The College of Arts and Sciences is the largest, and the most diverse, of the four colleges at Sacred Heart University. In addition to the Bachelor of Arts, Bachelor of Science and Associate degrees at the undergraduate level, the College of Arts and Sciences offers several innovative and dynamic graduate programs. Graduate programs in Applied Psychology, Chemistry, Communication and Media Studies, Computer Science, Criminal Justice, Environmental Systems Analysis and Management, and Religious Studies offer students an ideal balance of hands on, practical training and rigorous academic study. These programs of study are supplemented with a robust internship program, which prepares our graduate students for employment in the professional fields. As with all programs of study at Sacred Heart, our graduate students distinguish themselves through their pursuit of the common good and a commitment to high moral character.

Biology

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MASTER OF SCIENCE IN ENVIRONMENTAL SYSTEMS ANALYSIS AND MANAGEMENT

Goals and Objectives

Graduates of this Professional Science Masters program will be well versed in the technical and professional skills required to work in today's technologically-oriented, quantitative, communication-intense, teamwork-driven world. A unique feature of the program will be employment of a case study/problem solving approach to instruction that will incorporate close teamwork. In addition, quantitative reasoning is embedded throughout the program, fostering the type of practical applied mathematics skills that professionals in the environmental field require to succeed. Graduates will receive extensive training in the use of modern analytical instrumentation and digital field data collection equipment in our newly renovated and equipped teaching and research laboratories.

The Environmental Systems Analysis and Management program will prepare its graduates to:

- Understand the complex interactions between and among the living and non-living components of the environment that influence the sustainability and health of the earth's environment.

- Understand the myriad ways that human activity affects the environment and the essential resources functional ecosystems provide to sustain human society.

- Be competent in modern environmental analysis and assessment methodology (Geographic Information Systems, Analytical Instrumentation, Digital Data Collection, Survey Methods, etc.)

- Be competent in essential professional skills required to succeed in today's job market, including oral and written communication, teamwork and problem solving, and the fundamentals of business management.

Admission Requirements

Individuals who hold a bachelor's degree with a 3.0 GPA or higher (on a 4.0 scale) from a regionally accredited
college or university will be considered for admission to the ESAM program. Students should have a degree in a natural science such as Biology, Chemistry, Physics, or Environmental Science, but it is not required.

Minimum prerequisite courses for admission to the ESAM program include:

- 1 year each of major’s level General Biology and General Chemistry
- 1 semester of Organic Chemistry
- 1 semester of Pre-calculus
- 1 semester of Elementary Statistics

Applicants are required to submit:

- Official transcripts from all undergraduate institutions attended.
- One page written personal statement describing career goals, interests and qualifications for the program
- Two letters of recommendation
- Professional résumé
- Official GRE test score report preferred

Required Coursework (27 Credits)

**The ESAM Core (18 Credits)**
- ESAM 501 Principles of Environmental Science and Ecosystem Management I
- ESAM 502 Principles of Environmental Science and Ecosystem Management II
- ESAM 504 Environmental Geology, Hydrology and Soils
- ESAM 505 Field Methods and Analysis
- ESAM 506 Environmental Sampling and Analysis

**Professional Skills Core (9 Credits)**
- ESAM 503 GIS for Environmental Analysis
- ESAM 507 Environmental Problem Solving and Impact Assessment
- BU 601 Organizational Management and Business Communication

**Elective Courses (6 Credits)**
- ESAM 543 Restoration Ecology
- ESAM 553 Ecosystem Ecology
- ESAM 561 Environmental Chemistry
- ESAM 563 Hazardous Waste Management
- ESAM 573 Environmental Policy
- ESAM 589 Special Topics in Environmental Systems Analysis and Management
- PS 531 Organizational Behavior

**Project Requirement (6 Credits)**
- ESAM 599 Environmental Research Project

The program is designed to be completed in two years of full-time study, but may be completed over a longer periods (typically 4 years) for students on part-time status.

In addition, undergraduate students majoring in biology or chemistry are able to apply for admission to the program in their junior year and begin taking graduate courses during their senior year while at the same time completing a Bachelor of Science degree. This 4 plus 1 option allows completion of a combined Bachelor and Master’s of Science in 5 years. If you would like more information on this accelerated track, please contact the program director. Completion of this combined degree in 5 years requires summer coursework and careful planning is essential to meet all program requirements.

**COURSE DESCRIPTIONS**

**ESAM 501 Principles of Environmental Systems Analysis and Management I**
This first course of a yearlong in-depth investigation into our environment will focus on the scientific principles that underlay the concept of sustainable
environmental systems. Learning to think about the environment with an emphasis on sustainability will lead us to pollution and waste prevention instead of only focusing on clean up and disposal. Future environmental scientists must focus on preservation of ecosystems rather than a few select species, environmental restoration, conservation of resources, and the stabilization of our world's human population.

**ESAM 502 Principles of Environmental Science and Ecosystem Management II 3 CH**

This second course of our yearlong in-depth study of our environment will concentrate students’ efforts on sustaining environmental quality. We will explore multiple types of air, water and terrestrial pollution and the effects of pollution on human and environmental health. The focus of the course will be case studies and problem based learning exercises centered on examples of environmental degradation. The final section of the course concentrates on analysis of the economics and politics of the environment and the concept of sustainability.

**ESAM 503 GIS for Environmental Analysis 3 CH**

This course focuses on the GIS principles, methods, and techniques that are particularly relevant to and useful for problem solving in environmental analysis and management. Specifically this course has four major components: an overview of selected GIS principles including data models, scale and spatial sampling, and spatial autocorrelation; a review of the major techniques or issues for environmental data acquisition and integration; an introduction to environmental analysis and modeling techniques; and a discussion of several applied areas of environmental modeling techniques as related to landscape ecology, hydrology, natural hazards, natural resources management, and environmental planning.

**ESAM 504 Environmental Geology, Hydrology and Soils 4 CH**

This course acquaints students with the basic concepts of environmental geology with an emphasis on fundamental concepts and methods in the study of hydrology, water resources, and soils. This course focuses application of the principles of geology, hydrology, and soil science to environmental characterization and problem solving.

**ESAM 505 Field Methods and Analysis 4 CH**

The analysis of an ecosystem requires an appreciation of ecological principles, and an understanding of the physical processes and biological components that influence a community. Students will learn and practice basic components in environmental biotic sampling and analysis in both terrestrial and aquatic environments. The course emphasizes sampling of vegetation, vertebrates and invertebrates, as well as management and analyses of data gathered in the field. Extensive field work will be conducted in the Housatonic River watershed and adjacent Long Island Sound. Due to the nature of New England's seasons students enrolling in the course will be required to participate in intensive field work experiences during the late summer between year 1 and 2 of the program.

**ESAM 506 Environmental Sampling and Analysis 4 CH**

Students will be exposed to Environmental Protection Agency’s (EPA) Quality Assurance & Quality Control (QA/QC) plans and will have hands on laboratory experience in analyzing environmental samples for organic and inorganic contaminants using EPA test protocols and major environmental instruments such as Gas Chromatography/Mass Spectrometry (GC/MS), Inductively Coupled Plasma Spectroscopy (ICP) and Atomic Absorption (AA). The course will concentrate on analyzing samples collected from the Housatonic River watershed and adjacent Long Island Sound.
ESAM 507 Problem Solving and Impact Assessment 3 CH
Emphasis on the process of solving complex environmental problems associated with the Housatonic River watershed and adjacent Long Island Sound. Student teams consider the procedures used to evaluate environmental problems and perform environmental impact and risk assessments. The format and content of state and federal impact assessment reports will be addressed.

ESAM 543 Restoration Ecology 3 CH
Ecological restoration is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability. Restoration ecology is the study of how to return an impaired or degraded ecosystem to a close approximation of its remaining natural potential, as defined by such indices as ecologic habitat, water quality, biodiversity, functionality, dynamic stability, etc. This course examines the scientific basis of restoration programs in the U.S. and worldwide through consideration of interdisciplinary theories and practices. Specifically we will focus on restoration needs and goals, restoration approaches for various ecosystems, restoration planning and implementation, and the uncertainty and sustainability of restoration designs. Students will be exposed to a variety of restoration concepts through lectures, seminars, and independent projects. Finally students will actively participate in ongoing restoration projects in the Housatonic River watershed.

ESAM 553 Ecosystem Ecology 4 CH
Students will explore the interactions of organisms and their physical environment as an integrated system by focusing on one particular ecosystem. The model system utilized in this course will be the Housatonic Watershed. The faculty and students of the Environmental Systems Analysis and Management program will become participating members of the Housatonic Watershed Project organized by the federal Environmental Protection Agency and run locally by numerous non-profit and state organizations in Massachusetts, New York, and Connecticut. The students will be immersed in a thorough examination of the use, abuse, and management of this watershed through the prism of ecosystem science.

ESAM 563 Hazardous Waste Management 3 CH
This course covers topics associated with the management of hazardous waste. The topic selection emphasizes: pollution prevention within industry; waste minimization; recovery, reuse, and recycling, treatment technologies; and site remediation. The basics of hazardous waste regulation are also addressed.

ESAM 561 Environmental Chemistry 3 CH
The course explores chemical aspects of the human environment and sources, reactions, transport, effects and fates of chemical species in water, soil and living environments and effects of technology thereon.

ESAM 573 Environmental Policy 3 CH
This course is designed to provide an intensive introduction to the study of environmental policy. Development of environmental policy in the United States and the increasing globalization of environmental politics are considered. It explores the role of key policy actors in environmental policy formation and implementation. In addition, the course provides an overview and assessment of key U.S. and international environmental policy issues such as air and water pollution, waste management, energy, and population growth. Emphasis is placed on analyzing domestic and international case studies in environmental justice. The relations among science, politics, and policy are taught via case histories that include endangered species, air pollution, water quality, protected area management, facility planning, and hazardous site restoration.
ESAM 589 Special Topics in Environmental Systems Analysis and Management 1–3 CH
Regular offerings of one and two credit courses on topics of current interest will be regularly scheduled. Topics will depend on faculty expertise and student interest. The course will be taught in a seminar format.

ESAM 599 Environmental Research Project 1–6 CH
A research project will be designed in consultation with a faculty advisor that addresses a real-world environmental questions or issue. The projects will typically address a topic of concern to industry, non-profit environmental organizations, or local, state, or federal government agencies. Team research projects that address related components of significant environmental issues are encouraged. Detailed professional project reports will be prepared and defended in a public presentation. Accumulation of six credits in ESAM 599 is required for completion of the ESAM program. Students will typically enroll in ESAM 599 in each of the two semesters of their second year of study to accumulate the required six credits; however, both shorter and longer ESAM 599 enrollment schedules are possible depending on the specifics of the research project and/or student schedules.

BU 601 Organizational Management and Business Communication 3 CH
Examines and analyzes principles of planning, organizing, leading and controlling the activities of business, government and other organizations in a globally competitive environment. Focus is not only on developing students' knowledge of these areas, but also on developing their business skills, especially in the areas of analysis and written and oral communication.

PS 531 Organizational Behavior 3 CH
Explores behavior in organizations at individual, interpersonal, group, intergroup, and organizational levels of analysis. Emphasis is on identifying effective ways to achieve organizational goals.

Chemistry

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CHEMISTRY LABORATORIES

There are eight chemistry laboratories serving the needs of inorganic chemistry, organic chemistry, physical chemistry, analytical chemistry, instrumental analysis, biochemistry, environmental chemistry, and computational chemistry. These laboratories contain the following major equipment:

Spectroscopy

Jeol ECLIPSE 400 high resolution 400 MHz NMR Spectrometer with self-shielding magnet system; Bruker Alpha FTIR; PE Spectrum One FT-IR Spectrometers; PE Lambda 20, Ultraviolet/Visible Spectrophotometer; Buck Scientific ACCUSYS 211 Flame and Graphite Furnace Atomic Absorption Spectrometer with Autosampler; Kett NIR Composition Analyzer.

Chromatography

PE HPLC Binary UV/Vis System with Series 200 Autosampler; Gow Mac 550P and two Gow Mac 69-400 TCD-P Gas Chromatographs; Dionex DX-80 Ion Analyzer.
Electrochemistry

Pine Dual Potentiostat System; EG&G Parc 264A and EG&G Parc 384 Polarographic Analyzer/- Stripping Voltammetry; EG&G Parc 303A SMDE Electrode; EG&G Parc 616 RDE Electrode.

COMPUTERS AND SOFTWARE

Licenses
Hyperchem Molecular Modeling System; ACD proton and carbon-13 NMR software; Wiley 6th edition MS spectral library of 138,000 MS Spectra and NIST Library Chemical Structure Database; Sadtler search software and infrared spectrum library of 3500 organic and inorganic compounds; MATHCAD; ChemDraw; Chem3D; IR Tutor; Introduction to Spectroscopy; Spectra Deck; Turbochrom.

Others
Performance Plus HP 6890 GC/MS System with Purge-and-Trap Liquid Sample Concentrator; Rudolph Autopol IV Automatic Polarimeter; Johnson Matthey Mark II Magnetic Susceptibility Balance; Jenway PFP7 Flame Photometer; Bio-Rad Experion Automated Electrophoresis System; PE 48-well Thermal Cylinder for DNA analysis; IEC Centra CL2 Benchtop Clinical Centrifuge; Classic Series C-Line Model C24 Benchtop Incubator Shaker; Labconco Tissue Culture Enclosure.

MASTER OF SCIENCE IN CHEMISTRY

Sacred Heart University's Graduate Chemistry program includes a number of graduates with a Bachelor of Science degree in Chemistry who are working in the region and aspire to an advanced degree in Chemistry. The program is also composed of science graduates with a B.S. degree in other fields of science who are shifting career interests and want to obtain a degree in Chemistry. Enrollment in this program allows these students to use their science background to obtain an advanced degree in Chemistry without first obtaining a B.S. in Chemistry. This approach allows students to obtain a higher degree in the same time frame that it would have taken them to obtain just a B.S. in Chemistry. Local chemical industry scientists participate in the teaching of graduate courses. Students who opt to do research are allowed, if and when possible, to pursue their projects at their place of employment with joint supervision of their employer and University faculty. This allows students to work on relevant projects that interest them, while at the same time increasing collaboration between the University and local industries.

Goals and Objectives

The Master of Science in Chemistry program builds on the strength of the University's undergraduate Chemistry program. The program meets the needs of students and the chemical industry by offering a unique opportunity for career and personal advancement to employees of the local chemical industry, while serving the industry to employ and recruit better qualified chemists. In order to serve part-time as well as full-time students, graduate courses are offered in the evenings and on Saturdays. This, together with the University's ideal location, allows chemical industry employees to continue their study on a parttime basis while working full-time and thus take advantage of tuition reimbursement programs offered by their employers.

Course Loads

Both full-time and part-time graduate students are enrolled in the program. Full-time students must enroll in at
least nine credit hours per semester. This allows them to normally finish the degree requirements in two years. Part-time students are expected to enroll in three to six credit hours per semester. This allows them to finish the degree requirements in three years or less.

Student Transfer Credit Policy

Transfer credits are granted for appropriate graduate-level courses with a grade of B or better, taken at other regionally accredited institutions. Students, however, must complete at least 70 percent of the required credits including the thesis (when applicable) at Sacred Heart University and pass the comprehensive exam, in order to obtain an M.S. degree in Chemistry.

Admission Requirements

Admission to the program is in January and September of each year. Full-time students are expected to finish the degree requirements in four semesters. Part-time students may require at least three years. The University’s graduate admission policy is observed when admitting students to the program. Applicants with a B.S. degree in Chemistry or Chemical Engineering are accepted based on their undergraduate performance in Chemistry and other supporting subjects. Applicants with a B.S. degree in other areas of science and mathematics are admitted after completing the appropriate courses in Chemistry in order to meet individual graduate course prerequisites.

Degree Requirements

These tracks of study leading to an M.S. degree in Chemistry are available:
M.S. in Chemistry, Thesis Option
M.S. in Chemistry, Non-Thesis Option
M.S. in Molecular Biochemistry, Non-Thesis Option

M.S. IN CHEMISTRY, THESIS OPTION

Thirty semester hours of approved graduate credits must be completed for the degree with a minimum grade point average (GPA) of 3.0. Students must complete a 12-credit core plus a thesis.

Required Courses

CH 521 Advanced Organic Chemistry (3 credits) or CH 522 Organic Synthesis (3 credits)
CH 531 Advanced Physical Chemistry I: Molecular Structure (3 credits) or CH 532 Advanced Physical Chemistry II: Molecular Dynamics (3 credits)
CH 551 Advanced Analytical Instrumentation I: Spectroscopy (3 credits) or CH 552 Advanced Analytical Instrumentation II: Chromatography (3 credits)
CH 553 Advanced Inorganic Chemistry (3 credits) or CH 555 Theoretical Inorganic (3 credits)
CH 599 Thesis (6 credits)

M.S. IN CHEMISTRY, NON-THESIS OPTION

Thirty-four semester hours of approved graduate credits must be completed for the degree with a minimum GPA of 3.0. Students must complete a 12-credit core plus the Advanced Integrated Class/Lab.

Required Courses

CH 521 Advanced Organic Chemistry (3 credits) or CH 522 Organic Synthesis (3 credits)
CH 531 Advanced Physical Chemistry I: Molecular Structure (3 credits) or CH 532 Advanced Physical Chemistry II: Molecular Dynamics (3 credits)
CH 551 Advanced Analytical Instrumentation I: Spectroscopy (3 credits) or CH 552 Advanced Analytical Instrumentation II: Chromatography (3 credits)
CH 553 Advanced Inorganic Chemistry (3 credits) or CH555 Theoretical Inorganic (3 credits)
CH 595 Advanced Integrated Class/Lab (2+1 credits)
CH 598 Comprehensive Test (1 credit)

M.S. IN MOLECULAR BIOCHEMISTRY, NON-THESIS OPTION

Thirty-four semester hours of approved graduate credits must be completed for the degree with a minimum GPA of 3.0. Students must complete 16-credits of core courses plus 18 credits.

Required Courses
- CH 521 Advanced Organic Chemistry (3 credits) or CH522 Organic Synthesis (3 credits)
- CH 533 Biophysical Chemistry (3 credits)
- CH 553 Advanced Inorganic Chemistry or CH555 Theoretical Inorganic Chemistry (3 credits)
- CH 563 Biochemical Analysis (3 credits)
- CH 597 Computational Bioanalytical Chemistry Class (2 credits)
- CH 597L Computational Bioanalytical Chemistry lab (1 credit)
- CH 598 Comprehensive exam (1 credit)

Students electing the non-thesis option are required to pass a comprehensive exam. Students are required to take electives from graduate-level courses in Chemistry and no more than six credits of other approved courses in other related areas of science, mathematics, physics, biology and computer science.

Elective Courses (for the three options)

- CH 523 Organic Structure Determination (3 credits)
- CH 524 Special Topics in Organic Chemistry (2–3 credits)
- CH 534 Special Topics in Physical Chemistry (2–3 credits)
- CH 541 Advanced Biochemistry (3 credits)
- CH 545 Bioinformatics (3 credits)
- CH 547 Computation Chemistry and Molecular Modeling (3 credits)
- CH 549 Special Topics in Biochemistry (2–3 credits)
- CH 554 Special Topics in Analytical Chemistry (2–3 credits)
- CH 555 Theoretical Inorganic Chemistry (3 credits)
- CH 556 Chemical Applications of Group Theory (3 credits)
- CH 557 Bioinorganic Chemistry (3 credits)
- CH 559 Special Topics in Inorganic Chemistry (2–3 credits)
- CH 561 Environmental Chemistry (3 credits)
- CH 565 Environmental Sampling and Analysis (3 credits)
- CH 569 Special Topics in Environmental Chemistry (3 credits)
- CH 571 Polymer Chemistry (3 credits)
- CH 590 Chemical Information: Sources and Technology (3 credits)
- CH 595 Advanced Integrated Class/Lab (2+1 credits)

B.S./M.S. COMBINED DEGREE IN CHEMISTRY

This is a five-year undergraduate/graduate accelerated track. Students who complete this track receive both B.S. and M.S. degrees. Students must elect this track in their Freshman, Sophomore or Junior year. Traditional and Biochemistry concentrations are available at the undergraduate level. Students are required to complete 145 credits of undergraduate and graduate-level courses and a thesis. The thesis involves six credits of original research.
COURSE DESCRIPTIONS

CH 521 Advanced Organic Chemistry 3 CH
Prerequisite: CH 222 Organic Chemistry II or equivalent.

Explores the effects of structure and environment on reaction rates and equilibria and the use of statistical and quantum mechanics in organic chemical reactions. Topics include: organic reaction mechanism, Huckel theory, orbital symmetry, photochemistry and standard concepts of physical organic chemistry.

CH 522 Organic Synthesis 3 CH
Prerequisite: CH 222 Organic Chemistry II or equivalent.

Surveys three general classes of reactions: reduction, oxidation and the formation of carbon-carbon bonds. Each reaction is used as a tool in chemical synthesis.

CH 523 Organic Structure Determination 3 CH
Prerequisites: CH 222 Organic Chemistry II or equivalent and CH 351 Instrumental Analysis or equivalent.

Identification and structure determination of organic molecules by modern spectroscopic techniques. Emphasis is on IR, NMR, CMR and mass spectrometry. Hands-on work in NMR and FT-IR.

CH 524 Special Topics in Organic Chemistry 3 CH
Topics include: heterocyclic chemistry, medicinal chemistry, polymer chemistry, supramolecular chemistry, organometallic chemistry, radical and photochemistry and combinatorial chemistry.

CH 525 Supramolecular Chemistry 3 CH
Prerequisite: CH 222. This course explores the definition and concepts and aims to understand the structure, function and properties of self assembled multicomponent supramolecular assemblies of atoms, ions and molecules.

CH 530 Physical Chemistry 3 CH
Prerequisite: CH 331; co- or prerequisite: MA 253 or permission of the program director.

A prerequisite to CH 531. Explores advanced kinetics and quantum mechanics.

CH 531 Advanced Physical Chemistry I: Molecular Structure 3 CH
Prerequisite: CH 332.

Topics in quantum chemistry, molecular structure, group theory and applications of these topics to spectroscopy.

CH 532 Advanced Physical Chemistry II: Molecular Dynamics 3 CH
Prerequisite: CH 332.

Topics in statistical thermodynamics, collision theory, and reaction dynamics and mechanism.

CH 533 Biophysical Chemistry 3 CH
Prerequisite: CH 331. Explores the physical processes involved in living systems including molecular thermodynamics and equilibria, kinetics and transport phenomena, and applications of quantum chemistry and spectroscopy. Two 75-minute lectures per week.

CH 534 Special Topics in Physical Chemistry 3 CH
Topics include: magnetic resonance spectroscopy, statistical mechanics and mathematical and computer concepts in chemistry.

CH 537 Microscale and Nanophase Materials: Chemical Process and Analysis 3 CH
Prerequisite: CH 332. Explores the physical chemistry and materials science for processing and characterizing materials at the microscale and nanoscale levels.

CH 541 Advanced Biochemistry 3 CH
Prerequisite: CH 342 Biochemistry II or equivalent.
Explores the integration of the basic chemistry of biomolecules into living systems. Topics include: bioenergetics and metabolic pathways; biosynthesis and biodegradation of amino acids, proteins, nucleotides and DNA; chemical communication; hormones; and the cell cycle.

**CH 545 Bioinformatics 3 CH**
Covers basic computer programming and database design, a basic review of biochemistry, biomolecular sequence comparisons and alignments, biomolecular structure prediction, biomolecular function prediction, and data analysis to solve theoretical problems and application problems using bioinformatics programs.

**CH 547 Computation Chemistry and Molecular Modeling 3 CH**
This course provides an introduction to computational chemistry that is suitable for graduate students and advanced undergraduate students. Topics covered include a historical introduction to the subject, quantum mechanics, molecular mechanics, a brief introduction to statistical mechanics and a short review of thermodynamics. Students are required to solve theoretical problems and application problems using computational software, software that students might have to purchase. Example problems and applications are drawn from organic chemistry and biochemistry. Students must have access to a computer and the Internet and are expected to purchase at least one primary class text.

**CH 549 Special Topics in Biochemistry 3 CH**
Topics include: carbohydrate chemistry; enzyme kinetics; endocrinology; electrically excitable cells; computer-aided access to proteins and databases; cell motility; chemical concepts in genetic engineering.

**CH 550 Instrumental Analysis 3 CH**
Prerequisites: CH 252 and CH 331 or permission of the program director.

A prerequisite to CH 551. Explores theory and practice of instrumental methods of analysis: spectrophotometric, electroanalytical and chromatographic methods of separation and quantification.

**CH 551 Advanced Analytical Instrumentation I: Spectroscopy 3 CH**
Prerequisite: CH 351.

Fundamentals and practical aspects of analytical spectroscopy. Special emphasis is given to theory and instrumentation; methods and applications are covered.

**CH 552 Advanced Analytical Instrumentation II: Chromatography 3 CH**
Prerequisite: CH 351.

Fundamentals and practical aspects of analytical separation and chromatography. Special emphasis is given to theory and instrumentation; methods and applications are covered.

**CH 553 Advanced Inorganic Chemistry 3 CH**
Prerequisite: CH 331 Physical Chemistry I or equivalent.

The physical and chemical properties of the elements and their compounds are correlated with their positions in the periodic table. Bonding theory and coordination chemistry are emphasized. (This undergraduate/graduate level course also has an undergraduate course number of CH 355, Advanced Inorganic Chemistry, or equivalent.) Three credits will be given for the completion of this course with a grade of B or better.

**CH 554 Special Topics in Analytical Chemistry 3 CH**
Topics include: data acquisition and LIMS; aquatic chemistry; GC-MS: theory, instrumentation and method; thermal analysis; and applications of supercritical fluids.
CH 555 Theoretical Inorganic Chemistry 3 CH  
Prerequisite: CH 355 Advanced Inorganic Chemistry, CH 553 or equivalent.

An advanced theoretical study of bonding and spectroscopy of inorganic compounds. Topics include: crystal field, ligand field and molecular orbital theories of inorganic complexes; magnetic susceptibility; and electronic, infrared and raman spectroscopy.

CH 556 Chemical Applications of Group Theory 3 CH  
Prerequisite: CH 331 Physical Chemistry I or equivalent.

Presents basic principles of group theoretical methods. Topics include: molecular symmetry, normal coordinate analysis, molecular bonding and energy levels and theoretical basis for selection rules.

CH 557 Bioinorganic Chemistry 3 CH  
Prerequisite: CH 341 and CH 553. Focuses on the role and utilization of metals in biology and medicine and the ligands that nature employs including enzymes exploiting acid and redox catalysis.

CH 559 Special Topics in Inorganic Chemistry 3 CH  
Topics include: electronic spectra of transition metal complexes, reactions of transition metal complexes, ionic liquids and bioinorganic chemistry.

CH 561 Environmental Chemistry 3 CH  
Prerequisites: CH 221 Organic Chemistry I or equivalent and MA 151 Introductory Calculus or equivalent.

Focuses on the chemical aspects of the human environment. Examines the sources, reactions, transport, effects and fates of chemical species in water, soil, air and living environments and the effects of technology thereon.

CH 563 Biochemical Analysis 3 CH  
Prerequisite: CH 351. Explores theory and methods in analytical spectroscopy, chromatography and electrochemistry including UV-visible, fluorescence, luminescence, Raman, NMR, GC-MS, HPLC and voltammetry with special emphasis on applications to biochemistry. Two 75-min lectures per week.

Offered every 3 semesters

CH 565 Environmental Sampling and Analysis 3 CH  
Prerequisite: CH 561.

Discusses methods and protocols of environmental sampling and analysis in water, air and biological matrices. Addresses EPA quality assurance and quality control plans. Laboratory and field work include: sampling of surface and groundwater, performing chemical and biological analyses of water, monitoring treated effluent quality control and detecting hazardous contaminants.

CH 567 Experimental Design 3 CH  
Prerequisite: knowledge of basic statistics

The objective of this course is to teach students the statistical tools used by Chemists to design, conduct, and analysis experiments effectively and efficiently, also to teach students how to obtain information for characterization and optimization of systems. Students will also learn how to use Minitab software to conduct their analysis.

CH 569 Special Topics in Environmental Chemistry 3 CH  
Topics include: water and wastewater treatment systems; hazardous waste management; environmental regulations; environmental hydrology and water resource management; environmental organic chemistry; atmospheric chemistry and air pollution; chemical toxicology.
CH 571 Polymer Chemistry 3 CH  
Prerequisites: CH 222 Organic Chemistry II or equivalent and CH 331 Physical Chemistry I or equivalent or permission of program director.

An introduction to polymer chemistry through a study of step and chain polymerization and copolymerization as well as block and graft copolymers. Polymerization techniques in solution, emulsion and microemulsion are discussed as well as polymer structure and characterization with an overview of the properties of commercial polymers.

CH 590 Chemical Information: Sources and Technology 3 CH  
Information is a vital key to success in today's chemical industry. The premier chemical information sources will be reviewed with emphasis on Chemical Abstracts Service and Beilstein. Chemical information retrieval applications will be highlighted including STN International, Scifinder and Crossfire, in addition to Internet resources. Students will gain an appreciation for chemical database design and content as well as formulating queries for keyword and structure-based searches.

CH 595 Advanced Integrated Class/Lab 2+1 CH  
The central theme for this laboratory is inorganic coordination chemistry. Students are required to work on unified projects rather than a series of unrelated experiments. Projects involve synthesis and analysis of a complex or a pair of isomers. Emphasis is on analytical and instrumental methods that are fundamental for the characterization of inorganic compounds. Three hours of laboratory work per week.

CH 597 Computational and Bioanalytical Class/Lab 2+1 CH  
Prerequisite: CH 331 and CH 341. This course is split into two different but fully integrated sections: (a) a 2-hour (in silico) class and (b) a 3-hour (in vitro) lab. During the class (in silico) students will study and apply computational methods to molecular biochemical problems, yielding predictions about the structure and activity of various biochemical molecules. During the lab (in vitro), students will test the in silico predictions against empirical reality. Students will then be required to analyze and to provide an integrated and coherent interpretation of their in silico and in vitro results. This format will introduce students to the well-established field of bioanalytical chemistry, the emerging field of computational biochemistry, and the vital relationship between the two. This class/lab will take advantage of HyperChem software, NMR 400 spectrometer and available analytical chemistry and biochemistry instrumentation.

CH 598 Comprehensive Test 1 CH  
Chemistry graduate students (non-thesis track) are required to pass a comprehensive test (after the completion of 34 credits in coursework) in fulfillment of the MS degree.

CH 599 Thesis 3+3 CH  
Original research under the supervision of faculty member(s) leading to a written thesis.
Communication and Media Studies

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The Department of Communication and Media Studies (CMS) offers a 33-credit Master of Arts in Communication (MACOMM) with three certificate options in Corporate Communications/Public Relations (CCPR), Digital Multimedia Journalism (DMJ), and Digital Multimedia Production (DMP). The required courses in theories, methods, and ethics will lay the conceptual and technical foundation for the applied learning sequence of multimedia production courses. These courses, in turn, prepare the student for internships and the capstone mentorship experience, which culminates in the creation of a digital portfolio (or digifolio) of the student's work. By the completion of the degree, students will have compiled a portfolio of materials that demonstrates advanced skill sets for their respective job sectors. MACOMM students' productions are also consistently distributed, broadcast, and/or published through various media outlets while they are completing their multimedia production, internship, and mentorship coursework. MACOMM students acquire the social, artistic, and technical skills necessary to create substantive and professional multimedia communication projects, presentations, and artifacts. Students gain the necessary skills to succeed in a professional context, including effective communication and time management, teamwork and problem solving; and planning, organizing and leading in a professional context. The MACOMM students learn with industry-standard digital technologies and software used to produce and distribute multimedia content. In addition, students developed a theoretical, historical and practical understanding of the relationship of media to democracy and society, and the profound ethical and social responsibilities that come with being a professional communicator.

GOALS AND OBJECTIVES

Corporate Communication and PR students will learn how to plan, create, and distribute multimedia productions within organizations and to the public or consumers. CCPR gives students interested in working in a corporate or non-profit environment the professional multimedia skills that are increasingly attractive to a wide range of employers in a competitive job market and in the 21st century workplace. The focus of the Digital Media Journalism concentration will be on updating the skill sets of practicing journalists while also training aspiring journalists to be a one-person crew and “all platform” news producers in the post-print digital era. The post-print journalism era provides new opportunities for news producers and new media journalists trained in the latest technologies and multimedia techniques. The Digital Multimedia Production option will allow students to gain advanced production skills by completing a broader range of projects than the CCPR and DMJ counterparts. DMP students retain a more general focus, or—in close consultation with their faculty advisor—can tailor their production work to concentrate on sport/athletic communication, advertising and promotional multimedia production, or digital filmmaking.

ADMISSION REQUIREMENTS

A bachelor's degree from an accredited institution and official transcripts from all undergraduate institutions attended are required. A one-page personal statement describing career goals and reasons for interest in the program, along with two letters of recommendation and a professional résumé are also required.
No previous media production experience or communications coursework is required to complete the MACOMM Program. Accepted students will take an online pre-assessment survey and the appropriate MACOMM training workshops will be offered to ensure that all students have the necessary technical skills to begin the program.

DEGREE REQUIREMENTS

There are foundational courses in theories, methods, and ethics; a sequence of multimedia production courses; required internships; and a capstone portfolio project completed in close consultation with a faculty mentor or a MACOMM - partnered professional mentor from the student’s field of interest.

MACOMM Required Courses (21 credits)

CM 501: Media, Culture, and Communication (3 credits)
CM 502: Professional Communication in the Digital Age (3 credits)
CM 503: Media Ethics in a Professional Context (3 credits)
CM 517: Multimedia Production I (3 credits)
CM 518: Multimedia Production II (3 credits)
CM 617: Advanced Multimedia Production (3 credits)
One Elective (3 credits)

MACOMM Concentrations Courses (12 credits)

Corporate Communications & Public Relations (CCPR)
CM 696PR: CCPR Internship I (3 credits)
CM 697PR: CCPR Internship II (3 credits)
CM 698PR: CCPR Digital Portfolio and Mentorship I (3 credits)

CM 699PR: CCPR Digital Portfolio and Mentorship I (3 credits)

Digital/Multimedia Journalism (DMJ)
CM 696MJ: DMJ Internship I (3 credits)
CM 697MJ: DMJ Internship II (3 credits)
CM 698MJ: DMJ Digital Portfolio and Mentorship I (3 credits)
CM 699MJ: DMJ Digital Portfolio and Mentorship I (3 credits)

Digital/Multimedia Production (DMP)
CM 696DM: DMP Internship I (3 credits)
CM 697DM: DMP Internship II (3 credits)
CM 698DM: DMP Digital Portfolio and Mentorship I (3 credits)
CM 699DM: DMP Digital Portfolio and Mentorship I (3 credits)

COMMUNICATION CERTIFICATES

In addition to the full Master’s degree, the MACOMM program also offers three 12-credit Graduate Certificates consisting of CM501, CM502, CM517 and an internship and portfolio mentorship in the certificate’s area of concentration. Courses taken as part of a Certificate may be applied to the full MACOMM degree upon admission to the degree program.

COURSE DESCRIPTIONS

CM 501: Media, Culture, and Communication 3 CH
CM501 is an advanced survey of media history, theory, and analysis that examines the impact of communication technologies on U.S. society and global media culture. It also offers an overview of the development of the major media industries and professions, with a particular focus on journalism and public relations.

CM 502: Professional Communication in the Digital Age 3 CH
CM502 teaches students the techniques of effective communication within organizational and professional
contexts. Students acquire the methods necessary to communicate effectively between organizations and a variety of consumers and publics. The course uses the professions of public relations and journalism as its two comparative case studies. Special attention is given to the ways in which digital media and communication technologies (e.g., social networking, Web-based multimedia, blogging/vlogging, mobile Internet) are used by professional communicators in these fields.

**CM 503: Media Ethics in a Professional Context 3 CH**

CM 503 will examine ethical issues in both journalism and public relations through the use of guidelines established by the Society of Professional Journalists (SPJ) and the Public Relations Society of America (PRSA). Students will become familiar with ethical foundations and perspectives and apply those principles using case studies.

**CM 517: Multimedia Production I 3 CH**

CM 517 is a multimedia production course that teaches students the tools and skills necessary to produce and manage digital content in the contemporary communication environment. In CM 517 students design and develop regularly updated online content. Students will learn image creation and manipulation, document design, and techniques of publication and distribution as they engage with the world of digital communications.

**CM 518: Multimedia Production II 3 CH**

CM 518 is a multimedia production course that is focused on delivering to students the tools and skills necessary to produce and manage digital content in the contemporary communications environment. The primary focus of this course is the production of video-based stories and projects. Students will develop, write, shoot, and edit productions in HD video. Projects will include both the construction of original stories and the coverage of live events. In this course, students will learn lighting, sound, cinematography and editing, as they engage with the world of digital communications.

**CM 599: Special Topics in Communication 3 CH**

CM 599 is advanced course in the theory and history of communication and media. CM 599 integrates significant production assignments as part of MACOMM’s commitment to applied learning. Topics are chosen based on the interests of the MACOMM cohort and in response to changes in the communication and media environment.

**CM 600: Special Topics in Multimedia Production 3 CH**

CM 600 is advanced course in media production. Topics are chosen based on the interests of the MACOMM cohort and in response to changes in the communication and media environment.

**CM 617: Advanced Multimedia Production 3 CH**

Building on the tools and experiences gained in Multimedia Production I and II, students in Advanced Multimedia Production refine and master their multimedia production skills. In this practicum-based class, projects will include still and moving image creation and manipulation, and the design and management of web-based platforms to display these sounds and images. Advanced Multimedia Production centers on the creation, organization, and distribution of media artifacts in the service of digital communications.

**CM 696-7: Internship I and II 3 CH each**

Prerequisites: Completed 6 credits with 3.0 GPA; internship application must be approved by MACOMM Director.

Faculty supervised placement with professional media outlet or communications company in student’s area of interest.
CM 698-9: Digital Portfolio and Mentorship I and II 3 CH each
Prerequisites: Completed 24 credits; mentorship agreement must be approved by MACOMM Director.

Offers qualified students a supervised mentorship experience with a working professional or faculty member in the student’s area of interest. Students are required to deliver public presentations of their completed portfolios.

Computer Science and Information Technology

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The University confers Master of Science degrees in Computer Information Science (MS), with tracks in Information Technology (IT), Computer Science (CS), and our newest track, Computer Gaming Design and Development. It also offers recognized graduate certificates in .NET Technology, Computer Gaming Design and Development, Cyber Security, IDatabase Design, Information Technology, IT and Network Security, and Web Development and Multimedia, which are some of the most lucrative and dynamic fields in the contemporary marketplace. Students choose their curriculum track based on their educational and career interests. Course content includes use of software such as VB.NET 2010, Flash CS54, Fireworks CS54, Director 11, Java, C++, C#, ASP.net and content such as interactive multimedia, data communications, network security, Oracle, Artificial Intelligence (AI) and software engineering. Most classes are held in the evenings or on Saturday mornings in Fairfield, with some IT courses offered in Stamford and a few courses offered during the day. This structure accommodates working full-time students as well as those who may wish to participate in internships during the day.

ADMISSION REQUIREMENTS

Applications are processed on a rolling basis. Applicants should have a cumulative undergraduate GPA of 3.0 (on a 4.0 scale) or better. However, students may be admitted provisionally if their cumulative GPA is better than 2.5. Such students are allowed to take up to 12 credit hours and must maintain a 3.0 GPA in those courses. Provisional students who have completed 12 credit hours will then be considered for full matriculation. Except under unusual circumstances, applicants with a cumulative GPA of less than 2.5 are not admitted. A GPA of 3.0 is required to maintain good standing in the program and for graduation. All prospective students must complete an application for admission, submit official transcripts from each college or university attended (including Sacred Heart University) and forward two letters of recommendation and a résumé. Course waivers (to a maximum of nine credits) are granted on the basis of a student’s academic record.

PROGRAM PREREQUISITES

Students who do not have a bachelor’s degree in Computer Science or in a related field may be required to complete prerequisite coursework before full admission is granted. The number of courses is determined by which track a student chooses to pursue.

COMPUTER SCIENCE TRACK

Prerequisite Requirements

The following prerequisite courses may be required for those who wish to
pursue the Computer Science track. All courses are to be completed with a grade of B or better. Additional prerequisites may be recommended by the program director. All students are required to complete the following coursework unless waived by the program director:

CS 601 Assembly Language Programming and Computer Systems (3 credits)
CS 602 Advanced Data Structures and Algorithms (3 credits)
Calculus

COMPUTER SCIENCE MASTER’S DEGREE TRACK PROGRAM

Sacred Heart University offers both a graduate certificate and a Master of Science degree in this traditional track. This track is ideal for those who wish to pursue advanced study in areas of programming, data structures and fundamental computer language design.

Requirements

This track requires a minimum of 36 credit hours of graduate-level coursework to complete. Students may be required to complete an additional 13 credit hours of prerequisite coursework. Students with an undergraduate degree in Computer or Information Science may receive waivers for some courses. Course waivers are not granted for work experience. A thesis is not required; however, for those students in the scientific track who elect to complete a thesis, they must enroll in CS 690 Thesis I and CS 691 Thesis II. Those who do not elect to complete a thesis must complete at least three credits of CS 670 Research Project Seminar. A degree will be granted upon satisfactory completion of all coursework and a favorable recommendation of the faculty responsible for CS 670 or 690/691.

Electives

3–6 credits

Total: 36 credits

INFORMATION TECHNOLOGY TRACK

Prerequisite Requirements

The following prerequisite courses may be required for those who wish to enter the Information Technology track. All courses are to be completed with a grade of B or better. Additional prerequisites may be recommended by the program director. Prerequisite courses cannot be taken concurrently.

- CS 500 Introduction to Structured Programming (3 credits)
- CS 501 Introduction to Data Structures (3 credits)

Prerequisites total: 6 credits
INFORMATION TECHNOLOGY  
MASTER’S DEGREE  
TRACK PROGRAM

The Information Technology (IT) track is a new, innovative program designed specifically to accommodate the dynamic demands of the contemporary marketplace. With the exponential growth of the Internet and the wide-ranging ramifications of the accompanying technologies, the IT track will prepare individuals for careers that utilize, or are affected by, the latest technological advances and methods of modern business and industry.

Requirements

This track requires a minimum of 36 credit hours of graduate-level coursework. Students may be required to complete an additional six credit hours of prerequisite coursework. However, students with an undergraduate degree in Computer or Information Science may receive waivers for some courses. Course waivers are not granted for work experience.

Required Courses

- CS 551 Introduction to Object-Oriented Programming with Java (3 credits)
- CS 552 Windows Interface Design (VB.net 2008) (3 credits)
- CS 553 Web Design with Java Script (3 credits)
- CS 554 Fundamentals of Interactive Multimedia (3 credits)
- CS 601 Assembly Language Programming and Computer Systems (3 credits)
- CS 603 Database Design (Oracle) (3 credits)
- CS 620 Information Analysis and Systems Design (3 credits)
- CS 621 Principles of Data Communication (3 credits)
- CS 670 Research Project Seminar (3 credits)

Required courses total: 27 credits

Elective Courses

(Nine credits are required). A maximum of six credits can be an MBA (BU) offering. It is also at the discretion of the academic program director to approve any other CS or MBA course offering as an appropriate elective. The following is a partial list of electives:

- BU 651 Management of Global Telecommunications (3 credits)
- BU 652 Project/Program Management (3 credits)
- BU 653 International Electronic Commerce and the Internet (3 credits)
- CS 550 Dynamic Web Page Development (3 credits)
- CS 557 Web Programming with ASP (3 credits)
- CS 558 Advanced Topics in ASPNET (3 credits)
- CS 559 C# (3 credits)
- CS 560 Networking Applications (3 credits)
- CS 563 Flash Animation (3 credits)
- CS 571 Advanced Computer Gaming (3 credits)
- CS 572 OOP with C# and Games (3 credits)
- CS 573 Advanced C#-Based Game Programming (3 credits)
- CS 604 Advanced Software Engineering (3 credits)
- CS 611 Operating/Multiprogramming Systems (3 credits)
- CS 622 Network Security I (3 credits)
- CS 623 Advanced Network Security (3 credits)
- CS 624 Hands-on Network Security (3 credits)
- CS 640 Special Topics in Computer Science (3 credits)

Elective courses total: 9 credits

Degree total: 36 credits
COMPUTER GAMING DESIGN AND DEVELOPMENT MASTER’S DEGREE PROGRAM TRACK

This track in the MSCIS program is designed for the student who has:

• already completed an undergraduate track in Computer Gaming OR
• an undergraduate degree in Computer Science OR
• completed the graduate Gaming Design and Development certificate.

The objective of the track is to take the student beyond the rudiments of game design and development into more advanced Gaming or areas such as 3-D Game design and Game Design for mobile devices. It is intended that this track be structured for students who have pursued a CS track OR who have sufficient mathematical and programming credentials to successfully complete the required courses.

Prerequisites: (3 credits each)

- CS 501 Data Structures
- CS 573 Advanced C#-Based Game Programming or equivalent

Required Courses (all courses are 3 credits)

- CS 551 OOP with Java
- CS 603 Database Design (Oracle)
- CS 615 (Programming in Unix) or CS 611 (Operating Systems)
- CS 622 Network Security
- CS 614 Theory of Computation
- CS 661 Game Design and Development using 3-D
- CS 662 Game design, development, and implementation
- CS 663 Game Design for Mobile
- CS 664 Advanced Topics in Multiplayer Gaming
- CS 670 Research Project Seminar or CS 690-91 Thesis Work

Total required courses: 30 or 33 credits

Choose 2 CS electives (if non-thesis) or 1 CS elective (if thesis) from list below:

- CS 602 Advanced Data Structures and Algorithms
- CS 604 Software Engineering
- CS 623 Network Security II
- CS 642 Artificial Intelligence (highly recommended elective)
- (or other electives approved by Program Director)

Total required elective course credits: 3 or 6

Total Credits for track : 36

CERTIFICATE PROGRAMS

.NET Technology Certificate

The .NET Technology graduate certificate is a comprehensive and consistent programming model for building applications that can provide visually stunning user experiences and the ability to provide a multiple tiered approach to creating and delivering a variety of applications for web-based programming. This certificate will allow the student to work with and build projects in several of the most common and widely used .NET applications including VB.NET, C# and ASP.NET. All courses taken in this certificate program may be applied to a full MSCIS degree.

Certificate Requirements

The program requires the student to complete a minimum of twelve (12) semester credit hours of course work with a minimum cumulative GPA of
3.0. There are two prerequisites to the certificate: CS 500 and CS 501

All course credits earned in a certificate program may be applied to the master's program.

Prerequisite Courses (if required)
- CS 500 Introduction to Structured Programming (3 credits)
- CS 501 Introduction to Data Structures (3 credits)

Required Courses
- CS 552 Windows Interface Design (VB.NET) (3 credits)
- CS 603 Database Design (Oracle) (3 credits)
- CS 557 Web Programming with ASP.NET (3 credits)

Elective Courses (choose one)
- CS 558 Advanced ASP.NET (3 credits)
- CS 559 C# (3 credits)

Certificate Total: 12-18 credits (Depending on prerequisite)

Computer Gaming Design and Development Certificate

The graduate certificate in Computer Gaming Design and Development is designed for the graduate student who has not pursued a computer gaming track or major on the undergraduate level. It will give students an excellent introduction to the field of computer gaming design and development and courses taken may be applied to a full MS degree in either the IT, CS or a new Computer Gaming track which is expected to start in Spring 2012. This certificate is NOT designed for those students who already have significant course work in Computer Gaming.

Prerequisite Courses
- CS 500 Introduction to Structured Programming (3 credits)
- CS 501 Introduction to Data Structures (3 credits)

Required Courses
- CS 571 Advanced Computer Gaming (3 credits)
- CS 572 OOP with C# and Games (3 credits)
- CS 573 Advanced C#-Based Game Programming (3 credits)
- CS 662 Game Design, Development and Implementation (3 credits)

Certificate Total: 12 credits

Information Technology Certificate

A student may choose to enroll in the Information Technology Graduate Certificate program to learn specific skills in the area of Information Technology. The certificate program is ideal for those who are undecided about committing to a full master's degree program, but wish to pursue advanced study in this field.

Requirements

The program requires the student to complete a minimum of 12 semester credit hours of coursework, with a minimum cumulative GPA of 3.0. Students matriculated in the master's program are not eligible for a graduate certificate. However, students who have successfully completed a graduate certificate may apply to the master's program and may be able to use those credits earned in the certificate program toward the master's degree. Contact the program director to determine which, if any, graduate certificate credits may apply. Graduate admissions procedures must be followed.

Prerequisite Courses
- CS 500 Introduction to Structured Programming (3 credits)
- CS 501 Introduction to Data Structures (3 credits)

Required Courses
- CS 552 Windows Interface Design (VB.NET) (3 credits)
Elective Courses
(Choose two; other electives may also be available after consultation with the program director)
- CS 550 Dynamic Web Page Development (3 credits)
- CS 552 Windows Interface Design (using VB.NET) (3 credits)
- CS 561 Multimedia Authoring (Authorware) (3 credits)
- CS 563 Flash Animation
Certificate total: 12–18 credits

Interactive Multimedia Certificate
In response to the recent growth and use of multimedia applications in the modern business environment, this certificate has been explicitly designed for students who want to focus exclusively on the popular discipline of multimedia.

Requirements
The program requires the student to complete a minimum of 12 semester credit hours of coursework with a minimum cumulative GPA of 3.0. Regular program prerequisites still apply (CS 500 Introduction to Structured Programming and CS 501 Introduction to Data Structures). Students matriculated in the master’s program are not eligible for a graduate certificate. However, students who have successfully completed a graduate certificate may apply to the master’s program and may be able to use those credits earned in the certificate program toward the master’s degree. Contact the program director to determine which, if any, graduate certificate credits may apply. Graduate admissions procedures must be followed.

Prerequisite Courses (if required)
- CS 500 Introduction to Structured Programming (3 credits)
- CS 501 Introduction to Data Structures (3 credits)

Required Courses
- CS 553 Java Scripting for Web Design (3 credits)
- CS 554 Fundamentals of Interactive Multimedia (3 credits)

Web Development Certificate
This program provides students with the background and technical skills needed for a comprehensive understanding of the development, design and construction of professional web pages.

Requirements
The program requires the student to complete a minimum of 12 semester credit hours of coursework with a minimum cumulative GPA of 3.0. Two program prerequisites apply to those without suitable academic credentials in programming. Some required courses also require additional prerequisites (e.g., CS 501) All course credits earned in the program may be applied to the master’s program.

Prerequisite Courses (if required)
- CS 500 Introduction to Structured Programming (3 credits)
- CS 501 Introduction to Data Structures (3 credits)

Required Courses
- CS 550 Dynamic Web Page Development (3 credits)
- CS 552 Windows Interface Design (3 credits)
Cyber Security Certificate

The Graduate Certificate Program in Cyber Security is designed to provide individuals with an introduction to information security, risk and threat management, security architecture, and skills to effectively address the constantly changing threat landscape faced by people, companies, and governments today. The courses in the certificate program will:

- Provide a broad knowledge of networking and network security.
- Provide an overview of proper technology risk management practices.
- Help the individual be able to identify new and existing threats and determining methods to mitigate them.
- Provide the individual the skills to handle security incidents.
- Provide the individual with an introduction to building secure and defendable systems.

Certificate Requirements

The program requires the student to complete a minimum of twelve (12) semester credit hours of course work with a minimum cumulative GPA of 3.0. There are two prerequisites to the certificate: CS 621 and CS 622 (see below).

Prerequisite Courses (if required - 3 credits each)
CS 621 Principles of Data Communication
CS 622 Network Security I

Required Courses (3 credits each)
CS 626 Intro to Cyber-Security
CS 627 System Security
CS 628 Security Management

Elective Courses (choose one of the following - 3 credits each)
CS 629 Ethical Hacking
CS 641 Securing the Cloud
CS 642 Securing the Client/Server

IT and Network Security Certificate

Our country and, in fact, the entire world have become increasingly dependent on information technology as a means of staying competitive in business, industry, the arts, and commerce of all types. Education, electronic commerce, and the Defense Department are all areas that utilize technology on an exponentially expanding level with each passing year. But this dependence on and utilization of technology are accompanied by a growing risk of security issues that must be addressed if we are to thrive and survive in a technology-driven world. Inadequate security practices have left corporations vulnerable to a number of illegal activities such as computer fraud, telecommunications abuse, and unauthorized disclosure, modification, and destruction of information. National security has been and will continue to be threatened unless corporations and the government on all levels are able to effect and maintain sufficient computer security. The certificate program in IT and Network Security is designed to provide individuals with introductory networking, ethical, and security skills to effectively address the areas of concern mentioned above. The courses in the certificate program:

- provide an overview of networking protocols and how they can be secured;
- introduce the individual to an array of social and ethical issues
that are incumbent on those in providing security; and

• provide the individual with an introduction to computer programming, as it relates to the maintenance of security protocols.

Upon completion of the certificate program, the student will be better equipped to enter or continue as a professional in the cyber security field.

Requirements

The certificate requires a total of 12 credits plus two prerequisite courses (CS 500 and CS 501). Prerequisite courses may be waived if evidence of prior completion of these prerequisites can be supplied. Courses taken for the certificate can be applied toward the MSCIS degree.

Prerequisite Courses (if required)
CS 500 Introduction to Structured Programming (3 credits)
CS 501 Introduction to Data Structures (3 credits)

Required Courses
CS 621 Principles of Data Communication (3 credits)
CS 622 Network Security I (3 credits)
CS 623 Advanced Network Security (3 credits)

Elective Courses
CS 624 Hands-On Network Security (3 credits)
CS 625 Cryptography (3 credits)

Database Design Certificate

Prerequisites
CS 500 Introduction to Structured Programming (3 credits)
CS 501 Introduction to Data Structures (3 credits)

Required Courses
CS 603 Database Design (Oracle) (3 credits)
CS 631 Data Warehousing (3 credits)
CS 632 Advanced Database Topics (3 credits)
CS 633 Advanced Database Programming (3 credits)

(CS 603 will be a prerequisite for CS 631, CS 632 and CS 633)

COURSE DESCRIPTIONS

CS 500 Introduction to Structured Programming 3 CH
This is an introductory course in computer programming using a structured programming language. Representative topics include: iteration, selection, procedures, functions, arrays and classes.

CS 501 Introduction to Data Structures 3 CH
Prerequisite: CS 111 or CS 500 Introduction to Structured Programming or equivalent.

A continuation of CS 500 utilizing a structured programming language to further implement multidimensional arrays and other data structures including: linked lists, stacks, queues, trees, etc. Also provides introduction to recursion and data abstraction.

CS 502 C: Advanced Programming 3 CH
Prerequisite: CS 112 Data Structures or equivalent, or CS 501 Introduction to Data Structures.

Discusses advanced programming techniques with an emphasis on mathematical and scientific programming applications. Topics include: recursion, pointers and some advanced data structures. C language is introduced in this course.
CS 550 Dynamic Web Page Development 3 CH
Prerequisite: CS 500 Introduction to Structured Programming.

This course enables students to develop low-bandwidth visual effects for web pages. A variety of software is employed to develop web sites and media for the web. Topics include: web animation and interactivity using Adobe Flash®, a vector-based animation tool; vector-based graphic construction and digital compression using Macromedia Fireworks®, a graphic optimizing tool; and dynamic web page construction using Adobe Dreamweaver®, a visual HTML editor.

CS 551 Introduction to Object-Oriented Programming with Java 3 CH
Prerequisite: CS 501 Introduction to Data Structures.

Provides an introduction to the fundamental concepts of object-oriented analysis (OOA), design (OOD) and programming (OOP), and how object-oriented languages differ from procedural languages. Notation is used to teach the concepts of abstraction, encapsulation, modularity, hierarchy and polymorphism. This course is designed for both programmers and analysts. Both C++ and Java are used to implement these object-oriented concepts.

CS 552 Windows Interface Design (VB.NET) 3 CH
Prerequisite: CS 501 Introduction to Data Structures.

This course introduces the fundamentals of writing Windows applications, event-driven programming and the GUI. Topics include: dialogues, menus, controls, data types, scope and life of variables, objects and instances, fonts and graphics, simple file I/O and other DLL procedures. VB.net is used in implementing various Windows applications.

CS 553 Web Design with Java Script 3 CH
Prerequisite: CS 500 Introduction to Structured Programming.

This course shows how to embed Java “applets” into HTML pages, as well as create applets. The course covers the Java applet paradigm and the standard Java-class libraries. Students write Java applets, stand-alone applications, Native Libraries and content/protocol handlers for extending web browsers.

CS 554 Fundamentals of Interactive Multimedia 3 CH
Prerequisite: CS 500 Introduction to Structured Programming.

Students develop multimedia applications of their own design using Adobe Director®. This course explores principles for effective interactive multimedia design from concept definition, storyboarding, multimedia development and authoring to testing and revision. It covers techniques to include sound, graphics, photographs, animation, video and text into multimedia presentations. Adobe Director movies are developed for use in authoring applications such as business presentations, interactive kiosks, CD-ROMs and Shockwave movies for the web.

CS 555 Advanced Scripting with Interactive Multimedia 3 CH
Prerequisites: CS 501 Introduction to Data Structures and CS 554 Fundamentals of Interactive Multimedia.

This advanced multimedia development course explores program control for effective design and delivery of interactive multimedia applications. Students learn how to use the director's full-feature scripting language Lingo to develop the interactivity and program control of multimedia projects. Xobjects, special code segments that control external devices, are also covered.
CS 557 Web Programming with ASP.NET 3 CH  
Prerequisite: CS 552 Windows Interface Design and CS 603 Database Design (Oracle)

Covers Active Server Pages and how they allow for powerful web site creation by combining program code with standard HTML. The class is presented in a tutorial system application. Students will successfully learn how to program using Visual Basic Script, the most commonly used ASP programming language. Other relevant topics include: integrating databases with a web site and effective site functionality.

CS 558 Advanced Topics in ASP.NET 3 CH  
Prerequisite: CS 557 Web Programming with ASP.NET

The class will focus on some advanced ASP.NET topics such as AJAX, web services, building custom components, profiles, LINQ, and web parts.

CS 559 C# 3 CH  
Prerequisite: CS 552 Windows Interface Design (VB.NET)

Introduces the .NET platform using C# which is a modern object-oriented language to build interfaces with applications for both windows and the web. OLE Automation, and Database (ADO.NET) development will be introduced.

CS 560 Networking Applications 3 CH  
Prerequisite: CS 621 Principles of Data Communication.

This hands-on course provides an in-depth introduction to IP addressing, TCP/IP, routing of IP packets, Internet protocol, TCP, DHCP, DNS, network management and a brief introduction to network security including use of firewalls, proxy servers, and footprint analysis.

CS 561 Multimedia Authoring (Authorware) 3 CH  
Prerequisite: CS 500 Introduction to Structured Programming.

This authoring course covers design and delivery of interactive multimedia using an icon-based product. Students use the authoring tool Authorware to develop a variety of projects: CBT, interactive kiosks, performance support applications, interactive magazines and catalogs, educational games and interactive education and information that can be delivered over intranets.

CS 563 Flash Animation 3 CH  
Prerequisite: CS 557 Web Programming with ASP.NET

This is an introduction to Flash Animation class. Students will discover how to produce interactive multimedia. The course covers the Flash interface and tools used to develop Flash animations such as shape and motion tweening, motion guide path, masking, development of scenes, creation of movie clips and button symbols. They are used to create a variety of animations such as: interactive presentations, interactive greeting cards, interactive tutorials, Web Sites, puzzles and small games. Basic actionscript will be covered in this class.

CS 571 Advanced Computer Gaming 3 CH  
Prerequisite: CS 501 Introduction to Data Structures

An object-oriented approach to programming digital objects using Flash and Action Script 3.0. These programming techniques will be applied to both arcade and adventure games.

CS 572 OOP with C# and Games 3 CH  
Prerequisite: CS 571 Advanced Computer Gaming

An object-oriented approach to computer graphics using C#. Topics covered will include: classes, instantiation, event listeners, polymorphism, encapsulation, event handlers, functions and methods, and basic game logic.
CS 573 Advanced C#-Based Game Programming 3 CH
Prerequisite: CS 572 OOP with C# and Games

A game oriented programming course focusing on advanced graphics techniques using OpenGL and/or DirectX.

CS 601 Assembly Language Programming and Computer Systems 3 CH
Prerequisite: CS 501 Introduction to Data Structures.

Explores programming concepts at the interface of hardware and software: addressing, instructions, symbol tables, linkage, registers, ALU and CPU, anatomy of an assembler, relocatable code, macros, interrupts and debuggers.

CS 602 Advanced Data Structures and Algorithms 3 CH
Prerequisites: MA 151 Introductory Calculus, CS 502 C: Advanced Programming and CS 241 Advanced Programming Concepts Using “C.”

Explores the relationship between data structures and algorithms with a focus on space and time efficiency: review of recursion, data abstraction and complexity analysis, multilists, trees (including balanced binary trees, n-ary trees and Btrees), hash tables, external sorting, graphs and algorithm design techniques.

CS 603 Database Design (Oracle) 3 CH
Prerequisite: CS 501 Introduction to Data Structures.

Discusses goals and techniques in the design, implementation and maintenance of large database management systems: physical and logical organization; file structures; indexing; entity relationship models; hierarchical, network and relational models; normalization; query languages; and database logic.

CS 604 Advanced Software Engineering 3 CH
Prerequisite: CS 551 or permission of department.

Advanced Programming. Reviews models and metrics for software engineering in the large: software life-cycle models, software modeling tools, design and analysis of software subsystems, management of software projects, test plans, configuration control, reliability and metrics.

CS 605 Discrete Structures and Logic 3 CH
Prerequisites: CS 501 Introduction to Structured Programming and MA 151 Introductory Calculus.

Reviews the mathematical concepts and foundations of logic for computer science: sets, relations and functions; Boolean algebras; graphs; propositional and predicate logic; notions of logical consequence and provability; soundness and completeness of inference methods; resolution; unification; and introduction to theorem proving.

CS 611 Operating/ Multiprogramming Systems 3 CH
Prerequisite: CS 502 C: Advanced Programming.

Explores the management of resources in a multiuser system: memory allocation and management, process scheduling, protection, concepts of concurrent processes, study of different operating systems and multiprocessing.

CS 613 Structure of Programming Languages 3 CH
Prerequisite: CS 602 Advanced Data Structures and Algorithms.

Discusses the syntax and semantics of programming languages including: an introduction to theory of languages and grammars; concepts of design and implementation of programming languages; and the comparison of different
language paradigms such as imperative, functional, logic and object-oriented.

**CS 614 Theory of Computation 3 CH**
Prerequisite: Permission of instructor.

Reviews the theory of the power and limitations of computation and computers: Turing machines, recursive and recursively enumerable functions, equivalence of computing paradigms (Church Turing thesis), undecidability, intractability and introduction to NP-completeness.

**CS 615 Programming in Unix 3 CH**
Prerequisite: CS 611 or permission of instructor.

Discusses main issues of Unix OS programming and administration. In particular, it explores a popular Unix text editor Emacs, Unix file system, process manipulation, regular expressions and their use, filters, and system administration and security.

**CS 620 Information Analysis and System Design 3 CH**
Prerequisite: CS 501 Introduction to Data Structures.

Discusses the design, analysis and management of information systems: system lifecycle management, hardware and software selection and evaluation, the role of information systems in decision support and other functional areas of business, project management, systems development and analysis, module design and techniques to reduce system complexity.

**CS 621 Principles of Data Communication 3 CH**
Prerequisite: CS 501 Introduction to Data Structures.

A survey of modern data communication techniques, including: data communication and local networking, hardware (e.g., terminals, modems, multiplexors), nodal and host processor architecture, packet switching, network control, protocols, software management and security.

**CS 622 Network Security I 3 CH**
Prerequisite: CS 621 Principles of Data Communication.

Is there a security problem in computing? How do IT and network managers interface with business managers to create a security system that meets the needs of both sides of the business? How does network security support the business mission and how many resources is business willing to give to support network security? This course addresses these complex issues. Among the topics covered are: conventional encryption and message confidentiality, public key cryptography and message authentication, authentication applications, e-mail security, IP security, Web security, firewalls, security in mobile networks, and other security issues.

**CS 623 Advanced Network Security 3 CH**
Prerequisite: CS 622 Network Security I.

This is the second course in security that emphasizes security at the system level. The course covers secure encryption, systems, program security (viruses and other malicious code), controls against program threats, protection in general purpose operating systems, trusted operating systems, database security, security in networks and distributed systems, administering security, and legal and ethical issues in security.

**CS 624 Hands-On Network Security 3 CH**
Prerequisites: CS 621 Principles of Data Communication and CS 622 Network Security I.

Designed for IT graduate students, this course uses VMWare of Connectix Virtual PC to simulate different environments. It examines networking security topics, firewalls (using Linux), packet filters, NAT, PAT, socks and HTTP...
proxies; public key infrastructure (using Microsoft Certification Server), encryption algorithms, decrypting passwords, dictionary decryption, brute force decryption, certificate servers; and vulnerability assessment, identifying security holes, forensics, tracing, log analysis, Layer 5 vulnerabilities (Services/Daemons and OS), identifying denial of service attack (simulation), identifying a virus/work attack (simulation), packet monitoring (sniffing).

CS 625 Cryptography 3 CH
Prerequisite: CS 622 Network Security I or permission of instructor.

Designed for CS graduate students, the course covers theoretical and practical aspects of modern applied computer cryptography. Topics include: block and stream ciphers; hash functions, data authentication, and identification; and digital signatures. Special emphasis is given to public-key cryptosystems. The course includes implementation of various encryption algorithms in different programming systems.

CS 626 Intro to Cyber-Security 3 CH
Prerequisite: CS 622

What is Cyber-Security? What is a threat and how do you protect against the constantly changing cyberworld? Securing an organization’s cyber environment is everyone’s responsibility. This course will cover the following topics:

- Introduce Cyber-Security Concepts
- Cyber-Security Threats
- Cyber-Security Attack Types
- Cyber-Security Attack History
- Approaches to securing the organization
- Protections from Cyber-Security Threats
- Other security issues

CS 627 System Security 3 CH
Prerequisite: CS 626

How do you secure the critical infrastructure that supports our cyber-security landscape? What threats and attacks do systems constantly face? This course will address these complex issues in securing the system & applications that run in today’s organizations. Among the topics covered are:

- Secure System Hardening
- Access Controls
- Security System Management
- Secure Administration
- Security Monitoring
- Secure Back-ups
- Application Security Concepts
- Other security issues

CS 628 Security Management 3 CH
Prerequisite: CS 626

All of the new security technologies require good management to maintain effectiveness. With so many new technologies, how do we make the security technology effective? Where do we start? How do we measure and plan to improve a company’s security posture? This course will address these complex issues about managing security within an organization. Among the topics covered are:

- Policy & Information Security Program Development
- Incident Response
- Identity Access Management
- Security Governance
- Security Risk Management
- Vulnerability Management
- Security Metrics

CS 629 Ethical Hacking 3 CH
Prerequisite: CS 622

This course introduces students to the security threat of computer hacking and system vulnerabilities & exploits. The course will introduce techniques and hacking skills that blackhat hackers use to compromise systems. The class will teach students how to perform whitehat hacker and ethical hacking techniques to safeguard a computer network.
CS 631 Data Warehousing 3 CH
Prerequisite: CS 603 Database Design (Oracle)

Provides a comprehensive review of data warehousing technology. Areas of study include the evolution of the modern-day data warehouse; analysis and collection of business data requirements; dimensional modeling; the loading of data using Extraction, Transformation, and Loading (ETL) processes; data quality issues; and reporting from the data warehouse using SQL and Online Analytical Processing (OLAP) techniques. Several Oracle lab experiments are conducted to provide hands-on experience in the areas of data warehouse design, construction, data loading, and essential reporting techniques.

CS 632 Advanced Database Topics 3 CH
Prerequisite: CS 603 Database Design (Oracle).

Provides students with an advanced understanding of database technology. In addition to the entity-relationship model, alternate database models (such as EAV and OOD) are investigated. Possible topics include indexing, optimization, XML, online analytic processing (OLAP), embedded SQL, locking techniques and parallel and distributed systems. Specific topics covered and focus of this course changes to reflect modern trends and the latest technology.

CS 633 Advanced Database Programming 3 CH
Prerequisite: CS 603 Database Design (Oracle).

Provides students with a thorough understanding of database programming. Students use the latest technology to create front-end applications to hit large-scale backend databases. SQL and stored procedures are used to retrieve data from various data stores. Emphasis is placed on a layered approach to programming. User-friendly design principles and business logic are used to teach students how to implement large-scale windows and/or web applications. The specific technology used will vary to reflect current trends in database programming technology.

CS 640 Special Topics in Computer Science 3 CH
Prerequisite: Determined at the time of course offering. Presents one-time and first-time offerings of courses on current topics.

CS 641 Securing the Cloud 3 CH
Prerequisite: CS 627

Cloud computing is rapidly becoming a popular choice for hosting everything from entire operating systems, and software, to service (SaaS) applications such as websites, databases, email, data backup, and so forth. The course will provide an introduction to cloud technologies and their best practices. Learn the unique challenges posed by this type of platform and how to properly configure and secure cloud based assets.

CS 642 Securing the Client/Server 3 CH
Prerequisite: CS 626

Clients and servers run Operating System (OS) software as well as many applications with each presenting a unique concern from a security perspective. Get an in-depth look at how to properly harden today’s most popular Operating Systems: Microsoft Windows, Apple OS X, and Linux. This course covers built-in security features of each OS and how best to utilize these and other third party applications to setup a secure system. The course will also introduce how to secure services and applications provided with these OSes such as Sendmail and MS Exchange, MySQL and MS SQL Server, Apache and MS IIS.

CS 646 Computer Graphics 3 CH
Prerequisite: CS 602 Advanced Data Structures and Algorithms.
Reviews the principles of design and use of computer graphics: matrix algebra overview, basic drawing techniques, line and polygon clipping, linear transformations, projections, graphics standards and hardware, raster scan, refresh, storage, hidden line and surface elimination and shading.

**CS 648 Distributed Database Systems** 3 CH
Prerequisites: CS 603 Advanced Database Systems and CS 611 Operating/Multiprogramming Systems.

Explores the problems and opportunities inherent to distributed databases: file allocation, deadlock detection and prevention, synchronization, update consistency, query optimization, fault tolerance, etc.

**CS 650 Principles of Natural Language Processing** 3 CH
Prerequisite: CS 613 Structure of Programming Languages or CS 642 Artificial Intelligence.

Studies the issues arising in computer processing of languages like English and solution techniques: AI principles overview, significance of language structure in extracting meaning, ambiguities, parsing techniques, semantic issues, semantic models, pragmatics, text-based systems and case studies.

**CS 652 Neural Networks** 3 CH
Prerequisites: MA 151 Introductory Calculus and CS 642 Artificial Intelligence.

Discusses neural networks as a computation model complementary to symbolic AI: basic principles, history of neurocomputing, various models and their common ideas, applications in machine learning and pattern recognition and hybrid systems.

**CS 654 Object-Oriented Programming Using C++** 3 CH
Prerequisite: CS 502 C: Advanced Programming or equivalent.

Reviews the principles of OOP: encapsulation, polymorphism and inheritance. C++ is used as the main vehicle for getting the ideas across. Issues of multiple inheritance, persistence, etc. are covered, and comparison with other OOP languages are made, as time permits.

**CS 661 Game Design and Development using 3-D** 3 CH
Prerequisite: CS 573

The course will cover Open GL and/or some advanced tools of DirectX or other appropriate software which will facilitate the integration of 3-D action and movement in a game designed for the course. The students will work in teams (if appropriate) to complete a 3-D game during the course.

**CS 662 Game Design, Development, and Implementation** 3 CH
Prerequisite: CS 573

In this course students work as a team to develop an innovative, original computer game. Group responsibilities include project planning and documentation, teamwork, presentations and demonstrations. Students learn the technical skills involved in game architecture, including advanced character animation and nesting, game physics, sound syncing and editing, lighting simulation techniques, and game balance. Special attention will be paid to emerging game development opportunities in education, professional training, medicine, advertising and scientific research.

**CS 663 Game Design for Mobile Devices** 3 CH
Prerequisite: CS 662

In this course students explore the complex process required to design and build content and games for mobile devices. Students will learn how to structure and optimize code as well as
CS 664 Advanced Topics in Multiplayer Gaming 3 CH  
Prerequisites: CS 661 and CS 662

The course considers the technical, programming and creative aspects for developing an effective multi-player game. Topics covered include: virtual machines, connection techniques, live player chat, authoritative client and authoritative server choices, latency and clock simulation, lobby systems, real time competitive games, cooperative game play avatars, virtual worlds and user homes.

CS 670 Research Project Seminar 3 CH  
Prerequisite: Determined by the faculty advisor.

Required for the non-thesis option, the student works with a faculty advisor in defining a short research or implementation project. For a research project, the student surveys relevant literature, critically analyzes the state of the art and possibly synthesizes improvements. For an implementation project, the student implements and tests a solution to the chosen problem; the project could involve a combination of research and implementation. At the end of the project, the student writes a report approved by the faculty member and makes a public presentation of the work.

CS 690 Thesis I 3 CH  
Prerequisite: Determined by the faculty advisor.

Required for the thesis option, the student works with a faculty advisor in defining a substantial research or implementation project. For a research project, the student surveys relevant literature, critically analyzes the state of the art and synthesizes improvements. For an implementation project, the student implements and tests a solution to the chosen problem, comparing it with other work, if any; the project could involve a combination of research and implementation. At the end of this course, the student should have a well-defined problem, have surveyed relevant literature and have made partial progress toward the completion of the work. The student should be ready to make a brief presentation of the work in progress, as required by the advisor. Also, by the end of this course, a proposal describing the work should be written and approved by a thesis committee chosen by the student and the advisor, according to University policy.

CS 691 Thesis II 3 CH  
Prerequisite: CS 690 Thesis I.

A continuation of CS 690, this course is required for the thesis option. By the end of this course, the student completes the work remaining in the project started in CS 690, as defined by the written proposal. A thesis must be written and defended in front of the thesis committee. The presentation portion of the thesis defense is open to the public.

Criminal Justice

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GOALS AND OBJECTIVES

The Master of Arts in Criminal Justice program provides students with a comprehensive knowledge of all components of the criminal justice system. This program is open to recipients of undergraduate degrees in Criminal Justice as well as individuals who have developed a career interest in criminal justice after completing an undergraduate degree in another discipline. This Master of Arts
in Criminal Justice provides individuals with bachelor's degrees in Criminal Justice or other disciplines with the knowledge needed to obtain advanced professional positions in the field. It also enables individuals already employed in the field of criminal justice to advance further in their careers. Thirty credits are required to graduate from the program. Students must complete 18 required credits of the core curriculum plus an additional 12 credits of any elective courses. Students may also choose the 12 credits for a concentration in national security or criminal justice management. Upon completion of the required 30 credits, students desiring to pursue an advanced career in criminal justice must successfully complete a comprehensive examination. Students desiring to continue their education toward a Ph.D. should pursue the 3-credit thesis option rather than the comprehensive examination. The thesis course may be used to satisfy 3 of the 12 elective credits required.

REQUIRED COURSES
(18 CREDITS)

CJ 401 Theories and Analysis of Crime Causation and Deviance
CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System
CJ 403 Law, Society and Ethics
CJ 404 Issues in the Administration of the Adult and Juvenile Correctional Systems
CJ 405 Criminal Law
CJ 406 Methods of Research Design and Statistical Analysis

ELECTIVE COURSES
(12 CREDITS)

The program offers a variety of courses covering all aspects of the criminal justice system including:

CJ 506 Victimology
CJ 507 Organizational Procedures
CJ 508 Capital Punishment
CJ 509 Criminal Behavior and the Family
CJ 510 Criminal Profiling
CJ 511 Emergency Management
CJ 513 Issues in National Security
CJ 514 Domestic and International Terrorism
CJ 515 Budgetary Planning in Public Agencies
CJ 601 Internship/Practicum Experience in Criminal Justice
CJ 650 Criminal Justice Thesis

Concentration in National Security (12 credits)

CJ 510 Criminal Profiling
CJ 511 Emergency Management
CJ 513 Issues in National Security
CJ 514 Domestic and International Terrorism

ADMISSION

Bachelor of Arts or Science degree with a 3.0 GPA from an accredited four-year college or university (official transcripts required)

Completed Graduate application
Application fee
Two letters of recommendation
Personal statement
Admission Deadline

Although applications are reviewed by the Admissions Committee on a rolling basis, the University has a priority deadline of March 1 for Fall admittance and November 1 for Spring admittance for financial aid considerations.
Concentration in Criminal Justice Management (12 credits)

CJ 507 Organizational Procedures
CJ 511 Emergency Management
CJ 515 Budgetary Planning in Public Agencies
CJ 601 Internship/Practicum Experience in Criminal Justice

COURSE DESCRIPTIONS

CJ 401 Theories and Analysis of Crime Causation and Deviance 3 CH
Prerequisites: CJ 101 Introduction to Criminal Justice, CJ 200 Constitutional Law.

Examines the development and application of theories of crime causation and social deviance. The course includes an assessment of the issues and problems involved in controlling crime and deviance in society. Students learn about the nature of criminal behavior and the impact of this behavior on the victims, and study the development of programs and policies to control crime and assist the victims.

CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System 3 CH
Prerequisite: CJ 401 or permission of Department Chair.

Examines the current problems and issues facing the American criminal justice system. The course explores controversial policies such as the use of force, discretion, access to the justice system, organizational and legal issues related to decision-making within the criminal justice system, the role of the courts and the correctional system.

CJ 403 Law, Society and Ethics 3 CH
Prerequisite: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of the Department Chair.

Focuses on constitutional and ethical issues as they affect the operation of the criminal justice system. Topics examined include legal issues related to punishment and the ethical responsibilities of criminal justice agents.

CJ 404 Issues in the Administration of the Adult and Juvenile Correctional Systems 3 CH
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.

Explores the operation and nature of the American correctional system. The course examines the Juvenile Justice System as well as the adult correctional system. Theories and philosophies of correctional administration and the conditions that generate delinquent behavior are examined as well as current critical issues such as overcrowding, alternatives to incarceration, efforts to maintain family cohesion.

CJ 405 Criminal Law 3 CH
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.

Examines various topics in substantive criminal law as they affect the operation of the criminal justice system. Topics may include standards of evidence, defenses, and punishments.

CJ 406 Methods of Research Design and Statistical Analysis 3 CH
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.
This course must be taken at the graduate level. An undergraduate course in this subject cannot be substituted for the graduate course. Examines the research process and is designed to provide students with an understanding of the principles and practices of criminal justice empirical research. More specifically, methods of research and data analysis, as applied to the field of criminal justice, are presented. The application of these methods to criminal justice practice is demonstrated through various exercises. To better prepare capable professionals, students are taught both the language of scientific discourse and the ability to appraise empirical studies critically. To better prepare practitioners who are fair and respectful toward individuals from diverse backgrounds, research ethics, and sensitivity to populations at-risk are promoted.

**CJ 499 The Constitution and the Criminal Justice System 3 CH**
This course must be taken by students who did not take a course in Constitutional Law and Introduction to Criminal Justice on the undergraduate level. This course is an introduction to the criminal justice system providing an overview of the processes of criminal justice and a survey of the components of the system. (Does not count towards the 30 credits required for the degree.)

**CJ 506 Victimology 3 CH**
Prerequisites: CJ 101 Introduction to Criminal Justice, CJ 200 Constitutional Law.
Examine the victim through history. Course explores the victim movement, the nature and extent of criminal victimization and its affect on American society.

**CJ 507 Organizational Procedures 3 CH**
Prerequisites: CJ 101 Introduction to Criminal Justice, CJ 200 Constitutional Law.
Examine the criminal justice system from an organizational perspective.

Course explores fraud control, risk analysis, and corporate crime control through case studies.

**CJ 508 Capital Punishment 3 CH**
Prerequisites: CJ 101 Introduction to Criminal Justice, CJ 200 Constitutional Law.
Examine the theoretical, legal and ethical issues involved in this form of punishment.

**CJ 509 Criminal Behavior and the Family 3 CH**
Prerequisites: CJ 101 Introduction to Criminal Justice, CJ 200 Constitutional Law.
This course studies theories and research concerning the socialization experience and their impact on behavior. Topics examined include child abuse and neglect, parental substance abuse, disciplinary techniques, single parent families, etc.

**CJ 510 Criminal Profiling 3 CH**
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.
Studies the process of identifying characteristics associated with individuals who become criminal sociopaths. Sociological theories of crime causation are used in the examination of criminal typology.

**CJ 511 Emergency Management 3 CH**
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.
Examine the policies and systems necessary to govern in situations of conflict and uncertainty. Explores appropriate responses to serious incidents and disasters. Evaluates early warning
systems and prevention strategies. Students learn the techniques involved in planning and preparing for crises, and forecasting potential crisis situations.

**CJ 513 Issues in National Security 3 CH**  
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.

Examines the changes in American policy fostered by the terrorist attacks of 9/11/01. Students study the organizations and resources developed since 9/11/01 to defend national security. The course explores the role played by all the components of the criminal justice system in providing for the security of the nation. Also studied are the policies and practices that have been developed for this purpose by the various agencies that represent the criminal justice system. Specifically, students study the adjudication process as it relates to issues of national security and the correctional practices employed to maintain national security.

**CJ 514 Domestic and International Terrorism 3 CH**  
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of Department Chair.

Examines the history, current developments, and responses to both international and domestic terrorism. Emphasis is on the examination of the law enforcement response to terrorism, and the sociological models of consensus and conflict in an effort to better understand the nature of terrorism. Assesses the strategies of terrorists, their funding and their use of the media, and examines the efforts of terrorist victimization.

**CJ 515 Budgetary Planning in Public Agencies 3 CH**  
Prerequisites: CJ 401 Theories and Analysis of Crime Causation and Deviance, CJ 402 Critical Issues in the Administration and Management of the Criminal Justice System or permission of the Department Chair. Examines the nature of public budgeting and financial management from the perspective of a public manager. Explores public budgeting from an analytical perspective.

**CJ 601 Internship/Practicum Experience in Criminal Justice 3 CH**  
Prerequisite: CJ 406 Methods of Research Design and Statistical Analysis.

Students use their theoretical knowledge in a practical environment. Students are required to spend 150 hours interning in a criminal justice agency or use their current criminal justice work experience to apply theory. Students must observe and assist in the everyday operations of the agency. They are required to maintain a log of their activities and confer weekly with the faculty supervisor to discuss their individual progress. The class meets regularly with the professor so that students may share their internship/practicum experiences. Upon completion of the 150 hours, the student will prepare a two-part paper. Those fulfilling the requirements through their current work experience will also prepare a paper. The first part of the paper will consist of a literature review on a topic related to the internship. The second part of the paper will consist of a description of the work experience including the topics provided by the instructor/advisor.

**CJ 650 Criminal Justice Thesis 3 CH**  
Prerequisite: Completion of 27 seven credits required by the program.

This course may be taken in place of the Comprehensive Examination. It is appropriate for students wanting to continue their education toward a Ph.D. in Criminal Justice. The student works with a
mentor to develop a research project. The research project culminates in a thesis and an oral presentation of the thesis to faculty and students in the program.

Psychology

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MASTER OF SCIENCE IN APPLIED PSYCHOLOGY

Goals and Objectives

The Master of Science in Applied Psychology program provides students with the knowledge and skill of how to apply the science of human behavior to solve practical real-world problems. The program is built on a scientist-practitioner model in which students gain a solid foundation in the science of psychology and learn to apply this knowledge and skill set to real world, practical problems. With its strong foundation in research methods and quantitative reasoning and its numerous connections with community agencies, schools, and corporations, the program provides excellent preparation for a wide variety of careers in today's data-driven economy. Students are particularly well-prepared for a variety of leadership positions in governmental, community, and corporate settings. The program offers a unique delivery system of 8-week courses that allows one to complete his/her degree in one calendar year by taking courses in our on-campus program. One may also choose to take a more moderate pace by participating in the online aspect of the program. A minimum of 38 credits are required to graduate from the program. Students must complete 26 credits of the core curriculum and may be required to complete an additional four credits of prerequisite coursework. The remaining 12 credits are fulfilled with the completion of four elective courses. Students may choose to complete those 12 credits by participating in one of two concentrations (industrial-organizational psychology or community psychology). Students may also choose to take a combination of the two concentrations to graduate with a general degree. In addition, students may choose to begin by completing a certificate in either industrial-organizational psychology or community psychology.

Admission Requirements

- Bachelor of Arts or Science degree from an accredited four-year college or university (official transcripts required)
- Undergraduate degree in psychology or completion of required prerequisite psychology courses
- Minimum GPA of 3.0
- Statement of professional goals
- Two letters of recommendation
- GRE Scores preferred

Admission Deadline

Applications are reviewed by the Admissions Committee on a rolling basis.

Prerequisite Requirements

The following prerequisite course will be required for those who wish to pursue the MSAP program. The course must be completed with a grade of B or better. This prerequisite requirement may be waived by the director, if a candidate has completed sufficient past coursework.
Required Core Courses (24
Credits - 20 if PS 450 is waived)

- PS 450 Foundations of Psychological Science
- PS 500 Foundations of Applied Psychology
- PS 520 (PS 420) Developmental Issues Across the Life Span
- PS 525 Identifying and Managing Psychopathology in Community Settings
- PS 550 Applied Research Methods and Statistics
- PS 551 Individual Psychological Assessment and Appraisal
- PS 552 Program Development and Evaluation

Concentration In Industrial Organizational Psychology (12 Credits)

- PS 530 Personnel Psychology
- PS 531 Organizational Behavior
- PS 532 Job Analysis, Competency Modeling and Criterion Development
- PS 533 Employee Training and Development OR appropriate BU course

Concentration In Community Psychology (12 Credits)

- PS 540 Foundations of Community Psychology
- PS 541 Theories of Counseling and Personality
- PS 542 Counseling Methods and Techniques
- PS 543 Community Health Psychology

General Track (12 Credits)

Four electives, chosen in consultation with an academic advisor from above concentrations or PS 599 or other graduate courses, as appropriate

Required Capstone Experience (6 Credits)

- PS 590 Comprehensive Exam
- PS 595 Capstone Project I
- PS 596 Capstone Project II
- OR
- PS 600 Thesis I
- PS 601 Thesis II

COURSE DESCRIPTIONS

PS 450 Foundations of Applied Psychology 4 CH
This course is designed to provide those that did not major in Psychology with a scientific foundation of psychology theory. It is a required prerequisite course that may be waived, by the director, if sufficient past coursework has been completed. A minimum grade of B is required to continue to PS 500.

PS 500 Foundations of Applied Psychology 4 CH
This course will focus on the ethical and legal psychological issues, as well as the challenges and opportunities created by diversity in workplace, school, and community settings.

PS 520 (PS 420) Developmental Issues Across the Life Span 3 CH
This course will explore human development from childhood to old age, with a focus on developmental milestones and their influence on behavior in applied settings.

PS 525 Identifying and Managing Psychopathology in Community Settings 3 CH
In this course, students learn to identify those at risk of psychopathology in the community and to determine appropriate management and
referral of these individuals.

**PS 530 Personnel Psychology 3 CH**
Examines the application of psychological research, employment law, and ethical principles to human resource issues. Particular attention is given to hiring practices.

**PS 531 Organizational Behavior 3 CH**
Explores behavior in organizations at individual, interpersonal, group, intergroup, and organizational levels of analysis. Emphasis is on identifying effective ways to achieve organizational goals.

**PS 532 Job Analysis, Competency Modeling, and Criterion Development 3 CH**
Prerequisite: PS 530 Personnel Psychology

Students will learn how to conduct job analysis and competency modeling and how to use the results for designing personnel selection systems and performance appraisal instruments.

**PS 533 Employee Training and Development 3 CH**
Examines theory and techniques used to design, conduct, and evaluate instructional programs based on theories and principles of adult learning.

**PS 540 Foundations of Community Psychology 3 CH**
This course considers the legal, ethical, and practical issues that arise when providing counseling in community settings, and provides an overview of the entire process.

**PS 541 Theories of Counseling and Personality 3 CH**
Prerequisite: PS 540 Foundations of Community Psychology.

This class will cover the major approaches to personality and the schools of psychotherapy that have developed out of each. Students will critically evaluate each approach.

**PS 542 Counseling Methods and Techniques 3 CH**
Prerequisite: PS 541 Theories of Counseling and Personality

This class will teach students to recognize and apply basic counseling responses common across all approaches as well as those specific to each approach studied.

**PS 543 Community Health Psychology 3 CH**
Prerequisite: PS 540 Foundations of Community Psychology.

This course will examine the multidimensional field of community health psychology, developing student skills in advocacy, community organizing, health promotion, and social change regarding health.

**PS 550 Applied Research Methods and Statistics 4 CH**
This course provides an overview of the basic principles of applied psychological research with a focus on conducting research in community settings.

**PS 551 Individual Psychological Assessment and Appraisal 3 CH**
Prerequisite: PS 550 Applied Research Methods and Statistics

This course is designed to improve the knowledge, understanding and practices of those who take tests, construct tests, and administer tests in applied settings.

**PS 552 Program Development and Evaluation 3 CH**
Prerequisite: PS 550 Applied Research Methods and Statistics

Students learn how to assess the need for and then design, implement, and evaluate a program that benefits the workplace or community.

**PS 590 Comprehensive Exam 3 CH**
Prerequisite: Completion of 36 (32 if PS 450 is waived) credits in graduate program
In this course, the student completes an applied comprehensive exam that covers material from core and concentration courses

**PS 595 Capstone Project I 3 CH**  
Prerequisite: Completion of 36 (32 if PS 450 is waived) credits in graduate program

In this course, the student works with a faculty advisor in defining a short research or implementation project in an applied setting.

**PS 596 Capstone Project II 3 CH**  
Prerequisite: PS 595 Capstone Project I

In this course, the student completes the capstone project begun in PS 595, including a written report and oral presentation.

**PS 599 Special Topics in Applied Psychology 3 CH**  
Prerequisite: Completion of 36 (32 is PS 450 is waived) credits in graduate program

Designates new or occasional courses that may or may not become part of the department's permanent offerings. Courses capitalize on current events or student and faculty interests.

**PS 600 Thesis I 3 CH**  
Prerequisite: Completion of 36 (32 is PS 450 is waived) credits in graduate program

Students work with a faculty advisor in defining a substantial research or implementation project that gathers data or responds to a particular problem in the community.

**PS 601 Thesis II 3 CH**  
Prerequisite: PS 600 Thesis I

In this course, the student completes the research project begun in PS 600. The final thesis paper must be written and defended before the thesis committee in a forum that is open to other students and faculty.

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**Theology/Religious Studies**

June-Ann Greeley, Ph.D., Director  
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Throughout human history, religion has played an enormous role in the shaping of human actions and perceptions, as well as social institutions and values. The academic study of religion involves a sympathetic yet critical examination of the human attempt to answer the questions, “Who are we and why are we here?” It also allows us to understand better the complex world in which we live. The study of religion uses the methods of several disciplines, including theology, philosophy, history, psychology, sociology, anthropology, and literary criticism. Methodologically and topically diverse, the Master of Arts in Theology and Religious Studies (MATRS) program is unified by its commitment to the task of exploring the basic religious beliefs and insights that render human life and experience meaningful. Specific courses in the program examine the various symbols and myths, rituals and creeds, and events and institutions that illuminate the religious imagination and understanding. The student who completes the MATRS program will be able to engage in critical dialogue with his/her own religious tradition and other traditions; understand these traditions in their complexity; and articulate coherent, religiously informed answers to basic questions of human meaning.

**GOALS AND OBJECTIVES**

The Graduate Program in Theology and Religious Studies is designed to suit the needs and interests of a wide variety of students. Whether one wishes to prepare for doctoral work in religion, pursue a career in religious education,
or learn more about the world’s religious traditions in order to enrich one’s personal and/or professional life and activities, the program supplies a broad range of valuable resources. Each graduate student, in consultation with a faculty advisor, is encouraged to plan an appropriate course of study. In addition to the goal of intellectual enrichment, this program has proven particularly beneficial in the professional advancement of educators, writers, spiritual directors, and directors of religious education. It also offers a strong foundation for students contemplating further study toward a doctoral degree or the ministry.

ADMISSION REQUIREMENTS

Applicants must have a strong undergraduate record from an accredited college or university with a degree preferably in the humanities or social sciences. Official transcripts from all undergraduate and graduate institutions attended must be sent by those institutions to the Office of Graduate Admissions. Two letters of recommendation must accompany the application. A personal interview is required as part of the admission process. The Graduate Record Examination (GRE) is recommended for all applicants, and in some circumstances it may be required.

M.A. THESIS

Upon completing coursework, each MA student must write a master’s thesis. The thesis is a formal document that shows the student has made an original contribution to knowledge. Writing the thesis is a learning experience in which the student draws upon integrated knowledge of religious studies and research skills to present a distinctive interpretation of a problem in the field. The process typically requires a semester’s worth of planning and a semester’s worth of writing, under the direction of an advisor. See the program director to receive a full set of guidelines and to be matched with an advisor.

DEGREE REQUIREMENTS

All MA candidates must complete a total of 36 credit hours of graduate coursework, with a minimum GPA of 3.0. Student performance is reviewed by the graduate faculty at the end of each semester. If a student completes all coursework for the degree with a GPA below 3.0, then the student will be allowed to take a maximum of six additional credit hours of study to raise the average to 3.0. If this 3.0 average is not achieved, the student will not be allowed to continue in the program and no degree will be awarded. If a grade below C is earned in a required course, that course must be repeated. If a grade below C is earned in an elective course, the student must repeat that course or take another elective. In any case, the original grade is calculated into the GPA.

REQUIRED COURSES

RS 500 Research in the Study of Religion (3 credits)
RS 501 Phenomenology of Religion (3 credits)
RS 510 Modern Biblical Criticism and the Gospels (3 credits)
Elective in non-Christian religion (3 credits)

Any course that is primarily focused on a religious tradition other than Christianity. The department will provide a list of which courses meet the requirement in each year’s schedule.

Free electives (21 credits)

MA Thesis (3 credits)
COURSE DESCRIPTIONS

RS 500 Research in the Study of Religion 3 CH
Prepares the student for graduate-level work in religion. Provides opportunities to apply various research methods used in the field, including history, surveys, ethnographies, literary criticism, and philosophical/theological analysis. Develops customs of writing and citation for publications in religious studies and theology.

RS 501 Phenomenology of Religion 3 CH
Focuses on contemporary methods for the investigation of religion and prepares the student for graduate-level work.

RS 505 Ancient Religions and Cults 3 CH
Explores the beliefs, practices, and teachings of ancient world religions including those of ancient Egypt and Mesopotamia, the mystery cults of the ancient Greco-Roman civilizations, and the religious traditions of pre-Christian northern Europe (Scandinavia) and ancient Iran. The focus of study is on the sacred writings of the religions, with emphasis on such major topics as deities and divine powers, rituals of birth and death, gender studies, and the relationships between ancient faith traditions and the emergence of monotheism.

RS 510 Modern Biblical Criticism and the Gospels 3 CH
Provides a brief history of biblical criticism leading up to an in-depth analysis of the achievements of recent biblical research in the area of New Testament studies.

RS 514 Introduction to Eastern Religions 3 CH
Explores the religious traditions of Asia, including Hinduism, Buddhism, Taoism, Confucianism and Shinto. Students are introduced to the beliefs and practices of these traditions in their historical context and to manifestations of Eastern religions in the contemporary United States.

RS 515 Introduction to Islam 3 CH
A theological and phenomenological exploration of beliefs, practices, and symbology of Islam, incorporating extensive readings from the Qur'an, the hadith and shari'a, and Sufism. This course analyzes contemporary topics such as religion and gender, and religion and politics.

RS 517 Introduction to Western Religions 3 CH
A theological and phenomenological exploration of the beliefs, history and practices of Judaism, Christianity, and Islam with particular emphasis on the sacred scriptures and spiritual traditions of each religion.

RS 518 Cults, Sects and New Religious Movements 3 CH
Explores beliefs and practices of new religions in America, including Mormonism, Unification Church, Christian Science, Scientology, Theosophy, New Age, Neopaganism, and UFO cults. Presents both sociological and theological approaches to understanding new religions.

RS 519 Women in World Religions 3 CH
An analysis of women's role in Christianity, Judaism, Hinduism, and Islam—both historical and contemporary—using theories and methods of gender study.

RS 520 Women in Christianity 3 CH
A theological, textual and gender-based examination of women in the history of Christianity, incorporating critical analysis of texts written about and by Christian women. Topics include the image of
women and woman's spirituality in the Bible, writings of the Church Fathers, mystics, sectarian movements, and the feminist reconstruction of tradition.

RS 521: Women in Islam 3 CH
This course offers both a theological and an anthropological examination of the encounter between women and Islam. Dismissing polemics, and employing writings by and about Muslim women across the full scope of the Islamic world, the course will focus on women throughout the history of Islam, how Muslim women have realized and expressed their faith and engaged in patterns of practice, and new perspectives on faith, history, religious traditions and cultural practices articulated by the new generation of Muslim women scholars and artists.

RS 522 Women in American Religion 3 CH
A critical analysis of women and religion within the context of American history and culture. This course examines religious writings/narratives by Native American women, and American women in Christianity, Judaism, and Islam. The impact of race, class, history, and/or ethnicity upon religious experience is also explored in the writings of feminist, Womanist (African-American) and Mujerista (Latina) theologians.

RS 524 The Gospel of John 3 CH
Provides a critical interpretation of the Gospel of John.

RS 526 The Letters of Paul 3 CH
Examines the social and religious world of St. Paul, his biography, his writings in the New Testament, and how these influenced the developing Christian church.

RS 529 The Historical Jesus 3 CH
Attempts to recover the words and actions of the historical Jesus through a proper methodological examination of the sources. Special emphasis is given to the parables of Jesus.

RS 530 The Death of Jesus 3 CH
Traces the development of the traditions of the passion and death of Jesus as they are found in the gospels of Matthew, Mark, Luke, and John.

RS 532 Contemporary Religious Thinkers 3 CH
Examines the selected, representative writings of specific religious thinkers. In any given semester, the course focuses on the work of either an important theologian or a contemporary scholar of religion. (Students should consult the instructor to obtain information concerning the topic for that semester.)

RS 533 Religion and Ecology 3 CH
Examines how religion has shaped humanity's relationship with nature, and explores various religious and philosophical responses to contemporary ecological problems.

RS 535 Religion and Sexuality 3 CH
Introduction to the Study of Religion. Examines the relationship between religion and sexuality in various world religions. Topics include asceticism vs. eroticism, defining normality and deviance, sex as a means to challenge or maintain the social order, religious responses to the changing sexual morality in contemporary Western society.

RS 536 Catherine and Teresa 3 CH
Catherine of Siena and Teresa of Avila have both been named as “Doctors” of the Roman Catholic Church, an honorific granted to very few women, and indicative of the degree to which each woman has enriched the Catholic faith with her distinctive charism, her theological writings and her spiritual gifts. The course will explore the significant theological contributions of both women, contextualizing them and their works within their respective historical, religious and social milieus: Catherine (+1380) in 14th century Italy, and Teresa (+1582) in 16th century Spain. The course will also examine Dominican (Catherine)
RS 538 Spiritual Teachers and Thinkers 3 CH
Explores the representative spiritual writings of a specific religious teacher from the history of the world’s religions. Examples of such spiritual teachers include Hildegard of Bingen, Meister Eckhart, George Fox, Teresa of Avila, Ibn al’Arabi, and Martin Buber. Consult instructor for relevant topic.

RS 540 Understanding Theology 3 CH
Provides an introduction to the nature and role of theology. This course investigates both academic or “public” theology and confessional or Church-centered theology.

RS 542 Medieval Theology 3 CH
A critical examination of central doctrines of Christianity, Judaism, and Islam as they developed during the Middle Ages. This course analyzes particular modalities of theological expression such as mysticism, sacred art/architecture, and women’s visionary writings.

RS 543 Early Christian Thought 3 CH
Traces the course of the Church’s historical and dogmatic traditions from the New Testament period to the Middle Ages.

RS 544 Christian-Jewish Understanding 3 CH
Examines the historical and theological relationship between Judaism and Christianity beginning at the time of Jesus, which resulted in the separation of and misunderstanding between Christians and Jews through the Patristic period, Renaissance, Middle Ages, until the present time. Particular attention is paid to the recent positive studies in interreligious understanding advanced by the Second Vatican Council.

RS 555 History of Christian Ethics 3 CH
The ethical reflections of some of the most influential Christian thinkers from the Church fathers to the present (e.g., Augustine, Thomas Aquinas, and Martin Luther) applied to various important topics of ethical debate in Christian history (e.g., the notion of just war). A survey of the most important thinkers and documents in the history of Christian ethical reflection.

RS 560 Bioethics: Religious Approaches 3 CH
Introduces students to the methods and principles of biomedical ethics, and explores several ethical issues in medical practice and health care policy. The theoretical frameworks employed include religious-ethical perspectives in Christianity and some other religious traditions, as well as philosophical and social critiques and proposals. Major topics covered include euthanasia, reproductive technologies, human cloning, consent for experimentation, and allocation of health care resources.

RS 561 Symbol, Myth and Ritual 3 CH
Defines the basic categories of symbol, myth and ritual and explores their religious significance. Theoretical analyses of the symbolic imagination are also examined.

RS 562 Human Rights 3 CH
Investigates philosophical and religious theories of human rights, the modern history of rights, and ways to implement a human rights agenda.

RS 566 Foundations of Catholic Ethics 3 CH
Explores the historical sources and methods of reasoning in the Roman Catholic moral tradition. Critically examines current moral issues in Catholicism.

RS 567 Mysticism 3 CH
This course introduces the student to the dimension of spirituality known as mysticism, through readings in and critical analysis of mystical texts of the world’s religions, including Tao te Ching, the Hindu Upanishads, Zohar and other Kabbalistic texts, the poets
of Sufism, and Christian mystics from the history of Christianity.

RS 568 Classics of Western Spirituality 3 CH
Provides a close examination of the writings of one or more of the great spiritual masters of the Western religious traditions (e.g., John of the Cross, Theresa of Avila, Ignatius Loyola, Teilhard de Chardin, Martin Buber and Thomas Merton).

RS 575 Death and Dying in World Religions 3 CH
All religious traditions have regarded the process of dying unto physical death as a natural but also sacred state of being that imparts to life its deepest meaning and value. This course is the opportunity to explore, examine and analyze the perspectives on and beliefs about dying, death, and subsequent conditions of existence, that religious traditions, across historical time and geographical space, have promulgated. Students will examine the different spiritual practices around dying and death each religious tradition has formulated, and wider cultural responses to those beliefs and practices. Additionally, students will examine certain theologies of suffering and grief.

RS 577 Pilgrimage and Spiritual Journeys 3 CH
Introduces the religious ritual activity of pilgrimage, a spiritually inspired journey in time and over space. The concept is studied in several religions and from several methodological angles that occurs in many religious traditions.

RS 581 Religion, Health and Healing 3 CH
Explores theories and practices of healing in Eastern, Western and Primal religions. Examines research on connections between religion and health and efficacy of alternative and spiritual therapies.

RS 589 Religion, War and Peace 3 CH
Examines various religious perspectives on violence, war and the quest for peace.

RS 591 Religious Themes in Contemporary Fiction 3 CH
Explores the religious dimensions in the fiction of writers such as Cynthia Ozick, John Cheever, Toni Morrison and Italo Calvino.

RS 594 Elementary New Testament Greek 3 CH
An introduction to the nominal and verbal systems of Hellenistic Greek, this course provides a basis for reading the Greek New Testament.

RS 595 Intermediate New Testament Greek 3 CH
A study of the syntax of Hellenistic Greek in union with selected readings from the Greek New Testament. The aim of the course is to achieve a moderate reading proficiency.

RS 599 Special Topics in Religion 3 CH
Designates new or occasional courses that may or may not become part of the department’s permanent offerings. Courses capitalize on a timely topic, a faculty member’s particular interest, an experimental alternative to existing courses, etc. Course title is shown on the student’s transcript. Consult the current course schedule for available topics.

RS 601 The Church: Roman Catholic Perspectives 3 CH
Investigates Catholic thinking and teaching about the nature of the Church.

RS 602 The Roman Catholic Sacraments 3 CH
Explores the history of the sacraments, the theology behind them and their role in contemporary Catholic life.

RS 699 Independent Study 1–3 CH
An area of study for which no course is presently provided. The student must find an instructor competent in his or her proposed topic and secure the permission of the program director, chairperson, and the dean.