits
This course examines administration in the corrections environment. Topics include personnel management, budgeting and public finance, workforce development, staffing, special units, correctional policy development and planning. The role of technology and integrated justice systems are examined, as well as information system security.

AD 554 Principles and Strategies for Sustainability, I 6 credits
This course introduces students to the principles and strategies of sustainability as it applies to public works services in the community. Specifically, the course will present...
students with a study of: 1) the connections between the environment and mankind, 2) how air and water pollution affect public health, 3) the impact to the economy when water and transportation policies are not well thought out, 4) the importance of using long-term economic models in public policy decision making, 5) learning how to think in a holistic manner, 6) the attributes of a sustainable work culture, and 7) how to build community support for a sustainable program. Prerequisites: Completion of all prior core courses in seminars one, two and three or permission of the program director.

GJ 555 – Public Safety and Emergency Management 6 credits
This course introduces students to public safety and crisis management. Topics for study include managing crisis and public safety emergencies at different levels of government, personnel management, budgeting and public finance, leadership, workforce development, staffing, policy development and planning. Students also study the central aspects of information assurance and information system security.

GJ 556: Critical Incident Management for Public Safety 6 credits
This course explores public administration within the scope of critical incidents and crisis management. Among the topics to be studied are domestic terrorism and counterterrorism, the roles of the National Incident Management System and the National Response Framework, best practices for first responders, and constitutional issues related to the execution of first responder duties. Students will also study the use of specially trained and equipped units such as SWAT teams, and the role of community policing and community partnerships in responding to crises, whether manmade or natural. Prerequisites: Completion of all prior core courses in seminars one, two and three or permission of the program director.

AD 557 - Public Works Administration, Part I 6 credits
This course of study focuses on the local, state, regional, and national legal, political, technological, and operational issues key to public works administration in the areas of public utilities, water resources, transportation, facilities and structures, and parks and grounds. Topics include the historical development of, and technological advances in, public works management; the public works policy-making process and current public works policy; internal and external communication challenges; public affairs, enforcement, and emergency management roles of public works officials.

AD 567 - Public Works Administration, Part II 6 credits
This course of study focuses on local, state, regional, and national master public works planning, contract administration and project management; multi-year financing of public works projects; environmental impacts and other cost-benefit analyses, and decision-making modeling; multi-jurisdictional services and public-private joint ventures; and, trends and future challenges.

AD 558 - Certified Government Financial Manager Studies 6 credits
This course explores the legal and regulatory foundation for financial reporting and accountability for public organizations. Topics include development of transactions, enactment of appropriations, and incurrence of obligations or encumbrances. Other
topics include financial reporting, analysis of governmental financial performance, costing of government services, and auditing governmental organizations. For course readings students are provided the current study guides published by the Association of Government Accountants’ Certified Government Financial Manager, designed specifically to prepare professionals and students for the CGFM certification examination.

AD 559 - Public Organization Financial Management 6 credits
This course introduces students to four major areas of financial concern: Preparation of budgets; creating management strategies for the organization based on the principles of strategic financial management; obtaining financial resources from issuing bonds and levying taxes; and managing cash and employee retirement funds. Students will also examine contemporary perspectives on professional ethics and ethical behavior by leaders in the public sector especially in regards to their fiduciary responsibility in investing and managing public funds.

AD 561 - Capstone Studies 6 credits
This final core course offers students the opportunity to apply his or her learning in two tangible ways: the preparation of a capstone paper/project that offers a practical or theoretical solution to a program, operation or policy; and the writing of a paper suitable for publication in a professional journal. Each student presents the capstone project or paper at residency in June just prior to graduation.

Aerospace Studies

AS 101 - The Foundations of the United States Air Force 1 credit
This is a survey course designed to introduce students to the United States Air Force and Air Force Reserve Officer Training Corps. Featured topics include: mission and organization of the Air Force, officer-ship and professionalism, military customs and courtesies, Air Force opportunities, group leadership problems, and an introduction to communication skills. A mandatory leadership laboratory complements this course by providing cadets with followership experiences. Includes 1 lecture hour and Leadership lab (2 hours) and PT (3 hours). Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives

AS 102 - The Foundations of the United States Air Force 1 credit
This is a survey course designed to introduce students to the United States Air Force and Air Force Reserve Officer Training Corps. Featured topics include: mission and organization of the Air Force, officer-ship and professionalism, military customs and courtesies, Air Force opportunities, group leadership problems, and an introduction to communication skills. A mandatory leadership laboratory complements this course by providing cadets with followership experiences. Prerequisite: AS101 or equivalent. This requirement may be waived with the approval of the detachment commander. Includes 1 lecture hour and Leadership lab (2 hours) and PT (3 hours). Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives
AS 201 - The Evolution of USAF and Space Power  1 credit
This course focuses on facilitating the transition from Air Force ROTC cadet to Air Force ROTC candidate. Featured topics include: Air Force heritage, Air Force leaders, general aspects of air and space power, introduction to ethics and values, group leadership problems, and continuing application of communication skills. A mandatory leadership laboratory complements this course by providing cadets with their first opportunity for applied leadership experiences. Prerequisite: Must have successfully completed AS101 and 102 (or equivalent) or obtain approval from AFROTC Commander. Includes 1 lecture hour and Leadership lab (2 hours) and PT (3 hours). Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives.

AS 202 - The Evolution of USAF and Space Power  1 credit
This course continues its focus on educating and developing Air Force ROTC candidates to become Air Force officers. Featured topics include: Air Force heritage, Air Force leaders, general aspects of air and space power, introduction to ethics and values, group leadership problems, and continuing application of communication skills. A mandatory leadership laboratory complements this course by providing cadets with their first opportunity for applied leadership experiences. Prerequisite: AS201 (or equivalent) or obtain approval from AFROTC Commander. Includes 1 lecture hour and Leadership lab (2 hours) and PT (3 hours). Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives.

AS 311 - Air Force Leadership Studies  3 credits
A study of leadership and quality management fundamentals, professional knowledge, leadership ethics, and communicative skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory leadership laboratory complements this course by providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply the leadership and management principles discussed in class. Prerequisite: Must pass AS202 (or equivalent) with a C or better or permission of the Professor of Aerospace Studies. Includes 3 lecture hour and Leadership lab (2 hours) and PT (3 hours). Course Attributes: May be used as part of the six ROTC credits allowed for degree electives.

AS 312 - Air Force Leadership & Management  3 credits
AS 312 is a continuation of AS311 on the study of leadership and management fundamentals, professional knowledge, leadership ethics, and communicative skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory leadership laboratory complements this course by providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply the leadership and management principles discussed in class. Prerequisite: Must pass AS311 (or equivalent) with a C or better or permission of the Professor of Aerospace Studies. Includes 3 lecture hour and Leadership lab (2 hours) and PT (3 hours). Course Attributes: May be used as part of the six ROTC credits allowed for degree electives.
better or permission of the Professor of Aerospace Studies. Includes 3 lecture hour and Leadership lab (2 hours) and PT (3 hours). **Course Attributes:** May be used as part of the six ROTC credits allowed for degree electives

**AS 411 - National Security Affairs/Preparation for Active Duty** 3 credits
The course examines the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest include the military as a profession, officer-ship, military justice, civilian control of the military, preparation for active duty, and current issues affecting the military profession. Within this structure, continued emphasis is given to the refinement of communication skills. A mandatory leadership laboratory complements this course by providing advanced leadership experiences, giving students the opportunity to apply the leadership and management principles of the ROTC program. Enrollment restricted to students pursuing a commission. Prerequisite: AS312. Includes 3 lecture hour and Leadership lab (2 hours) and PT (3 hours). **Course Attributes:** May be used as part of the six ROTC credits allowed for degree electives

**AS 412 - National Security Affairs/Preparation for Active Duty** 3 credits
The course continues the study of the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest include the military as a profession, officer-ship, military justice, civilian control of the military, preparation for active duty, and current issues affecting the military profession. Within this structure, continued emphasis is given to the refinement of communication skills. A mandatory leadership laboratory complements this course by providing advanced leadership experiences, giving students the opportunity to apply the leadership and management principles of the ROTC program. Enrollment restricted to students pursuing a commission. Prerequisite: AS411. Includes 3 lecture hour and Leadership lab (2 hours) and PT (3 hours). **Course Attributes:** May be used as part of the six ROTC credits allowed for degree electives

**Architecture**

**AP 106 - Architectural Drafting** 3 credits
Techniques of architectural drafting are introduced as basic skills used to describe architectural form. The various graphic tools, techniques, and conventions are presented and the rationale behind their use is explained. In addition to the basic graphic constructions and multi-view projections, the methods of developing architectural plans, elevations, and sections are addressed. This course is primarily intended for students who have had little or no prior introduction to mechanical and architectural drafting. One hour of lecture and three 3-hours of studio per week. 1 lecture hour and 3 studio hours

**AP 111 - Fundamentals of Architecture** 4 credits
An introduction to the basic principles and skills that constitute the discipline of architecture. A series of two and three dimensional graphic exercises is used to cultivate an understanding of architectonics, the intentional arrangement of space and enclosure to communicate human values while also introducing graphic techniques for
communicating concepts and solutions. One hour of lecture and 9-hour studios per week.

AP 118 - Fundamentals of Architecture II  4 credits
A continuation of the introduction to the fundamental processes and technologies that constitute the discipline of architecture. This course investigates the design process, explores interactive computer graphics (CAD) as a design tool, and culminates with the application of these principles, processes, and skills to an architectural design problem. One hour of lecture and 9 hours of studio per week. Prerequisite: AP 111.

AP 211 - Architectural Design I  5 credits
The first in a sequence of design studio courses introducing the processes, judgment, and communications involved in the synthesis of architectural form. Through a focused series of individual and group projects, the influences of the human and physical contexts on form are explored. One hour of lecture and three 4-hour studios per week. Prerequisite: AP118. 1 lecture hour and 12 studio hours

AP 212 - Architectural Design II  5 credits
Second in a sequence of design studio courses emphasizing the processes, judgment, and communications involved in the synthesis of architectural form. Through a focused series of individual and/or group projects, the influences of functional requirements on form are explored. One hour of lecture and three 4-hour studios per week. Prerequisite: AP211. 1 lecture hour and 0 to 12 studio hours

AP 221 - Site Development and Design  3 credits
A course that deals with engineering principles and design considerations involved with site design. Earth shaping, drainage, roadway alignment, parking lot layouts, code requirements and environmental factors are studied prior to and after design changes. Two hours of lecture and one 2-hour studio per week. 2 lecture hours and 2 studio hours

AP 222 - Human Issues in Design  3 credits
An introduction to the psychological, sociological, and physical factors that influence the design of architectural space. The fields of anthropometrics, ergonomics, and proxemics are addressed, as well as considerations for barrier-free environments. Three hours of lecture/discussion per week. 3 lecture hours

AP 225 - Introduction to Passive Environmental Systems  3 credits
Through coordinated lectures and demonstrations, the impacts of environmental energies on architectural form are introduced and explored. Emphasis is given to the processes by which the architect orders light, climate, gravity, and sound responses to achieve building geometry. The course also addresses concepts and strategies for responding to environmental hazards, and designing healthy buildings and green architecture. Three hours of lecture. Prerequisite: AP118, EG110 or instructor’s permission. 3 lecture hours
AP 241 - Architectural Delineation 3 credits
A studio course in advanced graphic methods. Various rendering techniques, definitive design development, and the principles of construction drawings and architectural detailing are presented and explored through individual projects. One hour of lecture and two 2-hour studios per week. 1 lecture hours and 4 studio hours

AP 311 - Architectural Design III 5 credits
The development of the comprehensive building process as a synthesis of spatial, functional, and contextual concerns with emphases on building systems and materials. Individual and group problems are of a limited and defined scope. One hour of lecture and three 4-hour studios per week. Prerequisites: AP212 and AP325. Co-requisites: AP 327. 1 lecture hours and 12 studio hours

AP 312 - Architectural Design IV 5 credits
This fourth course in the design studio sequence continues the development of a comprehensive building design process with problems of complex but limited scope. The synthesis of spatial, functional, and contextual concerns, as directly linked to the understanding and employment of building systems, continues to provide a framework. One 1-hour lecture and three 4-hour studios per week. Prerequisite: AP 311. 1 lecture hours and 12 studio hours

AP 325 - Materials, Construction, and Design 3 credits
An introduction to the processes by which construction materials and systems are evaluated, selected, incorporated, and detailed in building design. Both measurable and immeasurable design responses to environmental energies are explored in soils, concrete, masonry, wood, and metals. Three hours of lecture per week. Prerequisite: AP225. 3 lecture hours

AP 327 - Active Building Systems I 3 credits
A survey of contemporary mechanical building equipment and systems, including heating, ventilation and air conditioning. Emphasis is placed on comparisons of design parameters, interfaces, and impacts on overall building form. Energy efficiency is addressed. Prerequisites: AP225 and MA107. 3 lecture hours

AP 328 - Active Building Systems II 3 credits
A continuation of AP 327, surveying contemporary electrical, lighting, and plumbing equipment and systems. Emphasis is placed on comparisons of design parameters, interfaces, and impacts on overall building form. Energy efficiency and building codes are addressed. Prerequisite: AP327. 3 lecture hours

AP 403 - Architectural Seminar in History and Theory 3 credits
As both an art and a science, the profession of architecture is continually undergoing change and reassessment. This elective seminar focuses on one or more specific issues and topics regarding the historic and philosophical contexts that influence architecture today. Typically these topics range from the study of specific historic periods or schools of thought regarding design to the diverse trends in current architectural
thinking. AP504 shall require a graduate-level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week. 3 lecture hours

AP 406 - Architectural Theory 3 credits
3 lecture hours

AP 411 - Architectural Design V 5 credits
Comprehensive problem-oriented design studio offered to fourth year students by various faculty members. The extension of the comprehensive design proves to include problems of an expanded scope and large scale, including building complexes and urban design. Individual and group problems emphasize the complex relationships of environmental factors, human concerns, and architectural form. This studio is considered the undergraduate capstone course in the undergraduate portion of the Architecture Program. A design portfolio, covering all seven semesters of studio work and including a written paper, is required to be submitted at the completion of this course. Prerequisite: AP312. 1 lecture hour and 12 studio hours

AP 412 - Architectural Design VI 5 credits
Elective problem-oriented studios offered to fourth year students by various faculty members. The extension of the comprehensive design process to include problems of expanded scope and large scale, including building complexes and urban design. Individual and group problems emphasize the complex interrelationships of environmental factors, human concerns, and architectural form. One hour of lecture and three 4-hour studios per week. Prerequisite: AP312. 1 lecture hour and 12 studio hours

AP 414 - Architectural Seminar In Design 3 credits
This elective seminar investigates in a non-studio setting one or more specific concepts, issues, or topics related to architectural design and its associated disciplines, such as urban, landscape, interior, and visual design. AP514 shall require a graduate level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisite: approval of instructor. Cross listed with AP520. 3 lecture hours

AP 424 - Architectural Seminar in Technology 3 credits
As both an art and science, the profession of architecture is continually undergoing change and reassessment. This elective seminar focuses on one or more of the specific issues, topics, or skills related to technologies in architecture today. Typically, these specific semester topics range from advanced materials and construction systems to energy-conserving design; from environmental issues to hands-on building experiences. AP520 shall require a graduate-level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: AP114, AP325, or approval of instructor. Cross listed with AP520. 3 lecture hours

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Revised October 2012-Posted 10/2012
AP 434 - Architectural Seminar in Process 3 credits
As both an art and science, the profession of architecture is continually undergoing change and reassessment. This elective seminar focuses on one or more specific topics regarding the current and future practice of architecture: what architects do, and how they do it. Typically, these topics range from design techniques to office management and from specialties within the practice, to the legal environmental, and social forces that influence it. AP534 seminar shall require a graduate-level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisite: instructor’s approval. Cross listed with AP534. 3 lecture hours

AP 436 - Project Delivery and Documentation 4 credits
Relationships between the formal methods of project delivery and the architectural office form the basic investigation of this course. The project delivery process and the methods of communication and the documentation involved provide a detail study of typical office procedures. The studio component of this course provides practical experience of the typical project delivery process. Documentation is approached as the fundamental means of architectural communication. This communication is multi-layered acting as a foundation for the means of production of contemporary architecture. Various tools will be utilized ranging from computer aided design to conceptual organization schema in both the practice of typical architectural project delivery and the development of new means of communication and production. Two hours of lecture and four hours of studio per week. 2 lecture hours and 4 studio hours

AP 455 - Special Projects in Architecture 1 to 3 credits
An execution of a singular project related to architectural design, history/theory, process, or technology selected by the individual student. The course focuses on in-depth independent research, development, and a formal written and/or graphic presentation of an architecturally-related topic not otherwise covered in course offerings. The student must secure a faculty member who will agree to serve as advisor/evaluator for the project. Limited to Architecture majors who have completed at least the first two years of the curriculum. Hours and credits to be arranged. 1 to 3 lecture hours

AP 456 - Senior Project 4 credits
4 lecture hours

AP 501 - Architectural Theory 3 credits
A course that introduces the deeper, often implicit and hidden motivations that influence the making of architecture. Basic human values and beliefs leading to classic philosophies and aesthetics are explored. Major historic and contemporary propositions on architecture are surveyed. AP501 requires a graduate-level paper or project. Three hours of lecture/discussion per week. Prerequisite: FA202. 3 lecture hours
AP 504 - Architectural Seminar in History and Theory 3 credits
As both an art and a science, the profession of architecture is continually undergoing change and reassessment. This elective seminar focuses on one or more specific issues and topics regarding the historic and philosophical contexts that influence architecture today. Typically, these topics range from the study of specific historic periods or schools of thought regarding design to the diverse trends in current architectural thinking. AP 504 shall require a graduate-level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: AP202 and AP308. Cross listed with AP403. 2 lecture hours

AP 511 - Architectural Studio VII 5 credits
Elective problem-oriented studio offered by various faculty members and/or visiting critics. Introspective problems are intended to broaden and deepen individual understanding of the processes, theories, and systems that influence the design of the built environment. Emphasis is on the thorough examination of all aspects of building. This course shall also include the identification, program preparation, and approval of the capstone project(s) to be undertaken in AP512 in the succeeding semester. One hour of lecture and three 4-hour studios per week. Only open to graduate students in Architecture. 1 lecture hour and 12 studio hours

AP 512 - Architectural Studio VIII 5 credits
Elective problem-oriented studio offered by various faculty members and/or visiting critics. Introspective problems are intended to broaden and deepen individual understanding of the processes, theories, and systems that influence the design of the built environment. Emphasis is on the thorough examination of all aspects of building. This studio shall consist of a single comprehensive design project that represents a capstone experience for the 5-year design sequence. As such, the individual program and design solution must be recorded in a bound format similar to that required for the thesis. 1 hour of lecture and 3 four-hour studios per week. Prerequisite: AP511. 1 lecture hour and 12 studio hours

AP 514 - Architectural Seminar in Design 3 credits
This elective seminar investigates in a non-studio setting one or more specific concepts, issues, or topics related to architectural design and its associated disciplines, such as urban, landscape, interior, and visual design. AP514 shall require a graduate level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisite: approval of instructor. Cross listed with AP414. 3 lecture hours

AP 520 - Architectural Seminar in Technology 3 credits
As both an art and science, the profession of architecture is continually undergoing change and reassessment. This elective seminar focuses on one or more of the specific issues, topics, or skills related to technologies in architecture today. Typically, these specific semester topics range from advanced materials and construction systems to energy-conserving design; from environmental issues to hands-on building experiences. AP520 shall require a graduate-level paper or project. This course may be
repeated for credit. Three hours of lecture/discussion per week. Prerequisites: AP114, AP325, or approval of instructor. Cross listed with AP424. 3 lecture hours

**AP 525 - Architectural Thesis Research** 5 credits
A singular design or design-related project selected by the individual student. The course consists of independent research done at a sufficient depth to display a mastery of the process of defining an architectural problem, including the investigation and discussion of the procedural, physical, and intellectual limits of this problem. The course culminates with the publication of an architectural program and a theoretical statement as well as the generation of all contextual information and design strategies necessary as the basis for AP526, Architectural Thesis. Three hours of class time and meetings with thesis advisors plus six hours of studio per week. Prerequisites: fifth-year standing and approval of Architecture program faculty. 3 lecture hours and 6 studio hours

**AP 526 - Architectural Thesis** 5 credits
Execution of a singular design or design-related project selected by the individual student. The project is based on independent research and preliminary design work produced in AP525 and is of sufficient depth and breadth to display a mastery of design skills and comprehensive understanding of the architectural issues related to form, process, judgment, representation, and communication. The work is done under the guidance of a thesis advisor chosen by the student. Two hours of meetings with thesis advisors plus twelve hours of studio per week. Prerequisite: AP525 with a grade of "C" or better. 2 lecture hours and 12 studio hours

**AP 531 - Architectural Internship** 6 credits
This course offers an opportunity for each student enrolled in Master of Architecture Program to develop a bridge between their academic experience and professional practice. As a "bridge" the learning experience is considered to move in both directions. The internship will allow individuals to apply knowledge learned in the classroom and will also allow the opportunity for individuals to bring practical experience to bear on their graduate studies. Each student enrolled in the course is responsible to secure a position with an architectural, or an architecturally-related/construction-related, firm for a period of no less than eight weeks. This position must be approved by the course instructor. The firm must also be willing to submit periodic and final evaluations of the student's performance. Distance learning technologies shall be employed during the employment period for communication between the students and the instructor. Requirements for the course shall include maintaining a journal and writing a major term paper related to professional practice. Typically, this course shall be taken during the summer between the fourth and fifth years, or as otherwise approved by the Dean. 8 weeks, summers. Prerequisites: Acceptance into the M. Arch. Program. 6 other hours

**AP 533 - Professional Practice** 3 credits
Investigation into the issues related to the professional practice of architecture in contemporary American society. Topics include project management, finance and
economics; business and practice management; and laws and regulations governing the profession. Three hours of lecture per week. 3 lecture hours

**AP 534 - Architectural Seminar in Process**

3 credits

As both an art and science, the profession of architecture is continually undergoing change and reassessment. This elective seminar focuses on one or more specific topics regarding the current and future practice of architecture: what architects do, and how they do it. Typically, these topics range from design techniques to office management and from specialties within the practice, to the legal environmental and social forces that influence it. AP534 seminar shall require a graduate-level paper or project. This course may be repeated for credit. Three hours of lecture/discussion per week.

Prerequisite: instructor's approval. Cross listed with AP434. 3 lecture hours

**AP 555 - Special Projects in Architecture**

1 to 3 credits

An execution of a singular project related to architectural design, history/theory, process, or technology selected by the individual student. The course focuses on in-depth independent research, development, and a formal written and/or graphic presentation of an architecturally-related topic not otherwise covered in course offerings. The student must secure a faculty member who will agree to serve as advisor/evaluator for the project. Hours and credits to be arranged. 1 to 3 lecture hours

**AP 558 - Global Issues in Architecture**

3 credits

A seminar course for fifth-year architecture majors that offers opportunity for in-depth analysis, discussion, and research into contemporary issues that impact the profession of architecture and architectural design. The course will be flexible in the terms of content so that the nature of the material has a currency relevant to the complex, changing nature of the profession. The topical choices may address global concerns such as sustainability, cultural changes, conservation and preservation, information technology, and the emerging role of the architect as a professional in the 21st century. The course structure will be more constant, reflecting the values embodied in the profession, the architecture program, and the university. Specifically, there will be a strong bridge made between pedagogy and teaching methodology; course material will be synthesized and applied in a manner that demonstrates critical thinking, teamwork, creativity and community service. Three hours of seminar per week. Open only to Master's students in Architecture. 3 lecture hours

**AP X1X - Vertical Architecture Studio**

5 credits

This problem-oriented studio offers an opportunity for students from various design levels to interact and contribute toward solutions of common topical architectural problems and issues. A maximum of two vertical studios may be taken in place of AP312, AP411, or AP412. Offered summers only. Prerequisite: AP118 or approval of instructor. 1 Lecture hour and 12 studio hours
Biology

- Biology electives must include at least one course from each of the following areas: anatomy (CAB1), physiology (CAB4), systematics (CAB5), and field biology (CAB3). [A single course can satisfy only one requirement.]
- Every biology major must take at least one botany (CAB2) and one zoology (CAB6) course.

**Distribution Requirement** | **Area Requirement**
---|---
CAB1 = (A) Anatomy requirement | CAB2 = (B) Botany requirement
CAB3 = (F) Field requirement | CAB6 = (Z) Zoology requirement
CAB4 = (P) Physiology requirement |
CAB5 = (S) Systematics requirement |

Distribution and Area courses must be taken as 4-credit laboratory.

**BI 101 - Principles of Biology I** 4 credits
This course is the prerequisite for all biology courses and satisfies general education laboratory science requirements for both majors and non-majors. This course gives an introduction to biochemistry, cell structure, metabolism, and protein synthesis, as well as human anatomy and physiology. Dissection of living and preserved animals is required. Classroom 3 hours, laboratory 2 hours. Offered fall and spring semesters.

**BI 102 - Principles of Biology II** 4 credits
This course is a prerequisite for most biology courses and satisfies general education laboratory science requirements for both majors and non-majors. This course explores genetics, evolutionary theory, diversity of life on earth, history of life on earth, and ecology. Dissection of preserved animals is required. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI101 or permission of the instructor. Offered spring semesters.

**BI 201 - Comparative Vertebrate Anatomy [CAB1 (A), CAB5 (S), CAB6 (Z)]** 4 credits
A study of the origins, structure and functions of the organ systems of representative vertebrates. An attempt is made to correlate form and function in the evolution of the vertebrates. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI101,102. Offered fall semesters of odd numbered years.

**BI 202 - Genetics** 3 or 4 credits
The physical and chemical basis of inheritance, expression, and interaction of the hereditary units, linkage, and variation. The application of Mendelian principles to plants and animals. Consideration is also given to microbial and viral genetics and genetic engineering. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI101 & 102, or permission of the instructor. Offered fall semesters.
BI 203 – Introduction to Scientific Method & Bioscientific Terminology 1 credits
An introduction to the philosophy of science, the scientific method and bioscientific terminology. Analysis of data and interpretation of scientific and science-related popular press articles is stressed. Includes exposure to various forms of scientific communication and data collection and analysis. Prepares the student for the rigors of majoring in the biological sciences. Classroom 1 hour. Prerequisites: Sophomore standing, major in Biology. Offered fall semester.

BI 215 - Human Anatomy and Physiology 4 credits
This is the first half of a two semester course exploring human anatomy and physiology. It covers cellular metabolism, tissues, and the following body systems: skeletal, muscle, cutaneous, and nervous. Dissection of preserved animals is required. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI101 or permission of the instructor. Offered fall semesters.

BI 216 - Human Anatomy and Physiology 4 credits
This is the second half of a two semester course exploring human anatomy and physiology. It investigates the following body systems: endocrine, digestive, respiratory, circulatory, lymphatic (including the immune response), urinary, and reproductive. Dissection of preserved animals is required. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI215 or permission of the instructor. Offered spring semesters.

BI 220 - Introductory Microbiology [CAB4 (P), CAB5 (S)] 4 credits
A survey of the field of microbiology with emphasis on those microorganisms of medical significance. Fundamentals of microbial structure, physiology and control are considered along with the role of pathogenic organisms in the infectious and disease processes. Laboratory exercises are designed to provide facility in visualizing, staining, culturing, enumerating, isolating, maintaining, and identifying micro organisms. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI101 or permission of the instructor. Offered spring semesters.

BI 240 - Environmental and Food Microbiology [CAB4 (P)] 4 credits
A course designed to develop an awareness of the essential role of microbes in maintaining the biosphere and the quality of life of its human inhabitants. The role of microorganisms as degraders, bioremediators and recyclers of essential elements will be presented and reinforced through laboratory exercises. The dependence of humans on microorganisms for health, food transformation, pharmaceutical production and genetic engineering will be explored in lecture and lab. Controversies surrounding the use of biotechnology to produce genetically engineered foods and animals as well as agents for bioterrorism, will be discussed. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI101, 102 or permission of the instructor. Offered even-numbered fall semesters.
BI 253 - Foods and Nutrition  
A course designed to provide the student with a background in organizational structure and activities that emphasize the physiological basis of nutrition with an analysis of nutritional needs at various age levels. Consideration given to the relationship of nutrition to health and fitness, principles of food selection, metabolism of nutrients, vitamins and minerals, energy balance and obesity, food safety and technology. Classroom 3 hours, Field Experience/Laboratory 2 hours. Prerequisite: BI101. Offered spring semesters.

BI 260 - Ornithology [CAB3 (F), CAB5 (S), CAB6 (Z)]  
A survey of avian biology and ecology to include evolution, the anatomical and physiological adaptations for flight, migration, behavior, reproduction and identification of birds and their songs. Integrated classroom, laboratory, and field studies will emphasize Vermont birds. Dissection of the pigeon during the spring semester is an integral part of the spring course’s laboratory component. The summer course features a nesting study in lieu of dissection. Classroom 3 hours, laboratory 2 hours. Offered spring semesters.

BI 275 - Environmental Biology  
An introduction to the interaction of man and the environment with emphasis on contemporary problems and their possible solutions. Local and global forms of pollution, detrimental environmental practices, and other relationships will be explored in the classroom and the laboratory. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI101, 102 or permission of the instructor. Offered even-numbered spring semesters.

BI 301 - Histology [CAB1 (A), CAB6 (Z)]  
A study of the cellular anatomy of the fundamental tissues and organs. May require dissection of living and preserved animals. Classroom, 3 hours, laboratory 2 hours. Prerequisite: BI101, 102 or permission of instructor. Offered even-numbered fall semesters.

BI 302 - Embryology [CAB1 (A), CAB6 (Z)]  
A study of the fundamental principles of development through the establishment of the major organs and systems, exemplified in the laboratory by study of representative embryonic forms. May require dissection of living and preserved animals. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI101, 102 or permission of instructor. Offered even-numbered spring semesters.

BI 304 - Physiology [CAB4 (P), CAB6 (Z)]  
A study of the comparative physiology of animals. Physical and chemical principles, cell physiology, with emphasis on homeostatic mechanisms and the study of functions of organ systems. May require dissection of living animals. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI101, 102, and 1 year of college chemistry. Offered even-numbered spring semesters.
BI 305 - Modern Laboratory Procedures [CAB4 (P)] 4 credits
Students are familiarized with the theories and applications of the new technologies that pervade the fields of biotechnology and molecular biology. Laboratory exercises illustrate key concepts and provide hands-on experience in the use of instrumentation essential to modern biologists. Classroom 2 hours, laboratory 4 hours. Prerequisites: BI 101, 102 or BI215, 216, and CH103, 104. Offered odd-numbered fall semesters.

BI 306 - Cell Biology [CAB1 (A), CAB4 (P), CAB6 (Z)] 4 credits
A molecular level examination of the ultrastructure and function of the cytoplasm, intracellular components, cell membrane, extracellular structures and formation, and excretion of extracellular products. Recent developments in molecular biology will be stressed, including the implications for the biotechnology industry. The laboratory component will include state-of-the-art procedures and will emphasize hands-on experimental techniques. May require dissection of living animals. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI101, 102 and one year of college chemistry. Offered even-numbered fall semesters.

BI 316 - Plant Taxonomy CAB3 (F), CAB5 (S), CAB2 (B) 4 credits
A general survey of the taxonomy and evolution of vascular plants, emphasizing herbaceous plants. Recognition of plant families, identification of species, and principles of collecting and preserving are stressed. Classroom 3 hours, laboratory 3 hours. Prerequisite: BI102 or permission of instructor. Offered even-numbered fall semesters.

BI 325 - Invertebrate Zoology [CAB1 (A), CAB3 (F), CAB5 (S), CAB6 (Z)] 3 or 4 crs
A fundamental course designed to give the student a general knowledge of the structure, physiology, life histories, and ecology of the invertebrate animals. Requires dissection of living and preserved animals. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI101, 102. Offered even-numbered fall semesters.

BI 326 - Natural History of the Vertebrates [CAB3 (F), CAB5 (S), CAB6 (Z)] 4 credits
A study of the classification, identification, and ecology of the vertebrates with special emphasis on the local fauna. Collection and preservation of organisms is an integral part of the course. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI101, 102. Offered odd-numbered fall semesters.

BI 330 - Immunology [CAB4 (P)] 4 credits
A course presenting the basic principles of immunology, including antigen-antibody characteristics, the role of the immune system in defense and disease, and the application of fundamental concepts in the development of new technologies and immunodiagnosis. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI101, 102 or BI215, 216, and 1 year of college chemistry. Offered odd-numbered spring semesters.

BI 341 - Plant Anatomy [CAB1 (A), CAB2 (B), CAB3 (F), CAB5 (S)] 4 credits
The anatomy of vascular plants analyzed from an evolutionary viewpoint. Cell structure, tissues, their distribution in roots, stems, leaves and reproductive organs,
and plant development are stressed. Classroom 3 hours, laboratory 3 hours. Prerequisite: BI102 or permission of instructor. Offered odd-numbered spring semesters.

**BI 351 - Dendrology & Silvics** [CAB1 (A), CAB2 (B), CAB3 (F), CAB5 (S)] 4 crs
An introduction to major woody plant species in the Northeast, including taxonomic characteristics, life histories, habitat requirements, and economic importance. Classroom 3 hours, laboratory and/or field work 3 hours. Prerequisite: BI102 or permission of instructor. Offered odd-numbered fall semesters.

**BI 360 - Pathophysiology** 3 credits
The study of human illness with primary emphasis on the pathogenesis of disease, its disruption of normal physiology, and the body's mechanism for restoring the steady state. The biology of the disease process is examined at the molecular, cellular, tissue, organ, and organ system level. Classroom 3 hours. Prerequisites: BI215 & BI216 with “C” or higher or permission of instructor. Offered fall semesters.

**BI 364 - Pathophysiology in Sports Medicine** 4 credits
The study of human pathology with primary emphasis on the pathogenesis of those pathological states most commonly encountered in sports medicine, their disruption of normal physiology and the body’s mechanism for restoring the steady state (homeostasis). The biology of the disease process is examined at the molecular, cellular, tissue, organ and organ system level. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI215 & BI216 with "C" or higher, or permission of instructor. Offered even-numbered spring semesters.

**BI 370 - Introduction to Neuroscience** 4 Credits
An interdisciplinary course designed to introduce the structure and function of the mammalian nervous system. Topics include, but are not limited to, neuronal development, sensory and motor systems, chemical control of the brain and behavior, and the underlying mechanisms of neurodegenerative disease. May require dissection of living animals. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI101 and either BI215 or PY230. Offered fall semesters.

**BI 399 - Topics in Biology** 4 credits
3 lecture hours and 2 lab hours

**BI 401 - Senior Seminar** 3 credits
This is the capstone course that integrates reading, writing, speaking and critical thinking skills. It includes instruction in scientific writing, use of contemporary scientific biological literature, library research techniques, and requires a major paper considering ethics in science and research. Students will prepare research papers on current topics using primary sources and give oral presentations on their topics to the department faculty. Classroom 3 hours. Prerequisites: senior class standing or permission of the instructor. Offered fall semesters.

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Revised October 2012-Posted 10/2012
BI 405 - Ecology CAB3 (F) 3 or 4 credits
The interrelationships between living organisms and their total environment are studied through a combination of lecture, laboratory and field studies. Major concepts include ecosystem structure and function, community development, species diversity, succession, interspecific and intraspecific relationships, competition, predation, behavior, population growth and regulation. Collection and preservation of plants and animals may be required. Classroom 3 hours. If taken for four credits also laboratory and/or field work 3 hours. Prerequisites: BI101, 102. Offered fall and spring semesters.

BI 418 - Medical Microbiology [CAB4 (P), CAB5 (S)] 4 credits
A study of pathogenic microorganisms including their general characteristics, physiology, pathogenesis, pathology, diagnosis, treatment, immunity, prevention, and control. Laboratory exercises are designed to familiarize students with diagnostic procedures used in the clinical microbiology laboratory. Classroom 2 hours, laboratory 4 hours. Prerequisite: BI220 or BI240. Offered even-numbered spring semesters.

BI 424 - Woodland Ecology and Management [CAB3 (F), CAB2 (B)] 4 credits
A review of biotic and abiotic factors controlling the forest environment, methods for determining vegetation structure and succession, introduction to major forest associations in the Northeast, and consequences of various harvesting and management techniques. Classroom 3 hours, field studies 3 hours. Prerequisites: BI351 or BI316, or permission of instructor. Offered even-numbered spring semesters.

BI 440 - Reading and Research 3 or 4 credits
Independent study under the supervision of a department faculty member. Open to junior and senior majors with permission of instructor. BI440 may be taken no more than twice, for a maximum of 7 credits. Students requesting this course must have a 3.0 GPA in biology courses or departmental approval. An approved topic, a brief outline of the research to be conducted, and a signature from a biology mentor must be submitted to the department chair before the end of the drop-add period of the enrolled semester.

BI 450 – Internship in Biology 3 or 4 credits

Graduate Business Continuity Management

BC 510 - Foundations of Business Continuity Management 6 credits
This seminar introduces students to the field of Business Continuity Management with an emphasis on the steps needed to develop a business continuity plan and risk management program. Students will learn about the functions and goals of a business continuity manager, and will experience first-hand the challenges of developing a continuity plan. Weekly sessions target the major steps in plan development such as project initiation, risk and business impact analysis, risk mitigation and control strategy development and implementation, response strategies, plan testing, as well as the organizational structure needed to sustain a continuity program over time.
BC 511 - Continuity of Government Operations  
This course teaches all of the elements needed to develop a Continuity of Operations plan for a governmental agency. The topics include organizational analysis, risk and threat analysis, mitigation.

BC 520 - Principles of Incident Management and Emergency Response  
This seminar teaches how to develop a plan for responding to a business disruption. Topics will include response procedures, notification, communication, and event management. Students will also learn how to manage public perceptions, and work with outside agencies and public sector emergency responders during and after an incident.

BC 521 - Public Sector Incident Management and Emergency Response  
This course teaches how to respond to incidents that effect governmental agencies. The topics include developing a response plan, emergency operations centers, emergency communication, and working with the first responder community. Students will also learn how to develop off-site backups and work areas, and how to get people and equipment in place for continuing operations during an emergency.

BC 530 - Developing the Resilient Organization  
One of the greatest challenges facing a continuity professional is to create a culture that supports organizational resiliency at all levels. The business continuity professional must bring together disparate constituencies to participate in an organization-wide resiliency program. This seminar teaches how to analyze an organization and work within its structure to create continuity policies and procedures. The seminar also examines leadership principles and how to effect change within an organization.

BC 540 - Business Continuity Risk Management  
This seminar examines the various aspects of risk management. Students will learn how to perform a risk assessment and then use that information to do a Business Impact Analysis. Students will also learn how to express risk in terms that will help to inform planning. The process will include defining Recovery Time Objectives (RTO) and Recovery Point Objectives (RPO) for response. Students will then learn how to differentiate between different types of control strategies by considering their value, viability, and appropriateness specific to their company.

BC 550 - Information Systems Continuity  
Information systems are the backbone of the modern corporation, and often its greatest vulnerability. Yet very often there is often a gulf within the organization between those responsible for continuity of operations and those responsible for IT systems. This seminar bridges that gulf by providing business continuity professionals with an understanding of information security and IT continuity principles. Students will understand the convergence of physical and information security to support the
development of a comprehensive, organization-wide, risk management and business continuity system to supports all functions within an organization.

**BC 560 - Implementation: Awareness Programs and Testing**  
6 credits

This seminar discusses the various types of education and empowerment activities that support testing and implementation of a continuity program. Students will learn different training approaches and how to engage and sustain cooperation from management, specialized teams, and general employees. Students will also delve into best practice recommendations for testing and exercising the company plan or isolated components, as well as how to use the results to continually improve the plan over time.

**Chemistry**

**CH 100 – Introduction to Forensic Science**  
4 credits

An introductory survey course of Forensic Science/Criminalistics. The course will focus on scientific principles behind the recognition, collection, preservation, analysis, and interpretation of physical evidenced found at a crime scene. The emphasis will be put on providing students with an understanding of the capabilities and limitations of forensic science as it is currently practiced. Lecture 3 hours, laboratory 3 hours. Recommended for students not majoring in science and engineering. Offered fall and spring semesters.

**CH 103 - General Chemistry I**  
4 credits

Introduction to chemical characteristics and behavior, stressing atomic structure, stoichiometry, chemical equilibrium and kinetics, and descriptive chemistry of important elements. Laboratory includes qualitative and quantitative exercises, and syntheses. Lecture 3 hours, laboratory 3 hours. Credit will not be granted for more than one of the following sequences: CH103-CH104, CH111-CH112, or CH103-CH112. Prerequisites: One year of high school chemistry; a score of 2 or better on the Norwich University Mathematics Placement Test or a "C" or better in MA103. Offered fall semesters.

**CH 104 - General Chemistry II**  
4 credits

Continuation of the study of chemical characteristics and behavior, stressing atomic structure, stoichiometry, chemical equilibrium and kinetics, and descriptive chemistry of important elements. Laboratory includes qualitative and quantitative exercises, and syntheses. Lecture 3 hours, laboratory 3 hours. Credit will not be granted for more than one of the following sequences: CH103-CH104, CH111-CH112, or CH103-CH112. Prerequisite: CH103. Offered spring semesters.

**CH 111 - Chemistry and the Chemical World**  
4 credits

Entry-level chemistry course introducing the non-science major to chemistry's impact upon the modern world. Qualitative interpretation of chemistry's role in areas of societal concern such as natural resources, environmental quality and pollution, and nuclear and alternative energy forms. Laboratory work will include qualitative as well
as quantitative investigations. Lecture 3 hours, laboratory 3 hours. Credit will not be granted for more than one of the following sequences: CH103-CH104, CH111-CH112, or CH103-CH112. Recommended for students not majoring in science and engineering. Prerequisite: Score of 1 or better on the Norwich University Mathematics Placement test or successful completion of MA005. Offered spring semesters.

CH 112 - Living Chemistry 4 credits
Introduces practical aspects of organic and biochemistry and will include applied areas of biochemistry, such as drugs and chemical therapy, nutrition and food additives, toxicology, and consumer chemistry. Laboratory emphasis directed toward synthetic and analytical techniques as applied to these areas. Lecture 3 hours, laboratory 3 hours. Credit will not be granted for more than one of the following sequences: CH103-CH104, CH111-CH112, or CH103-CH112. CH112 may not be taken for credit after successful completion of CH205. Recommended for students not majoring in science or engineering. Prerequisites: CH111 or CH103, or one year of high school chemistry taken within last five years, or by permission of the instructor; score of 1 or better on the Norwich University Mathematics Placement Test or successful completion of MA005. Offered fall semesters.

CH 204 - Quantitative Analysis 4 credits
A course on the general principles and laboratory practices of quantitative analysis, applied principally in colorimetric and volumetric determinations. Studies of theory and practical procedures associated with gravimetric analysis, potentiometric titrations, and use of pH-meters. Lecture 3 hours, laboratory 6 hours. Prerequisites: CH103, 104. Offered spring semesters of odd numbered years.

CH 205 – Survey of Organic Chemistry 4 credits
An introduction to the covalent compounds of carbon. Laboratory work involves elementary manipulation of organic laboratory equipment, preparation and identification of typical organic compounds, and the characteristics of the major functional groups. Lecture 3 hours, laboratory 3 hours. Prerequisites: CH103-104. Offered fall semesters of odd numbered years.

CH 214 - Communication in Chemistry 1 credit
This course illustrates the organization of the chemical literature, the efficient search of the literature and a formal introduction to scientific writing. Lecture 1 hour. Offered fall semesters of even years.

CH 225 - Organic Chemistry I 4 credits
An introduction to the study of carbon compounds; preparation and identification of typical compounds. Lecture 3 hours, laboratory 3 hours. Prerequisites: CH103-104 or by petition. Offered fall semesters.
CH 226 - Organic Chemistry II 4 credits
A continuation of the study of carbon compounds; preparation and identification of typical compounds. Lecture 3 hours, laboratory 3 hours. Prerequisite: CH225. Offered spring semesters.

CH 314 - Instrumental Methods 3 credits
A course on the theory of modern instrumental methods. Lecture 3 hours. Prerequisites: CH204 required, CH327-328 recommended. Offered spring semesters of even numbered years.

CH 315 - Analysis Laboratory 1 credit
A course that provides upper class laboratory experience in chemical methods of measurement and analysis. Laboratory 3 hours. Prerequisite: CH204. Offered spring semesters of even numbered years.

CH 324 - Biochemistry I 3 or 4 credits
A course on the chemical phenomena and energy effects in life processes. Topics include structure and function of biomolecules, metabolism (catabolism and anabolism), photosynthesis and recombinant DNA technologies. Lecture 3 hours, laboratory 3 hours. Prerequisites: CH103-104, and either CH205, CH226 or concurrent enrollment in CH226. Offered even numbered spring semesters.

CH 325 - Biochemistry II 3 or 4 credits
A continuation of the study of the chemical phenomena and energy effects in life processes. Topics include structure and function of biomolecules, metabolism (catabolism and anabolism), photosynthesis and recombinant DNA technologies. Lecture 3 hours, laboratory 3 hours. Prerequisite: CH324. Offered even numbered fall semesters.

CH 327 - Physical Chemistry I 3 credits
A course on the physical properties and structure of matter; general principles and theories of chemical interaction. Major areas studied are chemical applications of thermodynamics; phase equilibria; electrochemistry; reaction kinetics; description of electronic structure of atoms and molecules. Lecture 3 hours. Prerequisites: CH103-104; prerequisite or concurrent enrollment in college physics (recommended). Offered even numbered fall semesters.

CH 328 - Physical Chemistry II 3 credits
A continuation of the study of the physical properties and structure of matter; general principles and theories of chemical interaction. Major areas studied are chemical applications of thermodynamics; phase equilibria; electrochemistry; reaction kinetics; description of electronic structure of atoms and molecules. Lecture 3 hours. Prerequisite: CH327. Offered odd numbered spring semesters.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 337</td>
<td>Physical Chemistry Laboratory I</td>
<td>1</td>
<td>Laboratory investigations with written formal reports on the physical properties and chemical behavior of substances. Laboratory 3 hours. Prerequisite or concurrent enrollment: CH327. Offered even numbered fall semesters.</td>
</tr>
<tr>
<td>CH 338</td>
<td>Physical Chemistry Laboratory II</td>
<td>1</td>
<td>Laboratory investigations with written formal reports on the physical properties and chemical behavior of substances. Laboratory 3 hours. Prerequisite or concurrent enrollment: CH328. Offered odd numbered spring semesters.</td>
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<tr>
<td>CH 413</td>
<td>Chemistry Seminar</td>
<td>1</td>
<td>Part of a capstone experience that provides individual assignments, written reports, oral reports, and class discussions on chemical topics of current interest. Reading, writing, speaking and critical thinking skills are emphasized. Lecture 1 hour. Prerequisites: CH225-226, CH327-328. Offered fall semesters.</td>
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<tr>
<td>CH 421</td>
<td>Chemical Synthesis and Examination I</td>
<td>3</td>
<td>A capstone experience in which organic, inorganic and compounds of biological interest are synthesized and examined with respect to purity and properties. The objectives are to develop an integrated perspective on the general field of chemistry and to develop proficiency in practical laboratory procedures and in reporting results. Laboratory and occasional lectures 8 hours. Prerequisite or concurrent enrollment in: CH226, CH328. Offered fall semesters.</td>
</tr>
<tr>
<td>CH 422</td>
<td>Chemical Synthesis and Examination II</td>
<td>3</td>
<td>A capstone experience in which organic, inorganic and compounds of biological interest are synthesized and examined with respect to purity and properties. The objectives are to develop an integrated perspective on the general field of chemistry and to develop proficiency in practical laboratory procedures and in reporting results. Laboratory and occasional lectures 8 hours. Prerequisites or concurrent enrollment in: CH226, CH328. Offered spring semesters.</td>
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<tr>
<td>CH 425</td>
<td>Thesis</td>
<td>1-3</td>
<td>This course allows the student to conduct research on a project approved by the faculty of the Chemistry and Biochemistry Department. The student can be expected to perform the necessary experiments, organize and interpret the data and to communicate the results of the project with a comprehensive report. Prerequisites: CH226, or concurrent enrollment in: CH328, CH438. Permission of the department faculty is also required. The student may re-enroll in CH425 for up to 6 credits.</td>
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<tr>
<td>CH 438</td>
<td>Advanced Inorganic Chemistry</td>
<td>3</td>
<td>A course on the chemistry of the elements: properties, characteristics, and behavior. Lecture 3 hours. Prerequisites: CH327-328. Offered fall semesters of odd numbered years.</td>
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</table>
CH 439 - Advanced Organic Chemistry  3 credits
An advanced and thorough development of topics introduced in CH225-226. Lecture 3 hours. Prerequisites: CH225-226. Offered on occasion.

CH 440 – Advanced Physical Chemistry  3 credits
An advanced and thorough development of topics introduced in CH 327-328. 3 lecture hours. Prerequisites: CH 327-328. Offered on occasion.

CH 450 - Topics in Chemistry  3 credits
A course in which a selected limited topic in advanced chemistry is covered in depth. Prerequisite: permission of the instructor. Offered on occasion.

Civil Engineering

CE 211 - Surveying  3 credits
A course in the theory and practice of plane surveying. Horizontal and vertical control, design of circular and parabolic curves, tachometry, construction surveys and earthwork quantities are covered in lecture. Fieldwork presents the practical applications of lecture material with the use of transits, tapes, levels, electronic distance measuring devices and theodolites. Classroom 2 hours, laboratory 3 hours. Prerequisite: MA107.

CE 214 – Site Development and Engineering  4 credits
A course that teaches the tasks and considerations involved in environmentally sound land development. Road design and its interaction with development sites will be presented. Other topics covered include contours, drainage utilities, cut and fill, and aesthetic considerations. Codes and legal requirements will also be covered. CADD (Computer Aided Drawing and Design) software specific to Civil Engineering work will be introduced and employed extensively on student projects. Classroom 3 hours, laboratory 3 hours. Prerequisites: CE 211.

CE 220 - Introduction to Environmental Technology  3 credits
A study of the fundamentals of environmental control technology. The course covers the topics of air pollution, water pollution, solid and hazardous wastes, and radioactive wastes. Noise pollution and control are also covered. The generation and treatment of wastes along with their effects on the environment are included in the course. The laboratory includes the basic methods of measuring pollution. Three Credits: Classroom 3 hours. Four Credits Classroom 3 hours, laboratory 2 hours. Prerequisite: CH103 or CH111. Not open to engineering students.

CE 318 – Soil Mechanics  3 credits
An introduction to the engineering properties of soil: soil classification; soil structure and mineralogy; water flow through soils; compressibility and consolidation; shear strength. Laboratory testing of soils and soil exploration. Offered to allow students from other institutions to transfer 3 credit equivalent courses.
CE 321 - Materials Laboratory 1 credit
A laboratory course in the application of basic mechanics of materials principles to cement, aggregate, concrete, steel and wood. Operation of various types of testing machines and gauges. Tests of tension, compression, flexure, torsion, impact, shear, hardness and fatigue. Laboratory observations, analysis, interpretation and reports. Classroom 1 hour, laboratory 2 hours. Co-requisite: EG301 or CE351.

CE 322 - Fluid Mechanics Laboratory 1 credit
A laboratory course in which the principles of fluid mechanics are applied to civil engineering problems. The design and implementation of a laboratory research study, the analysis of data, the presentation of results, and the development of engineering conclusions are integral parts of this course. Lab topics include hydrostatics, pipe-flow, open channel flow, flow measurement, and resistance to flow. Classroom 1 hour, laboratory 2 hours. Prerequisite or concurrent enrollment: EG303.

CE 328 - Soil Mechanics 4 credits
An introduction to the engineering properties of soil: soil classification; soil structure and mineralogy; water flow through soils; compressibility and consolidation; shear strength. Laboratory testing of soils and soil exploration. Classroom 3 hours, laboratory 2 hours. Prerequisite: EG301 or permission of the instructor.

CE 332 - Engineering Hydrology 3 credits
A study of the location, movement, and distribution of the waters of the earth for practical applications to society. This course includes the study of the engineering aspects of precipitation, evaporation, infiltration, stream-flow and flood and drought prediction. The application of hydrological statistics and computer applications are stressed. Classroom 3 hours. Prerequisite or concurrent enrollment: EG303 or permission of the instructor.

CE 348 - Structural Analysis 4 credits
A course on the analysis of statically determinate and indeterminate beams, frames and trusses. Topics include loads to buildings, shear and moment diagrams, influence lines and classical methods of analysis. Computer applications are introduced using a general frame analysis program. The use of analysis in the overall design process is stressed using a semester-long project. Classroom 4 hours. Prerequisite: EG301.

CE 351 - Statics and Mechanics of Materials 4 credits
A study of elementary, primarily two-dimensional engineering mechanics. Fundamental concepts and basic laws of statics, force systems, structures, and support reactions for loading patterns. Stress-strain relationships to forces: concepts and applications. Consideration of engineering materials and their suitability in various structures and mechanisms. Classroom 4 hours. Prerequisites: MA107 and PS201. Not open to engineering students.
CE 419 - Foundation Engineering 3 credits
A course on the use of soil properties to determine bearing capacity and settlement of shallow and deep foundations. Design of earth and earth supporting structures. Classroom 3 hours. Prerequisite: CE328 or permission of the instructor.

CE 421 - Sanitary Engineering 4 credits
Sources, quantities and constituents of water and wastewater are examined and their interaction with the environment is developed. Design of chemical, physical and biological treatment facilities according to current practice is stressed. The laboratory develops standard methods of chemical, physical and biological examination and analysis. Classroom 3 hours, laboratory 3 hours. Prerequisites: EG303 and CH104.

CE 422 - Water and Wastewater Treatment 3 credits
A study of physical, chemical and biological processes for water and wastewater treatment. The course emphasizes the evaluation of unit processes and the design of water and wastewater treatment facilities. Classroom 3 hours. Prerequisite: CE421.

CE 432 - Solid and Hazardous Waste Engineering 3 credits
A course on the state-of-the-art techniques for disposal of solid and hazardous waste material. Aspects covered will be system design, public health protection, and environmental protection. Classroom 3 hours. Prerequisites: CH104 and junior or senior status in engineering or science.

CE 433 - Groundwater Hydrology 3 credits
A course that covers the basic principles of groundwater flow and modeling, its development as a water source, prevention of groundwater contamination and contaminated groundwater remediation. Classroom 3 hours. Prerequisite: CE328 or permission of the instructor.

CE 441 - Transportation Engineering 3 credits
The planning, design, and construction of transportation systems to meet the mobility requirements of society while considering economic, environmental, and societal constraints. System maintenance and administration are also included. Classroom 3 hours. Prerequisite: CE211 or permission of the instructor.

CE 442 - Design of Steel Structures 3 credits
An introduction to the design of steel structures using the LRFD-AISC code as the basis. Topics include design of tension, compression and bending members; bolted and welded connections. Classroom 3 hours. Prerequisite: CE348.

CE 444 - Reinforced Concrete Design 3 credits
An introduction to the design of reinforced concrete members under bending, shear and axial loadings according to ACI 318R code requirements. Topics also include one-way slabs, footings and retaining walls and an introduction to pre-stressed concrete. Use of the computer as a design tool is introduced. Classroom 3 hours. Prerequisite: CE348.
CE 450 - Air Pollution Control 3 or 4 credits
A course presenting sources of air pollution and the effect on the environment, the measurement of air pollutants, modeling of air pollutant dispersion, and design of control measures. Use of manual monitoring techniques and physical and chemical fundamentals to measure air quality. Course may be taken for three credits without the lab. Classroom 3 hours, laboratory 3 hours. Prerequisite: EG206.

CE 451 - Air Pollution Control Equipment Design 3 credits
This course builds on and amplifies material studied in CE450. Properties of air pollutant emissions and thermodynamics, fluid mechanics and heat transfer principles are utilized to design air pollution control equipment. Several major design projects are undertaken by student teams; interim and final design reports are required. In addition, a module on air quality modeling is included. Classroom 3 hours. Prerequisite: CE450.

CE 452 - Introduction to Air Pollution Control 3 credits
A course presenting sources of air pollution and the effect on the environment, the measurement of air pollutants, modeling of air pollutant dispersion, and design of control measures. Classroom 3 hours, laboratory 3 hours. Prerequisite: EG206

CE 455 - Structures I 3 credits
This course builds directly on the material learned in CE351 and is specifically directed to the study of the response of structural systems to various loadings. Gravity and lateral loads as well as load combinations on a structure are developed using appropriate building codes. The response of the structural system to imposed loading is studied by classical and computer analysis techniques. Finally, this course introduces the students to the design of simple steel structures that meet the appropriate building code. Classroom 3 hours. Prerequisite: CE351. Not open to engineering majors.

CE 456 - Structures II 3 credits
This course is intended to introduce the students to and develop an understanding of, structural design of wood, concrete and masonry. Particular attention will be given to failure modes of the member types and materials. Each of the principal member types, beam and column as well as connections, will be studied and members designed to meet the appropriate code. Classroom 3 hours. Prerequisite: CE455. Not open to engineering majors.

CE 457 - Wood, Steel, and Concrete Structures 4 credits
This course builds directly on the material learned in CE351 and is specifically directed to the study of the response of structural systems to various loadings. Gravity and lateral loads as well as load combinations on a structure are developed using appropriate building codes. The response of the structural system to imposed loading is studied by classical and computer analysis techniques. This course introduces the students to applications -- the design of simple structures of wood, steel, concrete and
other materials that meet the appropriate building code. Classroom 4 hours. Prerequisites – CE351

CE 458 - Structural Issues for Construction 3 credits
This course is intended to introduce the students to structural building applications, and to develop knowledge and comprehension of structural design of steel, wood, concrete, and masonry. Particular attention will be given to concrete members, concrete form design requirements, steel connections, failure modes of the member types and materials. Detailed construction issues with each material will be emphasized. Each of the principal member types, beam and column as well as connections, will be studied and members designed to meet the appropriate code. Classroom 3 hours. Prerequisites – CE455 or CE 457, Wood, Steel, and Concrete Structures

CE 460 - Construction Management 3 credits
A course on the organization, scheduling and management of the construction project utilizing CPM and PERT. Survey of management functions by which construction is authorized, purchased, supervised, accomplished, inspected and accepted, including labor management relations and site design. Classroom 3 hours. Prerequisite: MA107.

CE 464 - Specifications and Estimating 1 credit
A laboratory in plan reading, quantity analysis and cost estimating of Civil Engineering projects. Students will be exposed to standard formats for specifications and estimating. Students will write sample specifications and will gain experience in construction estimation. Laboratory 3 hours. Prerequisites: CE211 and CE460.

CE 475 - Senior Project Planning 1 credit
Each student will work with a mentor and together will define and analyze a project so that an efficient design can be completed. The project scope will be developed, tasks will be laid out, and a schedule to complete the project will be created. All of this will be presented orally and in written form in a project proposal. Prerequisite: Senior status. Co-requisite: CE460.

CE 480 - Senior Design 3 credits
A capstone course in civil engineering. This course builds on and integrates the engineering concepts developed in prior course work into the complete design of a major civil engineering project. The course will require a written and an oral presentation of the completed design to include, where appropriate, plans and specifications. Prerequisites: CE328, CE348, and CE421, or departmental approval. 3 lecture hours

CE 490 - Advanced Topics 1 to 4 credits
A course that provides instruction in an area of the instructor’s special competence and student interests. Advanced topics would be presented in such areas as air pollution control, water and wastewater treatment, bioremediation, and nuclear radiation. Offered as the occasion demands. Prerequisite: senior standing. 3 lecture hours and 3 lab hours
CE 501 - Hydraulics for Environmental Engineers  3 credits
A review of fluid mechanics and hydraulics fundamentals. Pipe flow and networks, open channel flow, measurement techniques for fluids.

CE 503 - Fundamentals of Soil Mechanics and Foundation Engineering  6 credits
Introduction to Soil Mechanics: An introduction to the engineering properties of soils: theory of soil compression and shear strength with practical applications.
Foundation Engineering: Determination of bearing capacity and settlement characteristics of shallow and deep foundations. Design and evaluation of earth slopes and earth retaining structures. Prerequisite: Acceptance into the Master of Civil Engineering program

CE 505 - Engineering Analysis Techniques  3 credits
A fast-paced review of fundamental techniques from typical undergraduate level calculus courses. Mastery of these topics is required for success in the differential equations and engineering analysis courses in the MCE program.

CE 506 - Engineering Mechanics I  3 credits
A review of engineering mechanics fundamentals from the fields of statics, dynamics, and mechanics of materials. Free body diagrams, force systems, equilibrium, geometric properties, kinematics, kinetics, stress and strain.

CE 507 - Fundamentals of Structural Engineering  6 credits
A review of the basic concepts of structural engineering that form the required background for later courses. Types of structures, construction materials, structural design, and safety issues are discussed. Students will become familiar with a number of typical structural design calculation methods for later use.

CE 509 - Fundamentals of Environmental/Water Resources Engineering  6 credits
A review of the basic concepts of environmental and water resources engineering that form the required background for later courses. Basic concepts from environmental chemistry, ecology, biology, microbiology, geology, and soil science along with an introduction to environmental engineering field. Designed to prepare students for entry into the Environmental Engineering sequence of the Master of Civil Engineering program.

CE 511 - Analytical Methods and Project / Business Management Fund I  6 credits
The Analytical Methods portion of the course includes first and second order differential equations, basic matrix algebra with emphasis on solving systems of equations and understanding eigenvalues and eigenvectors, numerical techniques for solving both differential and algebraic equations, and an introduction to partial differential equations. In addition to solving problems by hand, students will also be
using software tools. The Project and Business Management Fundamentals I portion of the course is an examination and understanding of issues related to organizational behavior and leadership in complex environments, such as engineering firms or construction project teams. The concepts of individual and group behavior, motivation, decision-making, team and organizational dynamics, communication, and leadership are explored to provide a conceptual foundation for future management and leadership roles.

CE 523 - Intermediate Soil Mechanics and Foundation Engineering 6 credits
Intermediate Soil Mechanics: General principles of soil mechanics and their applications, including soil structure, mineralogy, fluid flow through porous media, shear strength, slope stability, primary consolidation and secondary consolidation. Classical earth pressure theories. Subjects will be presented from a theoretical perspective and include practical applications.
Foundation Engineering: Analysis of shallow and deep foundations including bearing capacity and settlement of shallow footings, floating foundations, drilled piers and piles. Analysis of stability and design of retaining walls and anchored bulkheads. Prerequisite: EG 501 (Engineering Mathematics) or permission of Program Director

CE 525 - Physiochemical & Biological Processes in Water & Wastewater Treat 6 credits
Physical, chemical, biological, and advanced treatment unit processes. This course will cover basic physical, chemical and biological concepts, reactor kinetics, water and wastewater qualities and quantities, and physical, chemical, and biological unit processes. Design of individual unit processes and integration of unit processes into treatment trains capable of meeting treatment objectives will be emphasized. Prerequisite: EG 501.

CE 528 - Classical, Matrix, and Dynamic Analysis of Structures 6 credits
This course addresses two tracks of analysis. First, static analysis is investigated with advanced classical methods and with matrix methods, the cornerstone of the finite element method. Second, dynamic analysis is presented using both classical and matrix approaches for single and multiple degree of freedom systems. Analysis issues related to design codes are addressed for both static and dynamic conditions. The use of commercially available software is introduced. Prerequisite: EG 501.

CE 529 - Information Technology 6 credits
This course develops a base level competency in a host of project management software products. Virtual Design and Construction applications as well enterprise wide IT solutions will be examined. In addition it develops an understanding of the importance of integrating an information technology strategy across all aspects of the project and the organization. Prerequisite: EG 501 (Engineering Mathematics) or permission of Program Director
CE 533 - Earthquake Engineering and Soil Stabilization 6 credits
Earthquake Engineering: Evaluation of geotechnical earthquake hazards and mitigation. Plate tectonics, seismicity, wave propagation, characterization of ground motions, theory of vibrations, effect of local soil conditions on ground response, development of design ground motions, liquefaction, dynamic lateral earth pressures, slope stability and deformation, earthquake design codes. Soil Stabilization: The application of mineralogical and physicochemical principals to soil stabilization problems, and stabilization techniques for highway and foundation applications. Prerequisite: CE 523 (Intermediate Soil Mechanics and Foundation Engineering) or permission of Program Director

CE 535 - Stormwater Management & GIS Applications for Water Resources 6 credits
Stormwater management issues, from both flood control and water quality points of view, are integral water resource components associated with land development, urbanization, and watershed hydrology. This course will examine rainfall-runoff relationships (including statistical analysis), channel and basin routing, stormwater treatment, low impact development, best management practices, and wetland utilization and benefit/cost ratio analysis. Geographic Information Systems software will be introduced and applied for examining and analyzing decision-making processes involved with the stormwater management components of the course.

CE 538 - Design of Steel and Timber Structures 6 credits
An exploration of advanced structural design issues in the areas of both steel and timber. Using the latest provisions from the American Institute of Steel Construction and the National Design Specification for Wood Construction the course will cover the design and behavior of 2-D and 3-D framing, framing members and connections under various loading conditions, including wind and seismic. Strength and serviceability issues.

CE 539 - Contracts and Insurance 6 credits
This course addresses the risk characteristics of various contractual forms and the place that insurance and surety plays in the AEC arena. The emergence of new contractual forms from AIA and the ConsensusDocs require a new perspective on contracts and the project organization. This seminar will develop a strategic understanding of contract variables that span plans and specs to Integrated Project Delivery. Prerequisite: CE 529 (Information Technology) or permission of Program Director

CE 541 - Project / Business Management Fundamentals II 6 credits
An examination and understanding of: (1) the metrics employed in the planning and management of projects and (2) issues related to planning the formal structure of an engineering project. The planning and management metrics that will be examined include accounting, financial, and scheduling techniques that link monetary and temporal project issues. Contract systems will be analyzed as a basis for understanding the owner-engineer-contractor relationships. Altogether these
techniques will bring an understanding of the project environment that strives to optimize project performance throughout the entire life cycle.

**CE 553 - Computer Modeling in Geotechnical Engineering and Geotechnical Case Histories**  
6 credits  
Survey of computer methods and applications for analysis of complex geotechnical engineering problems. Finite element, finite difference and closed form solution techniques, modeling applications. Review of select geotechnical engineering case studies. Prerequisite: CE 533 (Earthquake Engineering and Soil Stabilization) or permission of Program Director

**CE 555 - Geoenviromental Engineering-Groundwater Flow & Waste Containment**  
6 credits  
This course approaches the field of geoenvironmental engineering from two points of view: groundwater flow and contaminant transport issues and the principals related to solid waste disposal and containment. The groundwater portion of the course will focus on flow and contaminant transport including aquifer properties, principles of ground-water flow, flow into wells, soil moisture and ground-water recharge, regional ground-water flow and the advection, diffusion and attenuation of ground-water contaminants. The solid waste portion of the course will focus on landfill siting, design and construction. Material properties and engineering design of geosynthetic components including geomembranes, geotextiles, geocomposites, and geosynthetic clay liners. Methods to estimate and design landfill leachate quantities and gas generation. The course will also spend time formulating proposals for the student’s upcoming capstone design project in Seminar Six.

**CE 558 - Design of Reinforced and Prestressed/Precast Concrete Structures**  
6 credits  
This course focuses on advanced topics in reinforced concrete design and an introduction to prestressed / precast concrete using the provisions of the American Concrete Institute. Beams, slabs, columns, deflections, analysis and design of prestressed members, loss calculations, use of standard precast members. Design and detailing for seismic loads. The course also includes an introduction to Geographic Information Systems as they apply to the structural engineering field and will spend time formulating proposals for the student’s upcoming capstone design project in Seminar Six.

**CE 559 - Project Finance and Accounting**  
6 credits  
This course focuses on understanding project risk and financial performance across all project participants. It will address traditional financial arrangements as well as new models such as the Special Purpose Entity (SPE) and Public Private Partnerships (PPP). This seminar will enable the student to address the ever increasing complexity of the financial arena. Prerequisite: CE 539 (Contracts and Insurance) or permission of Program Director
CE 561 - Capstone Design Project
and Utility System Fundamentals 6 credits
This six credit hour course has two parts: an in-depth capstone design project and an introduction to utility systems. Civil engineering projects have always had social, political, economic, and environmental impacts. The capstone design project requires you to anticipate these impacts prior to project implementation. As the engineer in a leadership position you will direct the project from conception to completion. This includes the preparation of a comprehensive project business plan that will include project goals, political hurdles, anticipated revenues and expenses, marketing, facility design, etc.; all pertaining to the design of a major civil engineering project. In addition to the capstone design project you will learn about a topic neglected in most undergraduate civil engineering programs, utility systems. This portion of the course will provide an overview of the fundamentals of utility systems: heating, ventilation, and air conditioning equipment; power supply systems and equipment; lighting, communication, and security systems; plumbing systems and equipment.

CE 571 - Elementary Geotechnical Tools Laboratory 1 credit
Survey of techniques for classification of soils, assessment of hydraulic properties, consolidation, and assessment of shear strength parameters of soils. Field experience in geotechnical exploration. Corequisite: CE 503 (Fundamentals of Soil Mechanics and Foundation Engineering) or permission of Program Director

CE 572 - Intermediate Geotechnical Tools Laboratory 1 credit
Survey of techniques for assessing permeability of soils using the flexible wall apparatus, Proctor compaction and triaxial shear testing. Field visit to geotechnical project site. Prerequisite: CE 553 (Numerical Methods in Geotechnical Engineering) or permission of Program Director

Criminal Justice

CJ 101 - Introduction to Criminal Justice 3 credits
A general survey of the principles, system, and process of criminal justice. Introduction to conceptions and definitions of crime, criminal law, and due process. Examination of the organization and operation of the three basic components of the criminal justice system -- the police, the courts, and corrections -- individually and in relationship to one another. Offered in fall semester. 3 lecture hours

CJ 102 - Substantive Criminal Law 3 credits
This course presents the development of criminal law in the United States and discusses its principles, sources, distinctions, and limitations. The following topics are covered in detail: criminal liability; offenses against persons, property, public peace and public justice; preparatory activity crimes; and defenses available to those charged with criminal activity. Offered spring semester. 3 lecture hours
CJ 201 - Criminology 3 credits
This course covers the various biological, psychological, and sociological types of theory that have been offered to explain the incidence of crime in society. Various types of crime, including violent, property, corporate, political and victimless crime, methods of studying crime, and characteristics of criminals are also examined. Offered spring semester. 3 lecture hours

CJ 209 - Methods of Social Science Research 3 credits
An examination of the methodological foundations of the social sciences; the logic and technique of empirical inquiry; the nature of social facts, the operationalization of concepts, and the construction of hypotheses; research designs including questionnaires, interviews, experiments, observation, and evaluation; the organization and analysis of data; graph and table construction and interpretation; the common problems of empirical social research; and research ethics. Emphasis given to criminal justice applications. Cross-listed with SO209. Offered fall semester. 3 lecture hours

CJ 300 - Topics in Criminal Justice 3 credits
Selected topics offered on occasion. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

CJ 301 - Criminal Procedure 3 credits
This course addresses the legal procedure connected with arrest, search and seizure, identification and questioning, bail setting, indictments, and plea bargaining. Offered fall semester. 3 lecture hours

CJ 304 – Juvenile Delinquency
An examination of the social and psychological dimensions of juvenile delinquency, its nature, extent, distribution, and patterns. Evaluation of theories and explanation of delinquent causation, and the investigation of delinquent subcultures. Consideration of labeling and conflict factors in the processing, prevention, and treatment of delinquents. Prerequisite: CJ 101. 3 lecture hours

CJ 305 - Juvenile Justice 3 credits
A general survey of the philosophy, system and process of juvenile justice. Examination of the social and legal control of juvenile delinquency by the police, courts and corrections, as well as by private agencies. Emphasis on the distinctions in philosophy, law, jurisdiction, organization and terminology between the juvenile justice system and the adult criminal justice system. Offered every other year. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

CJ 306 - Victimology 3 credits
An examination of the role of the victim in crime and the treatment of the victim by the criminal justice system. Instruction in the use of victimization data in determining crime rates and in developing prevention programs. Review of victim assistance, restitution and compensation programs. Offered every other year. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

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Revised October 2012-Posted 10/2012
CJ 307 - Social Control and Crime Prevention 3 credits
The course will focus on crime prevention as a method of social control and will examine processes of social control as social and institutional sources of crime prevention. Examination of personal defense, environmental, situational, community, and social models of crime prevention. Offered every other year. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

CJ 308 - The Police 3 credits
A general survey of American policing and police organizations. Examination of the history of the police and the police idea, as well as structural, cultural, and social psychological analyses of police organizations. Coverage of the topics of police socialization, behavior, and discretion; routine and specialized operations; community policing; and police misconduct, accountability and change in policing. Offered fall semester. 3 lecture hours

CJ 310 - The Courts 3 credits
An analysis of America's courts, and the courtroom work group with particular attention given to the dual role of the courts in adjudicating cases and interpreting the U.S. and state constitutions. Offered spring semester. 3 lecture hours

CJ 312 - Corrections 3 credits
An analysis of the development and present structure of the correctional process in America, including detailed examination of the operational problems of correctional institutions, probation and parole practices and other community-based correctional alternatives. Offered spring semester. 3 lecture hours

CJ 314 - Restorative Justice 3 credits
This course presents a new paradigm of community justice as an alternative to the retributive model. The course examines and contrasts restorative approaches and traditional punitive responses to crime. Topics include mediation, victim-offender reconciliation, reparation for harm done to victims and the community and offender reintegration into the community. Offered every other year. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

CJ 320 - Drugs and Society 3 credits
This course focuses on the interrelationships between drugs and the social order. Issues considered include: the nature and effects of legal and illegal drugs; the determinants of drug effects, especially the social determinants; the history of drug prohibition; drug addiction and drug treatment; and drug policy. Cross-listed with SO320. Prerequisite: CJ101 or permission of instructor. Offered every other year. 3 lecture hours

CJ 341 - Cyber Law and Cyber Crime 3 credits
The course includes extensive discussion of the legal constraints, both civil and criminal, that underlie acceptable behavior using computers and networks today.
Prerequisites: CJ101 or permission of instructor. Offered in fall semester. 3 lecture hours

**CJ 400 - Independent Study** 3 credits
An opportunity for qualified upper class students to engage in an intensive research program in fields of interest not satisfactorily covered by regular course offerings. Periodic conferences will be required. Prerequisite: written consent of the instructor to a specific project presented by the applicant. Open only to criminal justice majors with a cumulative quality point average of 2.5 or better and who have grades averaging 3.0 or better in prior course work in criminal justice. Offered on occasion. Prerequisite: criminal justice major and CJ 101. 3 lecture hours

**CJ 402 - Law and Society** 3 credits
An analysis of various theoretical perspectives on the nature, courses, organization and operation of law and legal systems. Emphasis will be placed on law creation, conflict resolution, the legal profession, and the role of law in social change. Cross listed with SO402. Offered every other year. Prerequisite: CJ 101 or permission of the instructor. 3 lecture hours

**CJ 403 - Criminal Justice Administration** 3 credits
An introduction to the principles of public administration as they are applied in the operation of criminal justice agencies. This course will emphasize how such topics as organization, decision making, leadership style, personnel policy, planning, and budgeting are specifically adapted by criminal justice administrators to meet the needs of their agencies. Simulations will be used extensively as a tool for mastering administrative principles. Prerequisite: CJ101 or permission of instructor. Offered every other year. 3 lecture hours

**CJ 405 - Internship** 3 credits
This elective course permits an upper-level student to participate directly in the criminal justice process by serving as an aide to agencies involved in the process. This offering is subject to the availability of such internships. Open only to junior and senior criminal justice majors, and to senior criminal justice minors on availability. Offered fall, spring and summer. Prerequisite: criminal justice major or permission of the instructor. 3 lecture hours

**CJ 410 - Senior Seminar** 3 credits
A course dedicated to intensive research and analysis of major issues in criminal justice. Emphasis will be placed on critical thinking and evaluation of topics previously discussed during the student's academic career in the criminal justice program. Attention will also be given to professional development topics, ethics and criminal justice policy. CJ 410 meets capstone requirement. Offered spring semester. Prerequisite: criminal justice senior or junior with permission of instructor. 3 lecture hours
CJ 421 – Comparative Criminal Justice Systems 3 credits
This course examines how countries other than the United States deal with the problem of crime and its control. It begins from the classic approach of a critical analysis of the history and development of the world’s great legal traditions, and the role and structure of the criminal justice systems inside those traditions. Prerequisite: CJ 101. Offered every other year. 3 lecture hours

CJ 422 – Civil Liability in the Criminal Justice System 3 credits
This course examines the civil law that governs criminal justice agencies. As representatives of the government, Criminal Justice agencies must adhere to the Constitution and other State and Federal laws. When they fail to do so, the aggrieved party has the right to sue. This course explores the major state and federal liability theories that govern the management and daily operations of the police and correctional facilities. In addition, this course draws on your previous police, corrections and law courses to explore management issues related to civil liability. Prerequisites: CJ 101, CJ 102, CJ 301. Open only to juniors and seniors. Offered every other year. 3 lecture hours.

CJ 423 - Evidence 3 credits
The course is an in-depth examination of the rules governing the admissibility or exclusion of evidence at trial. Subjects include competency of witnesses, direct and cross-examination of witnesses, the rule against hearsay and its exceptions, expert and lay opinion testimony, privileged communications, relevancy, procedural considerations, judicial notice, burden of proof, presumptions, form and type of objections, evidence. Prerequisites: CJ 101 and CJ 102. Open only to juniors and seniors. Offered every other year. 3 lecture hours.

CJ 424 – Murder: Our Killing Culture 3 credits
This course provides a comprehensive examination of the nature and extent of both the common and unusual forms of murder in the United States. The class examines characteristics, trends, and the theoretical explanations of homicide as well as the prediction and prevention of various kinds of murder. The impact of murder on homicide survivors is also examined as well as the use of murder as entertainment in our culture. The course is designed to give students greater insight into serial, spree and mass murder, intrafamilial homicide, murder in the workplace, profiling and stalking. Although emphasis is placed on the sociological determinants of murder, psychological and biological factors are also examined. Prerequisite: CJ 101 or permission of the instructor. Open only to juniors and seniors. 3 lecture hours.

CJ 425 – Domestic Violence 3 credits
This course provides a comprehensive examination of the nature and extent of domestic violence in the United States. Theoretical perspectives used to explain intimate violence are examined as well as the social factors that are related to patterns of intimate and family abuse. The course discusses domestic violence from a historical and global perspective and is designed to provide students with a greater understanding of the impact of domestic abuse on victims/survivors and society as a
whole. Topics including child and elder abuse; the criminal justice system’s response to domestic abuse; intervention, treatment and prevention strategies; and current research in the field are addressed as well as related crimes such as sexual assault and intrafamilial homicides. Prerequisite: CJ 101 or permission of instructor. Open only to juniors and seniors. Course is offered every other year. 3 lecture hours.

CJ 442 - Introduction to Computer Forensics 4 credits
This course provides the student with an ability to perform basic forensic techniques and use appropriate media analysis software. Knowledge of the security, structure and protocols of network operating systems and devices will be covered as students learn to gather evidence in a networked environment and to image and restore evidence properly without destroying its value. The student will learn and practice gaining evidence from a computer system while maintaining its integrity and a solid chain of custody. Within the laboratory, the student will gain hands-on experience in the use of current investigative tools. Prerequisites IS228 and CJ341. Offered in spring semesters. Classroom 3 hours, laboratory 2 hours

Communications

CM 109 - Introduction to Mass Media 3 credits
The mass media are so pervasive in contemporary society that students in many disciplines will find this course valuable. It provides a comprehensive overview of the development of such media as newspapers, magazines, books, radio, television, film, recordings and the Internet. In addition, it introduces students to issues of regulatory control, audience analysis, media ethics and international mass communications. 3 lecture hours

CM 207 - Journalism I: News Gathering 3 credits
This course covers the fundamentals of news gathering, reporting, and writing on assignment. Students learn to evaluate how the media relate events. The course also treats such issues as the right to privacy, the risks of libel, and the ethical contexts of gathering information. 3 lecture hours

CM 208 - Journalism II: Advanced News Gathering and Design 3 credits
This course continues CM207 and concentrates on in-depth and investigative reporting, interviewing and feature writing, as well as basic newspaper layout and design. Students explore the patterns of thinking and feeling that enable the reporter to make sound observations and judgments. Prerequisite: CM207 or permission of instructor. 3 lecture hours

CM 209 - Broadcast Writing 3 credits
This course acquaints the student with the theory and practice of writing for broadcast media. Students are introduced to writing styles used in radio, television, and film. They also learn about news gathering, documentary techniques, and dramatic writing. Prerequisite: CM109 or permission of instructor. 3 lecture hours

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CM 211 - Broadcasting Techniques 3 credits
This survey of broadcasting in America stresses the basic principles and professional techniques of radio and television. In addition to learning historical and contemporary applications of broadcast technology, students use campus radio broadcast facilities and the video production studio as working laboratories. Students develop perspective on changing industry standards. Prerequisite: CM109 or permission of instructor. 3 lecture hours

CM 261 - Interpersonal Communications 3 credits
This course provides an overview of the theories, practices, and processes of human communication, studying such subjects as language acquisition, signs and symbols, body language, proxemics, paralanguage, and feedback. The effects of communication on individuals, society, and intercultural issues are explored. Students identify communication problems and propose creative solutions to them. 3 lecture hours

CM 270 - Internet Communications 3 credits
A course designed to prepare students for the age of information by introducing them to the Internet as a medium of mass communication, research, and publication. Topics include the following: understanding how the Internet works and how it is changing the world; understanding how the Internet is being used for journalism, radio, television, advertising, and public relations; doing research by accessing scholarly databases or refereed articles and general sources; designing, creating, and publishing Web pages for academic and professional purposes; and discussing societal issues of equity, privacy, censorship, decency, copyright, and fair use. 3 lecture hours

CM 271 - Television Production 3 credits
An introduction to electronic field production (EFP), electronic news gathering (ENG), and multi-camera studio production with a special-effects switcher. The theory and techniques of insert and assembly video editing and of lighting are emphasized in the studio component of the course. Directorial and documentary techniques will be introduced. Prerequisite: CM209 or permission of instructor. 3 lecture hours

CM 303 - Advertising 3 credits
A survey of advertising practices and advertising campaigns. Students analyze the visual and verbal properties of successful advertising, discovering the key elements of creative strategy and design. Prerequisite: CM109 or permission of instructor. 3 lecture hours

CM 304 - Principles and Practices of Corporate Communications 3 credits
An analysis of the theory and practice of public relations, its functions in organizations, and its role in society. Students apply course material to public relations program planning and management by working individually and in groups on case-study projects. Prerequisite: CM109 or permission of instructor. 3 lecture hours
CM 309 - Editing  
This course emphasizes copy editing, layout, and feature and editorial writing for newspapers and magazines. Laboratory work is with The Norwich Guidon. This course introduces electronic editing and pagination. Prerequisites: CM207, CM208. 3 lecture hours

CM 311 - Speech Communication in the Workplace  
An introduction to the principles of organizational communication and the application of these principles in a variety of professional situations requiring strategic speech. Topics include formal and informal networks; listening; problem-solving and conflict negotiation styles; conducting job selection and performance appraisal interviews; holding effective meetings and group discussions; and giving oral presentations to prospective clients. Prerequisite: EN112. 3 lecture hours

CM 335 - Television Criticism  
This course develops critical perspectives on television programming and introduces students to the complexities of dramatic and non-dramatic programming, including serials, series, sitcoms, docudramas, documentaries, and news stories. 3 lecture hours

CM 351 - Radio Production  
This course, a continuation of CM211, is designed for students interested in developing their broadcast production skills as well as their understanding of the entire range of issues associated with radio work. In addition to discussing the most recent cable, satellite, and computer broadcast applications, the course emphasizes work on voice and diction, interviewing, radio news gathering and editing, cultural and public affairs programming, and commercial production. Prerequisite: CM211 or permission of the instructor. 3 lecture hours

CM 390 - Topics in Communications  
A course designed to introduce students to a special area or current topic in communications. Course material varies each semester. Analytical writing required. Prerequisite: permission of instructor. 3 lecture hours

CM 391 - Advanced Television Production  
This course draws on skills learned in CM271: Television Production. Students gain confidence in their abilities, explore advanced techniques, and learn how to become working members of a professional production team. Advanced areas of instruction include an introduction to the SONY BetacamSP and the development of skills necessary to function as an assistant editor (logging, digitizing, and rendering effects). This is the first in a track of advanced digital technology courses that must be completed in sequential order. 3 lecture hours

CM 392 - Documentary Television Production  
In this course, students learn the basic fundamentals of traditional long-form documentary production. Early units emphasize research skills, including letters, telephone contacts, and archival research. Later units cover on-camera interviewing,
logging, and organization of footage into off-line drafts. Students learn the functions of the assistant editor on major projects. This is the second in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM391. 3 lecture hours

CM 393 - Non-linear Digital Television 3 credits
Emphasizes the principles of non-linear post-production. Through discussion, practical exercises and demonstrations, students analyze the differences between linear and non-linear editing systems, and learn about the potential and limitations of digital technology. Students digitize and organize footage, edit sync and non-sync material, and assist in the development of sophisticated finished projects for professional portfolios. This is the third in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM392. 3 lecture hours

CM 407 - Senior Communications Seminar 3 credits
A required course for Communications majors, designed to provide students up-to-date information about the fields of radio, television, journalism, advertising, public relations, public information, wire services, and the Internet. Special applications of these fields in business, the military, politics, law, and other professions will be considered. As part of this capstone course, seniors will be required to present and analyze before an audience of department faculty and/or other faculty, a portfolio of prior work. Prerequisite: senior status or permission of instructor. 3 lecture hours

CM 408 - Communications Internship 3 credits
A course designed to combine practical work experience with college-level study in such communications areas as radio, television, advertising, film, journalism, and public relations. Normally, students are required to find their own internship location and must provide their own transportation. Prerequisite: senior status or permission of instructor.

CM 436 - Communications Law and Ethics 3 credits
A survey of laws pertaining to journalism, broadcasting, and advertising, emphasizing ethical problems facing journalists and media specialists. Students study the history of press freedom and control and explore First Amendment issues such as obscenity, libel, and the right to privacy. Special emphasis will be placed on media ethics. The course satisfies the General Education Ethics requirement. Prerequisite: CM109 or permission of instructor. 3 lecture hours

CM 491 - Media Composer Techniques 3 credits
An introduction to the basic technology and aesthetic possibilities of the Avid Media Composer (the industry non-linear post-production standard). As producers and editors, students lead teams of assistants in creating long-form projects. The course combines instructor-led discussion, hands-on demonstration, and mentoring assistance. This is the fourth in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM393. 3 lecture hours
CM 492 - Advanced Media Composer Techniques 3 credits
This course prepares students for professional careers as Media Composer producers and editors. It includes an introduction to medibase management and stresses speed and efficiency of organizing and editing material using Media Composer software, multiple digital audio tracks, and image compositing. Students create a finished program by course completion. This is the fifth in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM491. 3 lecture hours

CM 493 - Media Composer Graphics and Effects 3 credits
This course includes a study of the basics in designing multi-layered and multi-nested titles, graphics, and effects using the Pinnacle 3D Effects Module. Exercises help students learn to create both real-time and rendered effects. Topics include preparing and importing graphics, creating and using alpha matte keys, using Adobe Photoshop and third party packages, creating and saving effects templates, and short-cuts and tips for maximum quality and optimal render time. This is the sixth in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM492. 3 lecture hours

CM 494 - Advanced Media Composer Effects and Graphics 3 credits
Features use of advanced graphics software and broadening of skills learned in CM493: Media Composer Graphics and Effects. Students design complex program openings using 3D templates, mattes, chroma keys, advanced nesting, and title features. Third party packages used include Adobe After-Effects, BlueICE, and Artel BorixFX. This is the seventh in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM493. 3 lecture hours

CM 495 - Systems Configuration and Media Data Management 3 credits
Offers an overview of systems configuration and maintenance as well as media database management to minimize systems downtime and maximize Media Composer productivity. Laboratory work and role-playing give students practical experience. Topics include SCSI, storage, hardware and software troubleshooting, signal flow, systems integration, and issues involving external peripheral devices. Features a practicum conducted at Avid Technology. This is the eighth in a track of advanced digital technology courses that must be completed in sequential order. Prerequisite: CM494. 3 lecture hours

Chinese

CN 111 - Beginning Chinese I 6 credits
An intensive course providing an introduction to the Mandarin language, including both traditional Chinese characters and the Pinyin transliteration system. In this course, speaking proficiency (including familiarization with Chinese tones), aural comprehension, vocabulary acquisition, reading, and writing of Chinese characters are brought to a level enabling students to use the language actively in everyday
situations. Classroom 6 hours, laboratory 2 hours. Not open to students who have successfully completed CN205 or higher. 6 lecture hours

CN 112 - Beginning Chinese II 6 credits
This course is a continuation of CN111, with continued emphasis on each of the language skill areas speaking, listening, vocabulary development, reading, writing, and cultural competence, begun in the previous course. Classroom 6 hours, laboratory 2 hours. Not open to students who have successfully completed CN205 or higher. Prerequisite: CN111. 6 lecture hours

CN 205 - Intermediate Chinese I 3 credits
A course providing aural-oral practice in Chinese, in which students enter into full discussion of topics that include abstract themes and cultural perspectives; includes the expanded use of syntactical structures, the reading of sophisticated material, composition, and the viewing of selected Chinese films and documentary materials from Chinese-language television. Taught entirely in Chinese. Classroom 3 hours, laboratory 1 hour. Prerequisite: CN112, NU language placement exam, or permission of the instructor.

CN 206 - Intermediate Chinese II 3 credits
A course providing aural-oral practice in Chinese, in which students enter into full discussion of topics that include abstract themes and cultural perspectives; includes the expanded use of syntactical structures, the reading of sophisticated material, composition, and the viewing of selected Chinese films and documentary materials from Chinese television. Taught entirely in Chinese. Classroom 3 hours, laboratory 1 hour. Prerequisite: CN205 or the equivalent, NU language placement exam. 3 lecture hours

CN 301 - Advanced Chinese I 3 credits
Oral and written practice of the language through class discussions of selected Chinese texts. Selective review of grammar, especially of the more difficult and subtle aspects, designed to facilitate an idiomatic and fluent use of the language. Classroom 3 hours. Prerequisite: CN 206, NU placement, or permission of instructor

CN 302 - Advanced Chinese II 3 credits
Oral and written practice of the language through class discussions of selected Chinese texts. Selective review of grammar, especially of the more difficult and subtle aspects, designed to facilitate an idiomatic and fluent use of the language. Classroom: 3 hours. Prerequisite: CN 301, NU placement, or permission of instructor

CN 321 – Chinese Literature, Culture & Society I 1911-1949 3 credits
Introduction to major currents in Chinese social, literary, and cultural history from 1911 to 1949. Taught in Chinese. Prerequisite: CN 206 or a 300-level course, NU placement, or permission of instructor.
CN 322 – Chinese Literature, Culture & Society II 1949-Present 3 credits
Introduction to major currents in Chinese social, literary, and cultural history from 1949 to present. Taught in Chinese. Classroom: 3 hours. Prerequisite: CN 206 or a 300-level course, NU placement, or permission of instructor.

Computer Engineering

CP 431 - Network Security 3 credits
Topics include security for networked and internetworked computer systems. It examines secrecy, integrity, and other information assurance objectives in terms of high level policy and presents security services used to address those requirements. Selection and management of cryptographic algorithms and keys to achieve network security objectives will be addressed. Network security architectures, including public key infrastructures and their use of directory services, are examined in terms of systems able to insure that critical security functions are protected from unauthorized modification, are correct, and are always invoked. Access control in networked systems is examined. A review of past and current security architectures will be conducted. Topics include security peripherals for cryptography and authentication, the cascade problem, guards and filters. Laboratory will be used to introduce students to a variety of security-related technologies including discretionary access controls, mandatory access controls in both low and high assurance systems, identification and authentication protocols and database technology in trusted systems. Classroom 3 hours.

Economics

EC 106 - The Structure and Operation of the World Economy 3 credits
This course will introduce students to the operation of the world economy. Emphasis will be on the identification and description of economic concepts such as tariffs, multinational companies, stock markets, debt, international trade balances and international banking. These concepts will be developed utilizing examples from current world economic conditions. This course fulfills General Education Requirement #5: an understanding of economic institutions that are characteristic of human societies. Prerequisite: This is a freshman course - permission of instructor required for any exception. 3 lecture hours

EC 201 - Principles of Economics (Macro) 3 credits
Description and analysis of the American economic system in terms of basic economic concepts and the determination of national income and its fluctuation. This course fulfills General Education Requirement #5: An understanding of economic institutions that are characteristic of human societies. Prerequisite: one semester of college mathematics. 3 lecture hours
EC 202 - Principles of Economics (Micro) 3 credits
Study of the composition and pricing of national output, distribution of income and the pricing of productive factors, international aspects of trade, and the problems of growth. This course fulfills General Education Requirement #5: An understanding of economic institutions that are characteristic of human societies. Prerequisite: one semester of college mathematics. 3 lecture hours

EC 300 - Topics in Economic History 3 credits
This course will focus on the progress and development of economic institutions of industrialized nations. These institutions, such as private property, free markets, financial intermediation and discretionary fiscal policy, will be discussed in a historical perspective. Prerequisites: EC201 and EC202. 3 lecture hours

EC 301 - Intermediate Price Theory 3 credits
A study of the economic behavior of consumers and producers and their interrelationship in a market economy. Emphasis is on the application of economic theory and the tools of analysis to price determination and market behavior. Welfare economics and other modern analytical techniques are also introduced. Prerequisites: EC201, EC202 and either MA108 or MA121. 3 lecture hours

EC 302 - National Income Analysis 3 credits
The theory and policies of determining national income, achieving economic stability and maintaining economic growth. Attention is given to leading post-Keynesian and Monetarist economists’ interpretation of current economic conditions. Prerequisites: EC201, EC202, and either MA108 or MA121. 3 lecture hours

EC 304 - Labor Economics 3 credits
Operation of labor markets from theoretical and policy perspectives. Topics include: human capital theory, the impact of labor unions and public policy issues relevant to collective bargaining, unionism, wages and income. Prerequisites: EC201 and EC202. 3 lecture hours

EC 310 - Money and Banking 3 credits
The principles and institutions of money, banking and finance as they influence the performance of the economy. The major topics covered are the nature of money, commercial banking and financial institutions, central banking, monetary theory, monetary policy, inflation and the international monetary system. Prerequisites: EC201, EC202 and QM213 or permission of the instructor. 3 lecture hours

EC 331 - Business and Government 3 credits
A study of the institutional relationships between business and government, with stress upon public policies toward business and the role of government in fostering competition. Emphasis is placed upon the economic effects of the antitrust laws through outside readings and analysis of landmark court decisions. Other topics covered are concentration and mergers, restrictive business practices, monopoly and oligopoly. Prerequisites: EC201 and EC202. 3 lecture hours
EC 403 - Comparative Economic Systems 3 credits
The study of major economic systems. Theories of capitalism, socialism and communism and their implementation by major nations are discussed. Prerequisites: EC201 and EC202. 3 lecture hours

EC 406 - Public Finance 3 credits
An investigation of the effects of government expenditures and revenues on the efficiency of resource allocation and the equity of the income distribution. Topics covered include public goods, externalities, benefit-cost analysis, the structure of major taxes and expenditure and tax incidence. Prerequisites: EC201 and EC202. 3 lecture hours

EC 419 - International Economics 3 credits
International trade and the theory of comparative advantage. Special attention is given to free world trade and economic development in other countries and groupings as in the European Common Market. Prerequisites: EC201 and EC202. 3 lecture hours

EC 421 - History of Economic Thought 3 credits
Development of economic thought with emphasis upon the evaluation of economic theory as it has developed in response to problems of society. Prerequisites: EC201 and EC202. 3 lecture hours

EC 499 - Seminar in Economics and Finance 3 credits
A capstone economics course designed to integrate the students' undergraduate studies in economics, management, accounting, information systems and finance. Prerequisite: senior standing and permission of instructor. 3 lecture hours

Education

ED 101 - Foundations of Education I 1 credit
This is a one-credit course that is offered during the first semester of the freshman year and introduces teacher education licensure candidates to the teaching profession. Topics include teacher characteristics, demands of the profession, self assessment, the nature of teaching. Offered in the Fall. 1 lecture hour

ED 102 - Foundations of Education II 1 credit
This is a one-credit course that is offered during the first semester of the freshman year and introduces students to developmental theories starting at birth and going through adolescence. Offered in Fall. 1 lecture hour

ED 201 - Foundations of Education III 1 credit
This course examines the sociological aspects of education including the impact of the family, the community, and economic and cultural influences. Offered in Spring. 1 lecture hour
ED 202 - Foundations of Education IV 1 credit
This course examines the historical and philosophical aspects of education. Offered in Spring. 1 lecture hour

ED 234 - Learning and Teaching Strategies 4 credits
This course includes an overview of the most commonly used strategies in elementary and secondary classrooms. Topics include Introduction to portfolio, planning, instructional objectives, media and computer applications, common learning strategies (lecture, discussion, cooperative learning, role playing, questioning, discovery learning) evaluation and assessment of learning. Secondary teacher licensure candidates prepare units and lessons in their fields of study applying specific methods and materials of the subject area. All students participate in microteaching situations. Required for elementary and secondary teacher licensure candidates. Ten hours of classroom practicum are required in this course. Offered in Fall.

ED 351 - Methods of Teaching Science to Elementary Students 3 credits
This course examines objectives, methods, and content in elementary science instruction. Emphasis will be on student preparation, teaching and carrying out science activities. These activities will be ready for classroom use. National standards, Vermont Framework, and Vermont Grade Cluster Expectations will be the basis for the content and for the appropriateness of content at different grade levels. This course cannot be used to meet the general education laboratory levels. Ten hours of practicum is required and development of portfolio continues. Prerequisite ED234.

ED 360 - Language Arts & Teaching Reading in the Elementary School 4 crs
A study of language development and reading, including an introduction to traditional instructional methodologies of reading and a study of the whole language approach to the language arts. Students will have opportunities to apply theory in various settings. Required for elementary teacher licensure candidates. Prerequisite: ED234. Twelve hours of classroom practicum are required in this course. Offered in Spring. Development of portfolio continues.

ED 363 - Reading and Writing in the Content Area 4 credits
A course designed to familiarize content area teachers with the theories and practices of reading and writing in specific disciplines. Students will examine the developmental nature of the reading and writing processes and design discipline-specific materials. Students work as tutors at the secondary and college levels. Required of secondary teacher licensure candidates. Prerequisite: ED234. Practicum of 10 hours will be done by secondary track students. Offered in Fall. Development of portfolio continues.

ED 368 - Curriculum & Methods in Secondary Subjects 4 credits
An examination of the curriculum and teaching strategies associated with the subjects taught in the secondary school, including English, mathematics, science, and social studies. Students will learn about the general methods for teaching at the Middle/High school level, but will concentrate on their area of content concentration in both their practicum and final project. Knowledge and research in child growth and development

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is used as a guide for determining the curriculum materials and procedures that are suitable for secondary education students. Students work with adolescents, develop curriculum, and teach lessons in the Middle/High School. Students will keep a reflective journal of all their experiences in the practicum. Required for Teacher Education Licensure secondary track. A Practicum of 30 hours will be required in this course. Offered in the fall. Prerequisite ED 234, ED 363. Development of portfolio continues.

ED 403 - Problems in Education 1 to 3 credits
In this course students are involved in individual investigation, survey, or a project related to education. Offered on Demand. 1 to 3 lecture hours

ED 404 - Problems in Education 1 to 3 credits
In this course students are involved in individual investigation, survey, or a project related to education. Offered on Demand. 1 to 3 lecture hours

ED 425 - Student Teaching 12 credits
In this course there is a full-time student teaching assignment. This course may be taken only as a part of the education teacher licensure major. This is a capstone course for education teacher licensure students. Offered every semester. 14 lecture hours. A service-learning component is embedded in this course.

ED 432 - Curriculum & Methods of the Elementary School Subjects 4 credits
An examination of the curriculum and teaching strategies associated with the subjects taught in the elementary school, including mathematics, science, social studies and language arts. Knowledge and research in child growth and development are used as a guide for determining the curriculum materials and procedures that are suitable for children. Students work with children to develop curriculum and teach lessons in the elementary school. Required for elementary teacher licensure candidates. A Practicum of 30 hours will be done during this course. Usually offered in the fall semester. Prerequisite ED 234, ED 351, ED 360, and MA 360. Development of Portfolio continues.

ED 570 – Teaching and Learning I 6 credits
This seminar introduces students to key topics related to teaching and learning. Students in this seminar focus on developing a philosophy of teaching and learning and on designing and presenting a learning experience. (Graduate Certificate course only.)

ED 571 – Teaching and Learning II 6 credits
This seminar deepens students’ understanding of key issues involved in teaching and learning. A focus of this seminar will be to develop a course syllabus. Students will complete the seminar with a portfolio (a sample letter to a future employer, a philosophy statement, a learning experience document and a resume or CV) that will help them obtain employment. (Graduate Certificate course only.) Pre-requisite: ED570

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### Electrical Engineering

**EE 200 – Engineering Programming**  
3 credits  
Introduction to a high level programming language such as C/C++. Topics include structure and organization of a computer program, variables and basic data types, flow of control, functions, file I/O, arrays and strings, computer memory, CPU and pointers, user defined structures, computer algorithms, modular design and documentation. Introduction to object oriented programming concepts. Classroom 3 hours.

**EE 204 - Electrical Circuits I**  
3 credits  
A study of principles and methods of analysis of electric circuits with both direct and time varying sources in the steady state. KCL, KVL, mesh and nodal techniques. Network theorems are developed and applied to the analysis of networks. Energy storage elements. First order and second order circuits with forced and natural responses. Sinusoidal analysis, complex numbers, phasor diagrams. Power; average effective, and complex power in single phase systems. Classroom: 3 hours. Prerequisite or concurrent enrollment: MA122.

**EE 215 - Fundamentals of Digital Design**  
4 credits  
An introductory course on formal design techniques for combinational and sequential logic circuits. Topics include combinational logic networks, minimization techniques, registers, synchronous sequential networks, and control units. Applications of the concept developed in the classroom will be implemented in the laboratory. Classroom 3 hours, laboratory 2 hours.

**EE 240 - Electrical Concepts and Applications**  
3 credits  
A course on the theory and application of electrical devices and circuits. Discussions include magnetic circuits, transformers, electric machines, diodes, bipolar transistors, and field effect transistors. Integrated circuits are introduced. Digital switching circuits are treated, including logic gates, flip-flops, and counters. Operational amplifiers and their major applications are studied. Offered to qualified students not majoring in Electrical Engineering. Classroom 2 hours, laboratory 3 hours. Prerequisite: EE204.

**EE 242 - Digital Systems Design**  
4 credits  
Topics are hierarchical design methods, design and debugging of digital hardware, determination of circuit behavior, control and timing, machine organization, control unit implementation, and interface design. A hardware design language will be used and students will acquire design experience implementing digital hardware. Classroom 3 hours, laboratory 2 hours. Prerequisite: EE215.

**EE 303 - Electromagnetic Field Theory I**  
3 credits  
Maxwell’s Equations are developed from the experimental laws of electric and magnetic fields. Topics involving electric fields include Gauss’s Law, divergence, energy, potential, conductors, dielectrics, and capacitance. Topics involving magnetic fields include the Biot-Savart Law, Ampere’s Law, magnetic forces, magnetic materials,
and inductance. Maxwell’s Equations are used to describe wave motion in free space and in dielectric media. Classroom 3 hours. Prerequisites: MA223, EE204.

**EE 314 - Elements of Electrical Engineering** 4 credits
A course on the theory and application of electrical devices and circuits. Topics that are appropriate for discussion include dc circuits, single-phase and three-phase ac circuits, amplifiers, transducers, transformers, and electric machines. Offered to qualified students not majoring in Electrical Engineering. Classroom 3 hours, laboratory 3 hours. Prerequisite: MA122.

**EE 321 – Embedded Systems** 4 credits
The use of computing devices in embedded applications is introduced. Computer organization topics include the arithmetic logic unit, timing and control, memory, serial and parallel I/O ports, and the bus system. Programs are written and run in assembly language and higher-level languages. Additional topics include peripheral interface control, interrupts, cross assembly and applications. Classroom 3 hours, laboratory 2 hours. Prerequisite: EG 110 or IS 130.

**EE 325 – Computer Architecture and Operating Systems** 3 credits
Machine architecture - machine performance relationships, computer classifications, and computer description languages. Consideration of alternative machine architectures. Software influences on computer design. Topics include digital logic, VLSI components, instruction sets, addressing schemes, memory hierarchy, cache and virtual memories, integer and floating point arithmetic, control structures, buses, RISC vs. CISC, multiprocessor and vector processing (pipelining) organizations. Examples are drawn from Pentium and Sparc microcomputers. The primary focus is on the attributes of a system visible to an assembly level programmer. This course also introduces the fundamentals of operating systems. Topics include concurrency, scheduling, memory and device management, file system structure, security, and system performance evaluation. Lecture – 3 hours. Offered once per year.

**EE 350 - Linear Systems** 3 credits
This course provides the foundations of signal and system analysis. Linear, time-invariant, causal, and BIBO stable analog and digital systems are discussed. System input-output descriptions, convolution and the impulse response are covered. Additional topics include singularity functions, Fourier and Laplace circuit analysis, circuit transfer functions, Bode plots, ideal filters, and real filters including Butterworth, Chebyshev, and Elliptic. Discrete topics include the transform, difference equations, FIR and IIR filters, the bilinear transformation, the DTFT, the DFT, and the FFT. Classroom 3 hours. Prerequisite EE356.

**EE 356 - Electrical Circuits II** 3 credits
This course is a continuation of Electric Circuits I (EE204). The complete solutions of linear circuits by Laplace transforms are developed. The concepts of frequency response, resonance, network functions, two port networks including hybrid parameters are studied in depth. The concepts of transformers, power, coupled circuits,
multi-phase circuits, and Fourier series are introduced. Computer-based circuit simulation is used throughout. Classroom 3 hours. Prerequisite: EE204.

EE 357 - Electronics I 3 credits
The basic building blocks used in electronic engineering are studied. Diodes, bipolar transistors, and MOS transistors are modeled and then used to describe the operation of logic gates and amplifiers. Emphasis is placed on the operation and applications of standard integrated circuit chips. Classroom 3 hours. Prerequisite: EE204.

EE 359 - Electrical Engineering Laboratory 1 credit
Implementation, analysis, and design of electric and electronic circuits involving resistors, inductors, capacitors, diodes, bipolar transistors, MOS transistors, operational amplifiers and filters. Study and practice in the use of standard electrical engineering laboratory instrumentation. Laboratory 2 hours. Prerequisite: EE215; prerequisite or concurrent enrollment in: EE356, EE357.

EE 366 - Electronics II 4 credits
This course is a continuation of Electronics I (EE357). Analog and digital circuits are discussed. Analog topics include frequency response, real world applications of operational amplifiers, power amplifiers, filters, oscillators and A/D and D/A converters. Digital electronic building blocks are discussed, including flip-flops, counters, coding and decoding circuits and memory. Classroom 3 hours, laboratory 2 hours. Prerequisites: EE357, EE359.

EE 373 - Electrical Energy Conversion 4 credits
A course on principles of electrical energy conversion in electromechanical devices, machines, and power electronics. Analysis of transformers, polyphase synchronous and induction machines, single phase fractional horsepower machines, DC machines, and semiconductor converters. Classroom 3 hours, laboratory 2 hours. Prerequisite: EE356; prerequisite or concurrent enrollment in: MA224.

EE 411 – Infrastructure Control Systems 4 credits
Supervisory Control And Data Acquisition (SCADA) Systems are at the basis of the services upon which Americans have come to depend in their modern lifestyle. For that reason, it is important to protect these systems against natural disaster and terrorist threats. These systems depend upon networks of computers that interface with complex machinery and human operators in a semi-autonomous network of communications, computation, and machine control and cost accounting. In this course students will investigate the design of SCADA and Distributed Control Systems. The “Blue Team” students will build their own to withstand a cyber attack from students on the “Red Team”. Then the teams will change position and repeat the competition. Three hours of recitation, 2 hours laboratory. Prerequisites: EE325.

EE 459 - Power Systems Analysis 3 credits
This course presents the foundations of electric power systems analysis after an initial review of single and three-phase power, complex power and transformers. Topics
include per unit quantities, generators, transmission line models, transformer models, short-circuit analysis, load flow, and power systems economics. Lecture: 3 hours. Prerequisites: EE356 and EE373. Offered once per year.

EE 463 - Communication Systems 4 credits
Analog transmission of information signals by communication systems is analyzed. The component parts of transmitters and receivers including AM/FM modulators, filters, detectors and decoders are discussed. Mathematical concepts include the Fourier Series, Fourier Transform, dirac delta function and sinc function. Signal classification and digital modulation techniques such as ASK, FSK, PSK, PAM and QAM. Classroom 3 hours, laboratory 2 hours. Prerequisites: EE356, EE357, EE359.

EE 468 - Solid State Materials 3 credits
Solid state materials, physics of electronic devices and integrated circuit design are studied. Topics include silicon crystal properties, diffusion, implantation, lithography and circuit fabrication. Device models are derived for junction diodes, bipolar and MOS transistors. Classroom 3 hours. Prerequisites: EE303, EE357.

EE 478 - Control Systems 3 credits

EE 486 - Digital Signal Processing 3 credits
An introductory level course that discusses the conversion of analog signals to discrete time signals. Emphasis will be on the processing of discrete signals using both time-domain and frequency-domain analysis. These techniques will be applied to the design of digital filters. Classroom 3 hours. Prerequisite: EE350 or instructor's permission.

EE 487 - Digital Signal Processing Lab 1 credit
Implementation analysis and design of digital signal processing functions and techniques. Study and practice in the use of software and hardware platforms used for digital signal processing applications. Laboratory: 3 hours. Prerequisite: EE350. Co-requisite: EE486. This course is offered once a year.

EE 490 - Advanced Topics 3 credits
A course that provides advanced study in an area of the instructor's special competence. Courses that have been offered in the past include Power System Stability, Electrical Communications II, Microwave Theory and Techniques and Digital Systems. Offered as the occasion demands. Classroom 3 hours. Prerequisite: senior standing
EE 491 - Electrical System Design I 3 credits
Introduction to design problems. Application of concepts of electrical engineering to a capstone design project. The first of a two-semester sequence, this course focuses on the problem statement, specification, preliminary design, design review and approval stages of the design processes, the design process involves exploring alternate solutions and design optimization and simulation. Economic constraints and human factors are considered in the design process. The course requires nine hours per week of directed reading, research and experimentation. Prerequisite: seventh semester standing and permission of the instructor.

EE 494 - Electrical System Design II 3 credits
This course is the second in the two-semester capstone design project sequence. It focuses on the final stages of the design process-finalized design, implementation and testing. A written project report and an oral presentation to students and faculty is required. Nine hours per week of directed readings, research, and experimentation. Prerequisite: EE491.

Common Engineering Courses

EG 043 - Conference 0 credits
A scheduled weekly conference hour with the faculty and senior engineering students for discussions of topics such as placement, professional registration, professional ethics, and professional growth after graduation. The course includes a substantial writing component on ethics. A grade of satisfactory (S) is required for graduation. Classroom 1 hour. Prerequisite: senior standing.

EG 044 - Conference 0 credits
A scheduled weekly conference hour with the faculty and senior engineering students for preparation of the Fundamentals of Engineering (FE) exam. The student must take the FE exam to receive a satisfactory grade in this course. EG044 is not required if the student has already passed the FE exam. Classroom 1 hour. Prerequisite: senior standing.

EG 109 - Introduction to Engineering I 3 credits
An introduction to engineering, the concepts of engineering design and the non-technical aspects of engineering. The concepts of graphical communication skills to depict engineering designs using computer aided drawing will be covered. Students will perform design projects to incorporate the technical and the non-technical aspects of design into projects. Classroom 2 hours; laboratory 3 hours.

EG 110 - Introduction to Engineering II 3 credits
A continuation of EG109 to include an introduction to engineering computing through the design of algorithms to solve engineering problems. The design projects will be coordinated with mathematics and science courses being taken concurrently by the students to reinforce the material learned in those courses. Design projects will include
the technical and non-technical aspects of engineering design. Prerequisite: EG109 or permission of the instructor. Classroom 2 hours; laboratory 3 hours.

**EG 111 - Fundamentals of Engineering** 3 credits
An introduction to engineering and the concepts of engineering design. Includes an introduction to graphical communication skills used in engineering through the use of sketching and computer-aided design (CAD) on personal computers. The concepts of orthographic and isometric drawings are stressed and extended to include sections and dimensions. The use of spreadsheets in engineering is also included. This course is open only to students in an Engineering major or those with permission of the Engineering Dean. Classroom 2 hours, laboratory 3 hours.

**EG 112 - Fundamentals of Engineering II** 4 credits
A continuation of the concepts of engineering design. Includes an introduction to engineering computing through the design of algorithms using structured techniques that employ a high-level engineering computer language. This course is open only to students in an Engineering major or those with permission of the Engineering Dean. Classroom 3 hours, laboratory 2 hours.

**EG 201 - Engineering Mechanics (Statics, Dynamics)** 3 credits
A course in elementary engineering mechanics. Vector notation. Force systems, moments, equilibrium, the free body diagram. Friction, simple frames, trusses, beams, centroids, and second moments. Kinematics: rectilinear and curvilinear motion; translation and rotation; relative motion. Kinetics: force, mass, and acceleration; impulse and momentum; work and energy. Elementary vector calculus. Classroom 3 hours. Prerequisite or concurrent enrollment in: MA122 and PS211.

**EG 202 - Engineering Mechanics (Statics, Dynamics)** 3 credits
A course in elementary engineering mechanics. Vector notation. Force systems, moments, equilibrium, the free body diagram. Friction, simple frames, trusses, beams, centroids, and second moments. Kinematics: rectilinear and curvilinear motion; translation and rotation; relative motion. Kinetics: force, mass, and acceleration; impulse and momentum; work and energy. Elementary vector calculus. Classroom 3 hours. Prerequisites: EG201 and MA122.

**EG 203 - Materials Science** 3 credits
An introduction to the science of materials based on the physics and chemistry of their internal structures. The effects of structure on the properties and behavior of metallic, polymeric, ceramic, semiconductor, and composite materials. Classroom 3 hours. Prerequisite: CH103.

**EG 206 - Thermodynamics I** 3 credits
A study of the fundamental concepts and laws of thermodynamics and of the properties of pure substances, with applications to engineering processes and operations. Classroom 3 hours. Prerequisite or concurrent enrollment in: MA122.

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**EG 301 - Mechanics of Materials**  
3 credits  
A course on the concepts of stress and strain; effect of loads; analysis of plane stress and strain; deformations of beams, shafts, and axial members; buckling and combined stresses. Classroom 3 hours. Prerequisite: EG201.

**EG 303 - Fluid Mechanics**  
3 credits  
A study of fluid properties and their significance. Fundamental mechanics of compressible and incompressible fluid motion with application to engineering problems. Topics include resistance of fluids in laminar and turbulent flow; open-channel flow; fluid statics; dimensional analysis and similitude. Classroom 3 hours. Prerequisite: MA122; Prerequisite or concurrent enrollment: EG206 or permission of the instructor.

**EG 447 - Special Projects (Tech. Elective)**  
1 to 6 credits  
A report on an approved engineering design project or topic area to meet the specific objectives of a student in a particular area of study. Limited to students who have organized plans and/or projects that can be related to their engineering interests. Hours and credits to be arranged. Prerequisite: permission of the curriculum department chair and advisor. 1 to 6 other hours

**EG 450 - Professional Issues**  
3 credits  
A course to prepare the engineering student for the non-technical aspects of the engineering profession. Topics covered include engineering registration, ethical responsibilities, malpractice and legal responsibilities, and the business aspects of the engineering profession. Classroom 2 hours. Recitation 2 hours. Prerequisites: junior or senior status.

**EG 501 – Engineering Mathematics**  
6 credits  
First and second order differential equations, basic matrix algebra with emphasis on solving systems of equations and understanding eigenvalues and eigenvectors, numerical techniques for solving both differential and algebraic equations, and an introduction to partial differential equations. Basic concepts in probability and statistics, random variables, testing hypotheses, confidence intervals, and correlation along with the least squares line. In addition to solving problems by hand, students will also be using software tools. Prerequisite: acceptance into the Master of Civil Engineering program.

**Engineering Management**

**EM 301 - Project Management**  
3 credits  
This course covers the principles and practices of project management with particular emphasis on issues related to engineering and construction projects. Students will learn the principles of project management within the firm and in an environment characterized by inter-firm relationships. 3 lecture hours

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EM 302 - Supply Chain Management 3 credits
This course covers the principles and practices of supply chain management with particular emphasis on issues related to engineering and construction projects. Students will learn the principles of supply chain management and purchasing within the firm and in an environment characterized by inter-firm relationships. 3 lecture hours.

EM 402 - Construction Management Practices 3 credits
A capstone course in construction engineering management that explores the processes as applied to actual construction projects. Topics will be reviewed in the seminar. Students will work in teams to review how these topics were applied in an actual construction project and to design a construction management plan for a proposed project during the laboratory. Prerequisites EM301 & EM302. 3 lecture hours and 3 lab hours.

EM 405 - Preconstruction Planning 3 credits
This course addresses the initial phases of the building creation process. It focuses on addressing the owner's design and construction needs and the delivery of value to the owner. Business development, estimating, planning and presentation skills are emphasized. A Design/Build model is employed to encompass the full spectrum of architecture, engineering and construction (AEC) requirements. Classroom 3 hours. Prerequisites: EM302.

English

*Successful completion of EN 101 and EN 102 (or EN 107 and EN 108) is a prerequisite for all English classes above EN 112.

EN 005 - Basic English 3 non-degree credits
A review of the fundamentals of composition designed to raise the student's command of English to the college level. Required for those whose tests and records demonstrate weakness in diction, spelling, grammar, punctuation, and organization. Students assigned to EN005 must successfully complete the course before enrolling in EN101. This course will not meet any degree requirements and cannot be used as an elective. 3 lecture hours. Offered fall semester only.

EN 101 - Composition and Literature I 3 credits
EN 101 is devoted chiefly to the principles of written organization, exposition, argumentation, and research. Prerequisite: EN005 or Incoming test score. 3 lecture hours. Offered every semester.

EN 102 - Composition and Literature II 3 credits
EN102 provides, through an extension and intensification of the methods and approaches of EN101, an introduction to fiction, poetry, drama, and film. Prerequisite: EN101. 3 lecture hours. Offered every semester.
EN 105 - English as a Foreign Language I  3 credits
A course for intermediate non-native speakers of English that stresses writing, reading, speaking, and listening improvement and provides an introduction to the social and cultural values of the English-speaking world. 3 lecture hours. Offered every fall, as needed.

EN 106 - English as a Foreign Language II  3 credits
A course for advanced non-native speakers of English that stresses writing, reading, speaking, and listening improvement and provides an introduction to the conduct, organization, and reporting of library research. Prerequisite: EN105. 3 lecture hours. Offered every spring, as needed.

EN 107 - Composition and Literature for Foreign Nationals I  3 credits
A course for advanced non-native speakers of English that parallels the content and structure of EN101. The student and instructor will meet in conference to assess the student's progress in the course. Prerequisite: EN106 or permission of instructor. 3 lecture hours. Offered every semester.

EN 108 - Composition and Literature for Foreign Nationals II  3 credits
A course for advanced non-native speakers of English that parallels the content and structure of EN102. The student and instructor will meet in conference to assess the student's progress in the course. Prerequisite: EN107 or permission of instructor. 3 lecture hours. Offered every semester.

EN 112 - Public Speaking  3 credits
A practical course in the fundamentals of public address and speech analysis. 3 lecture hours. Offered every semester.

EN 201 - World Literature I  3 credits
A course that examines representative works of world literature up to the mid-seventeenth century. Texts are explored in their historical, cultural, and social contexts. EN201 is not a prerequisite for EN202. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every semester. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 202 - World Literature II  3 credits
A course that examines representative works of world literature from the mid-seventeenth century to the present. Texts are explored in their historical, cultural, and social contexts. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every semester. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 203 - Advanced Composition  3 credits
A course designed to move beyond the fundamentals of writing studied in EN101 and 102 and to develop the student's abilities as a writer through the composition and
analysis of extended essays on a variety of topics, employing a range of rhetorical approaches. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every fall.

EN 204 - Professional and Technical Writing 3 credits
A course that teaches the theory and practice of communicating on the job. Instruction addresses written, visual, and oral technical communication. Assignments involve students in practical, collaborative and technologically informed learning modeled upon realities of the work place. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every spring.

EN 205 - World Literature for Foreign Nationals I 3 credits
A course in reading and writing for non-native speakers of English, which parallels EN201. Assignments examine masterpieces of world literature and include study of the Greco-Roman, Judeo-Christian, Asian, African, and New World traditions up to the mid seventeenth century. Texts are explored in their historical, social and cultural contexts. The student and instructor will meet in conference to assess the student’s progress in the course. EN205 is not a prerequisite for EN206. Prerequisite: EN102 or EN108. 3 lecture hours

EN 206 - World Literature for Foreign Nationals II 3 credits
A course in reading and writing for non-native speakers of English, which parallels EN202. Assignments examine masterpieces of world literature and include study of the European, Asian, African, and New World traditions from the mid seventeenth century. Texts are explored in their historical, social, and cultural contexts. The student and instructor will meet in conference to assess the student’s progress in the course. EN205 is not a prerequisite for EN206. Prerequisite: EN102 or EN108. 3 lecture hours

EN 210 - Modern Short Story 3 credits
A study of the short story genre through reading, discussion, and written analysis of selected modern stories. The course also addresses the history of the short story and the nature and uses of the literary art. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every fall. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 220 - Children's Literature 3 credits
A course familiarizing students with the range and history of children's literature. Students revisit beloved classics as well as significant contemporary works, analyzing literary value. Prerequisite: EN102 or EN108. 3 lecture hours. Offered alternate years. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 225 - Survey of English Literature I 3 credits
An overview of British literature from the Anglo Saxons to the late-eighteenth century in their historical and cultural contexts, with attention to the development of the English language. May include texts in Middle English. Selections may include
sermons, chronicles, and letters as well as fiction, poetry, and drama. Provides a foundation for upper-level study in the discipline and is required for English majors. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every fall.

**EN 226 - Survey of English Literature II**
3 credits
An overview of British literature from the Romantics to the present in their historical and cultural contexts. May include non-fiction as well as fiction, poetry, and drama. Provides a foundation for upper-level study in the discipline and is required for English majors. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every spring.

**EN 227 - Survey of American Literature I**
3 credits
An overview of colonial and post-Revolutionary writing in its historical and cultural contexts, including the work of European explorers and native peoples in the eighteenth and early nineteenth centuries. Selections may include letters, travel narratives, and political documents as well as fiction, poetry, and drama. Provides a foundation for upper-level study in the discipline and is required for English majors. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every fall.

**EN 228 - Survey of American Literature II**
3 credits
An overview of American writing from the Civil War to the present in its historical and cultural contexts. Selections may include non-fiction as well as fiction, poetry, and drama. Provides a foundation for upper-level study and is required for English majors. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every spring.

**EN 239 - Introduction to Theater**
3 credits
A course that provides a basic introduction to theater as an art form and as an academic discipline. Topics of study include a survey of theater history; an analysis of the different forms of drama, including representative plays; and an introduction to the performance aspects of acting, directing, and theatrical design. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.

**EN 240 - Technical Aspects of Theatrical Design**
3 credits
A course that provides instruction in all phases of the construction of scenery and costumes, and in lighting production, together with an introduction to the design of these elements. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.

**EN 241 - Acting and Directing**
3 credits
A course that introduces the basic techniques of acting and directing, including instruction in the relationship of the actor to the other actors on the stage. Extensive use is made of improvisation and theater games. Directing instruction gives the student practice in the solution of directorial problems through the staging of scenes, tableaux, and pictorial dramatizations. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.
EN 242 - Play Production  1 to 3 credits
A course that provides study and performance of theater and play production techniques as well as rehearsal and presentation of a full-scale dramatic production. Students may choose to audition to act in a play or to work on one of the technical support crews. Three accumulated hours will comprise one 3-credit for free elective use only. Prerequisite: EN102 or EN108, or permission of the instructor. Offered every semester.

EN 244 - The Literature of Leadership  3 credits
A survey of major literary texts dealing with the theme of leadership. Differing examples and ideals of leadership are related to the philosophical assumptions and cultural values of the authors and civilizations represented by each work. Both advocacy and critique of these ideals are examined; contrasts among them emphasize the ethical implications of leaders' decisions. Topics include relationships among leadership, religion, and philosophy; leadership and technology; the role of coercion or political/economic power; and the potential conflicts of leadership and individual freedom. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every fall. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 245 - Science Fiction Literature  3 credits
A study of representative readings in science fiction literature centered on novels and short fiction from the late-nineteenth century to the present with a focus on how these works develop major themes associated with the genre. Prerequisites: EN 102 or 108. 3 lecture hours.

EN 250 - Crime in Literature  3 credits
A course in which students read and discuss works of literature that explore the ethical, social, and philosophical implications of criminal behavior and society's response to it. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every other year. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 251 - Literature of the Sea  3 credits
A study of literature about life at sea, especially during times of crisis. The course examines attitudes toward solitude, comradeship, and the ocean's beauty and power. Moral and physical qualities needed by a ship's officers and crew are also discussed. Readings are drawn from world literatures, ancient and modern. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every spring. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 270 - Military Literature  3 credits
A study of men and women in war and the military service, their ideals, experiences, and strategies as seen in foreign and American military literature of the 19th and 20th centuries. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every spring. A

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recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 272 - Veterans’ Literature and Writing  3 credits
In this course, students read a selection of works by veterans to explore how soldier-writers have given voice to their military experiences and to reflect on how writers have depicted war and the military experience. These texts will serve as models to students as they develop personalized writing projects, either critical or creative, over the course of the semester. This course is open to anyone who is currently serving, or has served, in any branch of the military. This course fulfills a literature, writing or humanities requirement. Prerequisite: EN 102 or 108 and instructor permission

EN 292 – American Ethnic and Cultural Literature  3 credits
The purpose of this course is two-fold: to acquaint the student with the writings of representative ethnic groups in America in terms of their contributions to American literature and culture in general; and to familiarize the student with both the problems of minority groups in integration and with the solutions which have been offered to these problems by the minority representatives themselves. The course will offer material form as many minority groups as time allows. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every other year. A recommended literature course for fulfillment of General Education or Bachelor of Arts degree requirements in literature, Arts and Humanities, or English.

EN 306 - Creative Writing  3 credits
A course designed for those who wish to explore their own writing. Attention will be given to specific problems in the writing of fiction, poetry, drama, and other literary forms. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every semester.

EN 307 - The History of the Motion Picture  3 credits
A study of the development of the motion picture from a technological curiosity to a powerful, pervasive vehicle for art and argument. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.

EN 308 - The Motion Picture Director  3 credits
A study, through readings and viewings of representative films, of the work of three great motion picture directors. Emphasized are their contributions to the art of the motion picture and their statements as artists viewing their own times. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.

EN 310 - The Art of the Motion Picture  3 credits
A study of cinema art direction, photography, editing, writing, and acting. Classes involve lecture, discussion, readings in film criticism and the viewing of selected films. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.
EN 311 - American Film Comedy  3 credits
A study of representative American film comedies from a variety of standpoints: generically (as manifestations of comic tradition); culturally (as examples of satire and social criticism); aesthetically (as products of cinematic and literary techniques); historically (as parts of an evolving tradition). Representative films include works by Keaton, Chaplin, the Marx Brothers, W. C. Fields, Jerry Lewis, Stanley Kubrick, Woody Allen, and others. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.

EN 320 - Literature of the Developing World  3 credits
A study of the literature of developing nations. The course emphasizes works that reveal a country’s distinctive religious, social, economic, and political institutions, and the challenges that confront them. Topics to be discussed may include: colonialism, the struggle for national identity, the impact of modern technologies on traditional values, tensions between military power and democratic processes, and the clash between the wealthy and the poor. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.

EN 333 - The Plays of Shakespeare I  3 credits
A study of selected early comedies, tragedies, and history plays. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every fall.

EN 334 - The Plays of Shakespeare II  3 credits
A study of selected mature comedies, problem plays, tragedies, and romances. Prerequisite: EN102 or EN108. 3 lecture hours. Offered every spring.

EN 350 - History of the English Language  3 credits
This course will trace the linguistic, material, and cultural development of the English language from its North Germanic beginnings to its current status as a global lingua franca, with special attention to the early British forms. We will attend to the structure of language (e.g., lexicon, syntax, phonetics) as well as to its socio-political aspects (e.g., migration, class, codification). Students will be asked to read, analyze, and contextualize texts in Old, Middle, and Early Modern English. Required for the English Major. Fulfills Gen. Ed. Humanities requirement but will not serve as literature elective. Prerequisite: EN 102 or EN 108.

EN 372 - British Romantic Literature  3 credits
A study of major Romantic literature, including selected novels of the period. Writers may include Wordsworth, Coleridge, Byron, Shelley, Scott, Wollstonecraft, and Austen. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered annually.

EN 375 - Victorian Literature  3 credits
A study of major Victorian literature, including selected novels of the period. Writers may include Tennyson, Browning, Rossetti, Wilde, and Dickens. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered annually.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisite</th>
<th>Offered Frequency</th>
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<tbody>
<tr>
<td>EN 376</td>
<td>Modern British Literature</td>
<td>3</td>
<td>A study of British literature from about 1900 through World War II. Writers may include Conrad, Woolf, Lawrence, and Joyce. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered annually.</td>
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<tr>
<td>EN 377</td>
<td>Recent British Literature</td>
<td>3</td>
<td>A study of British writing since World War II. Writers may include Rushdie, Sparks, Lessing, and McEwan. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered annually.</td>
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<tr>
<td>EN 391</td>
<td>Major Writers of the American Renaissance</td>
<td>3</td>
<td>A study of important American writers of fiction and non-fiction of the middle nineteenth century, including Hawthorne, Melville, Emerson, Thoreau, Poe, Fuller, and Douglass. Prerequisite: EN102 or EN108. 3 lecture hours. Offered alternate years.</td>
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<tr>
<td>EN 392</td>
<td>American Poetry From 1890 to the Present</td>
<td>3</td>
<td>A detailed study of modern American poetry from Robinson and Frost to the present. Prerequisite: EN102 or EN108. 3 lecture hours. Offered on occasion.</td>
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<tr>
<td>EN 393</td>
<td>Major American Social Realists</td>
<td>3</td>
<td>A study of the literary record of the American social, cultural, and psychological experience at home and abroad in the works of such writers as Howells, James, Wharton, and Cather. Prerequisite: EN102 or EN108. 3 lecture hours. Offered on occasion.</td>
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<tr>
<td>EN 394</td>
<td>American Short Story Writers</td>
<td>3</td>
<td>A study of the major artists and innovators of the genre, from Poe and Irving to Cheever, Updike, and beyond. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.</td>
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<tr>
<td>EN 395</td>
<td>Major 19th Century American Poets</td>
<td>3</td>
<td>A brief glance at Colonial and Revolutionary poets, with a more extended analysis of writers such as Poe, Longfellow, Lowell, Whitman, Dickinson, and Lanier. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.</td>
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<tr>
<td>EN 396</td>
<td>American Novelists 1920-1940</td>
<td>3</td>
<td>A study of the novels of writers such as Hemingway, Faulkner, Ellison, Larsen, Yezierska, and Steinbeck. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.</td>
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<tr>
<td>EN 397</td>
<td>Writers of Contemporary American Fiction</td>
<td>3</td>
<td>A course emphasizing the fiction of writers such as Updike, Oakes, Cheever, Alexie, Angelou, Pynchon, and O'Connor. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered every other year.</td>
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</table>
EN 398 - American Dramatists from 1918 to the Present 3 credits
A study of American plays, including musical comedy and the experimental theater of the fifties and sixties, by such authors as O'Neill, Anderson, Rice, Odets, Wilder, Williams, Miller, Shepard, Howe, and Albee. Prerequisite: EN102 or EN108. 3 lecture hours. Offered on occasion.

EN 406 - Major Figure Seminar 3 credits
A seminar that focuses on the work of a single author and allows depth of study and research. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered annually.

EN 420 - Thematic Seminar-Literature 3 credits
A seminar that explores a topic of interest in the humanities. Prerequisite: EN102 or EN108. 3 lecture hours. Usually offered annually.

EN 425 - Directed Study In Literature 3 credits
A course in which a student of demonstrated ability works with a faculty mentor in a well-defined area in Literature within the competence of the department faculty. Emphasis will be on student initiative, guided reading, and consultations with the mentor. *May be repeated once, on a different topic, for a maximum of 6 credits. Prerequisite: permission of the instructor and the department curriculum committee. 3 lecture hours. Offered as needed.

EN 450 - Senior Seminar 3 credits
The required capstone course for the major. EN450 measures students' ability to distinguish periods of English and American literature; to analyze a work in relation to one of several specified intellectual contexts; and to demonstrate competence in the practice of at least two critical approaches. Students are encouraged to bring to the seminar papers written for courses completed earlier in the major. Two essays (one of which fulfills the university requirement for a senior paper outlining ethical standards based on life experience) and a major oral presentation--to faculty members from both within and outside the English department--are required. Pre-requisite: senior status as an English major or minor or permission of the instructor. *May be repeated once, on a different topic, for a maximum of 6 credits. This course satisfies the university’s General Education Ethics requirement. 3 lecture hours. Offered every spring.

Environmental Science

ES 130 - Introduction to Environmental Law 3 Credits
Major Federal pollution regulation schemes, environmental economics, risk analysis, relevant common law, and constitutional and procedural issues are introduced. Vermont Environmental Law is addressed, as is a survey of the extensive and often novel regulatory approaches of the state of Vermont. The course introduces the law pertaining to environmental issues such as population, economic growth, energy, and pollution. Environmental problems are defined and alternative approaches for dealing with them are examined. Existing statutory efforts such as the National Environmental
Policy Act, the Clean Air Act, and the Resource Conservation and Recovery Act are analyzed. Does not fulfill a science requirement. Three lecture hours per week. Offered Spring of odd numbered years.

ES 251 - Sophomore Seminar Environmental Science 1 credit
This course introduces the fundamentals of scientific investigation and communication. A research project introduces the Scientific Method, while reading and comprehension of scientific literature is coupled with instruction in and application of technical and scientific writing. Other forms of scientific communication, including oral presentations, are addressed. Students learn the appropriate techniques for displaying and interpreting scientific data. Students may not earn credit for both ES251 and GL251. Offered Fall semester.

ES 270 - Fundamentals of Environmental Science 4 Credits
This lab science course investigates the atmosphere, hydrosphere, lithosphere, and pedosphere and their interrelations as well as the affect they have on humans and the role that humans play in large-scale change within these spheres. Subjects include modern climate principles and global climate change, water as a natural resource, natural hazards such as landslides, earthquakes and volcanoes, soil nutrient loss and erosion, sustainable agriculture, and other topics related to natural-human interactions. Prerequisite, one introductory Geology lab science. Offered Fall semester of even numbered years.

ES 450 - Directed Study in Environmental Science 4 credits
A capstone project carried out under the direction of a faculty member and in coordination with others taking this course. A laboratory and/or field component of the project will generate new data on an expanding base, and an environmental science report will be prepared based in part on the results of that work. Credit cannot be received both for this course and GL450. Offered fall semesters. 4 lecture hours

ES 451 - Environmental Seminar 3 credits
A capstone course offered in a seminar format with required reading, writing, and group participation. Designed to provide an integrating experience with sufficient flexibility to pursue individual interests. This course also includes oral and poster presentations of senior research projects, and examination of codes of ethics in the environmental sciences. Classroom 3 hours. Credit cannot be received both for this course and GL451. Offered spring semesters.

Finance

FN 311 - Corporate Finance 3 credits
Development of the basic theoretical framework for decision-making in financial management, emphasizing the time-value of money and the analysis of cash flows. Areas of concentration are financial institutions and markets, financial statement analysis, the role of time value in finance, bond and stock valuation, capital budgeting decision process, risk and return analysis, cost of capital and dividend policy.

Revised October 2012-Posted 10/2012
Prerequisites: AC206 or AC201, EC202, QM213 or permission of the instructor. 3 lecture hours

**FN 407 - Corporate Finance II**  
3 credits  
Special topics in financial management including: international managerial finance, mergers and acquisitions, hybrid and derivative securities, working capital management, short-term and long-term financing, financial planning, leverage analysis and capital structure theory. Prerequisites: QM213, FN311. 3 lecture hours

**FN 412 - Investments**  
3 credits  
Methods of security analysis and portfolio management, including the current theoretical literature and thought. Discussion and analysis of current events and their implications for stock price behavior. Prerequisites: QM213, FN311. 3 lecture hours

**Fine Arts**

**FA 201 – History/Theory of Architecture I**  
3 credits  
This course explores the architecture of different cultures from around the world beginning with the earliest evidence of human habitation and ending with the arrival of the renaissance. It examines the development of domestic, civic, and religious sites, as well as towns and settlements. The course explores major cultural, social, technological, and ideological influences on built environments, as well as examines the history, the context, and the form of notable examples. Three hours of lecture per week. Preference given to architecture majors. Note: Students who successfully complete this course may not take FA221.

**FA 202 – History/Theory of Architecture II**  
3 credits  
This course explores the architecture of different cultures from around the world focusing on Western architecture from the Renaissance to the 19th century. It examines the development of domestic, civic, and religious sites, as well as towns and settlements. The course explores major cultural, social, and technological influences on built environments, as well as looks at the history, the context, and the form of notable examples. It additionally examines the developing ideologies of prominent practitioners. Three hours of lecture per week. Preference given to Architecture majors.

**FA 221 - History of Visual Arts I: Prehistoric to 1350**  
3 credits  
This course presents a survey of the history of art (including painting, sculpture, decorative objects, and architecture) from prehistoric times through the Middle Ages. While the course focuses on Western society, the art of non-Western cultures is also included. Formal analysis is used to link the visual language of art with social, political, and psychological concerns. Throughout the semester basic questions about art are explored with the intent to stimulate critical thinking about the specific cultures that produce the works. Three hours of lecture per week. Note: Students who successfully complete this course may not take FA201.
FA 222 - History of Visual Arts II: 1350 to the Modern Era 3 credits
This course presents a survey of the history of art (including painting, sculpture, decorative objects, photography, and architecture) from approximately 1350 until the early 20th century. While the course focuses primarily on Western art, the art of selected non-Western cultures is also included. Throughout the semester specific examples of art are explored with the intent to develop a deeper understanding of the goals and agendas of the individual artists and/or cultures that produce the works. Formal analysis is used to link the visual language of art with social, political, and psychological concerns. The ideologies of noted artists will be also explored. Three hours of lecture per week.

FA 240 - History of American Art 3 credits
This course presents a survey of American art and architecture from colonial times to the present. Emphasis is placed on the rise and development of the arts in the United States and the changing nature and functions of art in American Society. European influences and Native American contributions will be noted. Three hours of lecture per week.

FA 250 - Topics in Art 3 credits
Topics, which vary each semester, focus on past and current issues in art related to social and historical contexts, aesthetic theories, traditions, and innovations, as well as the role of art and the artist as agents of cultural communications. This course may be repeated for credit. Three hours of lecture per week.

FA 260 - Art Appreciation 3 credits
This course is introductory in nature and focuses on varied ways to appreciate art: the role of the viewer, the purposes and functions of art, the creative process, materials and technology available to the artist, the role of art in both Western and non-Western cultures, and the definitions and issues of artistic styles. Three hours of lecture per week.

FA 308 – History/Theory of Architectural III 3 credits
This course presents a survey of architecture from approximately the mid eighteenth century through to the early 1930s, focusing on the rise and early development of the modern movement. It integrates the historic aspects of the key examples of architecture and urban design from this era with the theoretical ideas that generated the built form. Included in the course content is a discussion of the new programs, new social/economic/political organizations and new construction materials and methodologies the drove the search for new forms to represent the new ideas of the modern industrialized era. Prerequisite: FA202. 3 lecture hours

FA 309 – History/Theory of Architecture IV 3 credits
This course presents a survey of architecture from approximately the 1930s to the present day focusing on the various evolutionary paths of architectural development, including the codification of the international style and the subsequent challenges to the modern dogma into eras of mid and late modernism, expressionism, nationalism,
organicism, brutalism, regionalism, postmodernism, deconstructivist architecture, and into the integration of the digital in design and manufacture of built works. Each evolutionary stance is discussed through analysis of the key works integrating the historic aspects with the theoretical ideas that generated the architectural works. Prerequisite FA308. 3 hours of lecture.

French

FR 111 - Beginning French I 6 credits
The main purposes of this intensive course are to lead students to communicate in French at a basic level, to appreciate the French-speaking world, and to develop cultural awareness. In a highly interactive environment, students learn to understand, speak, read, and write French. French-language films, videos, and music presented in lab sessions are selected to reinforce the cultural material discussed in class, improve speaking and listening skills, and address differences in nonverbal communication. Not open to students who have successfully completed FR205 or higher. Classroom 6 hours, laboratory 2 hours.

FR 112 - Beginning French II 6 credits
A continuation of FR111 in which language skills are brought to a level enabling students to participate more fully in general conversation, to read more sophisticated passages, and to write with a firmer command of syntactical structures. Cultural competency is further developed. Classroom 6 hours, laboratory 2 hours. Prerequisite: FR111, NU language placement exam. Not open to students who have successfully completed FR205 or higher.

FR 150 - Topics Course 3 credits
Specialized topics relating to French and Francophone culture, literature, business practices, or language. Topic will be indicated in the schedule of classes. This is an introductory-level course. Course may be repeated for credit if the topic differs. May be taught in French or English; see schedule of classes. (May be taught in French or English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours; laboratory varies with topic of course.

FR 205 - Intermediate French I 3 credits
A course providing aural-oral practice in French, in which students enter into full discussion of topics that include abstract themes and cultural perspectives; includes the expanded use of syntactical structures, the reading of sophisticated material, composition, and the viewing of selected French and Francophone films and documentary materials from French-language television. Taught entirely in French. Classroom 3 hours, laboratory 1 hour. Prerequisite: FR112, NU language placement exam, or permission of the instructor.

FR 206 - Intermediate French II 3 credits
A course providing aural-oral practice in French, in which students enter into full discussion of topics that include abstract themes and cultural perspectives; includes the
expanded use of syntactical structures, the reading of sophisticated material, composition, and the viewing of selected French films and documentary materials from French television. Taught entirely in French. Classroom 3 hours, laboratory 1 hour. Prerequisite: FR205 or the equivalent, NU language placement exam. 3 lecture hours

FR 250 - Topics Course 3 credits
Specialized topics relating to French and Francophone culture, literature, business practices, or language. Topic will be indicated in the schedule of classes. This is an intermediate-level course. Course may be repeated for credit if the topic differs. May be taught in French or English; see schedule of classes. Course may be repeated for credit if the topic differs. (When taught in English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours; laboratory varies with topic of course.

FR 311 - Advanced French I 3 credits
A continuation of grammar review at the advanced level; further development of oral expression through discussion and formal presentations. An introduction to the analysis of Francophone literature and film; an overview of major events, including cultural and scientific developments affecting French thought. Students will prepare written work in a workshop atmosphere in which rewriting and collaboration are encouraged in order to teach self-correction. Readings, lectures, discussions, student presentations, written work entirely in French. Classroom 3 hours, laboratory 1 hour. Prerequisites: FR206, NU language placement exam, or permission of the instructor.

FR 312 - Advanced French II 3 credits
A continuation of grammar review at the advanced level; further development of oral expression through discussion and formal presentations. An introduction to the analysis of Francophone literature and film; an overview of major events, including cultural and scientific developments affecting French thought. Students will prepare written work in a workshop atmosphere in which rewriting and collaboration are encouraged in order to teach self-correction. Readings, lectures, discussions, student presentations, written work entirely in French. Classroom 3 hours, laboratory 1 hour. Prerequisites: FR206, NU language placement exam or permission of the instructor.

FR 321 - A Survey of French Literature I 3 credits
An introduction to French literature. Lectures, reading, discussion in French. Includes an historical survey of French civilization comprising developments in art, music, philosophy, and science. Readings in French literature from the Middle Ages to 1789, from the chivalrous medieval epic to the philosophies of the Enlightenment and expression of the egalitarian ideal of the Revolution. Readings, lectures, discussions, student presentations, written work entirely in French. Prerequisites: FR206, or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours
FR 322 - A Survey of French Literature II 3 credits
An introduction to French Literature. Lectures, reading, discussion in French. Includes an historical survey of French civilization comprising developments in art, music, philosophy, the technology of warfare and the sciences. Readings in French literature from Romanticism to literature of the Absurd and beyond. Readings, lectures, discussions, student presentations, written work entirely in French. Prerequisites: FR206, or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

FR 327 - French Literature of the Twentieth Century I 3 credits
A study of French literature (novel) from the latter part of the 19th century to the present day. Topics of study include concurrent developments in the other art forms and in the sciences; the impact of the World Wars on Francophone authors and artists. Readings, lectures, discussions, student presentations, written work in French. Prerequisites: FR206, or a 300-level course (may be taken concurrently), NU language placement exam or permission of the instructor. 3 lecture hours

FR 328 - French Literature of the Twentieth Century II 3 credits
A study of French literature (poetry, theater, and film) from the latter part of the 19th century to the present day. Topics of study include concurrent developments in the other art forms and in the sciences; the impact of the World Wars on Francophone authors and artists. Readings, lectures, discussions, student presentations, written work in French. Prerequisites: FR206, or a 300-level course (may be taken concurrently), NU language placement exam or permission of the instructor. 3 lecture hours

FR 331 - Adv French Composition, Conversation, and Translation I 3 credits
A course in French stylistics, translation, oral reports and discussions in French. Prerequisites: FR206, or a 300-level course (may be taken concurrently), NU language placement exam or permission of instructor. 3 lecture hours

FR 332 - Adv French Composition, Conversation, and Translation II 3 credits
A course in French stylistics, translation, oral reports, and discussions in French. Prerequisites: FR206, or a 300-level course (may be taken concurrently), NU language placement exam or permission of instructor. 3 lecture hours

FR 350 - Topics Course 3 credits
Specialized topics relating to French and Francophone culture, literature, business practices, or language. Topic will be indicated in the schedule of classes. This is an advanced-intermediate to advanced-level course. Course may be repeated for credit if the topic differs. May be taught in French or English. Course may be repeated for credit if topic differs. (When taught in English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours; laboratory varies with topic of course.
FR 415 - Seminar: Topics in French Literature  
Study of a particular author, theme, genre, or literary movement, including cultural themes. Offered as occasion demands. Topic varies each year these courses are offered. Prerequisites: FR300-level course or permission of instructor. 3 lecture hours

FR 421 - Reading & Research on a Topic in French Literature & Civilization  
A report on an approved project of original research in French literature or civilization under the direction of a department member. Limited to students who have demonstrated aptitude for independent work. May be scheduled either or both semesters. Prerequisites: FR300-level course, or permission of the instructor. 3 lecture hours

Foreign Study

FS 001 - Off Campus Study Program  
12 credits

Freshman Triad

FT 001 - Freshman Triad  
A seminar in which first year students are introduced to university life, its purpose, development and traditions, while developing skills for academic success and life-long learning. The mechanisms employed in this course include reading, writing assignments, discussions, visits to resource and research centers, and visits by speakers. 1 lecture hour

Graduate Business Administration

GB 501 – Fundamentals of Business Management  
6 credits
This seminar presents broad-based fundamental learning in economics, management, marketing and operations management from the perspective of a business manager. Students will focus on the economic framework for business decision-making, learning the importance of an ability to assess market conditions as the context for all business strategy development and implementation. The seminar will emphasize management’s ability to plan for and execute advantageous strategy so as to achieve organization objectives through efficient and effective allocation of its human, capital and intellectual resources. Marketing and operations management will be a core seminar component in which students will learn theory and skills that represent best practices in the marketing and operations management of products and services. Prerequisite: None.

GB 502 - Quantitative Methods and Financial Analysis for Managers  
6 credits
The seminar will introduce standard techniques of quantitative analysis, business mathematics and statistics integrated into a context of business management. Business
mathematics will provide the essential tools for the quantification of business processes through the study of calculus, finance, and other fundamental math systems for business problem solving, while statistics learning will encompass probability, sampling and related risk assessment techniques. Financial analysis will be studied by first establishing understanding of the nature of accounting statements, with emphasis on the use of accounting information to assess financial health of an enterprise. The financing decision will then be introduced and examined, followed by learning of the standard options for funding the enterprise. This will include an examination of the characteristics of financial markets and the common types of financing instruments and securities which are traded in capital and money markets, and which are the vehicles for external financing, as needed to meet organizational objectives. Prerequisite: None.

GB 507 – Business Analysis Tools 6 credits
This seminar provides students with critical tools of quantitative analysis. The seminar covers the fundamentals of business statistics, economics, finance, and elements of finite mathematics such as probability theory, probability distributions, decision theory, and mathematics of finance. Business statistics will equip students with analytical techniques for making business decisions under uncertainty. Finite mathematics introduces students to the mathematics of time value of money which is used for determining the value of individual projects as well as the worth of an entire company. Economics introduces models to analyze the interaction between the markets and the firm’s strategy, the impact of macroeconomic fiscal and monetary policies, and the dynamics of international trade and finance.

GB 508 – Business Management Fundamentals 6 credits
This seminar introduces two subjects: introduction to business administration and advanced business financial analysis. Introduction to business administration provides basic fundamentals to business strategies and functions: strategic management, management, marketing, and operations. Advanced business financial analysis, relying on financial accounting, focuses on the analysis of financial statements oriented toward determining how to analyze and manage a firm and how to determine the adequacy of its strategies and a firm’s success.

GB 511 - Strategic Resources Management 6 credits
This seminar focuses on the strategic management of the intangible assets of an organization: human capital, information capital, and organizational capital. Human motivation, workforce utilization, performance measurement, leadership, organizational culture and change, management information systems, knowledge management, and contingency planning are discussed in detail during the seminar. You learn to translate strategy into operational terms and to align the organization to its strategy.

GB 522 - Managerial Finance 6 credits
This seminar is designed to introduce the student to the problems of finance function and to the responsibilities of the chief financial executive and his/her staff in the ongoing operations of the firm. Emphasis will be on efficient allocation and uses of
funds. The seminar includes many topics such as Financial Analysis, Cash Flow and Financial Planning, Capital Budgeting, Valuation Models, Risk and Return Analysis, Leverage and Capital Structure, Working capital Management, and International Business Finance. Prerequisites: Completion of GB 511, or permission of the program director

GB 532 - Strategic Marketing and Operations Management 6 credits
This seminar centers on Marketing and Operations Management each from their own functional perspectives in a business organization and how to achieve integration of the two functions for optimal business performance. The seminar uses the Product Life Cycle (PLC) model as a framework for integrating the two disciplines and demonstrating how the nature and interface of marketing and operations change as the firm’s products evolve through the PLC. Prerequisite: Completion of Seminar GB522

GB 544 - Project Management Techniques, Tools and Practices 6 credits
This seminar focuses on the “nuts and bolts” or fundamentals of project management and practices. The course will explore the key elements of project management from the project management framework, the project life cycle, project process and key project management knowledge areas. Additionally, project integration, scope, time, cost, quality, resource and schedule management will be studied. Other key areas of focus will be project management procurement and overall project communications requirements. Prerequisites: GB532

GB 545 - Multinational Business Finance 6 credits
This seminar focuses both on Advanced Topics in Corporate Finance and on Multinational Business Finance. Multinational Enterprises (MNEs) are unique institutions that act as catalysts and facilitators of international trade and as important producers and marketers in host countries where their subsidiaries are located. This seminar builds on seminar 2 but it also identifies and describes in details the differences between multinational business finance and domestic financial management. The major topics presented in this seminar are Global Financial Environment, Foreign Exchange Theory, The Foreign Exchange Market and Derivatives, Foreign Exchange Exposure, Financing The Global Firm, Foreign Investment Decisions, and Managing Multinational Operations. Prerequisites: GB532

GB 546 - Leading Change in Business Organizations 6 credits
This seminar focuses on the strategic management of change in organizations. Students learn about change from a leadership as well as a management perspective in business organizations, national and multinational. This Seminar is broad based and will focus on differentiating the conceptual and theoretical change models in order to assist the student in understanding the best ways to lead and manage change. Students will learn the importance of a manager’s ability to understand and follow the change management process in a collaborative manner. The Seminar will help students learn about and practice management skills that foster positive changes in people and organizations. Prerequisites: GB532

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Revised October 2012-Posted 10/2012
GB 552 - International Business Management 6 credits
The International Business Seminar addresses the strategic management of internationally active organizations. A theoretical framework is provided that will enable learners to compare, contrast, and evaluate the differences between domestically and internationally active organizations. Learners will examine and apply concepts pertaining to the globalization of business, the internationalization of a specific organization, and the factors that influence these two outcomes. Learners will learn how to make decisions rooted in the increasingly international context of today’s business world.

GB 553 - Organizational Leadership 6 credits
Each component of this seminar will contribute to a single integrated learning experience about leading change in an organization. As leaders, you will try out proven change management processes and techniques while learning to develop action plans to help in the achievement of tangible, successful results. Topics will consider both a global virtual world and on-site workplace environments. Learn about different change management models and problem-solving techniques to apply to different scenarios. Learn to apply information effectively as you lead change.

GB 554 - Project Management Leadership, Communications and Teams 6 credits
This seminar focuses on the important aspects of project management leadership, effective communications and the management of project teams. In this seminar the students will explore the fundamental principles of good project management, which will include: leadership skills, winning stakeholder cooperation, writing the rules to manage expectations, project risk management, creating realistic schedules, achieving accurate project estimates, trade-offs between project cost, schedule and quality, building strong project teams, clear communications, measuring progress, problem solving, defining clear requirements and apply lean principles in project management. This seminar will take these important project leadership, communication and team management skills and integrate them with some of the key concepts and ideas coming out of Seminar 4’ “nuts and bolts” seminar, resulting in fundamental principles of project management being integrated with leadership, communications and team building practices and challenges. Prerequisites: GB544, or permission of the program director

GB 555 - Investments and Portfolio Management 6 credits
This seminar is concerned with the characteristics and analysis of individual securities as well as with the theory and practice of optimally combining securities into portfolios. The recent creation of new securities and trading strategies that would have been impossible without concurrent advances in computer and communications technology combined with continuing progress in the theory of investments have made the field of investments and portfolio management much more complex and exciting. This seminar will be organized around two basic themes that security market is a highly efficient market and an investor who diversifies and takes a long-term approach to investing is generally rewarded with higher returns and less risk. These simple
observations are, extremely, powerful in their implications for planning and implementation of investment strategies. Prerequisites: GB522

**GB 556 - Strategic Organizational Behavior**  
6 credits

This seminar focuses on strategic organizational behavior in business organizations. Students learn about the importance of strategic alignment in order to enable effective organizational behavior. Systems thinking and organizational behavior provide a framework which the student can use both to analyze and influence the behavior of individuals and groups within the organization. This seminar is broad-based and will focus on analyzing and applying various holistic strategic organizational behavior models in order to assist the student in understanding the best ways to assess and impact the strategic alignment of organizations. Students will learn the importance of a manager’s ability to understand and use various organizational behavior and organizational strategy models. The seminar will help students learn about and practice management skills that foster strategic alignment and effective behavior in people and organizations. Prerequisite: GB546, or permission of the program director.

**GB 560 - Strategic Management**  
6 credits

This seminar addresses the strategic management of entire organizations, which implies total responsibility for integrating and coordinating all activities and the accomplishment of long-term goals that determine organizational survival. Analytical models are used to dissect actual case scenarios, identify the underlying strategic nature of business problems, and develop strategic recommendations for their resolution. You will debate the topical and controversial issues of corporate management and will have the opportunity to interact with industry leaders. The seminar concludes with a project that integrates results of prior seminars into a cohesive strategic analysis of an international company using the BSC. A comprehensive outcome assessment examination will be administered during this seminar. (6 credits)

**GB 564 - Strategic Management in Project Management**  
6 credits

This seminar focuses on the application of the concepts and ideas coming from the GB 544 and GB 554. In this seminar, the students will apply the fundamental principles of project management from the project management framework, the project life cycle, project integration, scope, time, cost, quality, and schedule management. Students will also include the integration of leadership skills, winning stakeholder cooperation, project risk management, building strong project teams, clear communications, measuring progress and problem solving in the completion of a proposed project. Prerequisites: GB544 and GB554, or permission of the program director.

**GB 565 - Strategic Management in Finance**  
6 credits

The aim of this seminar is to illustrate and exercise the application of tools and concepts of modern finance. This seminar represents the culmination of the study of finance at Norwich University MBA program. The seminar relies on the techniques and theories of Corporate Finance, Multinational Business Finance, and Investments to expand the students’ strategic perspectives and enhance their financial analysis.
skills. Case analysis is the approach used in this seminar and managing for corporate value creation is the focus of all cases used in this seminar. Prerequisites: GB522, GB545, and GB555

**GB 566 - Strategic Management in Organization Leadership** 6 credits
Students apply principles of Leading Change, Strategic Organizational Behavior and Strategic Management to people and organizations to impact performance and ensure future success. This seminar develops an understanding of the implications of strategic alignment to organizational success. It differentiates conceptual and theoretical change models to assist students in understanding the best ways to lead change while considering individual and group behavior as tied to strategy. The seminar demonstrates how strategic leadership, organizational behavior, and change theories are applied in a collaborative manner and will lead to aligning stakeholders interest. Prerequisites: GB546 and GB556, or permission of the program director

**Graduate Diplomacy**

**GD 510 - Theory and the International System** 6 credits
In this seminar students will review the basic theories that govern international relations and political science. As no one theory fully explains the international system, a firm grasp of the leading paradigms gives a student a solid foundation on which to build the degree. This seminar will also trace the historical evolution of diplomacy within the international system giving the student a sense of its progression and an awareness of the milestones of diplomatic interaction within that system.

**GD 511 - The History of Diplomacy in the International System** 6 credits
In seminar is a comprehensive overview of diplomacy, international relations, and world order in the context of the modern state system, 1648 to the present. The seminar provides an introduction to the international political environment through studies in foreign policy decision-making. As a joint offering between the Mater of Military History and the Master of Arts in Diplomacy, the seminar combines the fields of history and political science by using an analytical framework of historiography and IR methodology.

**GD 520 - Law and the International System** 6 credits
In this seminar students will explore the structure of the international system as defined by the rules and guidelines for that system. A student will be introduction to international law terminology, history and its theory. The laws surrounding conflict, war and war crimes will be explored. Of special interest will be the laws pertaining to human rights. Finally the more up and coming areas of international law will be explored, environmental law and the growing body of law concerning humanitarian intervention.

**GD 530 - Economics and the International System** 6 credits
In this seminar students will explore the international economic system. The impact of modernization within the system will be examined. The controversy over the concept
of globalization will be explored. The debate over free trade verses protectionism will be investigated. A student will become familiar with the international financial network and its institutions. Special attention will be given to Third World development issues. Finally the idea of economics as a tool of diplomacy and military power will be raised.

GD 540 - Conflict Avoidance, Prevention & Containment in the International System 6 credits
In this seminar students will address the multiple schools of debate concerning the causes of conflict and war. The increasingly controversial are of peacekeeping, peacemaking and peace enforcement will be reviewed with an eye toward lessons learned. Transnational forces, including non-governmental organizations will be investigated. Finally the important concept of multilateral diplomacy as a tool to avoid conflict in the international system will be examined.

GD 542 - Terrorism; Introduction and State Sponsored Terrorism 6 credits
This seminar examines how states have used terrorism as a tool in managing their international relations. The seminar also evaluates the actions that the international community took to deter state-sponsored terrorism. Case studies will be used to complement theory and to allow for comparative analyses of actions taken by the international community in different situations. In this seminar students will examine the dos and don’ts of negotiating peace, its hazard, unexpected consequences and lessons learned. Of increasing importance is learning how to recover from atrocities, through trials, truth commissions and amnesty. Post conflict governing recovery is also explored. Reestablishing the rule of law, the dominance of civil society and the institutions of governance. Finally students will examine the politics and cultural impact of rebuilding, including the economic and financial costs.

GD 544 - Global Commerce and the International System 6 credits
Students evaluate the role of private-sector businesses in the international system. This seminar focuses on examining internal and external environmental conditions when conducting business in a global environment; in particular, students explore the impact of economics, law, politics, and culture on multinational business endeavors. Country-specific data and internal organizational factors that influence managerial decision-making in multinational organizations are analyzed. The fundamental goal of this course is to increase understanding of the global business environment and thereby enhance the ability to function effectively across borders.

GD 550 - Conflict Resolution & Post-Conflict Reconstruction in the International System 6 credits
In this seminar students will examine the dos and don’ts of negotiating peace, its hazard, unexpected consequences and lessons learned. Of increasing importance is learning how to recover from atrocities, through trials, truth commissions and amnesty. Post conflict governing recovery is also explored. Reestablishing the rule of law, the dominance of civil society and the institutions of governance. Finally students
will examine the politics and cultural impact of rebuilding, including the economic and financial costs.

**GD 552 - International Terrorism by Non-State Actors**  
6 credits  
This seminar examines the phenomenon of transnational terrorism by non-state actors. Ideology, psychology, and strategies of major transnational groups are addressed to provide an understanding of their long-term goals and operations. Terrorist groups’ relationships with WMD proliferation and organized crime are examined, together with possible future trends in terrorist operations. Case studies of key groups will be used to provide comparative analysis.

**GD 554 - Cross Cultural Management in the International System**  
6 credits  
Students review fundamental topics in human resources management as these pertain to globally active organizations: corporate, non-profit, and governmental. The seminar focuses on building personal skills in dealing with intercultural Human Resources Management differences; selecting, evaluating, and compensating employees in international assignments; training and developing expatriate employees; dealing with culture shock; and examining the effects of repatriation. Students will be asked to apply the concepts of conflict management, resolution, and avoidance to specific “at-work” situations.

**GD 560 - Military Intervention & Conflict Management in the International System**  
6 credits  
In this seminar students will examine conflict in all its forms. Such aspects as covert operations, psychological warfare, special operations and limited warfare will be introduced. The increased emphasis on multinational coalitions and conflicts will be explored. A renewed emphasis will be given to terrorism, including the use of Chemical, biological and nuclear agents. Special cases of civil war and collapsed state conflicts will be reviewed. Finally the impact of modern warfare, most notably to the environment will be investigated.

**GD 561 - Human Rights and Conflict in the International System**  
6 credits  
In this seminar students will probe the complicated connections between the protection and enforcement of human rights norms and the roots, unfolding, and termination of armed conflict. Borrowing from the fields of peace-building, conflict resolution, diplomacy, and law, the seminar builds upon the themes of conflict prevention and post-conflict reconstruction developed in previous seminars by focusing on how human rights abuses make conflict, especially violent conflict, likely, and how a respect for the political, civil, economic, and social claims of individuals might repair and restore such societies.

**GD 562 International Response to Transnational Terrorism**  
6 credits  
This seminar surveys the strategies and policies used by states to combat transnational terrorism. It includes the development of international law as a tool against terrorism. It focuses on diplomatic and multilateral approaches to deal with cross border issues, and government policies designed to improve internal and multinational coordination.
and cooperation. Differences and commonalities among states in their approaches to terrorism are highlighted in an effort to examine best practices.

**GD 564 Global Corporate Diplomacy**  
6 credits  
The capstone seminar addresses the issue of how international commerce depends upon the public goodwill, the development of which is the function of corporate diplomacy. The seminar will enable students to develop knowledge, competencies, and tools for implementing strategic communications in order to deal effectively with international constituencies, including the government, the news media and the Internet, and NGOs. Special emphasis will be laid on developing analytical skills to shape public opinion, build corporate reputation, and deal with crisis in a cross-cultural environment.

**GD 570 Thesis Seminar**  
6 credits  
Students allowed to pursue a thesis will explore the purposes, problems, and strategies of empirical and theoretical research. Students will examine the fundamental assumptions of, justifications for, and criticisms of the scientific study of international politics. The seminar will focus on ways of designing and conducting empirical political study, including discussions of conceptualization and operationalization, the rules and problems of measurement, logics of research design, and a range of observational and data-gathering techniques. Attention will be given to the advantages and pitfalls of particular research strategies. There are four main objectives of the seminar: to provide an overview of the research approaches most commonly adopted by scholars of international relations. To help students become more thoughtful critical readers of social science literature. To give students additional tools with which to explore their own thesis project. Finally, students will be exposed to both the quantitative and qualitative research methods.

**Geography**

**GE 104 - Introduction to Geography**  
3 credits  
A survey of man's occupancy of the earth, his cultures and economies, their distribution and spatial relationships. 3 lecture hours

**GE 300 - Topics in Geography**  
3 credits  
Select topics offered normally in a Spring semester. 3 lecture hours

**Graduate Information Assurance**

**GI 512 - Foundations and Historical Underpinnings of Information Assurance**  
6 credits  
This seminar explores the historical foundations of information assurance from the early days of mainframes to the foundations of today’s sophisticated networks and distributed computing systems. It examines the earliest thinking about data structures and domains, interoperability between different computing platforms and mechanisms
for data transfer and proceeds to the emergence of encryption as a defense against early forms of computer crime. This seminar looks at privacy, policies, and security standards and regulatory requirements. Finally, the seminar addresses the underlying models that define information assurance and takes a first look at IA architecture.

**GI 522 - Information Assurance Technology**  
6 Credits
This seminar focuses on the use of technological defenses against threats and exploitations of vulnerabilities in information systems. Topics include physical security measures, access controls, security elements of operating systems, network security measures, anti-malware tools, anti-spam measures, anti-piracy systems, software development methods supporting security, and security certifications for software products.

**GI 532 - Human Factors and Managing Risk**  
6 Credits
This seminar focuses on the ways that business objectives, user attitudes and user activities significantly influence both the development of an information assurance program and its successful implementation. The first week focuses on Operations Security and why it is the foundation for an IA program and the key to the program’s effectiveness.

The following five weeks explore security awareness as a component of organizational culture: crafting the information assurance message; understanding ethical decision-making as a factor in security; understanding social psychology and how behaviors will influence the effectiveness of security activities; using employment practices and policies to support information security; and creating Acceptable Use and e-mail policies.

The final four weeks examine different elements of Risk Management from basic principles through application. The NIST Special Publication 800-30 provides a solid foundation for the risk management issues. Two popular risk assessment processes, and several other processes that help identify risk will be discussed.

**GI 542 - Information Assurance Management & Analytics**  
6 Credits
This seminar is arranged in four general areas beginning with examining and exploring the strategic and gradually narrowing down to the tactical level:


The curriculum explores the aspects, methods, and alternatives in information assurance management and compares/utilizes them with respect to non-IT-related management approaches and styles. Additionally, it explores alternatives in building support and consensus for projects and activities and focuses heavily on adding value to the organization. Developing an information assurance marketing plan is examined and is used to help identify techniques of improving the information assurance
awareness. Analytics are explored both in terms of metrics and measuring business impact, and problem solving and project management techniques and alternatives are included.

Concentration in Public Sector Continuity of Government Operations

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Concentration in Business Continuity

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<td>BC510 - Foundations of Business Continuity Management</td>
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<tr>
<td>BC520 - Principles of Incident Mgmt &amp; Emergency Response</td>
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Concentration in Forensics and Incident Response Management

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<thead>
<tr>
<th>Course</th>
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<td>GI 551 - Computer Forensic Investigations</td>
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This course focuses on the spectrum of tools and techniques used to investigate digital incidents whether in a civil or criminal environment. Information assurance professionals are expected to have a broad understanding of digital incidents, their management, investigation and analysis. This seminar provides that broad understanding and places it in the context of other information assurance domains. These discussions of digital investigation and forensics cover topics from both the technical and management perspectives. This coverage aids the information assurance professional’s understanding and application of domain-specific knowledge.

GI 554 - Computer Security Incident Response Team Management  

6 Credits

Students will analyze and apply the key points in creating and managing a computer security incident response team (CSIRT), also sometimes known as a computer incident response team (CIRT) or a computer emergency response team (CERT). Major topics include establishing CSIRTs; responding to computer emergencies; securing the CSIRT; managing the CSIRT with respect to professionalism, setting priorities for triage, and protecting personnel against burnout; and learning from emergencies using the incident postmortem and by establishing continuous process improvement within the organization. Students will use their case study to apply their knowledge to real-world situations and will prepare recommendations for establishment of a new CSIRT or improvement of their existing CSIRT.

Geology

GL 110 - Introduction to Geology  

4 credits

An introduction to Earth’s internal and external physical processes, its materials and landforms, and the connection between natural phenomena and humans. Topics include: minerals, rocks, water and natural resources; plate tectonics, mountain building, volcanism, earthquakes, slope failure and related hazards; rivers and flood management; erosion, soil degradation, desertification and sustainable agriculture; sea-level rise, coastal and wetland erosion and shore zone management. Discussion of human interaction with the Earth will range from local policy to global economic decisions. Offered fall and spring semesters. Classroom 3 hours, laboratory 2 hours.
GL 111 - Oceanography
4 credits
A basic survey of the physical, chemical, and geologic character of the world’s oceans. Topics include patterns of energy exchange, chemical cycles, geological environments within the sea, and evolution of ocean basins. Classroom 3 hours, laboratory 2 hours. Offered spring semester only.

GL 156 – Introduction to Earth Evolution
4 credits
The course introduces the 4600 million year history of the evolution of Earth and life. Data and scientific theories for earth history are presented for major events including: the birth of the planet; plate tectonics and evolution of continents, mountains and ocean basins; evolution of the atmosphere and oceans; long-term climate change; and the evolution of life and mass extinction events. The lab focuses on the rock record, fossil life, and dating methods as they pertain to Earth history. Classroom 3 hours, laboratory 2 hours. Offered spring semester only.

GL 251 - Sophomore Seminar in Geology
1 credit
This course introduces the fundamentals of scientific investigation and communication. A research project introduces the Scientific Method, while reading and comprehension of scientific literature is coupled with instruction in and application of technical and scientific writing. Other forms of scientific communication, including oral presentations, are addressed. Students learn the appropriate techniques for displaying and interpreting scientific data. Students may not earn credit for both ES251 and GL251. Classroom 1 hour. Offered Fall semester.

GL 253 - Geomorphology
4 credits
A course on the origin and evolution of Earth’s surface features by geological processes acting upon various earth materials and geological structures. Classroom 2 hours, laboratory and/or field work 4 hours. Prerequisite: GL110. Offered spring of even-numbered years.

GL 257 - Sedimentation
4 credits
A course that provides the analysis and interpretation of sedimentary rocks, sedimentary processes and environments of deposition. Classroom 2 hours, laboratory and/or field work 4 hours. Prerequisite: GL110. Offered fall of even-numbered years.

GL 258 - Stratigraphy and Tectonics
4 credits
An introduction to the fundamentals of stratigraphy and tectonics. Plate tectonic theory is investigated, from its inception to the present. Stratigraphic concepts are presented, at the general level and in light of tectonics, with focus on Vermont and regional stratigraphy and tectonic history. Classroom 3 hours, laboratory 3 hours. Prerequisite: GL110. Offered Spring of odd-numbered years.

GL 260 - Projects in Geology
1 to 4 credits
A course that provides a geological field or laboratory project on a topic chosen by mutual consent of the student and the instructor. A written report is required. Prerequisites: GL110 and permission of the instructor.
GL 261 - Field Geology 4 credits
A study of the techniques used in the measurement of large and small scale geologic structures. Emphasis is placed on field recognition of features such as bedding, cleavage, folds, faults and their use in geologic mapping. Classroom 3 hours, laboratory 3 hours. Prerequisite: GL110 or permission of the instructor. Offered fall of even-numbered years.

GL 262 - Structural Geology 4 credits
A course that provides the analysis and interpretation of patterns in the structural features of the earth's crust. Topics include the genesis of tectonic features, analysis of strain in rocks, the interpretation of multiply-deformed rocks. Classroom 3 hours, laboratory 3 hours. Prerequisite: GL261 or permission of the instructor. Offered spring of odd-numbered years.

GL 263 - Mineralogy 4 credits
Introductory crystallography and crystal chemistry are used to explain the properties of minerals. Each of the major mineral groups is studied in the laboratory with a focus on developing competency in the identification of the ore minerals and the rock-forming minerals. Development of an understanding of mineral associations is emphasized and field trips allow opportunity to improve these skills. Classroom 3 hours, laboratory 3 hours. Prerequisite: GL110 or permission of the instructor. Offered fall of odd-numbered years.

GL 264 - Petrology 4 credits
Following an introduction to optical identification of the rock-forming minerals using the polarizing microscope, the mineralogy and textures of common rocks are studied by means of thin sections. The genesis of these rocks is explained through a study of the physical and chemical systems they represent. Classroom 3 hours, laboratory 3 hours. Prerequisite: GL263. Offered spring of even-numbered years.

GL 265 - Glacial Geology and Paleoclimate 4 credits
The first half of this course covers glaciology and glacial deposits and landforms, with a strong focus on field investigation. The second half of the course presents the data and hypotheses on Quaternary climate change, including traditional glacial chronology and marine and ice core data and resultant chronology. Global climate change, both past and present, is a central theme of the course. Classroom 3 hours, laboratory 3 hours. Prerequisite: GL110. Offered Fall of odd-numbered years.

GL 450 - Directed Study in Geology 4 credits
A capstone course in which there is preparation of a geological report based on a project of original research involving field, laboratory, or library study or some combination of these. Conference schedules will be determined by the nature of the project and the student’s schedule. Offered fall semesters as needed. Student cannot receive credit for this course and ES450. 4 lecture hours.
GL 451 - Geology Seminar 3 credits
A capstone course for fourth-year students designed to review advanced geological concepts in a seminar format. The course also includes oral and poster presentations of senior research projects, and examination of codes of ethics in the geological sciences. Offered spring semester as needed. Student cannot receive credit for this course and ES451. 3 lecture hours

German

GR 111 - Beginning German I 6 credits
An intensive course providing an introduction to the German language, in which speaking proficiency, aural comprehension, vocabulary acquisition, reading, and writing are brought to a level enabling students to use the language actively in everyday situations. Not open to students who have successfully completed GR205 or higher. Classroom 6 hours, laboratory 2 hours.

GR 112 - Beginning German II 6 credits
A continuation of German 111, in which language skills are brought to a level enabling students to participate more fully in general conversation, to read more sophisticated passages, and to write with a firmer command of syntactical structures. Classroom 6 hours, laboratory 2 hours. Prerequisite: GR111 or NU language placement exam. Not open to students who have successfully completed GR205 or higher.

GR 150 - Topics Course 3 credits
Specialized topics offered relating to culture, literature, business practices, language or linguistics. Topic will be indicated in the schedule of classes. May be repeated for credit as topics vary. May be taught in German or English; see schedule of classes. Course may be repeated for credit if the topic differs. (May be taught in German or English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours.

GR 205 - Intermediate German I 3 credits
A sequence that provides aural-oral practice in German, in which students are enabled to enter into full discussion of topics that include abstract themes, review and expanded use of syntactical structures, intensive and extensive reading, and composition. Classroom: 3 hours, laboratory: 1 hour. Prerequisite: GR112, NU placemen exam, or permission of the instructor.

GR 206 - Intermediate German II 3 credits
A sequence that provides aural-oral practice in German, in which students are enabled to enter into full discussion of topics that include abstract themes, review and expanded use of syntactical structures, intensive and extensive reading, and composition. Classroom 3 hours, laboratory 1 hour. Prerequisite: GR205, NU placement exam, or permission of the instructor.

Revised October 2012-Posted 10/2012
GR 250 - Topics Course  
3 credits
Specialized topics offered relating to culture, literature, business practices, language, or linguistics. Topic will be indicated in the schedule of classes. May be repeated for credit as topics vary. May be taught in German or English; see schedule of classes. Course may be repeated for credit if the topic differs. (When taught in English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours.

GR 321 - Survey of German Culture I: From the Beginnings to 1848  
3 credits
Introduction to major currents in German social, political and cultural history from the time of the Roman Empire until the Revolution of 1848. Taught in German. Prerequisite: GR206, NU language placement exam, or permission of the instructor. 3 lecture hours

GR 322 - Survey of German Lit I: From the Beginnings to 1848  
3 credits
Introduction to major texts and literary figures from the Roman Era until the Revolution of 1848, including, among others, Tacitus, Charlemagne, the courtly poets, Luther, the literary Baroque, Lessing, Goethe, Schiller, Kleist, the brothers Grimm, Buchner, and Heine. Taught in German. Prerequisite: GR206, a GR300-level course, NU language placement exam or permission of the instructor. 3 lecture hours

GR 323 - Survey of German Culture II: 1848 to 1945  
3 credits
Introduction to major currents in German social, political, and cultural history from the Revolution of 1848 through Bismarck and German unification to World War I, the Weimar Republic, and the period of Fascism and the Holocaust. Taught in German. Prerequisite: GR206, a GR300-level course, NU language placement exam, or permission of the instructor. 3 lecture hours

GR 324 - Survey of German Literature II: 1848 to 1945  
3 credits
Introduction to major texts and literary figures from the first unification of Germany until the end of World War II, including Nietzsche, Hofmannsthal, Rilke, Thomas Mann, Kafka, Brecht, and others. Taught in German. Prerequisite: GR206, a GR300-level course, NU language placement exam, or permission of the instructor. 3 lecture hours

GR 325 - Survey of German Culture III: 1945 to the Present  
3 credits
Introduction to major currents in social, political, and cultural history of the Germanies and Austria, post-war to post-wall: the period of Allied occupation followed by the economic miracle of the 1950s and 60s, radicalism and upheaval in the late 60s and 70s; and, finally, the rise and fall of the Berlin Wall, culminating in the uneasy co-existence between East and West that has prevailed since re-unification. Taught in German. Prerequisite: GR206, GR300-level course, NU language placement exam, or permission of the instructor. 3 lecture hours

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Revised October 2012-Posted 10/2012
GR 326 - Survey of German Literature III: 1945 to the Present 3 credits
Introduction to major texts and literary figures active since the end of World War II, including Borchert, Boll, Celan, Bachmann, Frisch, Durrenmatt, Grass, Christa Wolf, Peter Schneider, Jurek, Becker, and others. Taught in German. Prerequisite: GR206, GR300-level course, NU language placement exam, or permission of the instructor. 3 lecture hours.

GR 350 - Topics Course 3 credits
Specialized topics offered relating to culture, literature, business practices, language, or linguistics. Topic will be indicated in the schedule of classes. May be repeated for credit, as topics vary. The number ascribed to the course will reflect the level of the material under study as well as the level of proficiency expected of the student. May be taught in German or English; see schedule of classes. Course may be repeated for credit if the topic differs. (When taught in English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours.

GR 415 - Seminar on a Topic in German Literature and Culture 3 credits
A study of a particular author, theme, genre, or literary movement, including cultural themes. Offered as occasion demands. Topic varies each year these courses are offered. Prerequisite: GR300-level course or permission of the instructor. 3 lecture hours.

GR 421 - Reading and Research in German Literature or Civ 3 credits
A report on an approved project of original research in literature or civilization under the direction of a department member. Limited to students who have demonstrated aptitude for independent work. May be scheduled either or both semesters. Prerequisite: GR300-level course permission of the instructor. 3 lecture hours.

Graduate Universal Course

GU 590 - Selected Topics 1 - 6 credits
This seminar will require a student(s) to make an original, extended, and in-depth study of an approved topic within their field of study and as approved by an appropriate Program Director. This course is used most often in combination with other listed courses where the student has transferred less than six credits. Approval of the Program Director is required to take the course.

History

Distribution Codes for History Majors: A course may be used to satisfy only one Distribution and one Area requirement for History majors.

Distribution Requirement
CAH1 = European History
CAH2 = Non-Western History
CAH3 = Pre-Modern History
CAH4 = United States History

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Distribution Codes for Studies in War & Peace Majors: A course may be used to satisfy only one Distribution requirement for Studies in War & Peace majors.

**Distribution Requirement**

- CAW1 = Core Elective
- CAW2 = Pre-Modern/Non-Western Elective
- CAW3 = History Survey Courses
- CAW4 = International Elective

**HI 107 - The History of Civilization I (CAW3) 3 credits**

A survey providing a global perspective of the history of human cultures and institutions from earliest times to 1500 CE, focusing on Europe, Asia, and Africa. The course offers an active and participatory environment to the study of history through discussions, simulations, study of primary sources, and research assignments. Open only to first year students or by permission of department. Offered annually. 3 lecture hours

**HI 108 - The History of Civilization II (CAW3) 3 credits**

A survey of major world civilizations that provides a global perspective of the development of the modern world from 1500 to the present. The course offers an active and participatory environment to the study of history through discussions, simulations, study of primary sources, and research assignments. Open only to first year students or by permission of department. Offered every semester. 3 lecture hours

**HI 121 – American History Survey I (CAW 3) 3 credits**

A survey of American history from the Age of Discovery to 1877. American institutions ranging from political and economic to social and cultural will be examined. Open only to freshmen and sophomores. Offered every semester. 3 lecture hours

**HI 122 – American History Survey II (CAW 3) 3 credits**

A continuing survey of multiple facets of American Civilization as presented in HI121, focusing on the period from the close of political Reconstruction in 1877 to the present. The maturation of democratic institutions and the emergence of the United States as a world power will also be examined. Open only to freshmen and sophomores. Offered every semester. 3 lecture hours

**HI 201 – Ancient Greece and Rome (CAW 2, CAW 4) 3 credits**

A survey of Greek and Roman civilizations from the origins of the polis to the fall of the Western Roman Empire. Prerequisite: Sophomore standing or higher. Usually offered annually. 3 lecture hours

**HI 202 – The Middle Ages: Europe 500-1500 (CAW 2, CAW 4) 3 credits**

The history of Europe from the fall of the Roman Empire to 1500. The class examines the major political, economic, social, and cultural trends in the development of a distinctive European civilization, built primarily on Christian, Greco-Roman, and Germanic foundations. Prerequisite: Sophomore standing or higher. Usually offered annually. 3 lecture hours

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HI 209 – Historical Methods 3 credits
This course introduces students to the methods, techniques and conventions of historical research and writing, including such skills as identifying, understanding, analyzing and interpreting primary and secondary sources, compiling bibliographies, citing sources, and understanding historiography. In addition, this course approaches the issue of ethics through a discussion of the ethical responsibilities of historians, including a discussion of plagiarism. Required for all history majors. Open to sophomore history majors only or by permission of department chair. This course does not fulfill the General Education History requirement. The course must be completed by the end of the junior year. Offered annually in the fall semester. 3 lecture hours

HI 211 – Early East Asian Civilizations (CAW 2, CAW 4) 3 credits
This broad, historical survey course is about the civilizations and cultures of East Asia and the people that lived in them until the immediate post-Mongol conquest period. The core of the course will cover the areas that include modern Japan, China and Korea with reference to the inner Asian steppes. This lecture based course will be supplemented by primary source readings and discussion on Chinese and Japanese cultures, art and political philosophy. Prerequisite: Sophomore standing or higher. Usually offered annually. 3 lecture hours

HI 212 – Modern East Asian Civilizations (CAW 2, CAW 4) 3 credits
This is a broad historical survey of the transformation of societies and states in East Asia from traditional empires to modern nation states. Rather than an exhaustive survey of facts and dates, this course is designed to introduce students to key questions in modern East Asian history. This lecture based course will be supplemented by primary source readings and discussion on Chinese and Japanese culture and politics. Prerequisite: Sophomore standing or higher. Usually offered annually. 3 lecture hours

HI 214 – Survey of the Middle East (CAW2, CAW4) 3 credits
This course is a survey of a historically vital region. It will include an overview of the area known as the “Cradle of Civilizations and Monotheism,” as well as the rise of the Islamic Caliphate, the rise and fall of the Ottoman Empire, and the late 19th and 20th Centuries European imperialism and colonialism. The greatest emphasis, however, will be on the modern period. In order to fully comprehend the contemporary situation, it is necessary to include an historical examination of the cultural and religious diversity, as well as the political complexity of the people and states which comprise the so-called Middle East. Prerequisite: Sophomore standing or higher. Offered in the spring semester. 3 lecture hours

HI 215 – Regional Material Culture of Vermont 3 credits
A survey of the human-manipulated landscape of Vermont from the time of European settlement in the mid-18th century to the present. The course will trace the impact of economic, social, cultural, and technological forces on the landscape. Students will observe, through extensive field observations, how those forces have shaped the environment of the region. Topics will range from land use patterns, agricultural
practices, commercial trends and industrial development to community development, architecture, transportation, and tourism. Students will learn to interpret the rich and complex tapestry of material culture readily observable in Vermont including: field patterns, stone walls, forests, quarries, town commons, cemeteries, dwellinghouses, meetinghouses, schoolhouses, mills, factories, roads, bridges, commercial centers, and tourist facilities. This two-week field course is offered only in the summer school and meets daily 9:00 a.m. to 5:00 p.m. Prerequisite: Sophomore standing or higher and permission of the instructor. 3 lecture hours

HI 218 – Survey of Sub-Sahara Africa (CAW2, CAW4) 3 credits
This course encompasses the history of sub-Saharan Africa from approximately 1800 to the end of the so-called “Cold War.” It is a comprehensive introduction to the numerous and diverse cultural, political, and economic entities comprising this complex area of the world. The central themes of the course, however, will be the related phenomena of the Trans-Atlantic Slave Trade, European colonialism, and western neo-colonialism and their varying impact upon the different regions. 3 lecture hours

HI 223 – Europe’s Age of Revolution. 1500-1800 (CAW 4) 3 credits
This course traces Europe’s path from medieval to modern by examining a series of political, intellectual, and technological revolutions between 1500 and 1800. Topics will include the Reformation, Scientific Revolution, Enlightenment, American and French Revolutions, and the Industrial Revolution, all discussed within the broader context of cultural change, social reform, and technological development, Prerequisite: Sophomore standing or higher. Offered annually. 3 lecture hours

HI 224 – Modern European History (CAW 4) 3 credits
This course examines the political, military, and social history of Europe in the nineteenth and twentieth centuries. The nineteenth century witnessed remarkable changes in European society and politics. It was an age of romantics and reactionaries, liberals and imperialists, revolutionaries and racists, nationalists and irrationalists. At the beginning of the twentieth century, Europe dominated the world. However, two world wars, the rise and fall of fascism and communism, the concept of superpowers, and the growth of mass consumer society destroyed the old European hegemony and led to a new and evolving idea of “Europe”. Prerequisite: Sophomore standing or higher. Offered alternate years. 3 lecture hours

HI 227 – Modern British History, 1688 – Present (CAW 4) 3 credits
The history of the British Isles from the “Glorious Revolution” of 1688 to the region’s current struggles with maintaining national identity at the dawn of the twenty-first century. Emphasis will be on the decline of the monarchy, the establishment of parliament as a truly representative body, and the rise and fall of the British Empire. Prerequisite: Sophomore standing or higher. Offered alternate years. 3 lecture hours

Revised October 2012-Posted 10/2012
HI 228 – Norwich University History  
3 credits
The history of Norwich University placed within the context of the history of higher education and the wider framework of U.S. cultural history. Prerequisite: Sophomore standing or higher. Offered on occasion. 3 lecture hours.

HI 235 - Military History I  
3 credits
This course examines the history of world military affairs and patterns of warfare from the ancient period through the mid-eighteenth century. Particular attention will be given to the interplay of cultural, political, and technological factors in the formation of military institutions and in the experience of warfare. Prerequisite: Sophomore standing or higher. Offered every semester.

HI 236 - Military History II  
3 credits
This course examines the history of world military affairs and pattern of warfare from mid-eighteenth century to the present day. Particular attention will be given to the interplay of cultural, political and technological factors in the formation of military institutions and in the experience of warfare. Prerequisite: Sophomore standing or higher. Offered every semester.

HI 303 – Colloquium in Ancient History  (CAH 3, CAW 2, CAW 4)  
3 credits
A reading and writing intensive course, emphasizing historical research and analytical skills. Possible topics include, but are not limited to, the development of historical writing, the Roman Empire, women in antiquity, pagans and Christians, etc. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered annually.

HI 304 - Colloquium in Medieval History  (CAH 3, CAW 2, CAW 4)  
3 credits
A reading and writing intensive course, emphasizing historical research and analytical skills. Possible topics include, but are not limited to, the Crusades, medieval Christianity, and medieval women. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered annually.

HI 315 – Modern China  (CAH 2, CAW 2, CAW 4)  
3 credits
A standard reading and lecture course, Modern China introduces students to the major processes shaping twentieth century Chinese history. The course emphasizes regional knowledge, historical research and analytical skills building. Major topics will include in all cases an overview of Chinese history since 1700 (late imperial and twentieth century “modern” China) with emphasis on political, social history and environmental developments. Other sub-topics in the course include, but are limited to, nation building/nationalism, gender issues, and border/Central Asia relations. Prerequisite: C or better in one 200 level history course or instructor permission. Offered annually. 3 lecture hours.
HI 317 – Modern Japan  (CAH 2, CAW 2, CAW 4)  3 credits
A standard reading and lecture course, Modern Japan introduces students to the major processes of shaping twentieth century Japanese history. The course emphasizes regional knowledge, historical research and analytical skills building. Major topics will include in all cases an overview of Japanese history since 1868 (Tokugawa dissolution through the late twentieth century) with emphasis on political and economic history. Other sub-topics in the course include, but are not limited to, Japan-in-the-world (international relations), gender issues, ethnic relations and the environment. Prerequisite: C or better in one 200 level history course or instructor permission. Offered on occasion. 3 lecture hours.

HI 319 - Colloquium in Chinese History  (CAH 2, CAW 2, CAW 4)  3 credits
This is a thematic, reading and writing intensive course, emphasizing historical research and analytical skills. Possible topics include, but are not limited to, the development of ethnicity and ethnic visions of regional history in China, China’s military history, frontier/border history, Ancient China and Greece, etc. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered alternate years.

HI 321 – Reformation Europe  (CAH 1, CAW 4)  3 credits
The years immediately following the 1517 publication of Martin Luther’s Ninety-Five Theses saw a sudden and unprecedented upheaval in European society. This course will examine the social, political, and spiritual context of late medieval Europe, then consider the implications of the Reformation for politics, gender and the modern world. Original sources in translation will form the basis for discussion, supplemented by lecture and secondary materials. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 322- Colloquium in Early Modern European History (CAH 1, CAW 4)  3 credits
A reading and writing intensive course covering a specialized topic within the history of Early Modern Europe. Topics could include the Thirty Years War, Crime and Deviance, the Enlightenment, the French Revolution, or Persecution and Tolerance. Designed for history majors in their junior or senior years. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered annually.

HI 326 - Nazi Germany and the Holocaust (CAH1, CAW4)  3 credits
This course examines the political, military, cultural and social history of Germany during the period of Nazi rule, 1933-1945. Special attention is given to the sources of support for Nazism, the structure of the National Socialist state, the role of Adolf Hitler, and the Holocaust. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 329 - Modern Russian History, 1917 to the Present (CAH1,CAW4)  3 credits
This course examines the political, military, and social history of Russia and the Soviet Union from the birth of the Soviet state through the present day. The foundations of
the Soviet state - ideological, industrial, and social - proved too shaky to support the needs and expectations of a modern society. From Nicholas II to Lenin, Stalin to Yeltsin, this course examines the unique and dynamic leadership of Russia, as well as the lives of ordinary people in this fascinating culture. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 331 - The Colonial Period of American History (CAH4) 3 credits
A study of the settlement and development of the British colonies from their origins to 1763. Offered alternate years. Prerequisite: C or better in one 200 level history course or instructor permission. 3 lecture hours

HI 332 - The American Revolution (CAH4,CAW1) 3 credits
A study of the separation of the 13 British colonies from the mother country and establishment of the United States as an independent nation in the period 1763-1789. Offered alternate years. 3 lecture hours

HI 333 - Colloquium in Early American History (CAH 4) 3 credits
An intensive reading, research and writing course focusing on selected topics relating to early American history. The chronological range of possible topics extends from the Age of Discovery in the sixteenth century through the American Revolution and the ratification of the U.S. Constitution in 1789. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered on occasion.

HI 334 - The Citizen-Soldier in American History (CAH4,CAW1) 3 credits
An examination of the evolution of American military policy from the colonial era through the Vietnamese War, giving special attention to the perennial conflict between the advocates of a professional army and the proponents of a civilian soldiery. Offered alternate years. Prerequisite: C or better in one 200 level history course or instructor permission. 3 lecture hours

HI 335 - Colloquium in 19th Century United States History (CAH4) 3 credits
A reading and writing intensive course, emphasizing historical research and analytical skills. Possible topics include, but are not limited to, the rise of political parties in the United States, the Gilded Age, etc. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered annually.

HI 338 - U.S. Diplomatic History, 1776-1914 (CAH4,CAW1) 3 credits
A study of the foreign relations and foreign policies of the United States from the American Revolution up to the First World War. Topics include territorial expansion, the War of 1812, the Mexican-American War, the expansion of American trade, and the Spanish-American War. Offered alternate years. Prerequisite: C or better in one 200 level history course or instructor permission. 3 lecture hours
HI 339 - U.S. Diplomatic History, 1914-present (CAH4,CAW1) 3 credits
A study of the foreign relations and foreign policy of the United States from the First World War to the present. Topics include the two World Wars, the Cold War, the Korean War, the Vietnam War, and post-cold war policy. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 340 – Colloquium in Twentieth Century U.S. History (CAH4) 3 credits
A reading and writing intensive course, emphasizing historical research and analytical skills. Possible topics include, but are not limited to, World War I, the Great Depression, the 1960’s, and the Rise of the Modern Conservative Movement. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered annually.

HI 341 - U.S. Civil War Era, 1848-1877 (U.S.) (CAH4,CAW1) 3 credits
This course examines the causes of the American Civil War, the course of the conflict, and the subsequent period of reconstruction through 1877. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 345 – Colloquium in the History of the Middle East & Northeast Africa (CAH2, CAW2, CAW4) 3 credits
This colloquium topic deals with the history of the Ottoman Empire, one of the most significant and longest lasting empires in world history. It rose from the remnants of the Byzantine Empire to be the most powerful “state” in the world during the 15th and 16th Centuries. Even in its decline, the Ottoman Empire played a key role in European and global politics. Its disintegration during the late 19th and early 20th Centuries would have a lasting impact on subsequent events throughout Middle East and Eastern Europe. Special emphasis will be placed upon the evolution of its political, military, and economic institutions, as well as its successful integration of numerous and disparate ethnic and religious groups. 3 lecture hours

HI 355 Colloquium in Modern Military History (CAW1) 3 credits
A reading and writing intensive course, emphasizing historical research and analytical skills. Possible topics include, but are not limited to, the First World War, the Second World War, the military history of Russia, etc. Prerequisite: C or better in one 200 level history course or instructor permission. May be repeated for credit with a different topic. Offered annually.

HI 360 - Topics in U.S. History (CAH4) 3 credits
Topics vary. Prerequisite: C or better in one 200 level history course or instructor permission. Offered on occasion. 3 lecture hours

HI 361 - Topics in Modern European History (CAH1, CAW4) 3 credits
Topics vary. Prerequisite: C or better in one 200 level history course or instructor permission. Offered on occasion. 3 lecture hours
HI 362 - Topics in Pre Modern History (CAH3, CAW2, CAW4) 3 credits
Topics vary. Prerequisite: C or better in one 200 level history course or instructor permission. Offered on occasion. 3 lecture hours

HI 363 - Topics in Non-Western History (CAH2, CAW2, CAW4) 3 credits
Topics vary. Prerequisite: C or better in one 200 level history course or instructor permission. Offered on occasion. 3 lecture hours

HI 371 – Nation-Building (CAW1) 3 credits
This course provides an exposure to the challenges of creating or re-creating nations after a period of crisis and upheaval. Whether following wars, grants of independence from foreign rule, or human rights atrocities, countries must undertake political, economic, and social reforms to construct stable, popularly accepted, and economically viable politics. How have nations tried to accomplish this complex task in the past hundred years? Historical case studies may be drawn from Africa, the Caribbean, Europe, and Asia. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 372 – Military History of the United States I, 1775-1902 (CAH4, CAW1) 3 credits
This course will trace the evolution of American military power from the early days of frontier and revolutionary conflict to an era of American imperial ambition at the end of the nineteenth century. Particular attention will be given to strategic challenges of protecting/expanding the American state, the tactical innovations and failures of nineteenth century warfare, and the formulation of the civil-military relationship in American politics and society. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 373 – Military History United States II, 1902-Present (CAH4,CAW1) 3 credits
This course will explore the evolution of the American military from its days as a small frontier force at the turn of the twentieth century to its present status as a multi-tasking, global power. Specifically, this course will examine the struggle of American political and military leaders to work together in developing strategies and tactics capable of tackling the complex challenges of modern warfare. Prerequisite: C or better in one 200 level history course or instructor permission. Offered alternate years. 3 lecture hours

HI 400 - Independent Study 3 credits
An opportunity for qualified upper class students to engage in an intensive reading or research program in fields of interest not satisfactorily covered by regular course offerings. Periodic conferences will be required. Prerequisites: written consent of the instructor to a specific project presented by the applicant. Offered as occasion demands. Prerequisite: C or better in one 200 level history course or instructor permission. 3 lecture hours
HI 405 - History Internship 3 to 12 credits
Supervised experience at a museum, archives, historical society, or restoration project involving research or field work. Direct participation in such activities as the editing of manuscripts, the interpretation of artifacts, or the preservation of historic structures. Prerequisite: permission of department chair. Normally open only to seniors. Offered as occasion demands. 3 to 12 lecture hours

HI 430 – Capstone Seminar in U.S. History (CAH4) 3 credits
A semester course for advanced students, primarily for senior History or Studies in War & Peace majors. Topics vary from semester to semester. Prerequisite: Completion of one history colloquium with a grade of C or higher and permission of the instructor.

HI 431 – Capstone Seminar in Modern European History (CAH1) 3 credits
A semester course for advanced students, primarily for senior History or Studies in War & Peace majors. Topics vary from semester to semester. Prerequisite: Completion of one history colloquium with a grade of C or higher and permission of the instructor.

HI 432 – Capstone Seminar in Pre-Modern History (CAH3) 3 credits
A semester course for advanced students, primarily for senior History or Studies in War & Peace majors. Topics vary from semester to semester. Prerequisite: Completion of one history colloquium with a grade of C or higher and permission of the instructor.

HI 433 – Capstone Seminar in Non-Western History (CAH2) 3 credits
A semester course for advanced students, primarily for senior History or Studies in War & Peace majors. Topics vary from semester to semester. Prerequisite: Completion of one history colloquium with a grade of C or higher and permission of the instructor. 3 lecture hours

HI 490 - Honors in History I 3 credits
First semester of a two semester sequence honors thesis project. The first semester is devoted primarily to research. Not repeatable for credit. Does not fulfill distribution requirement for major. Prerequisite: permission of the instructor and program director. 3 lecture hours

HI 491 - Honors in History II 3 credits
Second semester of a two semester sequence. The second semester is devoted to writing and defending the honors thesis. Not repeatable for credit. Does not fulfill distribution requirement for major. Prerequisite: A grade of “B” or higher in HI490 and permission of the instructor and program director. 3 lecture hours

HI 520: Colonial, Revolutionary and Early National History 6 Credits
This seminar explores American history from the era of contact through the early nineteenth century. The seminar is organized on a thematic rather than chronologic basis. It introduces students to the main themes and historiography of the period. Discussions and readings will lead students to examine areas of early seventeenth through early nineteenth-century American history and historiography.
HI 530: Nineteenth Century American History   6 Credits
This seminar explores American history from the Early National period to the eve of the First World War. This seminar is organized on a thematic rather than chronologic basis. It introduces students to the major themes and historiographic debates of this period of U.S. history. Discussions and readings will lead students to examine areas of nineteenth-century American history and historiography.

HI 540: Twentieth Century American History   6 credits
This seminar explores American history from the turn of the twentieth century and focuses on both internal developments and a greater American role in global affairs. It introduces students to main themes and historiography of the period, including the struggle for equality at home for women, immigrants and minorities, increasing American involvement in foreign conflicts, social, political and economic developments, and the relationship with the natural and built environments. Discussions and readings will lead students to examine other areas of twentieth-century American history and historiography

Interdisciplinary

ID 110 - Ecology and Geology of the Connecticut River Valley   4 credits
This course starts with a four-day, on-campus, period. During this time there are lectures and slide presentations on water chemistry, water pollution, flora and fauna of the river and valley, and geology of the Connecticut River valley. Canoe instruction, biological and geological identification procedures, surveying methods, and water analysis techniques are also taught. A nine-day canoe trip follows during which the ecology and geology of the upper river valley are studied. The final day of the course is spent back on campus for additional testing and the preparation of final reports. This four-credit laboratory science course is intended for non-science majors and is offered during the time between graduation and the beginning of summer school. 75 hours

ID 220 - Interdisciplinary Studies   3 credits
The study of a current subject of academic inquiry that falls across disciplinary boundaries. Specific topics of ID220 are approved for instruction on a case-by-case basis by the respective Deans, following review by program, departmental and/or divisional curriculum committees, which also determine whether such courses may count as divisional electives. Each division decides whether its recommending body shall be the program, department, and/or division. The course is taught by faculty from two or more academic disciplines. Descriptive titles reflecting course content are included on student transcripts. ID220 may not be used to satisfy the requirement of a history course for all baccalaureate degrees. General prerequisite: sophomore standing; additional prerequisites may be announced at pre-registration. 3 lecture hours
International Studies

IN 101 – Introduction to International Studies 3 credits
Drawing upon the major disciplines within the social sciences, this course provides a multidisciplinary understanding of the forces that shape and affect relationships among human communities. Among the topics considered are: Ethics and human rights, geography and spatial analysis, the role of culture, and the Independent and combined effects of politics and economics. In addition, the course introduces students to the methods used to address the questions and problems with which the discipline is concerned.

IN 350 – Topics in International Studies 3 credits
Selected Topics in international studies to be used to cover subjects not included in the regular offerings. The course can be offered and taught by faculty in other disciplines upon prior approval of the history & Political Science Department Chair. The course seeks to enhance an appreciation for the multidisciplinary nature of international studies. 3 lecture hours

IN 410 – Seminar in International Studies 3 credits
This capstone course is a research and writing intensive course designed to introduce students to graduate level work in International Studies. Seminar topic will be determined by the instructor. Prerequisite: Senior standing or permission of the instructor. 3 lecture hours

IN 490 – Honors in International Studies 3 credits
This course is intended for senior students who have demonstrated superior research and writing skills. It requires the commitment of an entire academic year. Topic determined by the student and faculty member. Prerequisite: Senior standing and permission of the instructor.

Information Systems

IS 100 – Foundations of Computer Security & Information Assurance 3 credits
This survey of computing and information assurance fundamentals is required for computer science and information assurance majors. The course focuses on learning to use key concepts and terminology in information technology, computer science, networking, and information security. Discussions regarding computing ethics, safety, and professionalism are included throughout. No prerequisites. Permission is required for non-Computer Science and non-Computer Security majors. 3 lecture hours.

IS 120 - Business Applications & Problem Solving Techniques 3 credits
An introductory course in management information processing. The course explores the most important aspects of information systems with specific emphasis on business applications, practical usage, and current information. The student will obtain skills in word processing, spreadsheet analysis, presentation tools and website design using
professional software packages. Structured problem-solving techniques will be emphasized throughout the course. Practical implementation projects and case studies will be used to reinforce topics such as computer, academic, and professional ethics for an information-based society. 3 lecture hours

**IS 121 - Introduction to Computer Programming** 3 credits
An introduction to computer programming in a high-level language. This course combines the mechanics of learning a first computer language with the fundamental stylistic elements of general problem solving. Emphasis on the creation of basic gram structures, modular design, and logical flow of control is reinforced by writing programs both in and out of the classroom. Prerequisite: IS120 or permission of instructor. 3 lecture hours

**IS 130 - Introduction to Computing** 3 credits
A breadth-first introduction to the discipline of computing. This course provides a broad survey of the sub-disciplines within computer science and information systems culminating in the exploration of programming fundamentals. Topics include: hardware survey, software survey, software engineering strategies, algorithmic design, ethics in computing, societal impact of computing, history and theory of computing, and an introduction to information systems and their application, and introductory programming. Throughout the course, responsible computer, academic, and professional ethics in an information-based society will be stressed. 3 lecture hours

**IS 131 - Computer Programming** 3 credits
Application of fundamental programming concepts using a high level language. The course will emphasize object-oriented design and implementation techniques. Good software engineering practice will be introduced by means of programming projects that illustrate the importance of software quality attributes. Prerequisite: IS130. 3 lecture hours

**IS 221 - G.U.I. Programming** 3 credits
A study of the design and implementation of the graphical user interface. The course will present fundamentals of usability and human factors in GUI design. One or more of the following will be studied and implemented in a student project: Visual Basic programming, Web programming, GUI code generators. Prerequisite: IS131. 3 lecture hours

**IS 228 - Introduction to Data Structures** 3 credits
An introduction to the basic concepts of data and the techniques used to operate on the data. Topics will include the file handling, searching, sorting, multi linked structures, trees, and graph presentations. Prerequisite: IS131 with a grade of “C” or higher. 3 lecture hours

**IS 240 - Database Management** 3 credits
A study of the concepts and structures necessary to design and implement a database management system. Various data models will be examined and related to specific
examples of database management systems. Techniques of system design, system implementation, data integrity, and file security will be examined. Prerequisite: IS228 with a grade of “C” or higher. 3 lecture hours

**IS 300 - Management Information Systems** 3 credits  
This course will provide an overview of information systems, their role in organizations, and the relationship of information systems to the objectives and structure of an organization. Management of software projects, decision making with regard to systems development, and organizational roles with regard to information systems will also be discussed. 3 lecture hours

**IS 301 - Software Engineering I** 3 credits  
An in-depth initiation to the system development life cycle, the techniques of information analysis, and the logical specification of the system. Documentation and communication aids are introduced as well as interpersonal approaches and techniques used in analysis. Prerequisite: IS240 with a grade of “C” or higher. 3 lecture hours

**IS 302 - Software Engineering II** 3 credits  
Utilizing techniques, the student will progress through the phases of specification, design, implementation, and testing of information systems. Object-oriented design techniques are used to design new logical and new physical systems for business related problems. Both technological and managerial aspects of system design and implementation are considered. Students will learn the importance of and design of security systems such as firewalls and passwords. Prerequisite: IS301. 3 lecture hours

**IS 330 - Ethics in Computing & Technology** 3 credits  
The course is designed to expose students to some of the ethical dilemmas posed to our culture as a result of the current technological trends. Students will study various ethical standards and creeds offered through a variety of organizations (e.g., ACM). Students will learn to evaluate case studies from an ethical perspective. Students will be expected to conduct literature surveys, produce bibliographies, write literature reviews, and present oral summaries of research as well as offer critical evaluation of writings related to ethics and technology. This course fulfills General Education Requirement #6: The ability to think critically and make ethical decisions. 3 lecture hours

**IS 340 - Information Systems Security Assurance I** 3 credits  
This course provides an overview of design considerations involved with the security of site design. The course will also provide and understanding of the Levels of Trust and system accreditation/certificate processes. Life cycle management of software, hardware, and physical plant, from planning through destruction will be examined and reinforced using case studies. Additionally, understanding of the variety of security systems involving computers and networks and an ability to evaluate vulnerabilities will be discussed. 3 lecture hours
IS 342 - Management of Information Assurance 3 credits
This course focuses on the management of the information assurance process. Topics include human factors in reducing security breaches, security incident detection and response, remediation, management’s role in information assurance, and other considerations in framing and implementing information assurance policies. The final section reviews current topics of particular interest and activity in the field of information assurance. 3 lecture hours

IS 353 - Business Programming Languages 3 credits
A study of programming languages commonly used in business applications. A working knowledge and appreciation of the power of several business languages are obtained through programming assignments based on business-related subjects such as payroll, mailing lists, and sorting. Prerequisite: IS228. 3 lecture hours

IS 370 Introduction to Information Warfare 3 credits
This course introduces students to the overall concept of Information Warfare (IW) and Information Operations (IO), particularly with regard to the US Federal government and the Department of Defense. Introduction to IW / IO surveys the development of Information Warfare (IW) and Information Operations (IO) as these elements of power have become more important for the United States Department of Defense (DoD) and Federal Government as a whole. The course assumes only a rudimentary familiarity with the basic concepts and terminology of modern Internet usage and computing and is not a technology-focused course. Prerequisites: None. Open to third and fourth year students or by permission of instructor. 3 lecture hours.

IS 380 Offensive Information Operations 3 credits
This course introduces students to the overall concept of Offensive Information Operations (O-IO), which are conducted across the range of military operations at every level of war to achieve mission objectives. Combatant commanders must carefully consider the potential of IO to deter, forestall, or resolve crises. The course assumes only a rudimentary familiarity with the basic concepts and terminology of modern Internet usage and computing and is not a technology-focused course. Prerequisites: IS370 Introduction to IW/IO. Open to third and fourth year students or by permission of the instructor. 3 lecture hours.

IS 406 – Special Topics in Computer Science 3 credits
A study of topics chosen from areas of current interest that are not offered as part of the permanent curriculum. This course may be taken for credit more than once. 3 lecture hours.

IS 407 - Politics of Cyberspace 3 credits
This course explores the interrelations of modern computing and communications technology with politics, power, news, privacy, crime, and creativity. The course assumes only a rudimentary familiarity with the basic concepts and terminology of modern Internet usage and computing and is not a technology-focused course. Open to third and fourth year students or by permission of the instructor. 3 lecture hours.
IS 408 - Programming Languages 3 credits

The course covers languages and language processors, data types and representation, operations on data types, sequence control data, control, storage management, introduction to translation, language selection for applications. Classroom 3 hours. Prerequisites: IS228

IS 410 - Computing Internship 3 credits

Internships within CS/CSIA are designed to provide computing majors with the opportunity to apply and expand their knowledge within the computing discipline. The student must be a junior or senior at the time of enrollment and have good academic standing. The student must have the internship approved beforehand by a faculty member in CS/CSIA and have the written consent of the CS/CSIA Program Coordinator. In addition, a supervisor within the sponsoring organization must agree to provide a written description of the internship beforehand, and provide progress reports during and after the internship experience. 3 lecture hours

IS 411 - Cyber Investigation 3 credits

This course is an introduction to cyber investigation. It includes elements of cyber crime, cyber warfare and cyber terrorism. The course will examine investigative techniques for cyber investigators, case studies of representative cyber crimes and cyber warfare incidents, some cyber investigation tools and expert witnessing. The course builds up to a mock trial where students act as a cyber investigation task force on an actual case of cyber crime. This is a course that incorporates extensive reading as well as hands-on lab exercises. No prerequisites. Open to third and fourth year students or by permission of the instructor. 3 lecture hours

IS 440 - Software Engineering III 3 credits

An advanced course in the field of Software Engineering. Students will refine their use of the methods and procedures of software development from conception of an idea through its implementation and beyond. A variety of software process models will be studied. The course will seek to balance theoretical foundations with practical application. A team project will be assigned to allow for the application of software engineering techniques. The course will investigate methodologies and research with the purpose of improving personal and organizational quality and productivity. Classroom 3 hours. Prerequisites: IS302 or permission of the Instructor. Computer Engineering students do not require IS302 as a prerequisite. 3 lecture hours

IS 455 - Contemporary Issues in Computer Science 3 credits

A capstone seminar which will vary every term in accordance with the current issues of the time. Students are to work with the instructor as they explore today's issues and trends in preparation of a thesis or project. Emphasis will be placed on critical thinking, research and evaluation of current issues. A comprehensive computer exam is included in this course. Each student will be required to prepare a paper outlining ethical standards based on the student's life experiences. Prerequisites: IS302, or permission of the instructor. 3 lecture hours
IS 460 - Data Communications and Networks 3 credits
An introductory study in fundamental concepts of computer networks and data communication including a survey of major protocols, standards, and architectures. Students will implement simple data communication protocols in the laboratory. Prerequisite: IS228. 3 lecture hours

Mathematics

Students will not be granted more than 12 degree credits in mathematics courses below 200.

MA 005 - Preparatory Mathematics 3 non-degree credits
A review of high school mathematics with some geometry in preparation for freshman level mathematics. Students assigned to MA005 must satisfactorily complete it before enrolling in any other mathematics course. MA005 if required must be completed by the end of the first year of study. 3 lecture hours

MA 101 - Mathematics: A Liberal Art 3 credits
An investigation of mathematical concepts and methods with emphasis given to their impact on current and ancient problems. Topics include logic, counting problems, probability, geometry and mathematics of finance. Emphasis is on techniques of problem solving. Prerequisite: Satisfactory completion of MA 005 or equivalent as determined by departmental placement testing. Not open for the first time to a student with a grade of "C" or higher in MA107, or with credit for any mathematics course requiring MA107 as a prerequisite. Offered fall semesters. 3 lecture hours

MA 102 - Mathematics: A Liberal Art 3 credits
An investigation of mathematical concepts and methods with emphasis given to their impact on current and ancient problems. Topics include mathematics of voting systems, basic graph theory including Euler circuits and the traveling salesman problem, the mathematics of population growth, statistics, and finding fair shares. Emphasis is on techniques of problem solving. Prerequisite: Satisfactory completion of MA 005 or equivalent as determined by departmental placement testing. Not open for the first time to a student with a grade of "C" or higher in MA107, or with credit for any mathematics course requiring MA107 as a prerequisite. Offered spring semesters. 3 lecture hours

MA 103 - College Algebra 3 credits
A comprehensive study of algebraic topics, this course provides a strong foundation for subsequent mathematics-based courses. Topics include: sets, the real number systems, polynomials and factoring, linear and quadratic equations. Prerequisite: Satisfactory completion of MA005 or equivalent as determined by departmental placement testing. Not open for the first time to students who have received degree credit in any math course except MA101, MA102. This course does not fulfill the
General Education requirement in mathematics. 3 lecture hours

MA 107 - Precalculus Mathematics  4 credits
A course on topics in precalculus mathematics involving algebra and trigonometry designed to prepare students to progress into introductory calculus. It is a rapid development of elementary topics in algebra to linear, quadratic, logarithmic, and exponential functions, followed by an analytical treatment of trigonometry. Prerequisite: Grade of "C" or better in MA103 or equivalent as determined by departmental placement testing. Not open for the first time to students with credit in any course requiring MA107 as a prerequisite. 4 lecture hours

MA 108 - Applied Calculus  4 credits
A course on topics in analytical geometry progressing to differential and integral calculus. Presentation of a wide variety of practical applications to technology, business, and science. Not open for the first time to a student with credit in MA121 or any course requiring MA108 as a prerequisite. Prerequisite: MA107 or equivalent as determined by departmental placement testing. Not more than one of MA108 or MA121 may count as degree credit. 4 lecture hours

MA 121 - Calculus I  4 credits
An introduction to plane analytic geometry and to differential and integral calculus. Prerequisite: grade of "C" or better in MA107 or equivalent as determined by departmental placement testing. Not more than one of MA108 or MA121 may count as degree credit. 4.000 Lecture hours

MA 122 - Calculus II  4 credits
A continuation of MA121. Transcendental functions, methods of integration, vectors, polar coordinates, indeterminate forms, L'Hôpital's Rule, improper integrals, infinite sequences and series. Prerequisite: MA121 or "C" or better in MA108 and permission of the department. 4 lecture hours

MA 212 - Finite Mathematics  3 credits
This course includes linear algebra with applications to systems of equations, linear programming, math of finance, sets, combinatorial analysis, and probability theory. Prerequisite: MA107 or equivalent as determined by department placement testing. Offered fall semesters. 3 lecture hours

MA 223 - Calculus III  4 credits
This course continues MA122. Topics include multiple integration, solid analytic geometry, partial differentiation, two- and three-dimensional vector analysis. Prerequisite: MA122. Offered fall semesters. 4 lecture hours

MA 224 - Differential Equations  4 credits
Ordinary differential equations are developed as models of physical phenomena. Differential equations are investigated by finding exact solutions and using computer software to determine the solution to linear and non-linear problems. Solution
techniques include operator methods, Laplace transforms, and numerical methods. Prerequisite: MA122. Offered spring semesters. 4 lecture hours

**MA 232 - Elementary Statistics**  
3 credits  
A course that covers the study of frequency distributions, averages and standard deviations, normal curve, probability, decision-making, sampling techniques, testing hypotheses, chi-square, student-t and F-distributions, correlation and linear regression. This course is valuable for those who plan to enter teaching. Prerequisite: A college level mathematics course or equivalent as determined by departmental placement testing. Not open to students with credit in MA311. 3 lecture hours

**MA 235 – Clinical Mathematical Methods**  
3 credits  
A course investigating mathematical concepts and methods used in the health care settings. This course will cover the essential math for medication calculations, the continued development of statistical techniques utilized in scientific research, and the mathematics of population dynamics and epidemiological studies. Case studies will be used where appropriate. Emphasis will be on critical thinking and logic of math in a health care environment and in health care research and administration. This is a mathematics course for Nursing Majors. Prerequisites: MA232. Offered Fall semesters. 3 lecture hours and 1 laboratory hour. 3 credits.

**MA 240 - Introduction to Number Theory and Cryptology**  
3 credits  
An introduction to fundamental topics in number theory, including the real number system, prime numbers, modular arithmetic, the Euclidean Algorithm, Fermat's Theorem, Euler's Theorem, Euler's Phi Function. Topics will be applied to Caesar and affine ciphers and the Chinese Remainder Theorem. Prerequisite: MA107 and knowledge of a programming language or permission of the instructor. Offered fall semesters. 3 lecture hours

**MA 241 - Mathematical Computation and Modeling**  
3 credits  
A course designed to introduce effective problem solving strategies and modeling techniques to find solutions to complex and often ill-defined problems. Introductory material chosen from common experiences encompassing many academic disciplines. Emphasis is placed on the development of mathematical models and computation on a variety of computing platforms and programming environments. Prerequisite: MA108, MA121 or permission of instructor. Offered spring semesters. 3 lecture hours

**MA 250 - Communication in Mathematics**  
1 credit  
This course illustrates the organization of the mathematical literature, the efficient search of the literature and a formal introduction to writing mathematics. Prerequisite: Sophomore Mathematics Major or permission of the instructor. 1 lecture hour

**MA 303 - Advanced Calculus I**  
3 credits  
A course that provides an extension of concepts of basic calculus to functions of several variables to include limits, continuity, differentiation, and Riemann integration.
Treatment of selected topics not included in the basic calculus series as a foundation for more advanced courses in analysis and applied mathematics is also included. Prerequisite: MA223 and either MA306 or permission of the instructor. Offered Fall semesters of even numbered years. 3 lecture hours

MA 304 - Advanced Calculus II
3 credits
A course that continues with the content of MA303, including limits, continuity, differentiation, and Riemann integration. Treatment of selected topics not included in the basic calculus series as a foundation for more advanced courses in analysis and applied mathematics is also included. Prerequisite: MA303. Offered Spring semesters of odd numbered years. 3 lecture hours

MA 306 - Discrete Mathematics
3 credits
A course in logic, sets, techniques of proof, relations and functions, directed and undirected graphs, algebraic systems, Boolean algebra, and emphasis on applications in various areas of computer science. Prerequisite: MA108 or MA121 and knowledge of computer programming. Offered fall semesters. 3 lecture hours

MA 308 - Modern Geometry
3 credits
A course in modern geometries that includes foundations of Euclidean geometry and the development of non-Euclidean geometries. Recommended for prospective teachers. Prerequisite: MA108 or MA121. Offered Spring 2010 and every third year. 3 lecture hours

MA 309 - Algebraic Structures
3 credits
A course on groups, rings, fields, morphisms, vector spaces; special topics selected from group theory, algebraic number theory, field theory, Galois theory. Prerequisite: MA306 or permission of the instructor. Offered Fall semesters of odd numbered years. 3 lecture hours

MA 310 - Linear Algebra
3 credits
A theoretical course on such topics as matrices, determinants, linear equations, vector spaces, bases and dimensions, linear transformations, eigenvalues, and eigenvectors. Prerequisite: MA223 or permission of the instructor. Offered spring semesters. 3 lecture hours

MA 311 - Statistical Methodology
3 credits
A course designed to provide a firm foundation for the employment of statistical methodology in engineering and the sciences. Examples drawn from the technical fields will be used throughout. The course will cover probability, continuous and discrete statistical distributions, estimation, tests of hypotheses, and sample regression. As time permits, other topics may be examined based on the interests of the students. Prerequisite: MA223. Offered fall semesters. 3 lecture hours
MA 312 - Statistical Methodology II  
A continuation of MA311. Continued development of statistical techniques utilized in scientific and engineering research. Topics to be covered include regression, multiple regression, analysis of variance, experimental design, statistical quality control, and reliability analysis. Prerequisite: MA311. Offered Spring semesters of even numbered years. 3 lecture hours

MA 318 - Cryptology  
A course that covers fundamental mathematical concepts from modern algebra, number theory, and other areas of mathematics. Provides a foundation for the understanding of classical encryption systems and modern encryption methods. Emphasis on the mathematical underpinnings germane to cryptology. Prepares students for advanced study of modern cryptography. Experience implementing encryption, decryption and cryptanalytic methods on a variety of systems. Prerequisite: MA240 and knowledge of a programming language or permission of instructor. Offered spring semesters. 3 lecture hours

MA 360 - Teaching Mathematics at the Elementary - Middle School Level  
A course in the content, methods, and materials for the teaching of elementary and middle school mathematics. Prerequisites: MA107. 3 lecture hours

MA 370 - Introduction to Operations Research  
A course that concentrates on the fundamental concepts and techniques necessary to enable an individual to obtain "optimal" solutions to problems in business, economics, engineering, and the physical and behavioral sciences. Topics include linear programming, network analysis, dynamic programming. Prerequisites: MA212 or MA223. Offered Spring semesters of odd numbered years. 3 lecture hours

MA 380 - Theory of Computation  
This course introduces the theory of computability, including important results from the study of automata and formal languages. Includes introductory material about the theory of directed graphs and trees. A discussion of automata and their relationship to regular, context free and context-sensitive languages. General theories of computability, including Turing machines, and recursive functions. Further topics include decidability, undecidability and computational complexity. Prerequisite: MA306. Offered Spring semesters of even numbered years. 3 lecture hours

MA 390 - Numerical Linear Algebra and Analysis  
Numerical techniques for solving problems in linear algebra and analysis. Topics to be studied include integration, interpolation, function approximation, solutions of systems of equations, locating Eigen values. Attention will be paid to the theoretical aspects of the techniques, with particular emphasis on estimation of errors and on convergence properties of iterative techniques. Prerequisites: MA241, MA224. Offered Spring 2009 and every third year. 3 lecture hours
MA 405 - Complex Analysis  
A course in complex numbers, analytic functions, differentiation, and integration of complex functions, Taylor and Laurent series, evaluation of improper real integrals. Prerequisites: MA223 and either MA306 or permission of the instructor. Offered Spring 2011 and every third year. 3 lecture hours

MA 407 - Vector Analysis  
A course that analyzes scalar and vector fields. Topics included are Newtonian kinematics and Kepler's Law of Planetary Motion, gradient, divergence, curl, theorems of Green, Stokes, Gauss, curvilinear coordinates. Prerequisite: MA223. Offered Fall 2009 and every third year. 3 lecture hours

MA 411 - Senior Seminar  
Advanced study designed to develop student competence in working independently and to afford students an opportunity to pursue topics not otherwise offered by the department. Prerequisite: senior standing in mathematics or permission of the instructor. This is the capstone course for the Mathematics Major. 3 lecture hours

MA 412 - Senior Seminar  
Advanced study designed to enhance student competence in working independently and to afford students an opportunity to pursue topics not otherwise offered by the department. Topics may extend research performed in MA411 or be a topic independent of MA411. Prerequisite: MA411. 3 lecture hours

MA 421 - Number Theory  
A course in the properties of integers, prime numbers, congruencies, Diophantine equations, quadratic reciprocity. Prerequisite: MA306 or permission of the instructor. Offered Spring 2011 and every third year. 3 lecture hours

**Mechanical Engineering**

ME 211 - Mechanical Engineer Tools I  
An extension of EG109 with a more in-depth treatment of 3-D solid model generation including extrusion, revolving, sweeping and lofting. Further development and modification of 3-D solid drawings. Laboratory: 3 hours. Prerequisite: EG109.

ME 307 - Thermodynamics II  
Applications of thermodynamics to power and refrigeration cycles, combustion mechanisms, mixture and flow processes. Development of thermodynamic relationships and equations of state. Classroom 3 hours. Prerequisite: EG206.

ME 311 - Mechanical Engineering Tools II  
An extension of ME211 with additional application of computer based design and analysis methods. An emphasis will be placed on design for manufacturing and other tools appropriate to the mechanical engineering profession. Laboratory: 3 hours. Prerequisite: ME211.
ME 356 - Manufacturing Processes 4 credits
A study of the principles of manufacturing processes. Metal removal, casting, joining and deformation processes are covered as well as introductions to numerically controlled machinery, computer-aided manufacturing, rapid prototyping, robotics, computer integrated manufacturing and modern manufacturing systems. Classroom 3 hours, laboratory 3 hours. Prerequisite: ME311, EG203

ME 358 - Metallurgy & Manufacturing 4 credits
A study of the principles of physical metallurgy and manufacturing processes. The structure of metals, strengthening mechanisms, metal removal, deformation processes and welding are covered as well as introductions to numerically controlled machinery, computer-aided manufacturing, and robotics. Classroom 3 hours, laboratory 3 hours. Prerequisite: EG203.

ME 363 - Kinematic and Kinetic Synthesis 3 credits
A study of the principles of motion and the forces necessary to cause, and be created by motion. Applications to the design of typical machine elements such as gears, linkages and cams. Classroom 3 hours. Prerequisites: EG202, MA223.

ME 368 - Design of Machine Elements 3 credits
A study of the application of the theories of mechanics and stress analysis to the design of fundamental machine parts. Some of the topics covered are shafts, springs, screws, belts, gears, rivets, bearings and lubrication. Classroom 3 hours. Prerequisites: EG301.

ME 370 - Mechanical Systems Design 3 credit
An introduction to the methodology of design including problem definition, generation and evaluation of alternatives, and design completion. Emphasis is placed on creativity, feasibility, and the effect of economic and societal factors on alternative selection. Goals are achieved through the use of case studies and small projects. Classroom 3 hours. Prerequisite: junior standing.

ME 381 - Mechanical Engineering Laboratory I 2 credits
A study of the fundamentals of mechanical and electronic instruments and their use in measurement systems to obtain data on temperature, pressure, displacement, acceleration, and other physical variables. Introduction to experimental methods and procedures, reduction of data to significant form, and the organization of experimental results in written reports. Lecture 1 hour, laboratory 3 hours. Prerequisite: EE204.

ME 382 - Mechanical Engineering Laboratory II 1 credit
Application of instrumentation to observations of gas and liquid behavior, thermodynamic and mechanical aspects of machines and devices. Dynamic and transient considerations in instruments, physical systems, and experimental data. Laboratory 3 hours. Prerequisite: ME381.
ME 435 - Vibrations and Controls  

ME 465 - Heat Transfer  
A study of the fundamentals of heat transfer by conduction, radiation, and convection. Steady and unsteady state conduction. Study will include boundary layer theory, internal and external convective flows, two-phase flow, and heat exchange design theory. Classroom 3 hours. Prerequisites: EG206, EG303, MA224.

ME 466 - Gas Dynamics  
A course that continues EG303 as applied to compressible fluids. One and two dimensional flow and oblique shocks. Classroom 3 hours. Prerequisites: EG303, EG206. Offered as occasion demands.

ME 467 - Mechanical Engineering Design I  
A capstone design project is taken up to the point of prototype construction, testing and hardware specification. The specific skills and knowledge needed by practicing engineers in the product realization process are emphasized and developed. Classroom 3 hours. Prerequisite: senior standing, ME370.

ME 468 - Mechanical Engineering Design II  
Design completion of the capstone project initiated in ME467 including hardware specification, instrumentation, laboratory testing, data reduction, and evaluation. Written design report required with oral presentation and defense. Prerequisite: ME467. 1 lecture hours and 2 lab hours

ME 474 - Internal Combustion Engines  
A course that correlates previous work in thermodynamics, heat transfer and design in the study of internal combustion engines. Classroom 3 hours. Prerequisites: ME465, ME307. Offered as occasion demands.

ME 487 - Mechanical Engineering Laboratory III  
A continuation of the Mechanical Engineering laboratory sequence with experiments stressing the performance characteristics of heat power equipment and the application of theory learned in thermodynamics and fluid flow. Classroom 1 hour, laboratory 2 hours. Prerequisite: EG303. Prerequisite or concurrent enrollment in: ME307.

ME 490 - Advanced Topics  
A course that provides specific work in an area of the instructor's special competence and indicated student interest. An extension of basic principles to applied areas such as HVAC, heat transfer, thermodynamics, stress analysis, environmental control, turbo-
machinery, propulsion systems and aerodynamics. Classroom or seminar, 1-3 hours. Prerequisite: senior standing. Offered as occasion demands.

Management and Marketing

MG 098 – Junior Career Conference 1 credit
This third year seminar focuses on evolving career decisions for Business & Management majors. Guest faculty are drawn from University Board of faculty members and associates with extensive real-world business acumen. Students will experience developing skills to prepare for entering the global workplace in their chosen fields and professions. 1 lecture hour.

MG 099 – Senior Career Conference 1 credit
This fourth year seminar focuses on evolving career decisions for Business & Management majors. Guest faculty are drawn from University Board of faculty members and associates with extensive real-world business acumen. Students will hone and finalize skills to prepare for entering the global workplace in their chosen fields and professions. 1 lecture hour.

MG 101 - Introduction to Business 3 credits
The purpose of this course is to introduce the student to the world of business. Students will learn about business organization and ownership and will survey union management relations, marketing, accounting, finance, international business, the legal environment, and the stock market. The course is designed to explore the relationship between social responsibility and profits in our free enterprise system. Prerequisite: permission of instructor required for upperclassmen. 3 lecture hours

MG 305 – Introduction to Sports Management 3 credits
This course will provide an overview of the sports industry from the perspective of variety of stakeholders in the industry. It covers the major business disciplines of management, marketing, finance, operations, information technology, accounting, communications, ethics and law. 3 lecture hours

MG 309 - Management of Organizations 3 credits
A study of the functions of modern management: planning, organization, staffing, leading, and controlling. This study is applicable to the management of military, government, educational and non-profit, as well as business organizations. The ethical and social responsibilities of management and contemporary challenges such as the internationalization of organizations are integrated in all aspects of this course. Prerequisites: junior or senior standing or permission of instructor. 3 lecture hours

MG 310 - Production/Operations Management 3 credits
Principles and applied study of the operation of manufacturing and service organizations. Managerial tools and diagnostics, decision-making, and financial management are introduced. Problems of small, medium, and large-sized businesses are studied. Prerequisites: QM213. 3 lecture hours

303

Revised October 2012-Posted 10/2012
MG 314 - Marketing Management 3 credits
This course immerses the student in the strategies and processes of marketing management - market analysis, segmentation, targeting and positioning, and the implementation and evaluation of marketing plans. When the student has completed this course they will understand how a marketing plan is developed and have the skills necessary to identify, analyze and solve marketing problems. Prerequisite: EC202 or permission of instructor. 3 lecture hours

MG 319 - International Dimensions of Business 3 credits
This course is designed to familiarize the student with the basic concepts and terminology of international business, and to gain an appreciation of the differences in social, political, and economic conditions among nations and how these affect the conduct of business and trade between nations. Topics include comparative cultural, political, and economic environments, international trade theory and policy, foreign exchange and exchange rate determination, the dynamics of international business-government relationships, and corporate policy and strategy of the multinational firm. Prerequisite: EC201 or EC202. 3 lecture hours

MG 341 - Business Law I 3 credits
A study of the law and legal system as they affect business. Topics include the court system, constitutional law, torts, criminal law, contracts, property, and the Uniform Commercial Code. In discussing business law, students will learn how morality and social responsibility are integrated into our legal system. Each student will be required to prepare a paper outlining ethical standards based on the student's life experiences. Prerequisite: junior or senior standing. 3 lecture hours

MG 346 - Business Law II 3 credits
A continuation of the analysis of the legal dimension of business operations that was developed in Business Law I. Special emphasis will be given to the legal environment as it relates to the accounting student's professional certification. Topics include bankruptcy, commercial paper, secured transactions, agency, corporations, and partnerships. Prerequisite: MG341 or permission of instructor. 3 lecture hours

MG 351 - Organizational Behavior 3 credits
This course considers the individual, the nature of organizations, and the issues resulting from the dynamic relationship of people in organizations. The course addresses such topics as learning, personality, motivation, organization structure, leadership, ethics, communication, and change. Not open to freshman. 3 lecture hours

MG 360 – Health Economics & Policy 3 credits
This course introduces students to principles of health economics and public policy in health and social welfare. Topics include support for public health, policy intervention in health determinants, the relationship between government regulation and market competition, the demand for healthcare, and the supply of services. This course will
enable students to apply economic reasoning to the health-care challenges facing society. Prerequisite: One semester of college level mathematics or QM213.

**MG 408 - Human Resources Management** 3 credits  
The management of human resources is one of the most challenging and critical aspects of contemporary organizational functions. This course addresses such issues as the nature of the American labor force, equal employment opportunity, personnel planning and staffing, compensation, employee well-being and job security, and collective bargaining. In addressing these issues attention is given to the ethical, legal, and moral questions involved. Not open to freshman. 3 lecture hours

**MG 409 - Organizational Leadership** 3 credits  
This course prepares students to apply leadership principles to the roles they play as managers. Students will discover more about themselves and learn more about the connection between the individual and the organization. Other topics include organizational culture, structure, group behavior, motivation, power, politics, organizational change, and workplace conflict.

**MG 411 - Consumer Behavior** 3 credits  
This course is designed to help the student understand the concepts of consumer behavior that provides the basis for marketing strategies. Students will gain an understanding of how consumers make decisions regarding the purchase and use of products and services and the internal and external factors that influence this process. Prerequisite: MG314

**MG 416 - Advanced Marketing** 3 credits  
In this course students will examine the key concepts and issues in developing a marketing strategy from the perspective of the corporate and SBU decision-maker. The course will take students through the process for formulating marketing strategies under various market conditions, for developing strategic and tactical marketing action plans, and how to evaluate and control a marketing plan and budget. Students undertaking this course will be required to use knowledge gained from previous marketing subjects in completing course assignments. Prerequisite: MG314.

**MG 426 - Marketing Research** 3 credits  
This course explores the process and tools for data collection and analysis used to solve marketing problems. In addition, the subject addresses when marketing research is appropriate and how to define the research problem, as well as the role of marketing research in marketing decision making. This course will provide students with practical experience in the use of computer based data analysis techniques and make students aware of the biases and limitations inherent in various research methodologies. Prerequisites: QM213, MG314.

**MG 429 - Seminar in Advanced Management I** 3 credits  
A topics course addressing managerial problems in various environments. Prerequisites: MG309/209, MG310, FN311, and MG314. 3 lecture hours
MG 441 - Integrated Marketing Communications  
This course will provide students with the necessary knowledge and skills to develop appropriate communication strategies consistent with strategic marketing principles. The role of communications in the client organization's marketing plan is emphasized. The concept of Integrated Marketing Communication (IMC) for coordinating the individual communication elements of advertising, direct marketing and public relations to achieve specific marketing objectives is stressed. Prerequisite MG314. 3 lecture hours

MG 441S - Integrated Marketing Communications  
This course will provide students with the necessary knowledge and skills to develop appropriate communication strategies consistent with strategic marketing principles. The role of communications in the client organization's marketing plan is emphasized. The concept of Integrated Marketing Communication (IMC) for coordinating the individual communication elements of advertising, direct marketing and public relations to achieve specific marketing objectives is stressed. Students will complete a 40 hours practicum working with the NU Athletic Program and 3 lecture hours, plus 1 cr. (40 hours) Practicum. Prerequisite MG314. 3 lecture hours

MG 448 - Entrepreneurship  
A course that integrates the functional areas of management-human resources, finance, marketing, and operations which uniquely affect the small business enterprise. Case studies, lectures and practical application develop the student's problem solving abilities. Prerequisites: MG309/209, MG310, FN311, and MG314. 3 lecture hours

MG 449 - Administrative Policy and Strategy  
A capstone course designed to integrate the students' undergraduate studies. Case studies, collaborative assignments, writing assignments and oral presentations provide opportunities to synthesize and apply the knowledge gained from courses in the management program. A comprehensive School examination is included in this course. Prerequisites: MG309, MG310, FN311, and MG314.

MG 450 - Internship in Management  
The internship program is designed for students who want to apply their studies by working with a business, industry, or public agency. The student will be required to work closely with a faculty supervisor to develop and implement a structured experience tailored to the career goals of the student. Prerequisites: senior standing and written consent of the department chair and internship committee. Normally only available during the summer.

Graduate Military History

MH 510 - Introduction  
The first seminar examines how military history developed as a distinct discipline, and will train you in the "tools of the trade": historiography and methodology.
Historiography, or the art of practicing history as a distinct discipline, is an examination of the history of historical thought, from the first works of history in the classical world to the present time. The seminar will cover some of the varied historiographical schools and concepts that have evolved. Historical methodology and informational literacy will also be studied. How do historians gather information and formulate hypotheses? The development of research methods, including the use of primary and secondary sources, are discussed. History involves interpretation and the challenges of objectivity, selectivity, and bias are examined.

MH 520 - Western Way of War 6 Credits
This seminar explores the military history and Europe from classical Greece to the early 19th century. The seminar will explore the global patterns in warfare in the period prior to the Industrial Revolution. The evolution of European military power up to the early 19th century will receive special emphasis and be placed into a global context.

MH 530 - Military Thought and Theory 6 Credits
This seminar studies the most influential military theoreticians and strategists from the period of the Thirty Years War to the present day. Students will examine the theories of Clausewitz, Jomini, Douhet, Mahan, Corbett, and Mao Tse-Tung. This seminar also examines theories of deterrence and nuclear war as well as post-Maoist revolutionary warfare.

MH 540 - Non-Western Military History 6 Credits
This seminar will present an introduction to Non-Western military history, covering a wide range of topics including military thought, strategy and tactics, technologies, and cultural factors as they pertained to the waging of war. Non-Western military history is rapidly maturing as a field of scholarly inquiry, particularly with respect to Asia. Therefore, this seminar will introduce students to the latest scholarship and interpretations, which both challenge and complement aspects of the debates about Western superiority mentioned above. Due to the wider availability of source materials and the research expertise of the seminar designer, this seminar will devote more attention to East Asia than to other parts of the non-Western world.
Nevertheless, weekly lessons will be arranged topically and will in many cases encompass a variety of geographical areas. Students will be strongly encouraged to think comparatively throughout the class. Students will be challenged to determine if any society had definitely unique approaches to warfare or if the universals are far more important than the specifics.

MH 541: Chinese Military History (elective) 6 Credits
This seminar will provide an introduction to Chinese military history, covering a wide range of topics including military thought, strategy and tactics, technologies, and cultural factors as they pertained to the waging of war. This offering will introduce students to the latest scholarship and interpretations, which both challenge and complement aspects of the debates about the “Western way of war.” Students will be strongly encouraged to think comparatively throughout the class. In the process we
will attempt to determine if any society had definitely unique approaches to warfare or if the universals are far more important than the specifics.

MH 543: Amphibious Warfare (elective) 6 credits
This seminar examines amphibious operations from antiquity to the present. It also sketches broader contexts for amphibious warfare as it has affected political, diplomatic, and economic change by determining to what degree, if at all, various amphibious actions figured in what has been labeled as an early-modern “military revolution” that contributed to the “Rise of the West.”

MH 550 - U.S. Military History (elective) 6 credits
This seminar will present an introduction to American military history from the colonial era to the present. Students will be challenged to critically evaluate Russell Weigley’s “American Way of War” thesis and examine the impact American conflicts and the U.S. military has had an American society.

MH 551 - Race and Gender in Military History (elective) 6 Credits
This seminar will cover the complex issues surrounding racial integration in military institutions, including intriguing questions around citizenship and ethnicity. Students will also examine the history of women’s participation in warfare and issues of gender integration in the military.

MH 552 - Total War (elective) 6 Credits
This seminar will examine the origins of the concept and practice of “total war” in the period from the French Revolution to the end of the Cold War. The French Revolution, Napoleonic Wars, American Civil War, First World War and Second World War will be examined. Students will examine the evolution of modern war, the characteristics of “total war” as well as the usefulness of the concept of “total war” in describing these massive conflicts.

MH 562 - Capstone Paper 6 Credits
In this degree completion option a “Capstone Paper” must be written and submitted during the latter part of Seminar 6. The Capstone has all the elements of the traditional thesis, including a program-approved topic of the student’s own choosing to be explored in depth, the use of appropriate academic sources, and a defense of the Capstone during the student’s Residency.

MH 569 - Comprehensive Examination 1 Credit
This degree completion exercise is designed to assess students’ knowledge of military history in general and the specific sub-fields they have studied during their program of study. The goal of the written examination is to assess student knowledge in the field of military history gained during the students’ program of study. In each examination students must demonstrate graduate level knowledge of the pertinent historiography of the field(s) examined in their course of study, graduate level analysis, an ability to synthesize information from various scholarly sources and develop and defend their interpretation of historical events. Students must also make a credible case regarding
their argument’s historical and historiographic significance. **Prerequisites**: Successful completion of Seminars 1-6.

**MH 570 - M.A. Thesis**  
6 Credits  
The M.A. thesis is an original research project demonstrating the student’s ability to conduct primary source research and mastery of the historiography germane to the research question. The thesis must also demonstrate graduate level analysis, synthesis, and argument and make a compelling case for the argument’s historical and historiographic significance.

The M.A. thesis will require students to make an individual, original, extended, and in-depth study of an approved research question within the field of military history. The M.A. thesis requires research utilizing primary documents. Students pursuing a research question requiring primary and/or secondary sources in a foreign language must demonstrate advanced reading proficiency in the pertinent foreign language(s). Proficiency will be demonstrated via an external assessment such as the Defense Language Proficiency Examinations, Foreign Service Institute examinations or reading comprehension tests approved by the American Council on the Teaching of Foreign Languages. If required for the research project, proof of foreign language competency must accompany the petition for the thesis option. Thesis and additional fees will be applied.

**Prerequisites**: approval of Program Director, Associate Program Director for Academics and Capstone Director, successful completion of Seminars 1-5, and, if applicable, advanced reading knowledge of the pertinent foreign language(s).

**Military Science**

**MS 111 - Military Science I**  
1 credit  
Leader Development and Individual Soldier Skills I - An introduction to Army Customs, Courtesies, and Traditions. The curriculum includes an introduction to leadership development, the values and ethics of the Army, physical wellness and fitness, and stress management. Laboratory work concentrates on basic land navigation skills, field craft skills, and basic rifle marksmanship. 1 lecture hours and 2 other hours  

**Course Attributes**: Not eligible for use as part of the six ROTC credits allowed for degree electives

**MS 112 - Military Science I**  
1 credit  
Leader Development and Individual Soldier Skills II. The curriculum focuses on the leader development by emphasizing the Be, Know and Do characteristics vital for success as an Army officer. In addition, the importance of physical fitness and wellness continues to be stressed. Students are introduced to tactics within a team and squad structure, decision-making process and the structure and organization of the Army.
Laboratory work includes advanced land navigation skills, basic rifle marksmanship, and troop leading procedures. 1 lecture hours and 2 other hours

**Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives**

**MS 211 - Military Science II**

2 credits

A Study of the Principles of Small Unit Tactics-Leadership Laboratory-This course is designed to teach individual soldier skills required for survival in modern combat and the leadership roles required for the infantry team and squad leader in developing technically and tactically proficient soldiers. Cadets will receive hands-on training in intelligence gathering, radio communication, individual and crew served weapons. Cadets will be introduced to collective tasks such as tactical movements and formations needed to conduct squad offensive, defensive, and patrolling missions. 2 lecture hours and 2 other hours **Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives**

**MS 212 - Military Science II**

2 credits

A study of the Principles of Leadership and Small Unit Tactics II- Examines the leader’s role in directing and coordinating the efforts of subordinates. Decision making skills, problem solving skills and troop leading procedures continue to be honed through leadership roles. Laboratory work focuses on small unit tactics, advanced land navigation, physical fitness, and troop leading procedures. 2 lecture hours and 2 other hours **Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives**

**MS 311 - Military Science III**

3 credits

Advanced Tactics-Leadership Laboratory-An in-depth study of the light infantry squad and platoon operations in the offense and defense. Cadets will continue to develop their oral and written communication skills through preparation of warning, fragmentary, and operation orders; and their leadership and management skills through decision making and analytical skills utilizing combat estimates, battle analysis, and intelligence gathering. Prerequisite: Successful completion of four semesters of ROTC or approval by the Professor of Military Science. 3 lecture hours and 2 other hours **Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives**

**MS 312 - Military Science III**

3 credits

Advanced Leadership-Leadership Laboratory-A comprehensive study and application of light infantry and ranger patrolling operations. Cadets will learn leadership techniques by gaining a comprehensive understanding of the mission and organization of combat and reconnaissance patrols and the methods utilized by effective combat leaders. The course will explore historical examples to illustrate the critical importance of dynamic leadership. Prerequisite: Successful completion of MS311 or approval by the Professor of Military Science. 3 lecture hours and 2 other hours **Course Attributes: Not eligible for use as part of the six ROTC credits allowed for degree electives**
MS 411 - Military Science IV
3 credits
This course begins the transition from Cadet to US Army 2nd Lieutenant. This is the first of two senior capstone courses in Military Science. MS411 training will include Army Operations, training management, communications and leadership skills. Additionally, cadets will participate in selected studies of Military History to include a staff ride to a Revolutionary War battlefield. This training will enable cadets to attain knowledge and proficiency in several critical areas needed to operate effectively and efficiently as an Army Officer. These areas include: The Army’s training management system, coordinating activities with staffs, and counseling skills. These skills will assist them in leading Junior Army ROTC cadets throughout the school year. Instruction will include lecture/seminar, case studies, practical exercises and military laboratories to include field-training exercises. One-third of the grade will include a measurement of their ability to develop subordinate leaders and personnel. Various members of the Army Department Cadre will serve as Assistant Instructors. With the Addition of MS412 in the Spring, 2nd Lieutenants will leave for your Basic Officer Leadership Course (BOLC II) as Commissioned Army Officers possessing high moral character, instilled with Army Values, physically fit, knowledgeable in basic soldier skills and a rich understanding of leadership and management. 3 lecture hours and 2 other hours
Course Attributes: May be used as part of the six ROTC credits allowed for degree electives

MS 412 - Military Science IV
3 credits
Army Leadership and Professional Development-Leadership Laboratory: The second of two senior capstone courses. Students will study the origins, development, and implementation of US National Security Policy as it applies to the application of land power. Focus will be on understanding and conducting Peace Keeping Operations, the parameters in which the US will participate, and the role of the military in PKOs. Once understanding the larger picture, the students must understand how to prepare and train their particular organization to ensure their objectives support the national will. The course includes case studies of recent Peace Keeping Operations and how tactical decisions can affect strategic outcomes. Current events are constantly examined. Students will develop their individual leadership skills and knowledge through class seminars, leadership laboratories, and field training exercises. Students will learn how to assess the level of training in their organizations, develop a training plan to correct deficiencies and re-enforce strengths, and how to evaluate training results. The second half of the semester students will further develop an understanding of leadership in organizations, team building, counseling subordinates and the various support systems available to leaders. Students will develop oral and written communications skills by preparing written assignments in the military writing style and giving oral presentations. 3 lecture hours and 2 other hours
Course Attributes: May be used as part of the six ROTC credits allowed for degree electives
Music

MU 101 - Music Appreciation 3 credits
A survey course of western music from the medieval through the contemporary periods. 3 lecture hours

MU 200 - Applied Music 1 credit
A course that provides studio instruction in keyboard instruments, orchestra and band instruments, and voice under the guidance of a performing artist. Offered at various levels of advancement appropriate to the individual student. Objectives include analysis and mastery of technical problems and the study of literature characteristic of the instrument or voice. This course is repeatable for credit. Prerequisites: permission of instructor and audition, if required. Three accumulated hours will comprise one three-degree-credit course upon petition by the student. 1 lecture hour

MU 210 - Campus Choraleers 1 credit
A select group of 40 mixed voices organized for the study and performance of advanced choral works of all periods. Repeatable for credit to three accumulated hours. Repeatable without credit indefinitely. Three accumulated hours will comprise one three-degree-credit course upon petition by the student. Prerequisite: Audition. 2 lecture hours

MU 230 - Instrumental Ensemble 1 credit
A course that provides study, analysis, and performance of music for small instrumental groups of various combinations. An objective is to become acquainted with a wide variety of music and styles pertaining to the student's instrument and to other instruments as well. (This requires several sections to accommodate combinations. Sections are scheduled by the instructor with the students). Three accumulated hours will comprise one, three credit free elective course. 2 lecture hours

MU 260 - Regimental Band 1 credit
A course that provides study and performance of marching band literature and technique, as well as rehearsal and presentation of small ensemble pep band music. Membership is open, through audition, to members of the Corps of Cadets. This course is repeatable for credit. Three accumulated hours will comprise one three credit free elective course. 3 lecture hours

MU 271 - History of Jazz 3 credits
History of Jazz is a historically based music course to expose the student to American jazz. Jazz occupies a unique place in American cultural history. Although it has been influenced by the music of many countries, it remains a purely American phenomenon. The course will include the study of historical readings, listening to the many styles and artists of American jazz, and attendance at live performances. Upon completion of the course, the student should have a general knowledge of the various styles, artists, and social history of the period from 1890 to present. 3 lecture hours
MU 300 - The Vermont Philharmonic Orchestra 1 credit
A major project in community arts development through study and performance. The Vermont Philharmonic orchestra presents, throughout the state, a series of symphonic concerts each season. Membership is open to qualified players of orchestral instruments by audition. This course is repeatable for credit. Three accumulated hours will comprise one three credit free elective course.

**Naval Science**

**NS 121 - Introduction to Naval Science** 2 credits
Required for all freshman midshipmen. Provides a comprehensive overview of the Navy and Marine Corps organization, military courtesies, and traditions. 2 lecture hours and 2 lab hours. **Course Attributes:** Not eligible for use as part of the six ROTC credits allowed for degree electives

**NS 122 - Sea Power and Maritime Affairs** 3 credits
Required for all freshmen midshipmen. Provides a comprehensive overview of the Navy’s heritage, mission, and role in the development of the United States. 3 lecture hours and 3 lab hours. **Course Attributes:** Not eligible for use as part of the six ROTC credits allowed for degree electives

**NS 221 - Leadership and Management** 3 credits
Required for all sophomore midshipmen. Provides an introduction to the principles of both leadership and management for future leaders. 3 lecture hours and 2 lab hours **Course Attributes:** Not eligible for use as part of the six ROTC credits allowed for degree electives

**NS 222 - Navigation** 3 credits
Required for all sophomore Navy midshipmen. Provides an introduction to the principles of navigation and basic seamanship. 3 lecture hours and 2 lab hours **Course Attributes:** Not eligible for use as part of the six ROTC credits allowed for degree electives

**NS 242 – Marine Corps Weapons Systems** 2 credits
Required for all sophomore Marine midshipmen. Provides a comprehensive overview of weapons in the Marine Corps inventory. 2 lecture hours and 2 lab hours. **Course Attributes:** Not eligible for use as part of the six ROTC credits allowed for degree electives

**NS 321 – Naval Ship Systems I** 3 credits
Required for all junior Navy midshipmen (except Nurses). Provides an introduction to basic naval engineering concepts and naval propulsion systems. Lecture hours and 3 lab hours **Course Attributes:** May be used as part of the six ROTC credits allowed for degree electives
NS 322 - Naval Ship Systems II  
3 credits  
Required for all junior Navy midshipmen (except Nurses). Provides an introduction to basic naval weapons engineering concepts and weapons systems. 3 lecture hours and 2 lab hours Course Attributes: May be used as part of the six ROTC credits allowed for degree electives

NS 331 - Evolution of Warfare  
2 credits  
Required for all junior Marine midshipmen and MECEPs. Provides an overview of the development of warfare through the ages using the joint principles of warfare. 2 lecture hours and 2 lab hours. Course Attributes: May be used as part of the six ROTC credits allowed for degree electives

NS 342 – Small Unit Leadership Skills  
2 credits  
Required for all junior Marine midshipmen and freshman MECEPs. Provides candidates with all basic skills, knowledge and physical preparation for attending OCS during summer cruise. 2 lecture hours and 2 lab hours Course Attributes: May be used as part of the six ROTC credits allowed for degree electives

NS 421 - Naval Operations and Seamanship  
3 credits  
Required for all senior Navy midshipmen (except Nurses). Provides an introduction to advanced navigation and seamanship, shipboard operations and naval warfare doctrine. 3 lecture hours and 2 lab hours Course Attributes: May be used as part of the six ROTC credits allowed for degree electives

NS 422 - Leadership and Ethics  
3 credits  
Required for all commissioning seniors. Provides all prospective commissionees with advanced leadership, ethics, service etiquette, and junior training. 3 lecture hours and 2 lab hours Course Attributes: May be used as part of the six ROTC credits allowed for degree electives

NS 431 - Amphibious Warfare  
2 credits  
Required for all senior Marine midshipmen and MECEPs. Provides an overview of the history of amphibious warfare, with a focus on Marine Corps operations. 2 lecture hours and 2 lab hours. Course Attributes: May be used as part of the six ROTC credits allowed for degree electives
Nursing

Courses that link theory and clinical, e.g., NR 316 and NR 316L, require a grade of C+ or higher in theory and also a grade of Satisfactory in clinical to progress in the program. Lower grades in either course require that both courses, theory and clinical, be repeated to progress in the program.

NR 104 – Focus on Professional Nursing 3 credits
This survey course introduces the student to the profession of nursing and offers insight into career options, roles, and opportunities open to the baccalaureate nurse. The course encourages the student to think broadly about nursing while it provides an introduction to the foundations of the profession. Classroom 3 hours.

NR 105 – Promoting Healthy Individuals 3 credits
This course focuses on the use of basic concepts from nursing, nutrition, and biopsychosocial sciences and Healthy People 2020 to explore the determinates of health, wellness, and illness of individuals. Environmental, sociocultural, economic, and lifestyle factors that influence health are examined. Traditional western and alternative views of health will be discussed. Students will complete a health promotion project for an individual. Evaluation of health information as relevant and reliable will be incorporated as a foundation for health promotion. Classroom 3 hours.

NR 204 - Nursing Informatics 1 credit
This course is designed to provide students with an initial experience in accessing information from a variety of sources. Further, through active learning, this course guides students through utilization of a number of commonly used information technologies. Basic information and computer competencies will be learned and assessed. Lecture and learning experiences will be the primary methods of content delivery. Prerequisites: NR 104

NR 206 - Health Assessment Across the Lifespan 3 credits
In this course, students study age specific approaches to assessment of human health. Focusing on evaluation of health and function of individuals, students acquire knowledge of health assessment and promotion in relation to comprehensive nursing care. The concepts are presented within the context of human growth and development, culture, and environment. Students learn to perform a comprehensive and holistic assessment of the patient including: systematic collection, analysis, and synthesis of health data from patients and secondary sources. Successful students will demonstrate a physical examination on a laboratory partner at the end of the course. Prerequisites: BI 215, BI 216, NR 105. 2 hours of lecture and 3 hours of lab

NR 215 - Nursing Care of Client with Psychiatric & Mental Hlth Disorders 3 credits
In this course students are introduced to current theory and research about contemporary practices in mental health nursing. Students develop their use of self as
a therapeutic tool and focus on a holistic approach to assessment and care of persons with psychological issues and selected psychiatric disorders and conditions. Students will provide care to patients with mental health and social health problems and their families as part of the interdisciplinary health care team. Prerequisites PY211, PY220, NR204, NR206. Co-requisite N215L. Classroom 3 hours.

NR 215L - Nursing Care of Client with Psychiatric & Mental Hlth Lab 2 credits
In this immersion course students apply current theory and research about contemporary practices in care of patients with mental health and social health problems. Students demonstrate the use of self as a therapeutic tool and focus on a holistic approach to assessment and care of persons with psychological issues and selected psychiatric disorders and conditions. Students will provide care to patients with mental health and social health problems and their families as part of the interdisciplinary health care team. Clinical failure will result in overall NR215 course failure regardless of course theory grade. Prerequisites: PY211, PY220, NR204, NR206. Co-requisite NR215.

NR 219 - Simulations for Clinical Practice 2 credits
Simulations for clinical practice is a revolutionary course designed to teach the novice nursing student how to think like a nurse. The course will cover the essential nursing skills, nursing process, aspects of formation of nursing diagnosis through direct patient simulation. Simulations will be selected that will foster students to think critically about patients, their families, proper nursing interventions. Concept based learning techniques will be incorporated into the course. Students will begin to learn professional nursing cognitive and behavioral practices by learning critical concepts and skills through simulation. Teaching the course in the proposed fashion will allow students to gain beginning competence prior to entering acute care facilities. Prerequisites: Nursing majors only. NR 104, NR 105, NR 204, NR 206. Offered spring semesters. 6 Hospital simulated clinical hours/week.

NR 225 - Nursing Research for Evidence Based Practice 3 credits
This course introduces the student to the principles, methods, and process of research for evidence based practice. Content includes how research contributes to the development of nursing knowledge, improves nursing practice, supports design of nursing systems, and enhances education and professional accountability. Students will participate in appropriate data collection and other research activities while evaluating the ethical legal issues applied to research. The successful student will learn to integrate reliable evidence from multiple ways of knowing to better inform their practice and make clinical judgments. Prerequisites: NR204, NR206, MA232, and MA199 or permission of the instructor. 3 Lecture hours per week.

NR 314 – Technological Innovations in Clinical Nursing 1 credit
In this course the nursing student is introduced to clinical based nursing information technology. Nurses are expected to provide safe, competent, and compassionate care in an increasingly technical and digital environment. A major theme in this new
healthcare environment is the use of information systems and technologies to improve the quality and safety of patient care. This course provides foundational informatics competencies that all practicing nurses and graduating nursing students should possess to meet the standards of providing safe, quality, and competent care. 1 classroom hour per week. Prerequisites: NR 219.

**NR 316 - Care of the Adult I**  
3 credits  
In this course students integrate the physiological, psychological, spiritual, developmental and socio-cultural dimensions of adults as they study nursing care during wellness and illness. Focus is on the musculoskeletal, endocrine, immune, integumentary, gastrointestinal and genitourinary systems. Students learn the professional nursing role in planning care of the adult client. 3 Lecture hours per week  
Prerequisites: NR 219  Co-Requisite NR 316L

**NR 316L - Care of the Adult I Practicum**  
3 credits  
In this course students apply knowledge of the physiological, psychological, spiritual, developmental and socio-cultural dimensions of adults as they study nursing care during wellness and illness. Students learn the professional nursing role in planning care of the adult client through clinical experiences at external agencies. Acquisition of communication and psychomotor skills is critical to providing nursing care. Clinical hours 8 hours per week. Simulation 1 hour 50 minutes every 3rd week.  
Prerequisites: NR 219  Co-Requisite NR 316

**NR 321 - Nursing Leadership**  
3 credits  
In this course students focus on theoretical foundations and conceptual principles of nursing leadership and the skills necessary to practice leadership competently in healthcare environments. The course is designed to enhance leadership self-awareness and to encourage students to fashion personal perspectives on how to lead professionally. Analyzing trends and issues in the current healthcare system has implications for exercising leadership and will help students determine the way they can make a difference. 3 lecture hour Prerequisites: NR 314, NR 316, or permission of the instructor.

**NR 331 - Care of Women and the Childbearing Family**  
3 credits  
In this course students are introduced to current evidence based knowledge, theory and skills of the practice of maternal/newborn and women’s health nursing building on knowledge from preceding courses in the social and physical sciences, and nursing courses, to help the student further develop the professional role behavior. Covered topics may include health promotion, disease prevention, genetics, social justice, issues of access and gender in healthcare. The continuity of care delivery from practitioner’s office to hospital to home is stressed enabling the emerging clinician to see the interdisciplinary team at work in the care of women and childbearing families.  
Prerequisites: NR 314 and NR 316 Co-requisites: NR 331L
NR 331L - Care of Women and the Childbearing Family Practicum  1 credit
In the clinical practicum of Nursing Care of Women and Childbearing Families students apply current knowledge, research and skills in contemporary practice of maternal/newborn and women’s health nursing to the care of selected clients. Client selection will be based on availability and will include newborns, postpartal mothers, antepartal mothers and families, and intrapartal mothers and families. The emphasis will be on safe, evidence based care for this vulnerable patient population. Clinical hours 45. Prerequisites: NR 314 and NR 331 Co-requisite: NR 331.

NR 341L - Care of Children and Child Rearing Families  2 credits
In this course students apply knowledge of the causes of childhood and adolescent illness in context with the relevant developmental challenges specific to the patient. Health promotion needs of the child and family in illness are stressed. Critical thinking and empathetically appropriate communication serve as the context for care. Clinical hours - 80. Prerequisites: NR 316, NR 316L Co-Requisite NR 341

NR 341 - Care of Children and Child Rearing Families  3 credits
In this course students focus on the nursing care of children, adolescents and families dealing with health and developmental challenges of childhood and explore health promotion needs of childrearing families. This course employs a developmental perspective through which major causes of morbidity and mortality are examined while it challenges students to develop critical and creative reasoning skills and utilize empathetically appropriate communication skills as the basis for care. 3 lecture hours per week. Prerequisites NR 316, NR 316L  Co-Requisite NR 341L

NR 351 - Family Centered Nursing  1 credit
In this course students acquire an understanding of family centered care from a variety of cross disciplinary theoretical perspectives. Students will apply critical thinking in the analysis of family care across clinical settings and contexts. Traditional and contemporary family definitions will be examined along with the changes in structure, role, and function as families begin, age and face end of life issues. An introduction to the medical home will be incorporated, indentifying the roles of the health care team, the family and the client. 1 lecture hour Prerequisites: NR 316

NR 400 - Independent Study  3 credits
A course in which there is an opportunity to select and read in a specific area of interest that is not available through regular course offerings. Prerequisites: three baccalaureate nursing courses and permission of the instructor. Students will continually apply proper legal/ethical considerations into clinical practice. 1 lecture hours

NR 416 - Care of the Adult II  4 credits
In this course students are required to integrate the physiological, psychological, spiritual, developmental and socio-cultural dimensions of adults as they study nursing care during wellness and illness. Focus is on the neurological system, cardiovascular system, respiratory system, hematology and oncology. Students learn the professional nursing role in planning care of the adult client. 4 lecture hours per week.
NR 416L - Care of the Adult II Practicum 4 credits
In this course students apply knowledge of the physiological, psychological, spiritual, developmental and socio-cultural dimensions of adults as they study nursing care during wellness and illness. Students learn the professional nursing role in planning care of the adult client through clinical experiences at external agencies. Acquisition of communication and psychomotor skills is critical to providing nursing care. 12 clinical hours a week/ Simulation 1 hour 40 minutes every other week. Prerequisites: NR 331, NR 331L, NR 341 and NR 341L  Co-Requisite: NR 416.

NR 420 - Care of Clients and Families at End of Life 2 credits
In this course students will study current theory and research about contemporary practices caring for clients and their families at the end of life. It teaches students effective interaction skills with clients, families and health care providers. Throughout the course, students develop their use of self as a therapeutic tool and focus on a holistic approach to assessment and care of persons with a variety of life-limiting illnesses/diseases. Interventions will be discussed regarding the physical care as well as psychological, social, cultural and spiritual care of clients and their families as they face life's final journey. Classroom: 2 hours. Prerequisites: NR 331 NR 331L, NR 341, and NR 341

NR 421 - Coordinator of Care 3 credits
In this course students integrate the physiological, psychological, spiritual, developmental and socio-cultural dimensions of adults as they study nursing in the context of uncertain and complex clinical environments. Students will use previous medical surgical nursing knowledge and builds skill sets as they prepare to enter the nursing professions as a new graduate nurse. Students will work one on one with an agency preceptor in a specialty of interest. 3 lecture hours per week
Prerequisites: NR 416 and NR416L  Co-Requisite NR 421L

NR 421L - Coordinator of Care Practicum 4 credits
In this final undergraduate clinical practicum, students demonstrate achievement of knowledge and skills in nursing practice as they enter into professional practice. Clinical experiences include seven weeks of practice under the guidance of an agency preceptor. Students integrate knowledge and skills from the humanities and basic, behavioral, social leadership and nursing sciences in developing the professional role in selected adult and pediatric health environments. Learning experiences allow students to gain confidence; practice critical thinking, leadership and ethical decision making in clinical situations. 168 hours clinical, 30 Simulation hours  Prerequisites: NR 416 Co-Requisite NR 421

NR 431 - Promoting Health in Communities 3 credits
In this course students learn current theory and research about contemporary practices in community/public health nursing. In population-focused nursing, the group, aggregate, community, or population is the unit of care. Epidemiologic studies have

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shown that lifestyle, environmental and genetic factors are major determinants of population health. Students will work collaboratively with community agencies to address population-focused health issues. Classroom 3 hours
Prerequisites: NR 416 and NR416L  Co-requisite: NR 431L.

NR 431L - Promoting Health in Communities:
Clinical Practicum  2 credits
In this course, students will apply concepts of community/public health in providing population-focused care to groups, aggregates, and communities. Clinical experiences are coordinated in a variety of settings and require students to engage with individual agencies and in collaboration with community partners in addressing community/public health issues. Students are encouraged to clarify their own beliefs and values in order to provide nonjudgmental nursing care. Clinical hours: 80.
Prerequisites: NR 416, NR 416L  Co-requisite: NR 431.

NR 441 - Nursing Capstone  4 credits
In this course the student begins to transition to the role of graduate nurse and explores issues relevant to contemporary nursing practice including the ethics and regulation of practice. Local, state, national and international policies and initiatives and their influence on health of populations are examined. Students create and implement an approved capstone leadership project which is undertaken with guidance of faculty and clinical partners and reflects integration of all elements of the BSN curriculum. Classroom 2 hours; seminar leadership project 2 hours.
Prerequisites: NR 416 and NR 416L

NR 510 - Health Systems Analysis: Policy, Environment, and Structure  6 credits
This seminar presents a global perspective of the healthcare system. Content includes an historical overview of healthcare systems in the United States, issues of cost, quality and access, as well as trends, such as, cultural diversity, demographic shifts, economics, technological influences and ethical issues impacting health care delivery. The student will gain the essential understanding of the continuum of care and examine the impact of integrated delivery systems on care delivery processes and patient outcomes.

NR 520 - Theoretical Constructs for Leadership Roles in Nursing  6 credits
This seminar prepares the student with the theoretical foundation to function in management level nursing roles across a variety of nursing specialties and health care settings. The student will be prepared to understand, evaluate, and utilize appropriate theories within his/her own practice. Theoretical constructs will include nursing and other relevant theories from the social, organizational, and behavioral sciences. Specific theories addressed include: systems, change, nursing management, and leadership theories, as well as ethical principles in health care and professional role development. Theoretical concepts are augmented by individual projects that require the student to examine his/her practice setting using the above constructs.
NR 530 - Evidence-Based Practice  
6 credits
This seminar prepares the student to become proficient in the utilization of research, the critical evaluation of research, identification of researchable problems within a variety of practice settings, and the application of research to clinical problems. The course incorporates both quantitative and qualitative research methods, application of statistical analysis of data, the utilization of information systems for accessing, storing and analyzing data, identification of researchable clinical problems, critical analysis and application of existing research, and application of theoretical constructs to frame a research proposal. Class assignments related to evidence based practice are augmented as the student identifies a researchable nursing problem within his/her own practice setting and develops a related research proposal.

NR 531 – Clinical Concepts: Advanced Pathophysiology  
3 credits
This seminar may be taken at any point during the latter half of the Master’s program, either concurrently with one of the other seminars or after completion of the 6-seminar concentration. It will satisfy the requirements of some states (e.g., Texas and California) that stipulate advanced coursework in pharmacology, pathophysiology, and health assessment for nurse educators. The course will focus on the pathophysiology, assessment, and evidence based interventions of select acute and chronic conditions across the lifespan. This course will expand on undergraduate level knowledge of disease entities commonly found in patient populations cared for by students.

NR 540 - The Heath Care Organization: Behavior and Development  
6 credits
This seminar prepares the student to incorporate systems theory as a basis of understanding the impact of market forces on health care delivery. Course content includes theories of leadership and organizational behavior, design and culture as well as group dynamics (i.e., communication, conflict, negotiation). In addition, concepts which focus on governance, decision making, performance improvement will be discussed. Class work is augmented by case studies and individual project work that require the students to examine practices in their own organizations.

NR 541 – Clinical Concepts: Advanced Pharmacology  
3 credits
This seminar focuses on clinical applications of pharmacotherapeutic agents used in the care of patients. The seminar content is designed to build on prior pharmacological study of actions and effects of drugs on the human system across life span. Students will study pharmacologic mechanisms of action, effects on organ systems, routes of administration, pharmacokinetics, therapeutic uses, considerations related to age and physiological state, adverse reactions, contraindications, and regulatory issues related to nursing education practice.

NR 542 – Clinical Concepts: Advanced Health Assessment  
3 credits
This seminar will focus on advanced clinical history taking and physical assessment for patients across the lifespan. Course content focuses on concepts, theory and practice of comprehensives health histories and assessments for patients of all ages and states of health. Both components will require a comprehensive examination: a proctored paper.
and pencil exam for pharmacology and a videotaped health assessment demonstration for the latter portion of the seminar.

**NR 550 - Nursing Resource Management**  
6 credits  
This seminar focuses on the critical aspects of human and financial resource management. Human resource management including hiring practices, disciplinary action, and performance appraisal and performance improvement are examined in this seminar. Healthcare finance incorporating nursing unit based budget preparation, management control systems, and operations management are addressed. In addition, quality improvement, risk management and marketing are explored in this seminar. The student is expected to utilize his/her workplace environment for the exploration, development and application of the course objectives.

**NR 551 – Theoretical Foundations of Curriculum and Instruction**  
6 credits  
This seminar prepares students to apply theoretical concepts related to education and nursing to the development and implementation of curricula. Topics will include history of curriculum in nursing, theories of teaching and learning, instructional design theory and method, technology in education, learner diversity, and curriculum development. A precepted practicum experience will coincide with didactic coursework. Students will choose a preceptor in an educational role who can facilitate role development and the implementation of the students’ work. Students will be required to develop a curriculum for a course or unit of study and implement a portion of the course or program using technology. Student work will become part of the student’s portfolio and shared with peers in the electronic classroom.

**NR 560 - Strategic Management in the Nursing Environment:**  
6 credits  
Seminar 6 is the capstone course in the Master of Science in Nursing-concentration in Nursing Administration. The seminar consists of two integrated components: 1) online-classes, consisting of study and discussions related to the development of a learning contract, concepts related to strategic management and professional practice; 2) a 60-hour, self-directed administrative practicum to implement the learning contract objectives. Discussions will relate to the acquisition of the necessary tools for successful practice as a Master’s prepared nurse administrator. This culminating experience is designed to enable students to apply the knowledge and skills learned throughout the graduate program and to guide their future career goals.

**NR 561 – Scholarship of Teaching, Learning, and Evaluation**  
6 credits  
This seminar prepares students to measure and assess learners in a variety of nursing contexts (e.g., clinical evaluation, via simulation) as well as evaluate curriculum on the program level. Foundations of educational measurement and evaluation, learner assessment, objective development, the evaluation of critical thinking as well as the context of nursing education will be discussed. Students will take part in a concurrent precepted practicum in which they will be required to engage in clinical education and evaluation of learners, as well as the development of assessment strategies for
previously developed curriculum. Students will have an opportunity to reflect on the multiple roles of the nurse educator in practice. Prerequisites: completion of NR 510, 520, 530, 541, 551, and national certification in an area of specialty nursing practice, or permission of the Program Director.

**Masters Organization Leadership**

**OL 510 - Leadership Fundamentals** 6 credits
This course focuses on differentiating the conceptual and theoretical aspects and models of leadership and leadership studies in order for students to apply leadership skills and principles to their place of work. The fundamentals of leadership are taught within the context of present and past leaders with an emphasis on how to live out these fundamentals in an ethical manner.

**OL 520 - Emotional Intelligence** 6 credits
This course provides information about the new way of evaluating intelligence in individuals. This new measure of intelligence is called EQ or emotional intelligence. Students are given the opportunities and tools to evaluate their capacity to think about work through the lens of reflection and introspection as a guide to understanding the behavioral aspects of working together and providing customer service. By examining thinking patterns students will take away new skills in developing intuitive reasoning to enhance professional interpersonal relationships with peers and customers.

**OL 530 - Leading Change** 6 credits
A leader’s ability to understand and follow the change management process in a collaborative manner is a vital skill to master. A proactive mindset is a critical element in successful business or personal change. Students in this course will learn about different change management models, problem-solving to find the best ways to leverage change agents, and how to best manage change.

**OL 540 - Strategic Communications & Information Leadership** 6 credits
Strategic communication is a vital skill in today’s demanding, fast-paced, virtual or global workplaces. This course requires students to identify a personal leadership style, tendencies and preferences as a professional, and how one assimilates and applies information. Experiential learning is a large component of this course as students practice their skills at work and relay their experiences through a Leadership Development Portfolio (LDP).

**OL 550 - Strategic Organizational Behavior as Leadership in Org** 6 credits
This course recognizes the fundamental importance of utilizing and believing in an ethical strategy as a leader. Principled decision-making promotes triple-bottom-line thinking to heighten awareness of how important ethical practices are to promoting a lasting, honored, socially responsible brand. Several case studies will be reviewed to contrast the paths and results of several organizations whose leaders had a strategy, but not one grounded in ethical principles.
OL 560 - Developing a Learning Org for the Knowledge Based Economy  
This course involves forward-thinking concepts of coaching, mentoring and succession planning to promote a learning organization that is prepared for the retiring baby-boomers, emerging X-ers, Nexters and “others” currently co-existing in the workplace. Using the new Human Resources model, Human Capital Management (HCM) learning becomes a strategic function formalized via a corporate university or learning management system. This course also addresses how a leader can recognize the key components of the knowledge-based economy in their organization.

Physical Education

PE 107 - Foundations of Physical Education  
A course designed to provide students with an introduction to the professional aspects of the physical education profession. Includes historical and philosophical implications with emphasis on modern trends in program design. Acquaints students with professional organizations and reviews career possibilities in the field. 3 lecture hours

PE 161 - Physical Fitness & Wellness Assessment  
Introduces the student to the theory and practice of teaching physical fitness activities. A personalized assessment is conducted of health-related fitness and wellness components. Based on the evaluation results and individual interests, an exercise program is designed by each participant, which she/he is expected to revise and update during her/his professional preparation at Norwich University. Individualized exercise program prescriptions may include aerobics, cycling, jogging, lap swimming, walking, yoga, or weight training. Professional ethics, client privacy, and liability issues are stressed throughout the program. 3 lab hours

PE 260 - Personal and Community Health  
A course that emphasizes principles, problems, and procedures concerned with the improvement of individual and community health. Consideration is given to the nature of communicable diseases and the preventative measures used in schools and community. Health information protection and client privacy are stressed as an integral part of the community health care provider’s professional ethics. 3 lecture hours

PE 261 - Foundations in Health Education  
This course will teach historical development, professional standards, philosophy and program planning, including current best practices in the development, implementation and evaluation of health education programs. It will focus on developing personal and social health skills, including decision making, interpersonal communication, goal setting and self-management skills. In addition, this course will integrate teaching students media literacy, personal advocacy, and how to access valid health information, products and services and how to teach this to prospective students. Lecture 3 hours: Field Experience 2 hours. Prerequisite: PE260. Offered even-numbered fall semesters.
PE 265 - Lifelong Motor Development 3 credits
This course studies the sequential, continuous age-related process whereby movement behavior changes. The class will cover information processing theories, theories of motor learning, effects of practice regimens and feedback and biological changes experienced over a lifetime, which affect motor skill acquisition. Understanding lifespan motor development is important for educators at all levels, special education teachers, physical educators, coaches, and adult fitness leaders. 3 lecture hours

PE 304 - Motor Development Activities 4 credits
This course teaches students to apply principles of best practice to the development and delivery of appropriate instructional programs in individual and dual activities currently being taught in the public schools (e.g. dance, gymnastics, racket activities, orienteering). Consideration is given to the development of personal performance and skill acquisition in order to more effectively lead practical lessons in school. Students must demonstrate an understanding of, and competence in motor skill acquisition and physical education pedagogy in the context of public school instructional programs. 1 hour lecture, 4 hours lab.

PE 305 - Motor Development Activities II 4 credits
This course teaches students to apply principles of best practice to the development and delivery of appropriate instructional programs in team sport and group activities currently being taught in the public schools (e.g. cooperative/challenge activities, basketball, volleyball, softball, soccer, lacrosse, and floor hockey). Consideration is given to the development of personal performance and skill acquisition in order to more effectively lead practical lessons in school. Students must demonstrate an understanding of, and competence in motor skill acquisition and physical education pedagogy in the context of public school instruction programs. 1 hour lecture, 4 hours lab.

PE 306 - Outdoor Physical Education I 3 Credits
This course provides students with a comprehensive background in warm weather Outdoor Physical Education. Skills in trip planning, risk management, equipment selection concerning use and care, and group leadership techniques will be covered. This class will prepare students to recognize the assumption of risk, attractive nuisances, negligence, and the standard of care when facilitating an Outdoor Physical Education program. Students will study and practice principles and protocols for administering safe, high-quality outdoor education experiences in activities such as, canoeing, mountain biking, hiking & backpacking, and adventure. Also covered will be topics in animal and wilderness conservation, nutrition, compass use and navigation, and environmental ethics. 3 classroom/field experience hours. Prerequisites: PE 107, PE 161, or permission of instructor. Offered fall semester.

PE 307 - Outdoor Physical Education II 3 Credits
This course provides students with a comprehensive background in cold weather Outdoor Physical Education. Students will be actively engaged in winter activities.
This class will prepare students to conduct classes in outdoor education during the winter in activities such as, snowshoeing, cross-country skiing, and ice skating. Also presented will be, but not limited to, topics in animal and wilderness conservation, nutrition, mountain and cold weather illness and injuries, and snow science, such as avalanche assessment and ice assessment. An emphasis will be placed on preparing individuals to be active in cold weather under winter conditions. 3 classroom/field experience hours. Prerequisites: PE 107, PE 161, or permission by instructor. Offered spring semester.

**PE 333 - Management of Sports Facilities**  
This course is designed to help prepare students for careers associated with sport facility management. A detailed examination of facility utilization, including safety and security, scheduling, maintenance, and emergencies and emergency response will be applied to a variety of facilities. Additionally the administration of a facility with special attention to preventative supervision, risk management, facility assessment and design, project planning, and staffing will be examined. Facilities covered will include but not be limited to parks, recreation centers, gymnasiums, aquatic facilities, fitness centers, sports arenas, tennis courts, and golf courses. Classroom 3 hours. Prerequisites: PE 107 or PE 161. Offered even year fall semesters.

**PE 341 - Instructional Strategies P. E. in Elementary School**  
A course that provides classroom and laboratory experience designed to acquaint the student with basic materials, methods, and principles necessary to meet the educational needs of the elementary school child. Emphasis on curriculum development with consideration given to concepts of movement education and perceptual motor development. Application of movement theory to specific sports skills and activities. Health information protection and student privacy issues are included throughout the course of instruction. Classroom 2 hours, laboratory 3 hours on site at Barre Town Middle, Elementary School.

**PE 342 - Instructional Strategies P. E. in Middle-Secondary School**  
A course that places emphasis on ethics, principles, procedures, and techniques related to teaching health and physical education in the elementary and secondary schools. Methods of organization, types of programs, and content and materials of health and physical education courses. Laboratory experience provided in traditional and new media, self and peer evaluation, and micro teaching. Health information protection and student privacy issues are reinforced throughout this course. Classroom 2 hours, laboratory 3 hours on site at U-32 Jr.-Sr. High School/ Montpelier Public Schools/ and Northfield Middle-High School.

**PE 355 - Coaching: Leadership in Sports**  
A course covering the philosophy, principles, and techniques of coaching individual and team sports. Emphasis on the organization and administration of interscholastic athletics in relation to the achievement of education objectives. Opportunity for National Federation of State High School coaching certification. 3 lecture hours
PE 365 - Kinesiology 4 credits
A review of the structure and function of the skeletal and muscular systems with special emphasis on an analysis of human motion as related to human performance. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI215, 216 or permission of the instructor.

PE 371 - Physiology of Exercise 4 credits
A review of physiological principles of muscular activity with emphasis on the integration of body systems in the performance of exercise and various athletic activities. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI215, 216 or permission of the instructor.

PE 373 - Activities and Programs for the Disabled and Aging 3 credits
A study of activities and programs focused on meeting the needs of special population groups and the aging. Consideration given to teaching methodology and program planning for individuals and groups. Health information protection and client privacy is stressed as it relates to professional ethics and liability.

PE 406 - Readings in Physical Education 3 credits
This course examines the current literature on issues facing future professional educators of an ethical, legal or pedagogical nature. Students are expected to think, read, write and speak critically about these professional issues in the physical education discipline. The submission of a professional portfolio is required. Prerequisites: PE 107, PE341, PE342, PE 373, PE 304, & PE 305. Seminar 3 hours.

PE 426 - Internship 6 or 12 credits
A course designed to provide the Physical Education students with an intern-type experience in a professional setting appropriate to their career goals. Prerequisite: satisfactory completion of all courses in the major through the sixth semester. Cross listed as PE/SM/MG. A student may not receive credit for both.

PE 432 - Organization and Administration in Physical Education 3 credits
A course that emphasizes the study of administrative principles, functional organization, and supervision in relation to the total physical education program in grades K-12 and to managing sports facilities and sports programs. Major topics include personnel, curriculum, legal liability, intramurals, evaluation, budgeting and risk management. 3 lecture hours

PE 441 – Advanced Exercise Physiology and Prescription 4 credits
This course is designed to prepare and qualify students to work as personal trainers and fitness specialists in corporate fitness and health club facilities. The course bridges the gap between exercise physiology related course work and the practical application skills of personal training. Learn how to: properly screen and evaluate clients for safe participation in an exercise program; design and implement exercise prescriptions for multiple populations and successful goal attainment; and successfully sell and manage personal trainer services. Eligibility for a Personal Training Certification is provided
through the National Council on Strength and Fitness Board. Prerequisite: BI 215, PE 371, or permission of instructor. Offered Fall term.

* ED 425 – Physical Education majors seeking teacher licensure must complete ED 525. This course is described under the Education listing of courses.

**Philosophy**

**PH 210 - Foundations of Western Thought I: The Ancient World** 3 credits
The first in a four-semester sequence which enables students to enter the "great conversation" of western civilization, debating ultimate or philosophical questions about science, religion, self-awareness, ethics and politics. This course examines themes in the thought of Plato, Aristotle, and the Stoic, Epicurean, and neo-Platonist philosophers of the ancient world. Offered fall semester of even-number years. 3 lecture hours

**PH 230 - Logic** 3 credits
A study of the principles of valid reasoning and argument: how to analyze arguments, detect fallacies, apply logical rules, prove and refute conclusions from given premises. Both syllogistic methods of argument and modern systems of symbolic inference are studied. 3 lecture hours

**PH 303 - Survey of Ethics** 3 credits
An introduction to critical thinking about the fundamental principles on which moral judgments and ethical conduct are based. This course will survey the major historical and contemporary positions. This course satisfies the General Education Ethics requirement. 3 lecture hours

**PH 305 - Foundations of Western Thought II: The Middle Ages** 3 credits
This course considers the synthesis of Christianity with classical pagan philosophy achieved by St. Augustine and St. Thomas Aquinas (1225-1274). What became of the ancients' ideal of human knowledge (of the universe, the soul, the divine, and the political community) in an age during which philosophy became the "handmaid of theology"? What were the underpinnings of the "natural law" conception of moral and political philosophy? How did this Medieval synthesis break down on the scientific side with Galileo's challenge to Aristotelian physics and astronomy, and on the moral and political side with Machiavelli's portrayal of a Renaissance prince? Offered spring semester of odd-numbered years. 3 lecture hours

**PH 306 - Foundations of Western Thought III: 17th & 18th Centuries** 3 credits
This course follows the development of the European philosophical tradition through the age of religious upheaval, secular enlightenment, and scientific and democratic revolutions. Included is a discussion of Post-Aristotelian physical science -- especially the concepts of space, time, motion, and causation -- from Galileo through Descartes to Newton and a consideration of the foundation of modern moral and political philosophy by Hobbes and its continuation through Locke, Hume, Rousseau, and
Kant. Includes Kant's Copernican Revolution in moral philosophy and philosophical theology. The Enlightenment ideal. Offered fall semester of odd-numbered years. 3 lecture hours

**PH 307 – Found. of Western Thought IV: 19th and 20th Centuries** 3 credits
This course follows themes discussed in Foundations of Western Thought I, II, and III into the contemporary period. Works by Hegel, Kierkegaard, Marx, Mill, Nietzsche, Jaspers, Heidegger, Sartre, Russell, Weil, and Arendt. Offered spring semester of even numbered years. 3 lecture hours

**PH 322 - Business Ethics** 3 credits
This course considers a range of ethical issues arising in the business world which are of common public concern. It is intended to provide a working knowledge of the concepts, theories, and types of argument characteristic of ethics in general and an appreciation of how they relate to a market environment. The rights and responsibilities of businesses, managers, and employees to each other, to stockholders, and to society at large are examined in such contexts as marketing, accounting and auditing, job security, pensions and health care, working conditions, affirmative action, product liability and safety, executive compensation and governance, globalization, and the natural environment. This course satisfies the General Education Ethics requirement. 3 lecture hours

**PH 323 - Environmental Ethics** 3 credits
An introduction to ethical issues concerning the human and non-human natural environment. The course introduces the basic concepts, theories, and types of argument characteristic of traditional general ethics. Some writers on environmental ethics have claimed that ethical theory needs to be modified or extended in certain respects to do justice to environmental issues, and the course examines the reasons advanced for such claims. A second focus is the intersection of ethics and economics in thinking about the natural and manmade environment, a subject which might well be called “human ecology.” Topics addressed may include: the ethical implications of continued population and economic growth; questions concerning the finitude of available natural resources; the economics and politics of food and energy production; the “relocalization” movement; biodiversity and endangered species; pollution, waste disposal, and climate change; and the proper role of government and the free market in meeting all these challenges. The point of view taken will be that of an ordinary (though hopefully thoughtful and well-informed) citizen, rather than that of an expert in either economics or environmental science. This course satisfies the General Education Ethics requirement. 3 lecture hours

**PH 324 - Criminal Justice Ethics** 3 credits
This course provides a short introduction to general ethics, with applications to practices and problems in the criminal justice field. It uses the case study method to focus on immediate decisions which involve ethical dilemmas and typically face criminal justice professionals in the police, courts, and corrections. It also studies a selection of more general issues involving the criminal justice system which are of
common public concern, as well as the deeper question of why certain forms of behavior should or should not be criminalized. In this connection, a selection of recent high-profile Supreme and Appeals Court cases in the areas of civil rights and civil liberties will be discussed. The emphasis is on developing discussion skills and familiarity with essential patterns of legal and moral reasoning. This course satisfies the University’s General Education Ethics requirement. 3 lecture hours

**PH 340 - Philosophy of Non-Violence**

3 credits

A study of permissible uses of force by individuals and nations. Topics include the theory of the just war, pacifism and non-resistance, conscientious objection, civil disobedience, and the moral problem of nuclear armaments. 3 lecture hours

**PH 350 - Medical Ethics**

3 credits

This course explores the major medical ethics issues discussed in public policy debates and encountered by healthcare practitioners in clinical practice. Topics include the professional duties of healthcare professionals, patient rights, euthanasia, informed consent, proxy decision making, healthcare reform, surrogate motherhood, organ transplantation, human and animal research, and genetics. This course satisfies the university’s General Education Ethics Requirement. 3 lecture hours

**PH 360 - Philosophy of Science**

3 credits

A course examining the basic principles of scientific reasoning, questions concerning scientific progress and scientific revolutions and ethical issues in the technological application of scientific discoveries. Case studies are drawn both from the history of science and from contemporary controversies. Prerequisites: sophomore standing or above and one course in laboratory science. 3 lecture hours

**PH 400 - Reading and Research**

3 credits

An inquiry into the pertinent literature and source materials of a specific area concerned with a special project to be agreed upon by instructor and student. Prerequisite: consent of instructor involved. 3 lecture hours

**Physics**

Note: PS100 through PS212, taken with the lab, would satisfy general education requirements for courses in laboratory science.

**§PS 100 - Elementary Physics**

4 credits

A study of topics from kinematics, dynamics, fluids, energy, acoustics, electricity, optics, and modern physics chosen for applicability to physical education and health. Classroom 3 hours, Laboratory 2 hours. Prerequisite: MA103 or equivalent. Note: A student may not receive credit for PS100 if credit has been earned in PS201 or PS211.
PS 107 - Introductory Solar System Astronomy 3 or 4 credits
A descriptive study of the solar system, including the sun, planets, asteroids, comets and interplanetary space. The role of observation in the evolution of astronomy is emphasized. Lecture 3 hours, laboratory 2 hours. Does not count as a lab science if taken for 3 credits.

PS 108 - Stellar and Galactic Astronomy 3 or 4 credits
A descriptive introduction to the universe, including stars, galaxies, and recent deep space discoveries. Discussions survey the techniques used by astronomers to interpret the wide variety of observed phenomena in the cosmos. Lecture 3 hours, laboratory 2 hours. Does not count as a lab science if taken for 3 credits.

PS 110 - Physics of Continuous Media 3 credits
An introduction to fluid mechanics, sound and thermal physics. Open only to first year students or by permission of department. Classroom 3 hours, no laboratory. Offered spring semesters. Concurrent: MA108 or MA121.

*PS 201 - General Physics I 4 credits
An algebra-based study of mechanics, sound and heat, with correlated laboratory experiments. Classroom 3 hours, laboratory 2 hours. Prerequisite: MA107 or the equivalent.
Note: No student will receive credit for both PS201 and PS211, or for Both PS202 and PS212.

*PS 202 - General Physics II 4 credits
An algebra-based study of magnetism, electricity, light, and atomic physics, with correlated laboratory experiments. Classroom 3 hours, laboratory 2 hours. Prerequisite: PS201. Note: No student will receive credit for both PS201 and PS211, or for Both PS202 and PS212.

PS 205 - Basic Instrumentation in the Natural Sciences 4 credits
An introductory course in electricity and electronics including A.C. and D.C. bridge circuits, diodes and transistors, linear and digital integrated circuits. Emphasis is placed on the use of these devices in typical research equipment such as spectrophotometers, radiation counters, turbidity and conductivity meters, electronic thermometers, etc.. Lecture 3 hours, laboratory 3 hours. Prerequisites PS201, PS202. Offered odd numbered fall semesters.

PS 207 - Meteorology and Climatology 3 or 4 credits
A first study of atmospheric processes, elementary forecasting, and the major climatic classes. Particular emphasis is placed on the effects of these phenomena on human activities. Laboratory practice includes elementary forecasting techniques, observations, calculations, and theoretical analysis of weather and climate patterns. Classroom 3 hours, Laboratory 2 hours. Prerequisite: PS201 or PS202 or permission of the instructor. Does not count as a lab science if taken for 3 credits.
*PS 211 - University Physics I 4 credits
A calculus-based study of vectors; Newton's laws; uniform, accelerated, rotational and harmonic motion; conservation laws; fluid mechanics; elasticity. Classroom 3 hours, laboratory 2 hours. Required in chemistry, mathematics and engineering curricula. Prerequisite: MA121.
Note: No student will receive credit for both PS201 and PS211, or for Both PS202 and PS212.

*PS 212 - University Physics II 4 credits
A calculus-based study of topics in electricity, magnetism, waves and optics. Classroom 3 hours, laboratory 2 hours. Prerequisite: PS211. Prerequisite or concurrent enrollment in: MA122. Note: No student will receive credit for both PS201 and PS211, or for Both PS202 and PS212.

PS 232 - University Physics III 3 credits
A study of topics from quantum phenomena, spectroscopy, relativity, nuclear and solid state physics. Classroom 3 hours. Prerequisites: PS202 or PS212, MA223 or permission of the instructor.

PS 331 - Mechanics 4 credits
Newtonian Mechanics applied to a particle including rectilinear and general motion, linear oscillations, non-inertial reference frames, gravitation, and central forces. Non-linear oscillators and chaos. Classroom: 3 hours; laboratory: 3 hours. Prerequisites: PS202 or PS212; MA224 offered odd numbered fall semesters.

PS 332 - Mechanics II 4 credits
Newtonian Mechanics applied to a system of particles including planar and general motion of rigid bodies, and oscillating systems. Lagrangian and Hamiltonian dynamical formulations. Introduction to relativistic dynamics. Classroom: 3 hours; laboratory: 3 hours. Prerequisite: PS331. Offered even numbered spring semesters.

PS 354 - Thermodynamics 4 credits
A study of first and second laws of thermodynamics with applications; thermodynamic potentials and applications to systems in equilibrium; introduction to statistical mechanics including Boltzmann statistics, quantum statistics, and statistical interpretation of entropy. Classroom 3 hours, laboratory 3 hours. Prerequisites: PS202 or PS212; MA224. Offered even numbered fall semesters.

PS 363 - Optics 4 credits
A study of the nature and propagation of light; reflection and refraction, thick lenses, lens aberrations, and optical instruments. Interference, dispersion, diffraction, polarization, and color phenomena. Classroom 3 hours, laboratory 3 hours. Prerequisites: PS202 or PS212; MA224. Offered odd numbered spring semesters.
PS 421 - Advanced Laboratory I 1 to 2 credits
A laboratory investigation in a specific area of experimental physics designed in consultation with physics faculty. Prerequisite: Permission of the instructor. Offered fall semesters only.

PS 422 - Advanced Laboratory II 1 to 2 credits
A laboratory investigation in a specific area of experimental physics designed in consultation with physics faculty. Prerequisite: Permission of the instructor. Offered spring semesters only.

PS 423 - Electricity and Magnetism I 4 credits
A study of electrical circuits, electrostatic fields, application of Gauss' Law and Laplace's equation; dielectric theory; magnetic fields, induced electric fields and currents; theory of magnetic materials; Maxwell's equations and electromagnetic waves. Classroom 3 hours, laboratory 3 hours. Prerequisites: MA224 and PS205 or permission of instructor. Offered even numbered fall semesters.

PS 424 - Electricity and Magnetism II 4 credits
A continuation of PS423, studying electrical circuits, electrostatic fields, application of Gauss' Law and Laplace's equation; dielectric theory; magnetic fields, induced electric fields and currents; theory of magnetic materials; Maxwell's equations and electromagnetic waves. Classroom 3 hours, laboratory 3 hours. Prerequisites: PS423. Offered odd numbered spring semesters.

PS 441 - Modern Physics I 4 credits
An introduction to special relativity, quantum mechanics, structure and spectra of atoms and molecules, nuclear models, and nuclear interactions. Classroom 3 hours, laboratory 3 hours. Prerequisites: (PS202 or PS212) and MA224 or permission of instructor. Offered odd numbered fall semesters.

PS 442 - Modern Physics II 4 credits
A continuation of PS441, introducing special relativity, quantum mechanics, structure and spectra of atoms and molecules, nuclear models, and nuclear interactions. Classroom 3 hours, laboratory 3 hours. Prerequisite: PS441. Offered even numbered spring semesters.

PS 451 - Seminar I 1 credit
A study of special topics of current interest. This capstone course integrates reading, writing, speaking and critical thinking skills. Classroom 1 hour. Prerequisite: permission of the instructor. Offered fall semesters only.

PS 452 - Seminar II 1 credit
A continuation of PS451, investigating special topics of current interest. This capstone course integrates reading, writing, speaking, and critical thinking skills. Classroom 1 hour. Prerequisite: permission of the instructor. Offered spring semesters only.
PS 461 - Senior Project I 1 credit
A project-oriented capstone experience that integrates reading, writing, speaking and critical thinking. The senior student chooses a project with faculty advice and takes charge of its execution to a satisfying conclusion. The course requires oral and written presentations of the project results. Prerequisites: senior class standing and permission of the instructor. Offered fall semesters only.

PS 462 - Senior Project II 1 credit
A project-oriented capstone experience that integrates reading, writing, speaking and critical thinking. The senior student chooses a project with faculty advice and takes charge of its execution to a satisfying conclusion. The course requires an oral and written presentation of the completed project. Prerequisites: senior class standing and permission of the instructor. Offered spring semesters only.

* No student will receive credit for both PS201 and PS211, or PS202 and PS212.
§ A student may not receive credit for PS100 if credit has been earned in PS201 or PS211.

Political Science

Distribution Codes for Political Science Majors: A course may be used to satisfy only one Distribution and one Area requirement for Political Science majors.

Distribution Requirement
CAP1 = International Studies          CAP2 = Political Philosophy
CAP3 = Comparative Politics          CAP4 = American Politics
CAP5 = International Relations

Distribution Codes for Studies in War & Peace Majors: A course may be used to satisfy only one Distribution one requirement for Studies in War & Peace majors.

Distribution Requirement
CAW1 = Core Elective                   CAW4 = International Elective
CAW7 = International/Comparative Elective

PO 101 - Introduction to Politics 3 credits
A comprehensive introduction to the principal concepts and terminology of political science. In surveying the major political ideas, ideologies, and archetypal governing institutions, the course asks how political power is developed, preserved, and challenged. 3 lecture hours. Open freshman only, except by permission of department chair or unless a major requirement for another program or major.

PO 105 - American Politics 3 credits
A study of the theoretical, institutional, and behavioral elements of the U.S. political system. Offered both semesters. 3 lecture hours. Open freshman only, except by permission of department chair or unless a major requirement for another program or major.
PO 106 – Introduction to Public Policy and Administration 3 credits
An introductory examination of theoretical and practical approaches to policymaking and administration, the essential steps in the process, and the roles of key actors at all levels. This course prepares students for more in-depth study of all other facets of the political realm. 3 lecture hours. Open freshman only, except by permission of department chair or unless a major requirement for another program or major.

PO 202 - Introduction to Comparative Politics (CAW7) 3 credits
An introductory course that acquaints students with the comparative study of politics. The course will compare executive and legislative relationships, electoral systems, ideologies, and political parties. Various countries from around the world will be used to illustrate the application and consequences of different institutions and ideas. 3 lecture hours. Not open to freshman without instructor’s permission.

PO 215 - International Relations (CAW7) 3 credits
An inquiry in assumptions, theories, and dogmas of the modern state system. Examination and evaluation of such topics as realist theory; conflict resolution; game theory; decision-making theory; and ecopolitics. 3 lecture hours. Not open to freshman without instructor’s permission.

PO 220 - Research Methods 3 credits
An introduction to the methods of political analysis, standard nomenclature, and basic research methods relied upon in the study of politics. Emphasis is placed on quantitative methods and ethical issues in conducting research. 3 lecture hours. Not open to freshman without instructor’s permission.

PO 300 - Special Topics in Politics 3 credits
Select topics offered on occasion. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 301 – Special Topics in International Relations (CAP5) 3 credits
Select topics in the area of International Relations offered on occasion. Topics courses may be repeated for credit as long as a different topic is offered. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 303 - Political Philosophy (CAP2) 3 credits
After introducing the political philosophies of Socrates, Plato and Aristotle, this course explores the ideas of major Western thinkers from the Renaissance through the Industrial Revolution. The course not only examines each philosopher’s understandings of power, justice, equality and freedom, but also contemporary applications and implications of these ideas. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 305 - Geopolitics (CAP5,CAW1) 3 credits
Geopolitics will give students an increased appreciation of the influence of geography on political decision-making. This course will help students "visualize" world politics
and understand how geography affects both national and transnational political behaviors. Students will learn to think and write critically about such issues and forces as globalization, development, and conflict. Students will develop an understanding of how interests and perceptions are shaped by geography. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 310 - European Politics (CAP1,CAP3,CAW1) 3 credits**
A study of the political systems, cultures, and issues of selected countries from western, northern and southern Europe as well as Russia and the European Union. This course will also consider the relationship between domestic and foreign policies and the relationship between the United States and Europe. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 312 - The Presidency (CAP4) 3 credits**
A study of the presidential office and its relationship with the major American political institutions. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 313 - Political Parties and Interest Groups (CAP4) 3 credits**
A study of political parties and interest groups as they influence the decision making process, the formulation of government policy, and the selection of official personnel. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 314 - The Legislative Process (CAP4) 3 credits**
A study of the national and state legislatures in the United States through a combination of lectures, readings, contact with legislators, and actual investigations on the state legislative scene itself. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 315 - Public Opinion and Political Behavior (CAP4) 3 credits**
A study of the development of political attitudes and the formation of public opinion; the influence of public opinion on governmental policy through its relationship to political participation representation and leadership. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 320 - Topics in Area Studies (CAP1,CAP3,CAW4) 3 credits**
Selected topics in area studies will be offered on occasion. This course will be used to cover subjects not included in the regular offerings in comparative politics. Topics may include the politics of a particular country or region such as Latin America, Africa, Eastern Europe, or the Middle East. A topics course may also be offered on a particular issue area such as foreign and defense policy, healthcare policy, welfare policy, or environmental policy. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.
PO 321 - U.S. Constitutional Law (CAP4) 3 credits
Introduction to the evolution and structure of the American constitutional system, focusing on the federal relationship, the separation of powers, and judicial review, relying primarily upon the case method of analysis. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 324 - Civil Liberties 3 credits
An examination of the relationship of individuals to government, relying primarily upon the case method of study, with specific consideration of problems of equal protection, due process, privacy, and freedoms of speech and religion. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 325 - Contemporary Political Theory (CAP2) 3 credits
A survey of twentieth and twenty-first century political theory and philosophy, including contemporary theories of liberalism and communitarianism, feminist political thought, democratic theory, and post-modernism. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 330 - American Citizenship (CAP2,CAW1) 3 credits
Using the Declaration of Independence, the Constitution and the Bill of Rights as a foundation, this course examines what it means to be a citizen of the United States. The course addresses such questions as: What are citizens entitled to and what do they owe the state and each other? Is there an obligation to obey political authority? Is there ever an obligation to disobey authority? An important consideration is the role of the military in American political life and in particular, the relationship between the military ethic and republican values. Offered alternate years. 3 lecture hours

PO 331 – State and Local Politics (CAP4) 3 credits
The primary objective of this course is to gain an understanding of the role of the state and local political institutions within the context of American federalism. Emphasis is place on procedural and policy differences as well as political issues in state, regional, and local governments. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 333 - American Foreign Policy (CAP3,CAW1) 3 credits
Through studies of the three "levels of analysis" personal political psychology, bureaucratic politics, and international relations-this course examines the processes of American foreign policy formulation and execution; it explores the objectives, methods, and consequences of major U.S. foreign and military policies. If practicable, students will take part in role-playing simulations. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 340 - Revolution and Forces of Change (CAP1,CAP3,CAW1) 3 credits
A critical analysis of several revolutions that will examine causes, outcomes, and accepted explanations in an attempt to discern generalities applicable to all revolutions.

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Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 348 - Asian Politics (CAP1,CAP3,CAW1) 3 credits**
A study of the political systems, cultures, and issues of the People's Republic of China, Taiwan, Japan, North and South Korea, Vietnam, Indonesia, Pakistan, and India. This course will pay particular attention to the relationship between the West and Asia, the processes of "modernization," and the role of Asia in contemporary international relations. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 400 - Independent Study 3 credits**
An opportunity for qualified upper class students to engage in an intensive reading or research program in fields of interest not satisfactorily covered by regular course offerings. Periodic conferences will be required. Prerequisite: written consent of the instructor to a specific project presented by the applicant. Offered as occasion demands. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 403 - Internship 3 to 15 credits**
Direct participation in the practical workings of state, municipal, and Federal government. Ordinarily open only to seniors. Offered on availability to internships. Credits to be determined by instructor. Prerequisite: permission of the instructor. Not open to freshmen. Open to upperclassmen, otherwise by permission of the instructor.

**PO 405 - International Organizations (CAP5,CAW1) 3 credits**
This course focuses on the increasingly influential and varied roles international organizations play in the world today from peace and security to international development, human rights, and environmental protection. It traces the evolution of the thinking behind, and efforts to establish international organizations, and analyzes not only their promise and challenges, but also their successes and failures to date. Although particular attention is paid to the United Nations and its many affiliated bodies, regional organizations (e.g. European Union, Organization of American States, African Union, NATO), international non-governmental organizations (NGOs), and multi-national corporations are also assessed. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 410 - Capstone Seminar in Political Science 3 credits**
A research and writing course designed to introduce students to graduate standards of original research and critical writing in political science. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

**PO 412 - War and Peace (CAP5) 3 credits**
An inquiry into the ostensible causes of war-- biological, economic, psychological, strategic, and theological; and an examination of the purported causes of war -- personal probity, military counterpoise, political utopia, and world government.
Preparation of a substantial paper is required 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 415 - International Law (CAP5,CAW1) 3 credits
This course examines the development of international law, and assesses its effectiveness in governing the relations among nation-states. The course examines early as well as more recent efforts to build a body of such law. It compares international law with domestic law, and explores the principal sources of international law. The course uses cases to analyze the development of international law in areas such as extraterritorial jurisdiction, the range of sovereignty, diplomatic relations, the treaty system, arbitration and adjudication, the use of force, human rights, the environment, and economic relations. Offered alternate years. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 490 - Honors in Political Science 3 credits
The first semester of substantial, sequential, research and writing project. See description of department honors program. Offered as occasion demands. Course may be repeated once for credit. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

PO 491 – Honors in Political Science 3 credits
The second semester of honors in political science. Devoted to writing and defending the honors thesis. 3 lecture hours. Open to upperclassmen, otherwise by permission of the instructor.

Psychology

PY 210 - Psychology of Leadership 3 credits
This course is designed to introduce students to the theoretical aspects of leadership, and to help them understand how theory applies to real situations. Topics include leadership models, leader behavior, leadership skills, followership, teams and motivation. Students will be expected to analyze cases, current situations and their own leader style. 3 lecture hours

PY 211 - Introduction to Psychology 3 credits
An introduction to psychology as the science of behavior. Topics to be discussed will include learning, motivation, emotions, perception, personality, tests and measurements, and additional selected topics. 3 lecture hours

PY 212 - Abnormal Psychology 3 credits
A course on the origin and development of psychopathology with emphasis on the biological, social, and psychological determinants. Prerequisite: PY211 or permission of the instructor. 3 lecture hours

PY 220 - Developmental Psychology 3 credits
A lifespan study of normal development with emphasis on physical, intellectual, social, and emotional growth. Prerequisite: PY211 or permission of the instructor. This course
is taken concurrently with ED102 by Teacher Education/Licensure Students. 3 lecture hours

**PY 230 - Biopsychology**  
3 credits  
This course is a survey of the neurophysiological bases of human behavior. Topics include basic brain anatomy and physiology, neurotransmitters and drugs, sensation and perception, learning and memory, sleep, and neurological disorders. Prerequisite: PY 211 or permission of the instructor. 3 lecture hours

**PY 232 - Engineering Psychology**  
3 credits  
The objective of this course is to expose students to the theoretical foundations of research in human factors. Students will be introduced to basic concepts in psychology such as perception, attention, decision making, and motor control. Knowledge of these concepts is critical for the intelligent design of human-technological systems. Prerequisite: PY 211 or permission of the instructor. 3 lecture hours

**PY 234 - Forensic Psychology**  
3 credits  
A survey of psychological research and theory dealing with criminal behavior and the legal system. Topics include prediction of violent behavior, sexual assault, victimization, juvenile delinquency, scientific jury selection, criminal investigation and profiling, eyewitness testimony, assessment of mental competency, lie detection, DNA testing, and forensic science. Prerequisite: PY 211 or permission of the instructor. 3 lecture hours

**PY 236 - Cross-Cultural Psychology**  
3 credits  
This course will expose students to the influence of culture on human behavior, and will illustrate differences and commonalities in behavior (verbal and non-verbal), attitudes, and values across a range of cultures around the world. Issues concerning cultural contact and inter-cultural relations will be considered to enhance a student’s ability to deal with and understand variations in human behavior across cultures and ethnic groups. Methodological issues of particular importance to cross-cultural research will be discussed. Prerequisite: PY 211 or permission of the instructor. 3 lecture hours

**PY 238 - Political Psychology**  
3 credits  
This course will examine key research in political psychology which includes the interactions of political and psychological processes and their impact on behavior in personal, local and global communities. Prerequisite: PY 211 or permission of the instructor. 3 lecture hours

**PY 240 - Introduction to Social Psychology**  
3 credits  
A general survey of theories, methods and research on individual behavior in a social context. Among topics to be considered are: aggression, interpersonal attraction, affiliation, person perception, attitudes, group processes, and social influence. Prerequisite: PY211. 3 lecture hours
PY 241 - Introduction to Personality Theory  
An overview of selected influential statements regarding the structure, dynamics, and development of the human personality. Included are the theories of the Freudians (Freud, Jung, Adler), the Environmentalists (Dollard and Miller, Skinner), and the Existentialists and Humanists (Rogers, Maslow, Frankl). Comparisons among theorists are organized around philosophical and historical themes. Prerequisite: PY211. 3 lecture hours

PY 263 - Perception  
Coverage of the major themes and research in perception. Topics include perception of color, form, motion, depth, illusions, perceptual learning, development, and the physiology of perception. Prerequisite: PY211 or permission of the instructor. 3 lecture hours

PY 299 – Topics in Psychology  
Topics varied and offered on occasion. This course will be used to cover subjects not included in the regular offerings of psychology. Some topics might be limited to specific majors. May be repeated for credit with a different topic. 3 lecture hours

PY 313 - Experimental Psychology I  
A course on the principles and skills required to plan, execute, and interpret psychological research. Topics include the nature of science, the value of empirical evidence, psychology viewed as a science, the logic of experiments, and the ethics of using human subjects. Students are taught to develop a testable idea, to write and read research reports, and to design, conduct, and analyze univariate, and correlational studies. Prerequisite: PY211 or permission of the instructor. 3 lecture hours

PY 314 - Experimental Psychology II  
This course will teach students how to design, conduct, and report psychological experiments. The purpose of the course is to link the academic subject matter of psychology to the conduct of research in the laboratory and the field. Topics include the nature of science, formulation of hypotheses, measurement and reliability, research methods (including experimental, correlational, and observational techniques), research design, and ethics of using human subjects. Issues of experimental control, its relation to confounding and research design, and internal and external validity will be included. The course will also focus on the teaching of library research and scientific writing skills. Students will design, implement, analyze, and report results of several research projects. Prerequisite: PY313, or MA232, or permission of instructor. 3 lecture hours

PY 315 - Exceptional Child I  
An introduction to the developmental, emotional, behavioral, and learning characteristics of the special child. Topic areas include learning disabilities, retardation, emotional disorders, physical handicaps. Also included are federal and state laws, regulations, curricular adaptations and integration strategies. Required and only for
elementary and secondary Teacher/Education Licensure Candidates. Prerequisite: PY211 or permission of the instructor. 3 lecture hours

**PY 321 - Organizational Psychology**  
3 credits  
An analysis of organizational behavior including motivation, climate, leadership, and the use of such techniques as behavior modification in changing human behavior. Theoretical consideration will be followed by application experiences through role playing and case analysis. Prerequisite: PY211 or permission of the instructor. 3 lecture hours

**PY 324 - Adolescent Psychology**  
3 or 4 credits  
This course examines the physical, emotional, social, cognitive aspects of adolescence from a developmental perspective. Identity, autonomy, sexuality, achievement, and intimacy are examined within the context of the school, the peer group, and the family. Students will have the opportunity to work with adolescents in schools, recreational centers, counseling centers, or through youth service agencies. Required for secondary teacher licensure candidates (Formerly ED324, Educational Psychology). Prerequisite: PY211 or permission of the instructor. 3 or 4 lecture hours

**PY 344 - Cognition**  
4 credits  
Overview of research and theory on human cognitive processes emphasizing the acquisition, storage, representation, retrieval and use of knowledge. Topics include memory, concept formation, language and thought, problem solving and creativity, and cognitive development. Laboratory will include hands-on experiments in cognitive research paradigms. Prerequisite: PY 211 or permission of the instructor. 3 lecture hours and 2 lab hours

**PY 350 - Environmental Psychology**  
3 credits  
A study of the relationship between people and the environment, the use of space as a means of regulating social interaction, and human responses to environmental stressors such as overcrowding, toxic agents, noise, air, and water pollution. Also a brief look at ecological psychology in which setting-specific rather than person-specific determinants of a person's reaction to the environment are analyzed. Prerequisites: minimum junior standing, PY211, and permission of the instructor. 3 lecture hours

**PY 352 - Learning and Memory**  
4 credits  
This course provides an overview of historical and current research findings in the area of learning and memory. The subject will be approached from various theoretical approaches, including behaviorist, cognitive, and neurobiological paradigms. Laboratory will include hands-on experiments using research paradigms from the field of learning and memory. Prerequisite: PY 211. Or permission of the instructor. 3 lecture hours and 3 lab hours

**PY 355 - Psychology and the Law**  
3 credits  
A course that examines the research of psychology as it relates to the judicial process; the nature, source, and development of antisocial behavior; and forensic psychology
relative to the development of law and policy at the national and international levels. Prerequisites: PY211, junior standing and permission of the instructor. 3 lecture hours

**PY 360 - History and Systems of Psychology** 3 credits
An overview of significant movements, theories, and individuals in the development of contemporary psychology. The course is organized around philosophical themes and includes discussion of the philosophy and sociology of scientific growth, structuralism, functionalism, behaviorism, Gestalt psychology, and psychoanalysis. Prerequisite: PY211 and permission of the instructor. 3 lecture hours

**PY 398 - Thesis Preparation** 3 credits
The students will prepare a senior thesis prospectus in accordance with the ethical standards of the Human Subjects Committee. This course precedes PY498. Prerequisites: junior standing, permission of the instructor, PY211, PY313, PY314. 3 lecture hours

**PY 401 - Senior Seminar** 3 credits
This course is the capstone experience marking the end of a student's undergraduate studies. Students both majoring and minoring in psychology will be provided the experience of synthesizing their learning across their courses in the context of a liberal arts education. Prerequisite: senior status or permission of the instructor, PY211, PY313, PY314. 3 lecture hours

**PY 402 - Conference** 0 credits
Each Psychology major, must during his/her tenure at Norwich attend at least one professional Psychology meeting.

**PY 403 - Presentation** 0 credits
In order to complete the process of psychological inquiry and communication, each psychology major must present his/her senior research at an appropriate professional forum, spring semester, senior year. 1 other hours

**PY 451 - Thematic Seminar** 3 credits
A seminar course which deals with particular theories or areas of psychology not elsewhere covered in depth or within present course offerings. Prerequisite: PY211 and permission of the instructor. 3 lecture hours

**PY 452 - Thematic Seminar** 3 credits
A seminar course which deals with particular theories or areas of psychology not elsewhere covered in depth or within present course offerings. Prerequisite: PY211 and permission of the instructor. 3 lecture hours

**PY 453 - Internship** 3 to 9 credits
Assignments will include work and observation in local, state, and federal institutions or agencies concerned with the education, health, or the protection of society. Written and oral reports. Prerequisites: PY211 and permission of the instructor. 1 lecture hours
PY 471 - Directed Readings 3 credits
A course in which there is an opportunity to select and read in a specific area of interest that is not available through regular course offerings. Prerequisites: three psychology courses and permission of the instructor. 3 lecture hours

PY 498 - Senior Thesis 3 credits
A research course designed to enable a student to experience all phases of the experiment from literature research, experimental design, data collection and analysis, and written and oral reports. The student will learn all of the procedures, considerations, and standards necessary to ensure the ethical treatment of human participants. Prerequisites: PY211, PY313, PY314, PY398, senior standing and permission of the instructor. 3 lecture hours

Quantitative Methods

QM 213 - Business and Economic Statistics I 3 credits
A course emphasizing the development and presentation of statistical data for business and economic decision-making. Topics will include survey methods, statistical description measures, sampling distributions, statistical inference procedures, simple regression and time series analysis, and construction and use of index numbers. Prerequisite or concurrent enrollment in: MA212. 3 lecture hours

QM 317 - Business and Economic Statistics II 3 credits
A course in which the statistical concepts developed in QM213 are continued. New topics developed are multiple correlation and regression theory and analysis, the assumptions of regression analysis and econometric problems, and an introduction to simultaneous models and advanced topics. Prerequisite: QM213. 3 lecture hours

QM 370 - Quantitative Methods for Marketing & Finance 3 credits
A course in which the statistical concepts developed in QM 213 are continued. The focus of the course will be the application of statistical techniques to real world issues in Finance and Marketing. Emphasis will be placed on problem solving, class participation, computer applications and completion of a term paper. Prerequisite QM213. 3 lecture hours

Studio Arts

SA 103 - Introduction to Drawing 3 credits
An introduction to drawing, emphasizing articulation of space and pictorial syntax while developing abilities of perception and ways of seeing. Class work is primarily based on observational study. Assigned projects address fundamental and conceptual problems through historical and contemporary artistic practice. Three-hour studio, one-hour lecture per week.
SA 104 - Introduction to Visual Design  
3 credits
An introduction to the language of visual expression, using studio projects to explore the basic principles of visual art and design as a fundamental component of visual communication. Students acquire a working knowledge of visual syntax applicable to the study of art history, popular culture, and the art of composition. Three-hour studio, one-hour lecture per week.

SA 105 - Introduction to Painting  
3 credits
An introduction to the issues of contemporary painting, stressing a beginning command of the conventions of pictorial space, narrative, and the language of color. Students explore painting as a means of communicating ideas through visual symbols and metaphors. Class assignments and individual projects explore technical, conceptual, and historical issues central to the language of painting. Three-hour studio, one-hour lecture per week.

SA 106 - Introduction to Printmaking  
3 credits
An introduction to a diverse range of printmaking media: linocut, woodcut, and screen-printing process. Both color and black-and-white printing methods are explored. Class assignments and individual projects explore technical, conceptual, and historical issues central to the language of printmaking and its connections to contemporary culture. Three-hour studio, one-hour lecture per week.

SA 107 - Introduction to Photography  
3 credits
An introduction to photographic principles as a means of visual communication and its relationship to history and contemporary issues. The class examines the invention and history of photography. A single-lens reflex manual 35mm film camera is required. Three-hour studio, one-hour lecture per week.

SA 200 - Intermediate Studio  
3 credits
This course level is for students pursuing further study in one of the following areas: drawing, design, painting, photography, and printmaking. The focus is on developing more complex levels of thought more thorough incorporation of theory and individual initiative in project content and completion. Only one area of study will be pursued each semester. Can be repeated for credit. Six hours of studio per week. Prerequisite: SA100-level studio in area of study or permission of the instructor.

SA 205 - Water Media  
3 credits
This course examines water media, stressing an advanced command of the conventions of pictorial space, narrative, and the language of color and design. Class assignments and individual projects explore technical, conceptual, contemporary, and historical issues central to water media. Attention is given to each student’s unique and expressive handling of the media. Six hours of studio per week. Prerequisite: SA103 or instructor’s permission.
SA 210 - The Portrait  3 credits
This course explores the perceptual and conceptual means to construct the human face as a way to explore, understand, and portray the human condition. The structure of the head is examined as anatomy and as form. Historical examples are presented and examined as well as contemporary theory of the portrait and self-portrait. Six hours of studio per week. Prerequisite: SA103, or instructor’s permission.

SA 265 - Life Drawing  3 credits
The course focuses on study and exploration of the human figure using a range of approaches, with emphasis on observation, anatomy, spatial structure, and the use of life drawing as a means to analyze and explore the nature of the human condition. Historical examples ranging from cave painting to contemporary art are presented, researched, and discussed. Six hours of studio per week. Prerequisite: SA103, or instructor’s permission.

SA 300 - Advanced Studio  3 credits
This course is for students who have completed SA100 and SA200 level courses in their area of study and have a demonstrated ability to be self-directed and self motivated in their purposes and goals. Prior to registration, the student must have an approved outline for their individual course of study. Can be repeated for credit. Six hours of studio per week. Prior to registration, the student must submit in writing, and the instructor must accept, a proposed course of study.

Sports Medicine

SM 136 – Advanced Emergency Care of Injury and Illness  3 credits
This course follows the national standards for Advanced First Aid, CPR for Professional Rescuers, and Bloodborne Pathogens. Recognition, care, and temporary treatment of injuries and illness are discussed and the associated skills are practiced. In addition, this course will introduce basic concepts of emergency actions plans and initial injury evaluation. Upon successful completion of the course, students will be awarded national certification cards for: Advanced First Aid, CPR for Professional Rescuers, and Bloodborne Pathogens training. Classroom 2 hours, laboratory 2 hours.

SM 138 - Introduction to Sports Medicine  3 credits
This course provides students with an introduction to the principles of pharmacology, medical terminology, and documentation used in the care of physical active individuals. Students will gain an understanding of the concepts associated with injury assessment, tissue healing, wound care, protective equipment, therapeutic modalities and exercise and the health care team. Classroom 3 hours.
SM 210 - Medical Assessment of Injury and Illness  
4 credits  
Building on the assessment principles acquired in SM138 and 220; this course focuses on the techniques necessary to evaluate body systems for injury/illness. Classroom 3 hours, laboratory 3 hours. Prerequisites: SM 220 and BI 216.

SM 220 - Care and Prevention of Athletic Injuries  
4 credits  
Course provides students with the knowledge and skills essential for the proper prevention, evaluation, and treatment of common athletic injuries. Risk management and professional ethics are stressed. Classroom 3 hours, laboratory 3 hours. Prerequisites: SM 138 and BI 215. Co-Requisite: SM 227.

SM 226 - Clinical Education in Sports Medicine  
2 credits  
Emphasis will be placed on the application of knowledge and skills introduced in preceding courses. This course provides students the opportunity to develop clinical proficiencies introduced in preceding courses. Supervised practicum in athletic training setting. Class meets for 2 hours/week utilizing lecture, demonstrations and hands-on instructional techniques, plus Supervised Clinical Rotation (4-6 hours/week) and clinical proficiency evaluations. Prerequisites: SM 220 and PE 161. Open only to declared Athletic Training majors.

SM 227 - Clinical Anatomy & Biomechanics  
3 credits  
This course is designed to explore clinical anatomy and biomechanical principles, exposing students to the structural interrelationships that serve to form the basis for normal function and as a means to understanding structural and functional pathology. Classroom 3 hours. Co-requisite: SM 220.

SM 420 - Therapeutic Modalities  
4 credits  
Investigation of the physiological response of selected human body tissues to trauma and inactivity as well as the implications of said responses for the selection, use, and application of therapeutic modalities. Classroom 3 hours, laboratory 3 hours. Prerequisite: SM 220.

SM 422 - Therapeutic Exercise  
4 credits  
Investigation of principles, objectives, indications, contraindications and progression of various modes of conditioning and reconditioning exercises. Methods for evaluation, progress assessment and development of criteria for return to activity. Classroom 3 hours, laboratory 3 hours. Prerequisite: SM 420.

SM 426 - Internship  
12 credits  
A course designed to provide the Sports Medicine students with an intern-type experience in a professional setting appropriate to their career goals. Prerequisite: satisfactory completion of all courses in the major through the sixth semester. Cross listed as PE/SM. A student may not receive credit for both.
SM 439 – Leadership & Management in Sports Medicine 3 credits
Part of a two-semester capstone experience in sports medicine/athletic training. This course focuses on leadership, management, and professional ethics in sports medicine. Students will complete a series of organization and administrative projects and papers focused on personal and professional ethics. This course will satisfy General Education Goal 6 requirements. In addition, students will be required to lead the weekly discipline journal club discussion. Classroom 3 hours. Prerequisite: Senior Standing.

SM 440 – Evidence-Based Sports Medicine 3 credits
Part of a two-semester capstone experience in sports medicine/athletic training. This course focuses on the development and utilization of evidence-based practice research as it is applied to sports medicine. Prerequisites: SM 439 and MA 232.

**Sociology**

**SO 201 - Introduction to Sociology** 3 credits
An analysis of the order and change in social life, both at the micro (interactional) and macro (societal) levels. An examination of fundamental concepts and research methods applied to understanding culture and socialization; social groups and organizations; social stratification; and social change. 3 lecture hours

**SO 202 - Problems of Modern Society** 3 credits
This course examines the problems of American social institutions such as the family, the economy, and education, using basic sociological principles and paradigms. The course also covers problems of inequality, deviance, and problems of change and modernization. 3 lecture hours

**SO 209 - Methods of Social Science Research** 3 credits
An examination of the methodological foundations of the social sciences; the logic and technique of empirical inquiry; the nature of social facts, the operationalization of concepts, and the construction of hypotheses; research designs including questionnaires, interviews, experiments, observation, and evaluation; the organization and analysis of data; graph and table constriction and interpretation; the common problems of empirical and social research; and research ethics. Cross listed with CJ209. Offered in fall semester. 3 lecture hours

**SO 212 - Cultural Anthropology** 3 credits
Principles and methods in the comparative study of cultures. An examination of the concepts and theories in terms of which cultural anthropology is pursued. 3 lecture hours
SO 214 - Racial and Cultural Minorities  
3 credits
A study of relations between racial and ethnic groups in modern America. Attention is also given to selected subordinate groups in the U.S. and other countries. Offered in fall semesters. 3 lecture hours

SO 216 – Sociology of Health, Wellness, and Medicine  
3 credits
Introduction to the sociology of health, wellness, and medicine. Examines the cultural and institutional aspects of health, wellness, and healthcare systems through basic sociological principles, paradigms, and methods. Explores inequality in health outcomes, access to resources, and within the medical field. Includes an international comparative approach. Offered annually in the fall semester. Open only to Nursing majors in their third semester of the degree program, students with a Sociology minor, or by permission of the instructor and the department chairperson. 3 lecture hours

SO 300 – Selected Topics in Sociology  
3 credits
Selected topics offered on occasion. 3 lecture hours

SO 316 – Aging in Society  
3 credits
Introduction to the sociological study of aging in society. This course examines the cultural, relational and institutional interpretations of aging through the life course using basic sociological principles, paradigms and methods. Students will explore inequality as it relates to aging and diverse populations in terms of health outcomes, in access to resources, and within the medical field. Offered annually in the fall semester. Prerequisites: SO216 or S0201, or by permission of the instructor. 3 lecture hours.

SO 320 - Drugs and Society  
3 credits
This course focuses on the interrelationships between drugs and the social order. Issues considered include: the nature and effects of legal and illegal drugs; the determinants of drug effects, especially the social determinants; the history of drug prohibition; drug addiction and drug treatment; and drug policy. Cross-listed with CJ320. Offered every other year. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

SO 330 - Military Sociology (CAW1)  
3 credits
This course provides a sociological perspective of the military as both an institution and as an occupation. It examines the social structure and functions of the military and the social factors that influence behavior in and of the military. In terms of function, it examines the changing purposes of the military in view of changing national and international conditions; and in terms of structure, it examines the norms, values, traditions, organizations, and culture of the military. It is designed to provide greater insight into the routine life within the military and into contemporary issues confronting the military. Course taught in spring every other year. 3 lecture hours

SO 400 - Independent Study  
3 credits
An opportunity for qualified upper class students to engage in an intensive research program in fields of interest not satisfactorily covered by regular course offerings. Periodic conferences will be required. Prerequisite: written consent of the instructor to
a specific project presented by the applicant. Open only to students with a cumulative quality point average of 2.5. Offered on occasion. Prerequisite: Sociology minor and SO201. 3 lecture hours

**SO 402 - Law and Society** 3 credits
An analysis of various theoretical perspectives on the nature, courses, organization and operation of law and legal systems. Emphasis will be placed on law creation, conflict resolution, the legal profession, and the role of law in social change. Cross listed with CJ402. Offered every other year. Prerequisite: CJ101 or permission of instructor. 3 lecture hours

**Spanish**

**SP 111 - Beginning Spanish I** 6 credits
An intensive course providing an introduction to the Spanish language, in which speaking proficiency, aural comprehension, vocabulary acquisition, reading, and writing are brought to a level enabling students to use the language actively in everyday situations. Classroom: 6 hours, laboratory: 2 hours. Not open to students who have successfully completed SP205 or higher.

**SP 112 - Beginning Spanish II** 6 credits
A continuation of SP111, in which language skills are brought to a level enabling students to participate more fully in general conversation, to read more sophisticated passages, and to write with a firmer command of syntactical structures. Classroom: 6 hours, laboratory: 2 hours. Prerequisite: SP111 or equivalent, NU language placement exam. Not open to students who have successfully completed SP205 or higher.

**SP 150 - Topics Course** 3 credits
Specialized topics offered relating to culture, literature, business practices, language, or linguistics. Topic will be indicated in the schedule of classes. May be repeated for credit, as topics vary. May be taught in Spanish or English; see schedule of classes. Course may be repeated for credit if the topic differs. (May be taught in Spanish or English, this course may not count towards fulfilling the foreign language requirement.) Classroom: 3 hours. Prerequisite permission of the instructor.

**SP 205 - Intermediate Spanish I** 3 credits
A course that provides aural-oral practice in Spanish, in which students are enabled to enter into full discussion of topics that include abstract themes, review and expanded use of syntactical structures, intensive and extensive reading, and composition. Classroom 3 hours, laboratory 1 hour. Prerequisite: SP112, NU language placement exam, or permission of the instructor.

**SP 206 - Intermediate Spanish II** 3 credits
A course that provides aural-oral practice in Spanish, in which students are enabled to enter into full discussion of topics that include abstract themes, review and expanded use of syntactical structures, intensive and extensive reading, and composition.
Classroom 3 hours, laboratory 1 hour. Prerequisite: SP205, NU language placement exam, or permission of the instructor.

**SP 250 - Topics Course**  
3 credits  
Specialized topics offered relating to culture, literature, business practices, language, or linguistics. Topic will be indicated in the schedule of classes. May be repeated for credit, as topics vary. The number ascribed to the course will reflect the level of the material under study as well as the level of proficiency expected of the student. May be taught in Spanish or English; see schedule of classes. Classroom 3 hours. Course may be repeated for credit if the topic differs. (When taught in English, this course may not count towards fulfilling the foreign language requirement.) 3 classroom hours. Prerequisite permission of the instructor.

**SP 301 - Advanced Spanish I**  
3 credits  
Oral and written practice of the language through class discussions of selected Hispanic authors. Selective review of grammar, especially of the more difficult and subtle aspects, designed to facilitate idiomatic and fluent use of the language. Classroom 3 hours. Prerequisite: SP206, SP 300 level course may be taken concurrently, NU language placement exam, or permission of the instructor.

**SP 302 - Advanced Spanish II**  
3 credits  
Oral and written practice of the language through class discussions of selected Hispanic authors. Selective review of grammar, especially of the more difficult and subtle aspects, designed to facilitate an idiomatic and fluent use of the language. Classroom: 3 hours. Prerequisite: SP206, SP 300 level course maybe taken concurrently, NU language placement exam, or permission of the instructor.

**SP 321 - Introduction to the Literature of Spain I**  
3 credits  
A survey of peninsular Spanish literature from prehistoric Spain to the Modern Age. Lectures, readings, discussion, and written reports in Spanish. Prerequisite: SP206 or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

**SP 322 - Introduction to the Literature of Spain II**  
3 credits  
A survey of peninsular Spanish literature from the Modern Age up through the 20th Century. Lectures, readings, discussion, and written reports in Spanish. Prerequisite: SP206 or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

**SP 327 - Hispano-American Literature I**  
3 credits  
A survey of Hispano-American literature from the pre-Columbian period up through the 19th Century. Lectures, readings, discussion, and written reports in Spanish. Prerequisite: SP206 or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

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SP 328 – Hispano-American Literature II 3 credits
A survey of Hispano-American literature from the end of the 19th Century up through the 20th Century. Lectures, readings, discussion, and written reports in Spanish. Prerequisite: SP206 or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

SP 331 - Advanced Spanish Composition and Conversation I 3 credits
A study of Spanish stylistics, translation into Spanish from modern English texts, oral reports, and discussion in Spanish. Prerequisite: SP206 or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

SP 332 - Advanced Spanish Composition and Conversation II 3 credits
A study of Spanish stylistics, translation into Spanish from modern English texts, oral reports, and discussion in Spanish. Prerequisite: SP206 or a 300-level course (may be taken concurrently), NU language placement exam, or permission of the instructor. 3 lecture hours

SP 350 - Topics Course 3 credits
Specialized topics offered relating to culture, literature, business practices, language, or linguistics. Topic will be indicated in the schedule of classes. May be repeated for credit, as topics vary. May be taught in Spanish or English; see schedule of classes. Classroom: 3 hours. Course may be repeated for credit if the topic differs. (When taught in English, this course may not count towards fulfilling the foreign language requirement.) 3 lecture hours. Prerequisite permission of the instructor.

SP 415 - Seminar: Topics in Spanish or Latin-American Literature and Culture 3 credits
A study of a particular author, theme, genre, or literary movement including cultural themes. Topic varies each year these courses are offered. Prerequisite: SP300-level course or permission of the instructor. 3 lecture hours

SP 421 - Reading & Research in Spanish or Latin-American Literature * Culture 3 credits
A report on an approved project of original research in Spanish or Latin-American literature or civilization under the direction of a department member. Limited to students who have demonstrated aptitude for independent work. May be scheduled either or both semesters. Prerequisite: SP300-level course or permission of the instructor. 3 lecture hours
SSBC 510 - Foundation of Business Continuity Management  6 credits
This seminar introduces students to the field of business continuity management with an emphasis on the steps needed to develop a business continuity plan and risk management program. Students will learn about the functions and goals of a business continuity manager and will experience first-hand the challenge of developing a continuity plan. Weekly sessions target the major steps in plan development such as project initiation, risk and business impact analysis, risk mitigation and control strategy development and implementation, response strategies, plan testing, as well as the organizational structure needed to sustain a continuity program over time. Pre-requisites: Permission of Department Chair.

SSCM 305 – Introduction to Strategic Communication  3 credits
This course introduces students to principles of strategic communication. The course provides a detailed understanding of the important role that participatory web media play in strategic communication. Topics include understanding and defining strategic communication, public diplomacy, who is responsible for conducting strategic communication, challenges of U.S. strategic communication, improving strategic communication, and the future of strategic communication. Practical application of the tenets of strategic communication will be accomplished by reviewing and critiquing high-profile cases from the Iraq war and other significant events. This course will enable students to identify and apply the basic characteristics of effective strategic communication. Prerequisite: None

SSDA 306 - Science & Technology of Visual Augmentation Defense Systems  3 credits
This course is designed to provide students with a working knowledge of the science and technology associated with visual augmentation systems, to include design constraints as defined by target spectrum and atmospheric properties. Additionally, it examines the physiology of human vision and the unique phenomenon that is perception. By utilizing the tenets of the scientific method, students learn to characterize, hypothesize and predict system performance through experimental observation and quantitative analysis. Course material will prepare students to be critical operators and informed customers, capable of providing valued feedback to system designers. Pre-requisites: none

SSDA 310 - Emergency & Disaster Relief Operations  6 credits
This course examines the principles used by emergency managers to respond to local or regional disasters. Students examine the NIMS (National Incident Management System) and other standards governing emergency management. Pre-requisites: None. Note: this course is under development and will be reviewed by the University Curriculum Committee.
SSDA 315 - Insurgency and Conflict  6 credits
Students compare and contrast selected insurgencies and counter-insurgencies from across the globe. Students gain knowledge needed to analyze and establish mission profiles for past, present and future conflicts. Pre-requisite: None. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSDA 320 - Information Operations  6 credits
This course introduces students to the overall concept of information warfare (IW) and information operations (IO), particularly in regard to the US federal government and Department of Defense. Pre-requisites: None. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSDA 400 - Capstone  6 credits
Students analyze and synthesize learning from previous Strategic Studies & Defense Analysis courses, with a particular focus on ethics and leadership. Students analyze ethical scenarios and a tactical ethics text and present an in-depth ethical analysis paper. Students must address how their work will contribute to the U.S. Army’s body of knowledge about the topic(s) under discussion. Pre-requisites: Completion of all SSDA courses or permission of the Department Chair.

SSDA 490 - Selected Topics  1-6 credits
Students will study a specific topic of interest under the direction of an SSDA faculty member. Pre-requisites: To be determined on an individual basis. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSEC 310 - Socio-Economic Studies  3 credits
Students explore tenets and characteristics of various economics systems, analyze economic indicators, conceptualize problems and recommend possible solutions. Pre-requisites: None. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSEC 401 - Economic Studies  6 credits
In this regional economics course, students complete a research project to analyze the economy of a country or region of interest. Students survey and evaluate the economic institutions and infrastructure of the region. Local, regional and global challenges and opportunities that exist in the region will be explored. The study will include recommendations for improving the well-being of people by strengthening the region’s economic institutions and infrastructure. The course will culminate with a substantive research paper. Pre-requisites: Completion of SSEC 310 or permission of Chair of Department of Continuing Studies. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSEN 270 - Military Literature  3 credits
A study of men and women in war and the military service, their ideals, experiences, and strategies as seen in foreign and American military literature of the 19th and 20th centuries. Prerequisite: EN102 or EN108 or equivalency.
SSES 301 - Environmental Science  
A study of the dynamic interaction between human and environment with emphasis on ecosystem structure and function; the study, analysis and identification of optimal solutions to local and regional environmental issues and problems; and short- and long-term strategies for natural disaster or post-conflict remedial measures. Prerequisites: none. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSGD 511 - History of Diplomacy in the International System  
This seminar is a comprehensive overview of diplomacy, international relations, and world order in the context of the modern state system, 1648 to the present. The seminar provides an introduction to the international political environment through studies in foreign policy decision-making. The seminar combines the fields of history and political science by using an analytical framework of historiography and international relations methodology. Pre-requisites: Permission of Master in Diplomacy Program Director.

SSHI 310 - Historical Studies  
This is an overview of the historical development of political, cultural and economic behavior of institutions within a specific geographical context. Students will focus on a specific region, e.g., the Middle East, Latin America, Sub-Saharan Africa or Asia. Students will explore and develop an in-depth understand of the history of a region and the impact of that history on current events. Pre-requisites: none. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSMA 232 - Elementary Statistics  
A course that covers the study of frequency distributions, averages and standard deviations, normal curve, probability, decision-making, sampling techniques, testing hypotheses, chi-square, students-t and F-distributions, correlation and linear regression. Prerequisite: A college level mathematics course or equivalent as determined by departmental placement testing. Not open to students with credit in MA311.

SSMG 315 – Leadership  
In this course students learn key theoretical models of leadership and strategies for applying them in a range of situations, both military and non-military. Students identify key functions and skills of effective leaders, explore leadership styles through study of selected leaders, and evaluate the role of communication, negotiation, strategy, purpose and ethics in leadership. Students evaluate their own leadership effectiveness and develop a leadership tool kit. Prerequisites: none.

SSMG 320 - Strategic Planning  
This course is designed to enhance the critical and creative thinking skills needed to solve complex and ill-defined problems. The key themes are problem framing,
operational art, leadership, and the outcomes for human security. Students focus on historical and contemporary examples of strategic level planning in highly complex operations and use this learning as a framework for problem solving within and across agencies. Students complete a major team project that leverages skills learned to focus on a complex problem vignette that requires creating a course of action for the leader to meet the desired end state. Prerequisites: none.

**SSPO 302 - National Security Policy**  
3 credits  
This course introduces students to the issues and institutions of national security policy. Successful students will have an appreciation of strategic thought and strategy formulation, the ability to assess national security issues and threats, and an understanding of the political and military institutions involved in the making and execution of national security policy. Pre-requisites: none.

**SSPO 306 - Comparative Politics**  
3 credits  
This course introduces students to the basic methods, concepts and substance of comparative politics. Special attention will be paid to institutions and behaviors as well as development and modernization theories. The course provides students with tools to address such questions as: What is a political system? What are the different varieties of democracies and authoritarian regimes? Are some regimes more vulnerable to political violence than others? What explains the transition from authoritarianism to democracy and can that process be reversed? How does geography impact the political, economic, and social development of a region? Pre-requisites: none. Note: this course is under development and will be reviewed by the University Curriculum Committee.

**SSPO 318 - International Terrorism**  
3 credits  
This course addresses the effects of a variety of forms of sub-state violence on world affairs. Topics include sources of terrorism, its major characteristics, the problems it poses for global peace and stability, responses to terrorism by countries by and international organizations, and the problem of balancing public safety and personal freedom in dealing with terrorism. Pre-requisites: none.

**SSRE 300 - Comparative Religion**  
3 credits  
Based upon myth and built upon ritual, religious thought affects politics, economics, international relations and security. This course provides learners with the opportunity to explore and analyze the similarities and differences of world religions to better understand the impact of belief systems and religious themes on culture, human history and current affairs. Pre-requisites: None. Note: this course is under development and will be reviewed by the University Curriculum Committee.

**SSSO 330 - Military Sociology**  
3 credits  
This course provides a sociological perspective of the military as both an institution and as an occupation. It examines the social structure and functions of the military and the social factors that influence behavior in and of the military. In terms of function, it examines the changing purposes of the military in view of changing national and

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international conditions; and in terms of structure, it examines the norms, values, traditions, organizations, and culture of the military. It is designed to provide greater insight into the routine life within the military and into contemporary issues confronting the military. Pre-requisites: none.

SSSO 335 - Introduction to Cultural Competence 3 credits
Students learn key concepts in the study of cultures and explore how culture and cultural contexts and language influence values, expectations, behavior, communication styles and conflict resolution. Pre-requisites: None. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSSO 340 - Applied Practice in Cultural Competence 3 credits
Students develop their capacity for cross cultural competence though deepening understanding of ideologies, social institutions, and the relationship among environment, language and culture. The focus is on increasing knowledge, skills and attitudes needed for effective cross cultural communication. Pre-requisites: SSSO 335 or permission of Department Chair. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSSO 401 - Cultural and Anthropology Studies 6 credits
Students complete a study for a particular region in relation to its culture, social groups and organizations, social stratification, and other relevant characteristics of the region. The study will include a comparative analysis of the various cultures and ethnic minorities that exist throughout the region. The study will further explore how the legal structure of the region deals with the cultural challenges and opportunities in the region. The study will include recommendations for improvement and/or strengthening the regions’ societies. The course culminates with a substantive research paper. Pre-requisites: Completion of SSSO 335 and SSSO 340 or permission of Department Chair. Note: this course is under development and will be reviewed by the University Curriculum Committee.

SSSO 406 - Area Studies 6 credits
Students complete a study which surveys and evaluates a particular region in relation to its geographic location, diversity and resources. The study should include a summation of the geography of the region and how it relates to implementation of a project or the resolution of a problem in the region. It will examine the current natural resources and resource challenges of the region, paying particular attention to mineral, oil, water and other high valued items present in the region. It will analyze future challenges of the region in terms of geography as well as resources. The study will include recommendations for improvement and/or strengthening the region’s resources. The course will culminate with a substantive research paper. Pre-requisites: Completion of SSHI 310 Historical Studies or permission of Department Chair.
Athletic Training

ST 310 - Upper Extremity Injuries 3 credits
Advanced athletic training course that incorporates areas of assessment/diagnosis, clinical anatomy and biomechanics utilizing evidence-based medicine to provide a comprehensive approach to caring for upper extremity and cervical/thoracic spine injuries. Classroom 3 hours. Prerequisite: SM220.

ST 311 - Clinical Education in Athletic Training I 2 credits
Emphasis will be placed on the application of knowledge and skills introduced in preceding courses. This course provides students the opportunity to develop clinical proficiencies introduced in preceding courses. Supervised practicum in athletic training setting. Class meets for 2 hours/week utilizing lecture, demonstrations and hands-on instructional techniques plus Supervised Clinical Rotation (4-6 hours/week) and clinical proficiency evaluations. Prerequisites: SM 226, ST 320, PE 260.

ST 320 - Lower Extremity Injuries 3 credits
Advanced athletic training course that incorporates areas of assessment/diagnosis, clinical anatomy and biomechanics utilizing evidence-based medicine to provide a comprehensive approach to caring for lower extremity, pelvis and lumbar spine injuries. Classroom 3 hours. Prerequisite: SM220.

ST 321 - Clinical Education in Athletic Training II 2 credits
Emphasis will be placed on the application of knowledge and skills introduced in preceding courses. This course provides students the opportunity to develop clinical proficiencies introduced in preceding courses. Supervised practicum in an athletic training setting. Class meets for 2 hours/week utilizing lecture, demonstrations and hands-on instructional techniques plus Supervised Clinical Rotation (4-6 hours/week) and clinical proficiency evaluations. Prerequisites: ST 310, 311, SM 420, and PE 365

ST 410 - Clinical Education in Athletic Training III 3 credits
Emphasis will be placed on the application of knowledge and skills introduced in preceding courses. This course provides students the opportunity to develop clinical proficiencies introduced in preceding courses. Supervised practicum in an athletic training session. Class meets 2 hours/week utilizing lecture, demonstrations and hands-on instructional techniques plus Supervised Clinical Rotation (7-9 hours/week) and clinical proficiency evaluations. Prerequisites: ST 321, SM 210 and 422, PE 371 and BI 253.

ST 421 - Clinical Education in Athletic Training IV 3 credits
Emphasis will be placed on the application of knowledge and skills introduced in preceding courses. This course provides students the opportunity to develop clinical proficiencies introduced in preceding courses. Supervised practicum in an athletic
training setting.  Supervised Clinical Rotation (8-10 hours/week) and clinical proficiency evaluations. Prerequisites: ST 410 and SM 439. Co-requisite: SM 440.