

# THE GRADUATE SCHOOL

At Loyola University Chicago's Graduate School, we cultivate leaders—scholars who are motivated to make a real difference in the world. From academic fields to professional specialties, the Graduate School offers advanced study and research programs on the leading edge of a wide variety of disciplines in the humanities, natural and biomedical sciences, social sciences and the professions. The Graduate School's inception in 1926 has been marked by innovation, excellence, and commitment to teaching, research, and service. Over the years, the Graduate School has witnessed relatively steady growth and its programs have reflected the university's response to societal needs, university resources, and shifting academic environments.

The programs that today fall under the aegis of the Graduate School represent a combination of programs with deep roots and those that are relatively young in the school's range of offerings. Approximately 1,500 graduate students are enrolled in 25 PhD programs, two professional doctorate programs, 39 master's programs, 9 dual degree programs, 10 certificates, and 20 advanced bachelor's/master's programs. They work with more than 600 graduate faculty members on three campuses. We are a dynamic community of researchers and scholars united in a commitment to developing new knowledge, providing high quality training, enhancing professional credentials, and fostering creativity.

Because Loyola graduate programs have an ethics component, the University's Graduate School provides both the opportunity and the impetus for students from a wide variety of disciplines to conduct research that directly benefits humanity. The Graduate School serves the needs of students and faculty who work at the highest level of excellence in their field and fosters projects that build communities, promote social justice, address the complex problems confronting society, and promote global awareness.

Why Loyola University Chicago? Graduate students at Loyola learn from faculty members who are as committed to mentoring, instruction and intellectual discourse with students as they are to research and scholarship. Our setting in the heart of Chicago allows students to apply their knowledge through outstanding internship and field study opportunities at leading institutions and research settings throughout the metropolitan area. The rigorous intellectual environment at Loyola is informed by our commitment to serving our community and our world, in keeping with Jesuit values, a tradition that has typified Loyola University Chicago since its founding in 1870.

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## Graduate & Professional Standards and Regulations

Students in graduate and professional programs can find their Academic Policies in Graduate and Professional Academic Standards and Regulations (<https://catalog.luc.edu/graduate-professional-academic-standards-regulations/>) under their school. Any additional University Policies supercede school policies.

## Biochemistry & Molecular Biology (BMB)

### **BMB 400 Special Topics: Molecular Biology (1-3 Credit Hours)**

Courses of half a semester to a semester on different topics of molecular biology, treated in depth with readings of the current literature.

*Outcomes:*

To learn about diverse areas of Molecular Biology which are not treated in regular courses

### **BMB 417 Molecular Biology (3 Credit Hours)**

The Biochemistry and Molecular Biology course will cover diverse subjects of importance to modern cell and organismal biology from a molecular biology perspective.

### **BMB 471 Comp Molecular Genetics (3 Credit Hours)**

This course introduces advanced students to the importance of genetics to a wide range of biological problems.

*Outcomes:*

Students will demonstrate an ability to read, think, write, and speak critically about various genetic approaches used to identify essential genes, mutagenesis and recombination, transcription, development, symbiosis, and pathogenesis

### **BMB 490 Special Topics in Molecular Biology (1-3 Credit Hours)**

This course covers a specific topic in molecular biology. The topics can vary among different special topics courses.

### **BMB 499 Research in Molecular Biology (1-9 Credit Hours)**

The students do mentored work in a laboratory on a research project. Their performance is evaluated by their mentor at the end of the year, and is given a pass/not pass grade.

*Outcomes:*

To develop the ability to organize a research project proposing hypotheses and testing them in the laboratory and against the current literature

### **BMB 501 Molecular Biology Journal Club (1 Credit Hour)**

This is a weekly course where students take turns to present a scientific paper. Following the presentation there is a discussion by students and faculty. Students prepare the presentation under the supervision of a faculty mentor.

*Outcomes:*

To develop the ability to read and analyze a scientific paper and to develop oral presentation skills and appropriate visual aids

### **BMB 502 Seminar in Molecular Biology (0 Credit Hours)**

Biweekly seminars where invited speakers from outside the institution present their work. The presentation is followed by a discussion by students and faculty.

*Outcomes:*

To become familiar with current research in different molecular biology areas by listening to the actual scientist developing the work

### **BMB 524 Molecular Biology & Genetics of Development (2 Credit Hours)**

This is a weekly course on Molecular aspects of Developmental Biology, with a mixture of lectures, discussions of original papers and presentations by external speakers.

*Course equivalencies:* X-BICH524/MBIO524

*Outcomes:*

An understanding of the principles of developmental biology with emphasis in the molecular genetics of development

### **BMB 526 DNA Repair & Recombination (2 Credit Hours)**

This is a weekly course on mechanisms of mutagenesis, genetic repair and recombination. The course uses a mixture of lectures and discussions of original scientific papers.

*Course equivalencies:* X-MBIO526/BICH526

*Outcomes:*

An understanding of the basic mechanisms of mutagenesis, genetic repair, homologous recombination, and non-homologous end joining

### **BMB 590 Molecular Biology of Oncogenesis (2 Credit Hours)**

The course will cover different subjects in cancer molecular biology with a combination of lectures and discussions of original scientific papers.

*Outcomes:*

A basic knowledge about mechanisms of oncogenesis and the biology of cancer, and an ability to search and understand the classic as well as modern literature on the subject

### **BMB 595 Thesis Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the masters of science thesis and degree.

### **BMB 600 Dissertation Supervision (0 Credit Hours)**

The students work on their dissertation under the supervision of their mentor and of their dissertation committee. Their progress is evaluated by their mentor and is given a letter grade.

*Outcomes:*

Development of the dissertation project, writing and defense of the dissertation

## Bioethics & Health Care Leadership (BEHL)

### **BEHL 401 Clinical Topics in Bioethics (3 Credit Hours)**

This course provides an overview of the major areas of clinical biomedical ethics guided by extensive use of case discussions and analysis which will help to develop ethical problem-solving skills.

*Course equivalencies:* IPS 651/BEHP 401/BEHL 401

**BEHL 402 Justice & Health Care (3 Credit Hours)**

This course provides an overview of justice and health care with special emphasis upon the developing world by examining prevailing theoretical frameworks and how justice is played out in various health care systems.

**BEHL 403 Ethics Care Continuum (3 Credit Hours)**

This course prepares students to identify biomedical ethics issues in settings such as long-term care, rehabilitation care, dentistry, and alternative medicine, and to develop moral frameworks for addressing these issues.

**BEHL 404 Biomedical Ethics and Law (3 Credit Hours)**

This course serves as an introduction to biomedical ethics and the law and will introduce the history of bioethics and the US legal system by surveying a number of seminal legal cases.

**BEHL 405 Research and Ethics (3 Credit Hours)**

This interactive seminar will explore the responsible conduct of science with a focus on ethical issues in clinical research involving human participants.

**BEHL 406 Principles of Health Care Ethics (3 Credit Hours)**

This course provides an overview of important theories in bioethics and will examine major works by leading bioethics scholars to become more familiar with different approaches in the field.

**BEHL 407 Social Determinants of Health and Bioethics (3 Credit Hours)**

This course will review the theoretical work on social science (anthropology, sociology) and moral reasoning as it pertains to the discipline of bioethics, its philosophical roots, and the body of social science works in bioethics.

**BEHL 408 Ethics, Genetics and Health Policy (3 Credit Hours)**

This course provides an introduction to genetic ethics and a survey of topics that constitute the professional and popular literature in the field.

**BEHL 409 Religion and Bioethics (3 Credit Hours)**

This course is a thematic exploration of religion and bioethics with a specific concentration on its implications at the end of life.

**BEHL 410 Ethics Consultation (1-3 Credit Hours)**

This is a two-month course of online learning which includes a 3-day on-campus intensive experience for students including didactic sessions and ethics consultation skills development.

**BEHL 411 Public Health Ethics (3 Credit Hours)**

This course introduces current ethical issues in public health research, practice, and policy.

**BEHL 412 Organizational Ethics: Business, Professionalism, and Justice (3 Credit Hours)**

This course examines ethical issues in health care from the vantage point of decision makers who shape the system, e.g., physicians, health system administrators, community advocates, etc.

*Course equivalencies:* IPS 652/BEHP 412/BEHL 412

**BEHL 413 History of Medicine and Bioethics (3 Credit Hours)**

This course seeks to situate and examine the emergence and development of the field of bioethics within the history of medicine and the ethical concerns embodied in medicine's practice.

**BEHL 414 Moral Theology for Bioethics (3 Credit Hours)**

This course provides an introduction to Catholic moral theology through a historical review of its development and a consideration of key documents, events, arguments and concepts beginning with the scriptural witness of Christ and concluding with the moral teaching of John Paul II as it bears upon contemporary Catholic moral theology.

*Outcomes:*

Its goal is to assist in establishing an historical and theoretical foundation for those who are interested in bioethics as it is considered and practiced in the Catholic tradition

**BEHL 415 Ethical & Religious Directives for Catholic Healthcare Leadership (3 Credit Hours)**

This course offers a topical survey of bioethical issues pertinent to clinical practice in the Catholic context. The United States Conference of Catholic Bishops' document, Ethical and Religious directives for Catholic Health Care Services, 5th Edition, serves as the guiding document of the course. Topics and concepts considered include abortion, contraception, sterilization, nutrition and hydration, withdrawal of life support, care of the dying, cooperation, conscience, human dignity and personhood.

*Course equivalencies:* IPS 654/BEHP 415/BEHL415

*Outcomes:*

This course aims to assist students in establishing a substantive familiarity with the positions and moral reasoning of the Catholic tradition in clinical bioethics through a consideration of Church documents, scholarly texts and articles and formative debates within contemporary Catholic bioethics

**BEHL 416 Catholic Bioethics and Social Justice (3 Credit Hours)**

This course involves an historical study of the development of the body of official Catholic Social Teaching (CST) specific to its impact on healthcare delivery in the United States. Current developments in select key social issues and movements are also addressed insofar as those issues and movements influenced healthcare delivery. The pastoral letters of the U.S. Bishops, especially their teachings on healthcare reform, also receive attention. The interface between religious faith and public policy debates is a constant concern throughout the course. Practical strategies for fostering a social justice consciousness in healthcare settings are also considered.

*Course equivalencies:* IPS 655/BEHP 416/BEHL 416

*Outcomes:*

Extensive use of case discussion and analysis will help to develop the participants' understanding of the principles of CST and their application to the healthcare context

**BEHL 417 Narrative Ethics (3 Credit Hours)**

This course will consider a major theoretical framework in bioethics that has emerged as a serious alternative to principle-based bioethics. In this course, students will gain an understanding of what narrative bioethics is, read theoretical texts related to narrative ethics, and also read a variety of narratives that relate to medicine and health care (stories, films, etc). The role of narrative in the ethics consultation process will also be explored.

*Outcomes:*

This course aims to equip students with a sophisticated understanding of narrative and the role it plays in medicine and bioethics

**BEHL 418 Advancing Health Equity Practice (3 Credit Hours)**

This course introduces the frameworks and practice of health equity as it pertains to the field of bioethics. The tools and materials help students more effectively incorporate health equity into all aspects of their work. Topics include: community health, multi-sector community engagement, and innovative approaches to clinical and community work to improve populations health.

*Course equivalencies:* IPS 656/BEHP 418 / BEHL 418

*Outcomes:*

Effectively incorporate health equity into all aspects of bioethics practice

**BEHL 419 Organizational Ethics II: Ethical Leadership for Changing Healthcare Environment (3 Credit Hours)**

This course examines the theory, role, and elements of leadership that effectively serve non-profit healthcare systems. In particular, the nature of leadership is examined. Questions of leadership style and theories of what constitutes effective leadership are considered.

*Course equivalencies:* IPS 653/BEHP 419/BEHL 419

*Outcomes:*

Key focus on communication strategies and methods of organizational change

**BEHL 420 Advanced Topics in Bioethics and Law (3 Credit Hours)**

This class will explore the historical relationship between law and bioethics and examine how law and bioethics come together or may be at odds. Recognize/discuss changing nature of physician-patient relationship, continuing evolution of informed consent, intersection of commerce and science, changing definition of death, growing complexity of reproduction.

*Outcomes:*

Resolve dilemmas raised by changing biotechnology

**BEHL 421 Practicum in Clinical Ethics (3 Credit Hours)**

*Pre-requisites:* Department Consent *Outcomes:* This practicum will expose students to the practical applications of clinical ethics. The goal of the clinical ethics practicum is to provide doctoral students on the clinical ethics track the opportunity to use knowledge and skills acquired in the academic program in a clinical setting (e.g. community hospital or academic medical center), under the direction of a preceptor at that setting.

**BEHL 422 Practicum in Organizational/Public Health Ethics (1-3 Credit Hours)**

*Pre-requisites:* BEHL 419

The practicum will enable the student to work on a project which translates both general and discipline-specific information into organizational ethics or public health practice. Students must demonstrate the capacity to utilize knowledge and make evidence-based decisions regarding these topics, and exhibit leadership, creativity, and the ability to work well with others.

*Outcomes:*

Goal of the practicum is to provide students the opportunity to use knowledge and skills acquired in the academic program in a professional setting under the direction of a preceptor

**BEHL 423 Doctoral Capstone I (3 Credit Hours)**

*Pre-requisites:* Oral and Written Qualifying Exams

This course is an opportunity for doctoral students in our program to further develop a paper from their practicum experience and/or another course and revise it into a manuscript of publishable quality.

*Outcomes:*

Publishable peer-reviewed paper

**BEHL 424 Doctoral Capstone II (3 Credit Hours)**

*Pre-requisites:* BEHL 423

This course is an opportunity for doctoral students in our program to further develop a paper from their practicum experience and/or another course and revise it into a manuscript of publishable quality.

*Outcomes:*

Students will be required to appear on campus for a capstone presentation with faculty

**BEHL 425 Empirical Bioethics (3 Credit Hours)**

Provides an overview of empirical research in the increasingly interdisciplinary field of bioethics. Will examine the relationship between empirical data and normative claims and potential pitfalls that may arise when using information about what (is) to determine what (ought) to be done.

*Outcomes:*

Students will gain familiarity with the range of quantitative and qualitative research methods used in bioethics as well as academic disciplines, understanding of empirical studies on ethical problems in medicine, public health policy, and clinical research; Discussions will be relevant to a range of professional settings

**BEHL 426 Ignatian Spirituality and Medicine (3 Credit Hours)**

This course will explore the roots of Ignatian Spirituality as presented in the Spiritual Exercise and other writings of Ignatius Loyola and the early Jesuits. From this historical starting point, the course will shift to explore key themes that have emerged from this spiritual tradition as it relates to medicine, paying special attention to the Spiritual Exercises.

*Outcomes:*

This course aims to assist students in establishing a substantive understanding of Ignatian spirituality and the tradition of Jesuit education in which they participate as a means for leading faithful, joyful, and hopeful lives as physicians

**BEHL 427 Professionalism and Professional Ethics (3 Credit Hours)**

This course will review and critically examine the professional codes of ethics of a variety of health-related professions: medicine, nursing, dentistry, social work, chaplaincy, risk management, and allied health. We will examine the growth of professionalism as a movement and answer questions related to this topic.

*Outcomes:*

Understand what is a profession, what are professional ethics; Difference between common morality and professional ethics, and difference between applied ethics and professional ethics; We will also discuss whether a pan-professional ethics code is needed for the health care professions

**BEHL 428 Writing and Scholarship Skills (3 Credit Hours)**

Writing skills are an essential form of communication not only between the instructor and students but also among and between the students themselves. Topics covered: Academic Integrity; Grammar; Resource Development/Citation; Clarity/Formality; Development of a Thesis and Writing of a Thesis Statement; Organization and Outlining; Critical Thinking/ Analysis/Reasoning; and Development of a Conclusion.

*Outcomes:*

This course will provide a review of basic writing skills as well help students develop analytical and communication skills that are critical to scholarly writing in the multidisciplinary field of bioethics

**BEHL 429 Pediatric Ethics (3 Credit Hours)**

This course will introduce ethical topics in the areas of pediatric medicine and research. Topics to be addressed may include decision making, neonatal issues, teens and decisional authority, research with minors.

*Outcomes:*

Discover aspects of the pediatric population that raise unique concerns, create novel moral environments, and thus require nuanced and sensitive attention to and tools of ethical inquiry

**BEHL 430 Advanced Clinical Ethics Skills (3 Credit Hours)**

*Pre-requisites:* BEHL 410 Ethics Consult Simulation Seminar

Two-month blended course of online learning and two-day intensive experience on Health Sciences Campus in Maywood. Course provides an opportunity for advanced graduate students to improve and refine clinical ethics skills. Participants will practice consultation skills, evaluate performance of others, and receive feedback from faculty reviewers.

*Outcomes:*

Students will develop their own portfolio for quality attestation

**BEHL 431 Current Debates in Research Ethics (3 Credit Hours)**

*Pre-requisites:* BEHL 405 or permission from instructor

This course will focus on unique ethical issues that arise in research with special populations. Included but not limited to children; women, fetuses, and embryos; prisoners; indigenous and racial/ethnic minority communities; healthy volunteers. Research in emergency and international settings as well as research at the end-of-life will be discussed.

*Outcomes:*

Material covered in this course will be relevant for ethicists, IRB members, and clinical investigators

**BEHL 432 Global Bioethics (3 Credit Hours)**

This course will survey major topics in global bioethics. Students will be introduced to global bioethics frameworks, practices, and governance bodies in order to place bioethical problems in a global context. Attention will be given to how the global realities of health disparities and neoliberal economic policies impact bioethical questions. Guest lecturers will share experiences working in clinical ethics, public health, social justice, health care policy, and research across the globe.

*Outcomes:*

Students will gain knowledge regarding clinical ethics, public health, social justice, health care policy, and research across the globe

**BEHL 433 Mastering Clinical Ethics Consultation (3 Credit Hours)**

*Pre-requisites:* BEHL 410 and BEHL 430

This 2 week on-campus course provides an opportunity for advanced bioethics doctoral students in the clinical ethics concentration to refine their clinical ethics skills to a mastery level. Students will participate in simulated ethics consultations, practice communication and interpersonal skills and receive feedback on their performance. With access to LUHS, students will participate in clinical rounds, case discussions, and active ethics consultations and debriefing sessions. This course will require students to reach a predefined mastery level of skill in simulated ethics case consultations using the Assessing Clinical Ethics Skills (ACES) evaluation tool. They will also be required to write chart notes for ethics consultations.

*Outcomes:*

Students will achieve mastery of clinical ethics consultation skills, written chart notes, and improve communication and interpersonal skills

**BEHL 491 Special Topics (1-3 Credit Hours)**

Provides an opportunity to introduce new courses.

**BEHL 492 Master's Research - Capstone (3 Credit Hours)**

The capstone course is the final course which provides an opportunity for the student to develop a paper of publishable quality.

**BEHL 493 Independent Study (3 Credit Hours)**

This course will provide students with a broad introduction to the history and role of mission leadership in Catholic health care and will introduce students to the five main competency areas: theology/ministry, spirituality, ethics, organizational management/finance, and leadership. Guest faculty lecturers will share experiences working in mission integration in Catholic health care.

*Outcomes:*

Students will be introduced to the CHA "Competencies for Health Care Mission Leadership" in order to understand the scope of the position and how the various competency areas interact

**BEHL 500 Introduction to Healthcare Mission Leadership (3 Credit Hours)**

This course will provide students with a broad introduction to the history and role of mission leadership in Catholic health care and will introduce students to the five main competency areas: theology/ministry, spirituality, ethics, organizational management/finance, and leadership. Guest faculty lecturers will share experiences working in mission integration in Catholic health care.

*Outcomes:*

Students will be introduced to the CHA "Competencies for Health Care Mission Leadership" in order to understand the scope of the position and how the various competency areas interact

**BEHL 501 Church and Mission (3 Credit Hours)**

In the 21st century the Church is a concept best understood within a global context. We will explore the biblical and apostolic concept of Church progressing through Vatican II. We will also examine the four marks of the Church from both historical and contemporary perspectives.

*Course equivalencies:* X-IPS 402/ BEHL 501

*Outcomes:*

Articulate a vision of Church, evaluate and critique different ecclesiologies, and understand the development and structure of the Church from biblical times through Vatican II and contemporary times

**BEHL 502 Christian Doctrine (3 Credit Hours)**

This course surveys the historical evolution of Christian doctrine and its theological interpretations from the early church through the 21st century. It assists students in understanding how theological doctrines apply to contemporary ministry contexts, particularly the work of Catholic health care. The course explores the early Christological controversies, the Trinity, Grace, liberationist theologies, and the role of dialogue as a fundamental feature of the development of doctrine.

*Outcomes:*

Students will understand theological doctrine and apply to contemporary ministry contexts in Catholic health care

**BEHL 503 Foundations of Christian Spirituality (3 Credit Hours)**

Christian spirituality (the 'lived experience of Christian faith') is a separate but partnered academic field with theology today. Key issues are: defining 'spirituality', methods in the field, spirituality vs. institutional religion, Jesus Christ (christology), major figures and movements in Christian spirituality's 2000 year history, and classical and contemporary themes.

*Course equivalencies:* X-IPS 545 / BEHL 503

*Outcomes:*

Facility defining spirituality and Christian spirituality, and an informed understanding of the person Jesus Christ, the history of Christian spirituality, and the relationship of spirituality to theology and institutional religion

**BEHL 504 Spiritual Paths in World Religions (3 Credit Hours)**

This course explores the spirituality, theology, and practice of the major religious traditions. You will encounter other faith traditions by entering into their sacred prayer and worship experiences and learning from practitioners of that tradition how they encounter the sacred in their own lives.

*Course equivalencies:* X-IPS 403/BEHL 504

*Outcomes:*

Recognize the vast complexity of every religious tradition, resisting the urge to oversimplify; Engage those who practice other traditions in conversation; Experience the spiritual practice of other religious traditions

**BEHL 505 Advanced Concepts in Health Systems Management (3 Credit Hours)**

The course is structured around a framework that links strategic management with health care outcomes for today and tomorrow. Areas covered include: leadership, team building, planning, customers, markets, information and analysis, communication skills, conflict resolution, resource management, budgeting and organizational performance.

*Course equivalencies:* X-CMAN 468/BEHL 505/IPS 657

*Outcomes:*

Analyze major strategic management processes, describe how evidence-research practice can be applied in health systems management, and integrate a framework for strategic management with the key concepts of outcomes-based performance management

**BEHL 506 Fiscal Management for Health Care Organizations (3 Credit Hours)**

The course explores the relationship between the national economic environment and the financial context for current models of health care delivery. A variety of fiscal concepts and techniques such as cost accounting, cost behavior, budgeting, cost benefit/cost effectiveness analysis, cost-volume-profit analysis, cost variance analysis, and performance budgeting are explored.

*Course equivalencies:* X-IPS 658/CMAN 533/BEHL 506

*Outcomes:*

Students will develop a framework for understanding key issues in health care financial management; Students will develop a quantitative approach to decision making in health care administration through application of concepts

**BEHL 510 Integrated Doctoral Seminar in Ethics, Theology, and Healthcare (3 Credit Hours)**

The Integrated Seminars in Ethics, Theology and Healthcare (ISETH) are the core of the Doctorate in Healthcare Mission Leadership (D.HMCL) degree program. Students in the DHCML program are required to complete three of these seminars, which will be offered every Fall and Spring term with variable topics, as part of their degree program. These courses will be primarily theoretical and methodological in focus, rather than practical.

*Outcomes:*

This course is designed to build on and integrate students' prior graduate coursework in theology and bioethics with their ongoing work in Catholic healthcare

**BEHL 511 Mission, Leadership, and Spiritual Formation Seminar (3 Credit Hours)**

This course explores the theology, traditions, and current practices foundational for understanding and achieving formation as an essential offering of Catholic health care ministries. By examining a Face to Face Online Hybrid (greater than 75% online) Blended (30%-70% online) variety of methods and models of formation programs of Catholic healthcare in the United States, students will cultivate personal practices that enhance their ability to design and operationalize experiences for persons in various roles within the ministries they serve - from new associate orientation to senior leadership.

*Outcomes:*

Gain an understanding and practical ability to ensure the programs, resources, and encounters they design and facilitate are grounded in tradition of Catholic ministry, inviting to diverse participant populations, and support the achievement of specified outcomes; In so doing, understand and develop skills necessary to implement integrative, professional, and valued programs of formation

**BEHL 512 Canon Law, Sponsorship, and Church Relations (3 Credit Hours)**

This two-month course explores the theology, traditions, and practical applications of canon law in the context of Catholic health care. The course will provide an overview of canon law, the emerging theology of sponsorship and ministerial juridic persons, and review a variety of models of church relations current in contemporary Catholic health care.

*Outcomes:*

Students will gain fluency in canon law, gain knowledge of the particular canons in Catholic health care, and develop a deeper understanding of sponsorship in order to understand the specific sponsorship model applicable to their own healthcare context

## Bioinformatics (BIOI)

**BIOI 400 Programming Biology (1 Credit Hour)**

This is a 6-week course introduction to scripting programming languages within the framework of biological data analysis. Graduate-level standing required. Students will learn foundational methods and algorithms for analysis of biological data.

**BIOI 494 Bioinformatics Research Design (1 Credit Hour)**

Course Restricted to Bioinformatics MS students Research practices, including data collection and management, the experimental design process, and tools for critical analysis and preparation of scientific literature will be discussed.

*Outcomes:*

Students can describe and implement experimental design practices in bioinformatics

**BIOI 495 Special Topics in Bioinformatics (1-12 Credit Hours)**

The field of bioinformatics is ever evolving. As new technologies develop, demand arises for new methods and tools. Courses will focus on emerging trends in bioinformatics. Restricted to Bioinformatics Graduate Students. Student will learn about emerging topics in the field.

**BIOI 498 Bioinformatics Internship (1 Credit Hour)**

*Pre-requisites:* BIOI 500

An opportunity to obtain experience, knowledge, and skills in bioinformatics within a professional setting and thus expand the depth and breadth of the student's learning. Limited to MS Bioinformatics Non-Thesis track students only.

*Outcomes:*

Students can apply foundational principles in bioinformatics into practice

**BIOI 499 Bioinformatics Research (1-12 Credit Hours)**

*Pre-requisites:* Prerequisite: BIOI 494

Students will conduct independent hypothesis-driven bioinformatics research under faculty guidance. Research efforts will include literature surveys, experimental design, algorithm and software development, and data analysis. Limited to MS Bioinformatics Thesis track students only.

*Outcomes:*

Students can develop and utilize techniques for bioinformatics research

**BIOI 500 Advanced Bioinformatics (3 Credit Hours)**

*Pre-requisites:* BIOL 388 or BIOL 488

Students will study fundamental bioinformatics algorithms and emerging software tools in the field. The course will include the study of primary literature and design and implementation of bioinformatics algorithms.

*Course equivalencies:* X- BIOI 500 /BIOL 450

*Outcomes:*

Students can describe, design, implement, and evaluate bioinformatics algorithms

**BIOI 501 Bioinformatics Seminar (1-2 Credit Hours)**

*Pre-requisites:* BIOL 388 or BIOL 488

The seminar will introduce students to current topics in bioinformatics through presentations given by leaders in bioinformatics research. This course will also include more formal training in scientific presentation skills.

*Course equivalencies:* X-BIOI501/BIOL451

*Outcomes:*

Students can summarize, critique, and present bioinformatics research

**BIOI 565 Exploring Proteins (3 Credit Hours)**

*Pre-requisites:* Biochemistry, restricted to Bioinformatics Graduate Students

Proteins are polymer chains of amino acids that fold into compact states that differ in structure, size, shape, and dynamics. Computational tools are essential for the prediction of protein structures, protein interactions, and structure-based drug design.

*Outcomes:*

Students will learn the concepts of building blocks of protein structure, and protein folding

**BIOI 595 Thesis Supervision (1 Credit Hour)**

*Pre-requisites:* BIOI 499

Laboratory research under faculty guidance including training in scientific writing and the production of a thesis and research presentation.

*Outcomes:*

Students will develop skills in scientific writing and presentation; At the conclusion, students will present (written and oral) the results of their research

**BIOI 605 Master's Study (0 Credit Hours)**

This course provides FT status for a student who needs to meet the continuous enrollment requirement of the Graduate School while completing program requirements.

## Biology (BIOL)

**BIOL 401 Medical Literature and Ethics (3 Credit Hours)**

The course will include lectures on the foundational concepts of modern ethics, in class discussions of ethics primarily centered on discussion of cases from different ethical perspectives, quizzes to assess reading mastery and familiarity with material to qualify students on how to discuss cases and formal case presentations by student working groups.

**BIOL 402 Microbiology (3 Credit Hours)**

Lecture and laboratory. Fundamental concepts of microbial life, physiology, and metabolism.

*Outcomes:*

Students will learn the differences between the 3 domains of life and will comprehend the biochemistry, morphology, growth characteristics, structure and ecology of microbes

**BIOL 405 Advanced Development (3 Credit Hours)**

Developmental Biology draws from Genetics, Molecular Biology, Genomics, and Embryology and is a foundational science for understanding problems in Humans ranging from birth defects to cancer. Because of its multidisciplinary foundation, Developmental Biology is best thought of as a SYSTEM OF IDEAS, EXPERIMENTS AND OBSERVATIONS, as such you will greatly expand your scientific vocabulary and problem solving abilities during the course of this semester. Often you will need to draw on your stored knowledge from many disciplines to understand the topics we will cover. The course will comprise lectures on general development, evolution and developmental genetics, followed by discussions of papers on particular topics, and student presentations.

**BIOL 408 Writing for the Medical Professions (3 Credit Hours)**

This course will be required for the Master of Arts in Medical Sciences (MAMS) program. It will include readings related to developing the student's physician persona, and writings that are required for the medical school application process. Pre-requisites: Admission to the MA in Medical Sciences program.

*Outcomes:*

Students will be prepared to write effective primary and secondary essays for their medical school applications; communicate clearly their motivation to pursue a career in medicine and the relevance of their experiences to their pre-medical preparation

**BIOL 409 Advanced Genetics (3 Credit Hours)**

*Pre-requisites:* Restricted to students in the MAMS Program (Note: MAMS = MSCI-MA)

The course will comprise formal discussions on the molecular basis of information storage and retrieval in the cell, the role of genetics in human development and homeostasis, the mapping of human genes in familial or population contexts, and modern understanding of the connection between genotype, phenotype and human traits.

**BIOL 410 Advanced Cell Biology (3 Credit Hours)**

This course explores, in depth, the life cycle and activities of a typical eukaryotic cell. Some of the topics covered are cell polarity, cytoskeleton, plasma membrane, protein modifications and trafficking, extracellular matrix and cell death. Competencies to be gained in this course: To develop the skill of reading and analyzing the primary literature on topics pertaining to cell biology. Judging whether a conclusion is supported by sufficient data. Identifying the controls in published experiments. Exam-taking skill improvement using short reading passages from the scientific literature as topics.

**BIOL 413 Advanced Immunology (3 Credit Hours)**

Introduces innate and adaptive immunity, lymphocyte development, T-cell and B-cell mediated immunity, leukocyte trafficking, immunological memory hyperimmune reactions, autoimmunity, tumor and transplant immunity. Must be enrolled in the Master of Arts in Medical Sciences (MAMS) program.

*Outcomes:*

Students will acquire an overview of the human immune system that prepares them for success in a medical school immunology class

**BIOL 415 Advanced Parasitology (4 Credit Hours)**

Lecture and laboratory. A study of animal parasites, their distribution, structure, adaptations, life cycles, and host relationships.

*Outcomes:*

Students will learn to recognize the major groups of animal parasites, be able to explain their life cycles and describe the mechanisms that hosts use to ward off parasite infestation

**BIOL 416 Limnology Lec/Lab (4 Credit Hours)**

Lecture and laboratory. An introduction to the structure and function of lake and stream ecosystems. The course includes the integration of physical, chemical, and biological parameters. Laboratories include weekend field trips to aquatic habitats. Students will learn to evaluate the trophic status and health of a lake by the end of the course.

*Outcomes:*

Students will learn methods of sampling and analyzing physical, chemical and biological factors in lake and stream ecosystems, and how to integrate these complex data sets to answer ecosystem process-level questions

**BIOL 417 Wetland Ecology Lec/Lab (4 Credit Hours)**

Lecture and laboratory. An introduction to the study of wetlands habitats. This course includes discussion of physical and chemical factors, biota, production and community dynamics. Laboratories include several field trips to regional wetland habitats.

*Outcomes:*

Students will understand the functioning of wetlands, become aware of the variety of wetlands and become familiar with wetland biota, especially wetland plants

**BIOL 418 Aquatic Insects Lecture & Laboratory (4 Credit Hours)**

Lecture and laboratory. This course focuses on the classification and ecology of insects that have become fully or partially adapted to the aquatic environment. Emphasis will be on the ecology and biology (behavior, physiology and phylogeny) of aquatic insects. The course includes laboratory field trips to local and upper Midwest aquatic habitats.

*Outcomes:*

Students will acquire an understanding of the ecological relationships between aquatic insects and their physical and biological environment, including their interactions with humans

**BIOL 422 Research (1-6 Credit Hours)**

Laboratory or field research under faculty guidance emphasizing hypothesis testing, literature searches, experimental design, and use of appropriate techniques.

*Outcomes:*

Students will learn the full set of research skills required in doing an independent project and reporting the results

**BIOL 426 Entomology Lec/Lab (4 Credit Hours)**

Lecture and laboratory. An introductory course that covers the morphology, metamorphosis, classification and biology of the major insect groups. The laboratory includes dissection and the use of analytical keys and figures to identify insect taxa. Field trips and student collections add to the laboratory experience. They will also learn to distinguish immature insects from adult insects and to recognize the numerous beneficial insects as well as the small number that are detrimental.

*Outcomes:*

Students will learn to identify major insect groups in the field and in the laboratory

**BIOL 430 Virology (3 Credit Hours)**

This course covers the molecular details of viral infection and the diverse strategies used by these pathogens to invade cells and avoid immune clearance. The focus will be on mammalian viruses of biomedical relevance.

*Outcomes:*

Students will be able to demonstrate detailed understanding of basic viral structure, basic viral replication/infection cycles, and specific examples of viruses and their infection strategies

**BIOL 450 Advanced Bioinformatics (2 Credit Hours)**

*Pre-requisites:* BIOL 388 or BIOL 488

Students will study fundamental bioinformatics algorithms and emerging software tools in the field. The course will include the study of primary literature and design and implementation of bioinformatics algorithms.

*Course equivalencies:* X- BIOL 500 /BIOL 450

*Outcomes:*

Students can describe, design, implement, and evaluate bioinformatics algorithms

**BIOL 451 Bioinformatics Seminar (1 Credit Hour)**

*Pre-requisites:* BIOL 388 or BIOL 488

The seminar will introduce students to current topics in bioinformatics through presentations given by leaders in bioinformatics research. This course will also include more formal training in scientific presentation skills. Students can summarize, critique, and present bioinformatics research.

*Course equivalencies:* X-BIOI501/BIOL451

**BIOL 452 Human Anatomy and Physiology I (3 Credit Hours)**

The course objectives are to learn the gross anatomical structures of the human body. To organize the relationships between these structures and systems using patterns of innervation and development. To be able to apply anatomical knowledge in ways pertinent to clinical issues.

**BIOL 453 Human Anatomy and Physiology II (3 Credit Hours)**

*Pre-requisites:* Restricted to students in the MAMS Program

This is the second semester of a 2 semester course. We will cover the physiology of the cardiovascular, respiratory, digestive, renal, reproductive, and endocrine systems, in addition to acid-base and fluid balance, temperature regulation, and exercise physiology. Functioning will be discussed from a systems level to a molecular level.

**BIOL 455 Advanced Neuroscience (3 Credit Hours)**

This course will focus on the cellular, anatomical, and functional organization of the human nervous system that range in topics from ion channel physiology to cognition. Students will survey the elements of the nervous system necessary for a foundation for medical school. An understanding of pathologies presented in disease, dysfunction, and injury will be included.

*Outcomes:*

Learn foundational neurological concepts presented to first year medical students; Learn the pathology of neurological disease, dysfunction, and injury through clinical cases; Understand the neurological basis of higher-order functions

**BIOL 458 Developmental Neurobiology (3 Credit Hours)**

This course focuses on cellular and molecular underpinnings of the development of neuronal features of the nervous system. Topics include neural induction and subsequent differentiation events, regulation of neuronal survival, axon guidance, target selection, and synaptogenesis. Students will also learn how to critically read primary research papers and present these papers to the class.

*Outcomes:*

Students will become familiar with principles of neural development and the studies that led to those principles

**BIOL 461 Advanced Neurobiology (3 Credit Hours)**

The purpose of this course is to introduce major principles and concepts of modern neurobiology. An emphasis is placed upon an understanding of the electrophysiology of the neuron and the manner in which groups of neurons are organized into functional nervous systems subserving sensory, motor or integrative functions.

*Outcomes:*

Student will gain a solid foundation in nervous system structure and function

**BIOL 466 Advanced Biochemistry (3 Credit Hours)**

Life is based on four principle cellular components: proteins, lipids, carbohydrates, and nucleic acids. Biochemistry is concerned with the structure, function, and interactions of these compounds with one another and their environment. As such biochemistry plays a vital part in all aspects of the medical sciences since it not only helps us to understand how the (human) cell works on a molecular level but also how to decipher and possibly counter pathogenic conditions. Consider that almost all drugs used in medical treatment target proteins or groups of proteins to modulate their biochemical properties.

**BIOL 470 Biostats & Exp Design Lec/Lab (4 Credit Hours)**

This course is designed for students who are in, or plan to attend, graduate or professional school, and thus, will be working with their own data or critically analyzing existing data. This course will emphasize the theory and application of commonly used statistics in biology.

**BIOL 479 Biology AP Workshop (3 Credit Hours)**

No course description is available

**BIOL 482 Advanced Molec Genetics (3 Credit Hours)**

This course covers the molecular details of genetic processes such as DNA replication, RNA and protein synthesis, gene regulation and genome organization.

*Outcomes:*

Students will be able to demonstrate a detailed understanding of (1) basic molecular techniques, (2) the macromolecules involved in genetic processes, and (3) published experiments that underlie our knowledge of these processes

**BIOL 483 Pop Genetics (3 Credit Hours)**

Fundamental principles of population, ecological, and evolutionary genetics, including molecular evolution and analysis of the genetic structure of populations. They learn how to apply basic tools of population genetic analysis.

*Outcomes:*

Students develop knowledge and awareness of population genetic theory and information

**BIOL 485 Prin Electron Microscopy Lec/Lab (4 Credit Hours)**

Lecture and laboratory. This course focuses on the various areas of Electron Microscopy, both Scanning and Transmission. Topics include sample preparation, microscope operation, image acquisition using photographic and digital techniques, history and development, and new and special techniques. Students will also learn how to correctly interpret their results, and properly present their data.

*Outcomes:*

Student will become adept with the various techniques needed to produce research quality electron micrographs

**BIOL 488 Bioinformatics (3 Credit Hours)**

Students will engage in the applications of computer-based tools and database searching to better understand the fields of genetics, genomics, evolutionary biology, and personalized medicine. Students will be introduced to scripting programming languages for analyzing biological data sets.

*Outcomes:*

Students will be able to appropriately use computer software and databases to accurately analyze biological data and interpret the results, applying their understanding of genetic processes

**BIOL 493 Directed Reading (1-4 Credit Hours)**

Student investigates a current topic in biology.

**BIOL 495 Special Topics (1-4 Credit Hours)**

Special areas of study outside the usual curriculum, that vary each time the course is offered.

*Outcomes:*

Students will master a unique topic in biology

**BIOL 500 Scientific Logic (3 Credit Hours)**

The Scientific Logic course is designed to teach scientific literacy in terms of writing grant proposals, reading scientific literature, scientific presentations and debate. The course is framed within an evolutionary foundation.

*Outcomes:*

Students will gain knowledge in advanced evolutionary topics, while preparing a grant proposal and developing skills with respect to critical thinking and scientific inquiry

**BIOL 501 Seminar (1 Credit Hour)**

Students present specific, current research topics including their own research to the class and faculty.

**BIOL 502 Department Seminar (1 Credit Hour)**

Students meet and discuss the research presented by seminar speakers.

**BIOL 510 Instructions in Teaching Biology (1 Credit Hour)**

Introduction to the fundamentals of teaching biology.

**BIOL 511 Biology Teaching Practicum (2 Credit Hours)**

Students gain firsthand teaching experience by assisting in undergraduate courses.

**BIOL 595 Thesis Supervision (0 Credit Hours)**

Students conduct thesis research under the direction of their Thesis Director.

**BIOL 605 Master's Study (0 Credit Hours)**

Students conduct thesis research under the direction of their Thesis Director.

## Biomedical Sciences (BMSC)

### **BMSC 402 Statistical Methods for Biomedical Science (2-3 Credit Hours)**

This course covers a broad array of statistical methods for the biological and medical sciences. Topics include descriptive statistics, non-parametric methods, categorical data analysis, and regression methods for normal, non-normal, and repeated measures data. The course focuses on the analysis of real datasets using RStudio, although no previous programming experience is assumed.

*Course equivalencies:* CRME420/BMSC402/MPBH404

### **BMSC 405 Ethics in Biomedical Sciences (1 Credit Hour)**

This is an interactive seminar course where students discuss and debate ethics in biomedical sciences to foster integrity, professional character, and ethical problem solving skills.

### **BMSC 406 Special Topics (1-3 Credit Hours)**

This course covers a specific topic in biomedical sciences. The topics can vary among different special topics courses.

### **BMSC 410 Biochemistry and Molecular Biology (4 Credit Hours)**

This course will give students a broad understanding of the synthesis and functions of the major macromolecules that comprise a cell, and the biochemical mechanisms by which these molecules interact to contribute to cellular function.

### **BMSC 412 Cell Biology (4 Credit Hours)**

This course will provide students with knowledge of the structure and function of cells, including the experimental foundations of cell and molecular biology.

### **BMSC 414 Systems Biology (3 Credit Hours)**

This course will provide first year graduate students with an introduction to human physiology. Emphasis is placed on the major organ systems including the nervous, cardiovascular, pulmonary, renal, gastrointestinal and endocrine systems. Basic physiology of blood, skin and bone, as well as introductory concepts in immunology and pharmacology are also covered.

### **BMSC 416 Methods Biomedical Science (1 Credit Hour)**

This course will familiarize first year graduate students with various methods that are used in contemporary biomedical research. It will introduce methods relevant to molecular biology, tissue culture, transgenic model systems, imaging, biochemistry, bioinformatics, electrophysiology, and immunology.

### **BMSC 418 Presentation skills (1 Credit Hour)**

Scientists must communicate their work in numerous venues, from giving oral presentations in seminars and conferences to writing papers and grant proposals. This course is designed to train students in the design and delivery of effective oral presentations, a skill that can be readily adapted to serve as a starting point for written communications. Identify elements of an effective oral presentation 2. Deliver an effective oral presentation 3. Judge the effectiveness of oral presentations

*Course equivalencies:* IDIM418/BMSC418

*Outcomes:*

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### **BMSC 499 Research (2 Credit Hours)**

*Pre-requisites:* First year PhD students will register for one research rotation in the Fall semester (2 credit hours), and two research rotations in the Spring semester (3 credit hours)

Research rotation course for first year students in the Integrated Program in Biomedical Sciences.

*Outcomes:*

Research course will provide laboratory experience during the first year of study, expected to culminate in the selection of a dissertation research laboratory and mentor at the end of the first year

### **BMSC 600 Dissertation Supervision (0 Credit Hours)**

Following completion of the required 48 credit hours in the first 2 years, IPBS PhD students maintain registration via BMSC 600.

*Course equivalencies:* BMSC600/MIIM600/PIOL600

*Outcomes:*

IPBS PhD students will complete their degree work while registered for BMSC 600

## Catholic Studies (CATH)

### **CATH 400 Catholicism in the Americas (3 Credit Hours)**

This course examines social, political, and religious developments in the Americas from the colonial era with a particular focus on the years following the Second Vatican Council through the present day in order to explore a range of issues regarding the nature of religion, politics, and the role of the Catholic Church.

### **CATH 402 Catholic Church in Modern World (3 Credit Hours)**

This course will examine the Church in the modern world— with an emphasis on the relationship between Catholicism and democracy, placing particular stress on their relevance to contemporary American public life. In this context, Catholicism will be understood not only as a religious institution, but as the source of a tradition of communitarian social and political thought, while democracy will be understood not only as a form of government, but also as an ethos shaping American society. Authors and texts will include Alexis de Toucqueville, Orestes Brownson, Dorothy Day, John Courtney Murray, and relevant documents from Vatican II and the American hierarchy. The historic tension between Catholicism and democracy will be the subject of our conversation as will the possibilities for greater harmony between them. In particular, we will explore the possibility that Catholicism's communitarian orientation might serve as a corrective to American individualism and consumerism, while democratic institutions and practices might have something to offer Catholicism.

### **CATH 498 Integrative Project (3 Credit Hours)**

This is a synthesis course in which the student, in consultation with a faculty member, will independently research and develop a project that integrates subject-mastery and skills that they have developed over the course of their studies.

### **CATH 499 Independent Study (3 Credit Hours)**

Student will conduct in-depth research or reading, initiated by the student and jointly developed with a faculty member, into a specialized area of Catholic Studies not otherwise covered by course offerings.

*Outcomes:*

Students will be able to demonstrate in-depth understanding of a specialized area or topic in Catholic Studies

## Cell Biology/Neurobiology/Anatomy (CBNA)

### CBNA 405 Neuroscience (3 Credit Hours)

The student gains a fundamental knowledge of gross and microscopic structure of the human nervous system. This also includes the organs of special sense. Integrated into this structural base are the major physiological, pharmacological, and neurological aspects of the nervous system. Laboratory sessions permit individual study of the structure of the human brain and spinal cord.

### CBNA 415 Developmental Biology (3 Credit Hours)

The focus of this course is on the cellular mechanisms of differentiation, chiefly in vertebrate system. Topics include factors involved in commitment and induction, differential gene expression, role of growth factors, extracellular matrix, and cell-cell interactions.

### CBNA 421 Cellular Biology (3 Credit Hours)

A course that provides knowledge of the structure and function of cells, including the experimental foundations of cell and molecular biology (this course is the same as the BMSC 312 in the Core Curriculum).

### CBNA 425 Basic Ultrastructure (3 Credit Hours)

An introduction to the fundamentals of electron microscopy and to the ultrastructural basis of the cells and tissues of the body. The aims of the course to learn: (a) the basic operation of the electron microscope and auxiliary equipment; (b) specimen preparation techniques; and (c) and recognize the ultrastructure of cell constituents.

### CBNA 431 Advanced Neuroscience (2 Credit Hours)

A multi-disciplinary approach to the study of the nervous system at an advance level, which includes participation by faculty of various basic science and clinical departments. Topics for presentation and discussion are drawn from all aspects of the nervous system structure and function.

Special emphasis is placed on recent experimental developments in the field of neuroscience.

### CBNA 440 Neuroimmunology (1 Credit Hour)

Advanced reading course providing an overview of the CNS-immune interactions.

*Course equivalencies:* X-CBNA440/NRSC440

### CBNA 441 Signal Transduction (2 Credit Hours)

The study of the basic mechanisms of how hormone, neuroendocrine and growth factor messages are transduced into actions of the cell. Major signal transduction pathways within the cell will be explored (cross reference with Physiology 471)

### CBNA 442 Anatomical Techniques (1 Credit Hour)

A survey course presentation of various anatomical techniques that are used in the research lab is presented.

### CBNA 452 Introduction to Research (1-5 Credit Hours)

An introduction to the principles involved in conducting scientific research including hypothesis testing, experimental design and interpretation of data.

### CBNA 464 Teaching of Anatomy III (2 Credit Hours)

A practical experience in the teaching of neuroscience to medical and graduate students. Students assist in the planning, preparation and teaching of laboratory sessions. The course allows students to place the experience of teaching neuroscience on their transcripts as a graded course indicating to future employers that they have gained teaching experience.

### CBNA 502 Introduction to Conservation Medicine and Ecosystem Health (1-2 Credit Hours)

An overview of the relevant current conservation of medicine issues. Lectures are teleconferenced to/and from Loyola University Medical Center, Brookfield Zoo, The University of Illinois College of Veterinary Medicine, and Loyola's Lakeside Campus.

### CBNA 503 Neuroplasticity (2 Credit Hours)

This is a seminar course involving the study of neuro-anatomical and behavioral changes that occur in response to nervous system damage in adult and newborn animal models or humans.

### CBNA 505 Chronobiology (2 Credit Hours)

An introduction to the temporal structure of biological systems as evidenced by rhythmic variation in metabolic phenomena.

## Cellular & Molecular Oncology (CMO)

### CMO 499 Research (1-9 Credit Hours)

*Pre-requisites:* Restricted to students enrolled in CMO MS program  
CMO 499 is designed to give credit for laboratory research efforts that will result in a M.S. thesis. Students will learn theoretical and laboratory technical tools to investigate and test a hypothesis. Students will search the literature for background, rationale, and protocols for their research project. Students will communicate results and knowledge through written and oral communications.

*Outcomes:*

1) Clearly communicate, describe, and implement techniques used for a research problem; 2) Describe results-obtained; 3) Draw conclusions based on data-obtained; 4) List future directions; and 5) Understand the significance of the work

### CMO 502 Seminar (1 Credit Hour)

A seminar will be held on a rotating basis once per week. CMO M.S. students will be required to attend seminars as part of the CMO 502 course. This course is designed to help students stay abreast of current topics in oncology. Students will attend weekly seminars, and are encouraged to interact with both invited and current faculty speakers by asking questions and contributing to group discussions. Upon completion of this course CMO 502, students will have gained a better understanding of current oncology research. Restricted to students enrolled in CMO MS program

*Outcomes:*

1) Describe results or conclusions from a given seminar presentation; 2) Understand how research is advancing knowledge in a given field covered by a representative seminar, 3) Question new data or their interpretation

### CMO 503 Special Topics in Oncology (1 Credit Hour)

CMO 503 will be a new journal club course-discussing and analyzing papers from presenters in CMO 502 Seminar Series one week in advance of their seminar. CMO 503 and CMO 502 will be aligned to expose students to oncology-focused scientists presenting a seminar the following week. Students will read an article by the seminar speaker, participate in discussion sessions, and ask questions during the seminars. Restricted to students enrolled in CMO MS program

*Outcomes:*

1) Describe cutting edge research in the particular area of investigation covered by the course; 2) Discuss limitations to experimental approaches; 3) Discuss real-world application of the research topic being studied; and 4) Critically read scientific literature on cancer biology

**CMO 595 Thesis Supervision (0 Credit Hours)**

*Pre-requisites:* Completion of required coursework

Thesis supervision course for CMO MS students who have completed the required credit hours.

*Outcomes:*

Allows completion of thesis research and defense, required for degree

## Chemistry (CHEM)

**CHEM 400 Chemistry Seminar (1 Credit Hour)**

This weekly seminar series on current topics in Chemistry is presented by experts from outside Loyola.

**CHEM 401 Chemistry Methodology and Communication (3 Credit Hours)**

*Pre-requisites:* Graduate Standing

This is the common preparatory course providing all chemistry graduate students with the necessary skills to navigate towards their respective degrees and success post-degree. Topics include: notebooks, design of experiment, safety, ethics, effective communication of science, conflict resolution, and professional conduct.

*Outcomes:*

Students are prepared with the soft skills and formal training in research methodology and compliance expectations expected of a graduate student and a professional chemist in a senior role

**CHEM 415 Special Topics in Chemistry (3 Credit Hours)**

Specific titles and contents vary from semester to semester.

**CHEM 420 Advanced Organic Chemistry I: Struct-Stereo (3 Credit Hours)**

Important organic chemical concepts. Includes discussion of the stereochemistry of carbon, organic quantum mechanics, chemical kinetics and related mechanistic concepts, and an introduction to synthetic methodology.

**CHEM 422 Advanced Organic Chemistry III: Mechanism (3 Credit Hours)**

This is an intensive review of the more general types of organic chemical mechanisms, such as electrophilic and nucleophilic additions, substitution reactions, elimination processes, and hemolytic processes. The experimental approach to mechanisms is emphasized.

**CHEM 423 Medicinal Chemistry (3 Credit Hours)**

This course explores how medicinal chemists design and synthesize new drug candidates as well as the hurdles that must be overcome in meeting the FDA requirements of efficacy and safety on the road to market, emphasizing the therapeutic index that underscores the risk/benefit consideration of every drug.

*Outcomes:*

1) Explain risk/benefit of drugs in efficacy vs. toxicity and the therapeutic index/window; 2) Summarize interactions of drugs with receptors, enzymes, or nucleotides; 3) Analyze structure-activity relationships given potency data

**CHEM 424 Molecular Characterization Part A (3 Credit Hours)**

*Pre-requisites:* Graduate Students Only

This course will include a closer look at the theory and applications of several spectroscopic methods used for analysis of organic as well as inorganic compounds, including 1D and 2D methods employing <sup>1</sup>H and <sup>13</sup>C NMR, in addition to other elements; UV/Vis, combined with mass spectrometry.

*Outcomes:*

Students will be able to identify a compound's molecular structure based on spectroscopic means and understand the working principles behind those spectroscopies

**CHEM 425 Special Topics in Organic Chemistry (3 Credit Hours)**

Specific titles and contents vary from semester to semester. Some courses are: natural products, free radicals, molecular rearrangements, photochemistry, heteronuclear NMR, carbocyclic chemistry, medicinal chemistry, synthetic organic methodology, pericyclic reactions, heterocycles.

**CHEM 429 Research in Organic Chemistry (1-9 Credit Hours)**

Laboratory. Specific content varies on consultation with a faculty sponsor.

**CHEM 430 Physical Chemical Survey (3 Credit Hours)**

*Pre-requisites:* calculus and undergraduate physical chemistry

Covers chemical thermodynamics, molecular structure and spectra, and chemical kinetics. It includes review and survey of some recent research.

**CHEM 431 Chemical Thermodynamics (3 Credit Hours)**

*Pre-requisites:* calculus and undergraduate physical chemistry

An extended study of the principles of the thermodynamic laws followed by applications to real and ideal systems of gases, liquids, and solids; partial molal properties; principles and applications of quantum statistical thermodynamics to gaseous equilibria

**CHEM 433 Chemical Kinetics (3 Credit Hours)**

*Pre-requisites:* calculus and undergraduate physical chemistry

Description of rates of chemical reactions and interpretations thereof; principal theories of bimolecular and unimolecular processes; chain reactions; development of absolute reaction rate theory and application to a number of chemical systems; potential energy surfaces; includes heterogeneous kinetics, solution phenomena, isotopic effects, flow systems, empirical kinetic relations.

**CHEM 435 Special Topics in Physical Chemistry (3 Credit Hours)**

Specific titles and contents vary from semester to semester. Some courses are NMR spectroscopy, photophysical processes, molecular spectroscopy, computational chemistry, molecular modeling, and spectroscopy of surfaces.

**CHEM 436 Statistical Thermo Dynamics (3 Credit Hours)**

Methods of classical and quantum statistical mechanics applied to thermodynamic problems; calculation of thermodynamic quantities from spectral data; properties of real gases; selected problems in the solid state.

**CHEM 437 Quantum Mechanics I (3 Credit Hours)**

*Pre-requisites:* CHEM 302 or equivalent; strong courses in calculus and modern physical chemistry, and some knowledge of computer programming

A thorough introduction to elementary quantum chemistry: angular momentum, quantum mechanical operators, interaction of radiation with matter, the many-electron atom, introduction to matrix mechanics, approximate methods, SCF calculations, electronic structure of polyatomic molecules, recent molecular orbital calculations.

**CHEM 438 Quantum Mechanics II (3 Credit Hours)**

*Pre-requisites:* CHEM 437

This course is a continuation of CHEM 437, which is a thorough introduction to elementary quantum chemistry: angular momentum, quantum mechanical operators, interaction of radiation with matter, the many-electron atom, introduction to matrix mechanics, approximate methods, SCF calculations, electronic structure of polyatomic molecules, recent molecular orbital calculations.

**CHEM 439 Research in Physical Chemistry (1-9 Credit Hours)**

Laboratory. Specific content varies on consultation with a faculty sponsor.

**CHEM 441 Advanced Inorganic Chemistry (3 Credit Hours)**

The important topics in inorganic and organometallic chemistry are surveyed.

**CHEM 445 Special Topics in Inorganic Chemistry (3 Credit Hours)**

Specific titles and contents vary from semester to semester. Some courses are organometallic chemistry and catalysis, bioinorganic chemistry, physical methods in inorganic chemistry, inorganic reaction mechanisms, non-metal chemistry, transition metal clusters and X-ray crystallography.

**CHEM 449 Research in Inorganic Chemistry (1-9 Credit Hours)**

Laboratory. Specific content varies on consultation with a faculty sponsor.

**CHEM 451 Chemical Methods of Analysis (3 Credit Hours)**

Topics covered include the statistical evaluation of analytical results and sources of errors, sampling and significance of proper samples, optimization of experiments, review of acid-base theory, chelometry and its applications, theory of precipitation, oxidation and reduction reactions and applications.

**CHEM 452 Electrochemistry (3 Credit Hours)**

Fundamentals of electrochemistry, the application of electrochemical techniques and current literature.

**CHEM 454 Analytical Separations (3 Credit Hours)**

Topics include aspects of chromatography, partition, thin layer, gas and liquid chromatography, mass spectroscopy and other techniques.

**CHEM 455 Special Topics in Analytical Chemistry (3 Credit Hours)**

Specific titles and contents vary from semester to semester. This course may involve a lab. Some courses are analytical absorption and emission spectroscopy, electroanalytical methods, environmental chemistry, lasers in analytical spectroscopy, and mass spectroscopy.

**CHEM 456 Analytical Spectroscopy (3 Credit Hours)**

We will discuss photometric instrumentation, absorption, emission and fluorescence spectroscopy and types of analytical laser spectroscopy.

**CHEM 459 Research in Analytical Chemistry (1-9 Credit Hours)**

Laboratory. Specific content varies on consultation with a faculty sponsor.

**CHEM 460 Biophysical Chemistry (3 Credit Hours)**

This class will cover the role of molecular interactions in determining the structure and reactivity of complex biological molecules. Modern experimental techniques are used in studying these interactions in biological systems.

**CHEM 461 Biochemistry (3 Credit Hours)**

The conformation, dynamics and biological activities of macromolecules, generation and storage of metabolic energy, and genetic information and biosynthesis will be discussed.

**CHEM 465 Special Topics in Biochemistry (3 Credit Hours)**

Specific titles and contents vary from semester to semester. Some courses are protein chemistry, sequence and 3D structure, magnetic resonance spectroscopy, protein crystallography, bio-inorganic chemistry, molecular biology, molecular dynamics of proteins, and current developments in biochemistry and related areas.

**CHEM 469 Research in Biochemistry (1-9 Credit Hours)**

Laboratory. Specific content varies on consultation with a faculty sponsor.

**CHEM 470 Biochemistry I (3 Credit Hours)**

*Pre-requisites:* Completion of undergraduate organic chemistry  
This is the first part of a two-semester Biochemistry series that emphasizes important biochemical concepts on the structure and function of proteins, enzymes, carbohydrates, lipids and cell membranes as well as on the bioenergetic and regulatory principles behind the central and carbohydrate pathways.

*Course equivalencies:* X- CHEM 370/CHEM 470

*Outcomes:*

Students will be able to demonstrate an understanding of structural-functional relationships in biological molecules and how carbohydrates are metabolized

**CHEM 479 Research in Chemical Education (1-9 Credit Hours)**

*Co-requisites:* RMTD 400 and CIEP 229; This course is restricted to Chemistry Ph.D. students

*Prerequisites:* This course will count toward the research credits of those students seeking a Ph.D. degree with a focus on Chemical Education. It will examine the effects of numerous variables on the learning and teaching of chemical principles and skills.

*Outcomes:*

Students will be able to: \*describe the primary theoretical underpinnings of the chemical education research field; \*describe and apply methods for preparing research data collected for publication; \*describe and apply methods for analyzing chemical education research projects & manuscripts

**CHEM 480 Chemistry for Teachers I (3 Credit Hours)**

This course focuses on aspects specific to the teaching and learning of chemistry at post-secondary levels. Geared towards graduate students, undergraduate seniors, or current educators who plan on instructing college students, it explores principles surrounding how people learn chemistry and how to align pedagogies and environments to optimize learning opportunities for students. Course activities and assignments are designed to initiate the building of an instructional portfolio to prepare enrolled students for potential academic careers.

**CHEM 491 Laboratory Investigations in Chemistry C (1 Credit Hour)**

A course designed for high school science teachers to help construct and create chemistry laboratories for students in the context of urban high schools. Students must be enrolled in one of the SOE's M.Ed. in science ed cohorts.

*Outcomes:*

Learning how to teach inquiry based science labs; learning how to create labs within the constraints of an urban school district

**CHEM 497 Organic and Bio Chemistry for Teachers (3 Credit Hours)**

*Pre-requisites:* Must be enrolled in M.Ed. in Chem Ed program

A course designed for urban high school teachers to enhance knowledge of chemistry and chemistry teachers.

*Outcomes:*

Increased chemistry content knowledge, ability to teach inquiry based chemistry

**CHEM 500 Graduate Student Seminar (1 Credit Hour)**

This gives students an opportunity to prepare and present a professional chemistry seminar for other professional chemists. The presenter is trained in organizing materials for the 500 Graduate Student Seminar (1)presentation and has the experience of conveying high level technical information to a friendly audience in preparation for subsequent professional presentations in the industrial, academic, and/or scientific meeting arena. The topics of the seminar should not be related to the student's research. The course should be taken at least once by all degree-seeking students.

**CHEM 501 Directed Study (1-6 Credit Hours)**

A special reading project is undertaken by qualified students and directed by a faculty member of the department with chairperson's approval.

**CHEM 509 Doctoral Research (9 Credit Hours)**

Laboratory. Specific content varies on consultation with a faculty sponsor.

**CHEM 595 Thesis Supervision (0 Credit Hours)**

The course is for master's degree candidates after completion of course requirements.

**CHEM 600 Dissertation Supervision (0 Credit Hours)**

The course is for Ph.D. degree candidates after completion of courses, cumulative examinations, and research tool requirements.

**CHEM 605 Master's Study (0 Credit Hours)**

This course is for MS students in the (up to two) intervening semesters between completing coursework/research credits and beginning their thesis supervision.

**CHEM 610 Doctoral Study (0 Credit Hours)**

This course is for PhD students in the intervening two semesters (pre-candidacy) between completing coursework/research credits and beginning their dissertation supervision.

## Classical Civilization (CLST)

**CLST 499 Directed Study (1-3 Credit Hours)**

This course frames extensive and in-depth study of a selected author or topic involving the ancient Mediterranean world, for graduate students to pursue under the direction of a faculty member of the department.

*Outcomes:*

Students will engage with current scholarship in the field of the investigation, and will demonstrate significant learning

## Clinical & Applied Mass Spectrometry (CAMS)

**CAMS 401 Theory and Physics of Mass Spectrometry (4 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will cover the fundamental physical principles that are used in mass spectroscopy, with a primary focus on basic electricity and magnetism theory. This course will not be calculus based.

*Outcomes:*

At the end of this course students will be able to: 1) Describe the fundamental principles of Newton's Laws and Conservation of Energy; 2) Describe basic interactions between charged particles and electric fields; 3) Define electric potentials; 4) Describe the relationship between electric and magnetic fields; 5) Identify the direction a charged particle will move in a magnetic field; and 6) Derive the relationship between charge, mass and velocity

**CAMS 402 Chemistry of Protein Separation (4 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will cover the fundamentals of separating biological agents in solution for analysis by mass spectrometry.

*Outcomes:*

At the end of this course students will be able to: 1) Describe the composition of typical biological collections including blood and waste; 2) Describe best-practices for preparing collections for mass spectrometry; 3) Describe fundamentals of separating biomolecules according to size, charge and other physiochemical factors; and 4) Describe mechanisms and tradeoffs behind common approaches for separating biological samples via chromatography (liquid and gas)

**CAMS 403 Introduction to Mass Spectrometry Instrumentation (2 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will introduce the mass spectrometry instrumentation that is utilized in clinical, pharma, and academia, including HPLC and other sample preparation instrumentation.

*Outcomes:*

At the end of this course students will be able to: 1) Describe the basic technologies and instrumentation currently used for mass spectrometry; 2) Understand the basics in how to operate this instrumentation (theory, no hands on); 3) Appreciate the similarities and differences in the different technologies, and in what situation each instrument would be most appropriate; and 4) Describe the instrumentation used in sample preparation

**CAMS 411 Computation and Bioinformatics for Proteomics (3 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will cover the governing principles of analyzing proteomics data, with a special emphasis on data derived from mass spectrometry (MS). Computational methods and tutorials will complement the theoretical material.

*Outcomes:*

At the end of this course students will be able to: 1) Describe key approaches for matching MS spectra to known proteins, as well as identifying and quantifying protein content in analyzes samples; 2) Describe methodologies and limitations thereof for labeling and quantifying proteins of interest; 3) Perform routine computational analyses of MS data using python; and 4) Describe best-practices for objective data analysis and reproducibility

**CAMS 412 Clinical Considerations and Biomarker Development (3 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will cover fundamental concepts about the criteria for something to qualify as a biomarker and how they are analyzed by mass spectrometry from a variety of biological fluids and/or tissues. We will also discuss the broader uses of mass spectrometry in a clinical or hospital setting.

*Outcomes:*

At the end of this course students will be able to: 1) Compare and contrast aspects of good vs bad biomarkers and the utility of mass spectrometry for their detection in biological samples; 2) Describe best practices for sample collection and the limitations of using biological samples; 3) Describe current regulations and standards for biomarker use in the clinic; 4) Identify and describe biohazard safety issues when working with biological samples; 5) Describe analytical approaches for quantification of biomarkers; and 6) Describe the type of mass spectrometry assays typically used in a clinical or hospital setting

**CAMS 413 Advanced Mass Spectrometry Approaches (2 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will cover advanced MS approaches to address specialized needs. These approaches will frequently require specific instrumentation, and bioinformatics approaches, but sometimes only involve changes to sample preparation and interpretation.

*Outcomes:*

At the end of this course students will be able to: 1) Understand the need for specialized mass spec approaches; 2) Appreciate the theory behind specialized mass spec approaches; 3) Describe the technical and practical considerations when utilizing specialized MS approaches; and 4) Be able to choose the correct advanced MS approach for a particular situation

**CAMS 491 Mass Spectrometry Lab Rotation A (5 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will be a hands-on intensive laboratory rotation. Students will learn how to prepare samples that are "mass spec ready" from a variety of liquid and solid tissue biological samples. Students will learn quality control parameters and will produce high quality samples for use in the HPLC and mass spectrometer.

*Outcomes:*

At the end of this course students will be able to: 1) Process liquid and tissue biological samples for analysis by mass spectrometry; 2) Perform gel electrophoresis on prepared samples and excise selected gel bands; 3) Perform in-gel digestions using standard enzymatic approaches; 4) Perform in-solution digestions using standard enzymatic approaches; 5) Quantify protein samples before and after digestion; and 6) Use column chromatography to generate high purity samples

**CAMS 492 Mass Spectrometry Lab Rotation B (5 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

This course will be a hands-on intensive laboratory rotation. Students will learn how to perform normal LC-mass spectrometer general upkeep including HPLC setup, mass spectrometer calibration, quality control, etc. Students will then learn the process of running mass spectrometers for two types of approaches: discovery and targeted mode.

*Outcomes:*

At the end of this course students will be able to: 1) Setup HPLC, mass spectrometer and software; 2) Perform normal instrument upkeep including calibration, quality control, solution changes; 3) Be able to troubleshoot common instrument issues; 4) Analyze sample on mass spectrometer for discovery (two group comparison); 5) Analyze sample on mass spectrometer for targeted quantification (in simple solution); 6) Use bioinformatics software packages to analyze data from mass spectrometers; and 7) Understand how to present mass spectrometry data

**CAMS 493 Capstone Design - Applications in Mass Spectrometry A (2 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

During the course students will develop a written research proposal using mass spectrometry as the primary experimental approach to test their hypotheses. Students can choose from any relevant topic of interest such as the analysis of clinical biomarkers in disease, environmental endocrine disruptors, industrial pollutants, waste water contamination, etc. The topic must be approved by the student's advisor in advance.

*Outcomes:*

At the end of this course students will be able to: 1) Design quantitative experiments using mass spectrometry; 2) Describe and identify appropriate experimental positive and negative controls; 3) Describe statistical analyses relevant for their experimental design; 4) Discuss limitations and pitfalls of their research approach and describe alternatives; and 5) Critically evaluate the current literature and describe the rationale for their research study

**CAMS 494 Capstone Design - Applications in Mass Spectrometry B (2 Credit Hours)**

*Pre-requisites:* Enrollment in CAMS-MS program

During the course students will develop a written research proposal using mass spectrometry as the primary experimental approach to test their hypotheses. Students can choose from any relevant topic of interest such as the analysis of clinical biomarkers in disease, environmental endocrine disruptors, industrial pollutants, waste water contamination, etc. The topic must be approved by the student's advisor in advance.

*Outcomes:*

At the end of this course students will be able to: 1) Design quantitative experiments using mass spectrometry; 2) Describe and identify appropriate experimental positive and negative controls; 3) Describe statistical analyses relevant for their experimental design; 4) Discuss limitations and pitfalls of their research approach and describe alternatives; and 5) Critically evaluate the current literature and describe the rationale for their research study

## Computer Science (COMP)

**COMP 400A Object-Oriented Programming (3 Credit Hours)**

This programming intensive course with its weekly lab component provides an exploration in problem solving for graduate-level courses, using object-oriented programming in a language such as Java.

*Outcomes:*

To analyze and decompose problems, specify algorithms, and construct solutions by synthesizing classes, objects and other components of object

**COMP 400B Data Structures I (3 Credit Hours)**

*Pre-requisites:* COMP 400A

This course explores introductory data structures including array lists, linked lists, stacks, queues, binary trees, and hash tables. Efficiency of data structure operations is analyzed. Recursion, applications of data structures, and simple analysis of algorithms are covered. Students will be able to select appropriate data structures to integrate into algorithms to solve computational problems.

*Outcomes:*

Students describe linear data structures and analyze the performance of their operations

**COMP 400C Data Structures II (3 Credit Hours)**

*Pre-requisites:* COMP 400B and COMP 400D

This course explores advanced abstract data types in depth, such as sets, maps, and graphs, and reproduces their implementation using arrays and dynamically allocated nodes in an object-oriented language. The course also analyzes the performance of the data structures' built-in operations and related algorithms such as sorting, searching, and traversing.

*Outcomes:*

Students describe non-linear data structures and analyze the runtime performance of their operations, solve computational problems by synthesizing and integrating suitable data structures, and implement algorithms within the object-oriented paradigm

**COMP 400D Computing Tools and Techniques (1 Credit Hour)**

This course introduces students to the Unix shell environment and essential tools.

*Outcomes:*

Students who complete this course will develop fluency in the Unix (Linux) environment

**COMP 400E Discrete Structures (3 Credit Hours)**

This course provides the mathematical foundations for graduate-level study in computer science, including such topics as complexity of algorithms, modular arithmetic, induction and proof techniques, graph theory, combinatorics, Boolean algebra, logic circuits, and automata.

*Outcomes:*

To analyze properties of functions, relations, graphs, trees, paths; evaluate Boolean Expressions; apply induction towards proving correctness of algorithm and classifying resource usage; synthesize finite-state machines and logic circuits

**COMP 401 Computer Security (3 Credit Hours)**

*Pre-requisites:* COMP 170 or instructor permission

This is a foundations course on computer security, covering a comprehensive range of concepts and technologies, including security goals, encryption, penetration testing, software exploitation, reverse engineering, packet sniffing, and secure coding. The final project requires a presentation and technical report where the students will show and describe what they accomplished.

*Outcomes:*

Students will find and exploit vulnerabilities in computer and network systems; articulate cryptography and security goals, and synthesize the knowledge of different tools and techniques by applying them to an intensive real-world project

**COMP 403 Operations Management (3 Credit Hours)**

*Pre-requisites:* COMP 150 or COMP 170

Application of concepts and methods for managing production and service operation. Topics include demand forecasting, aggregate and capacity planning, inventory management, facility layout and location, just-in-time, managing quality, project planning, resource allocation, logistics. Emphasis on decision support

*Outcomes:*

Understanding of the role of operations management in organizations, and applying models of production and operations management to decision making

**COMP 404 Organizational Development (3 Credit Hours)**

*Pre-requisites:* COMP 251 or COMP 271

This course focuses on the manager's role in leading Organization Development and Change to maximize organization and individual effectiveness with a focus on Information Technology. The class explores Organization Development and Change theory, change practices, and discusses considerations a manager will face as a change agent in today's computing ecosystem.

*Outcomes:*

To understand the dynamics of change in organizations; learn techniques and strategies in managing change; develop skills that will enable a change agent mentality within the context of IT leadership

**COMP 405 Database Administration (3 Credit Hours)**

*Pre-requisites:* COMP 251 or COMP 271

Knowledge of the configuration and management skills needed for successful administration of a database server. The database administrator manages hardware, backup, security, tables and indexes, performance monitoring, query performance and optimization, and transaction performance. This course takes a user through the stages of maximizing the performance of a database server.

*Outcomes:*

Students will learn how to manage database performance, including topics such as the query optimizer, SQL EXPLAIN, table statistics, concurrency and transaction isolation levels, and security

**COMP 406 Data Mining (3 Credit Hours)**

*Pre-requisites:* COMP 251 or COMP 271

This course covers theory and practice of the analysis (mining) of extremely large datasets. With data growing at exponential rates knowledge gathering and exploration techniques are essential for gaining useful intelligence.

*Outcomes:*

Students will be able to define and critically analyze data mining approaches for fields such as security, healthcare, science and marketing

**COMP 409 Advanced Numerical Analysis (3 Credit Hours)**

*Pre-requisites:* (COMP 170 or COMP/MATH 215), MATH 212, and MATH 264

An introduction to advanced numerical analysis. Introduction to error analysis, numerical solution of equations, interpolation and approximation, numerical differentiation and integration, matrices, and solution of systems of equations, numerical solution of ordinary and partial differential equations.

*Course equivalencies:* X-COMP409/MATH409

*Outcomes:*

Students will have an understanding of advanced numerical analysis and its applications

**COMP 410 Operating Systems (3 Credit Hours)**

*Pre-requisites:* COMP 271 and COMP 264

The course introduces advanced operating system concepts including distributed, real-time and multi-threaded in addition to reviewing memory management, files, and processes.

*Outcomes:*

Students will learn important topics in advanced operating systems and be able to make presentations on the topics

**COMP 412 Open Source Computing (3 Credit Hours)**

*Pre-requisites:* COMP 271

This course will cover the fundamentals of Free and Open Source software development. Topics to be addressed include licensing, Linux, typical software development tools, applications, and techniques for managing remote servers.

*Outcomes:*

Students will learn to implement projects involving free and open-source software and learn how to participate in open-source projects effectively

**COMP 413 Intermediate Object-Oriented Development (3 Credit Hours)**

*Pre-requisites:* COMP 271

Principles of object-oriented design and implementation, including object modeling (UML or equivalent), interface design, refactoring and test-driven development. Study of design patterns, including Adaptor, Decorator, Iterator, Abstract Factory, etc. Coverage of implementation tools including IDEs, source-code control and testing.

*Outcomes:*

Use of interfaces in design; ability to recognize applications for design patterns, ability to refactor when necessary; ability to make effective use of test-driven development

**COMP 417 Social and Ethical Issues in Computing (3 Credit Hours)**

This course covers social, legal, and ethical issues commonly arising in key areas related to computing technologies.

*Outcomes:*

Understanding of laws and issues in areas such as privacy, encryption, freedom of speech, copyrights and patents, computer crime, and computer/software reliability and safety; understanding of philosophical perspectives such as utilitarianism versus deontological ethics and basics of the U.S. legal system

**COMP 418 Combinatorial Mathematics (3 Credit Hours)**

*Pre-requisites:* MATH 313 or COMP 163

The course covers basic combinatorial theory including permutations and combinations, the inclusion-exclusion principle and other general counting techniques, partitions, generating functions, recurrence relations, Burnside's Theorem, the cycle index, and Polya's formula.

*Course equivalencies:* X-COMP418/MATH418

*Outcomes:*

Students will learn mathematical techniques in discrete mathematics and applied combinatorics

**COMP 420 Software Systems Analysis (3 Credit Hours)**

*Pre-requisites:* COMP 271

This course uses Unified Modeling Language and similar notation to model the early software analysis and design phases, from collection of user requirements to determination of class needs through object-oriented design.

*Outcomes:*

Students will be able to capture business requirements in a software modeling document, and determine appropriate object-oriented classes suitable for final project implementation

**COMP 421 Math Models & Simulation (3 Credit Hours)**

This course covers tools for analyzing problems that are mathematically difficult. Discrete event simulation techniques and software tools for simulating processes are covered.

*Course equivalencies:* X-COMP421/MATH421/STAT421

*Outcomes:*

Student will learn foundations of discrete event simulation

**COMP 422 Software Development for Wireless and Mobile Devices (3 Credit Hours)**

This course will focus on the methods, tools, and technologies for developing software applications for wireless and mobile devices, such as personal digital assistants (PDA) and smart mobile phones.

*Outcomes:*

Students will learn user interface design for small screens, programming techniques for devices with limited memory and processing power, data synchronization for mobile databases, and wireless network programming

**COMP 424 Client-Side Web Design (3 Credit Hours)**

*Pre-requisites:* COMP 271

This course provides an in-depth study of the concepts and methods required for the design and implementation of the presentation layer of a web application. Coursework includes several substantial programming projects.

*Outcomes:*

Students will learn markup of static and dynamic content, content transformation, client-side executable content including client-side scripting and embedded applets, and web-based content management systems

**COMP 425 Rapid Applications Development (3 Credit Hours)**

*Pre-requisites:* COMP 271

This course will teach students how to design Rapid Application Development using an integrated development environment such as the .NET framework and methodology. It is designed to support object-oriented programming concepts.

*Outcomes:*

Students will create database applications and web applications using server-side technologies

**COMP 428 Algebraic Coding Theory (3 Credit Hours)**

*Pre-requisites:* MATH 212 or Permission

In this course, major types of error-correcting codes, encoding and decoding, and their main properties will be studied. The codes examined will include the Hamming, Golay, BCH, cyclic, quadratic residue, Reed-Solomon, and Reed-Muller codes.

*Course equivalencies:* X-COMP428/MATH428

*Outcomes:*

Students will learn both the theory and application of error-correcting codes

**COMP 429 Natural Language Processing (3 Credit Hours)**

*Pre-requisites:* (COMP 231 OR (COMP 271 or COMP 402)) AND (MATH 131 OR 161) and (STAT 103 OR STAT 203 OR ISSCM 241 OR PSYC 304 OR instructor permission)

In this course, students examine in depth the problems, methods, and applications of NLP. Topics will include information retrieval, sentiment analysis, machine translation, document classification, and question answering. We will also cover the underlying theory from probability, statistics, and machine learning that are crucial for the field.

*Outcomes:*

Students will explain areas of NLP such as information retrieval, sentiment analysis, machine translation, document classification, question answering; Students will apply tools of NLP to a domain of their choice

**COMP 431 Cryptography (3 Credit Hours)**

*Pre-requisites:* COMP 271 and (Comp 163 or MATH 313 or MATH 201) or Permission

This course introduces the formal foundations of cryptography and also investigates some well-known standards and protocols, including private and public key cryptosystems, hashing, digital signatures, RSA, DSS, PGP, and related topics.

*Course equivalencies:* X-COMP431/MATH431

*Outcomes:*

Students will gain an understanding of cryptosystems widely used to protect data security on the internet, and be able to apply the ideas in new situations as needed

**COMP 433 Web Services Programming (3 Credit Hours)**

Web services are Web-based enterprise applications that use open, XML-based standards and transport protocols to exchange data with calling clients. This course provides the APIs and tools you need to create and deploy interoperable Web services and clients using .NET and Java WSDP.

*Outcomes:*

Students will learn the standards and protocols for deploying web services

**COMP 434 Enterprise Software Development (3 Credit Hours)**

The course shows how to use Enterprise JavaBeans to develop scalable, portable business systems. The technologies taught in the course include: component models, distributed objects, asynchronous messaging, and component transaction monitors.

*Outcomes:*

Students will learn the architecture of EJB, entity and message and session beans

**COMP 436 Markup Languages (3 Credit Hours)***Pre-requisites:* COMP 271

This course is concerned with XML and its various component frameworks. The core frameworks to be covered include Document Object Model (DOM), Simple API for XML processing (SAX), the XML Path language (XPath), and XSLT.

*Outcomes:*

After taking this course, students will have working knowledge of XML and its connections to other ideas such as HTML, object models, relational databases, and network services

**COMP 437 Intro Concurrent Programming (3 Credit Hours)**

Many real-world software systems rely on concurrency for performance and modularity. This programming-intensive course covers analysis, design, implementation, and testing of concurrent software systems.

*Outcomes:*

An in-depth understanding of event-based and thread-based views of concurrency; the ability to develop concurrent software components using suitable languages, frameworks, and design patterns; familiarity with object-oriented modeling and development tools and test-driven development

**COMP 439 Distributed Systems (3 Credit Hours)***Pre-requisites:* COMP 313 and COMP 264; COMP 374 recommended

This course presents a modern discussion of distributed computing systems. Distributed computation, interactive services, collaborative computing, peer-to-peer sharing, and grid/utility computing are just a handful of distributed technologies that go beyond the capabilities of the traditional client/server model by allowing a collection of computers to be leveraged as a collective resource.

*Outcomes:*

Students will learn design and implementation, scalability of performance, reliability, and security of loosely interconnected systems

**COMP 440 Computer Forensics Investigations (3 Credit Hours)***Pre-requisites:* (COMP 150 or COMP 170 or COMP/MATH 215) AND (COMP 264 or COMP 317 or COMP 343)

This course introduces the fundamentals of computer/network/internet forensics, analysis and investigations.

*Outcomes:*

The student will learn computer software and hardware relevant for analysis, and investigative and evidence-gathering protocols

**COMP 441 Human-Computer Interaction (3 Credit Hours)***Pre-requisites:* COMP 271

This course studies the interaction between humans and computer-based systems. The course will provide students with the methods for evaluating, designing, and developing better interfaces between humans and systems.

*Outcomes:*

Students will acquire an awareness of different design and evaluation methods as well as practical, effective, and cost-consciousness methods for improving systems and their interfaces

**COMP 442 Server-Side Software Development (3 Credit Hours)**

Server-based web applications and services have become part of everyday life. This programming-intensive course covers analysis, design, implementation, and testing of multi-tiered server-based software systems along with typical tier-specific and technologies.

*Outcomes:*

An understanding of software architecture and integration in the development of multi-tiered server-based software; familiarity with object-oriented modeling and development tools and test-driven development

**COMP 443 Computer Networks (3 Credit Hours)***Pre-requisites:* COMP 271 or COMP 264

This course surveys packet-switched computer networks and attendant communication protocols, using the TCP/IP protocol suite on which the Internet is based as the primary model. We will also study general high-level network issues such as security, authentication, fault tolerance, and congestion.

*Outcomes:*

Students will understand how the Internet is constructed, how data is routed to its destination, how connections are made, how congestion is handled, and how security can be addressed

**COMP 445 Internet of Things Device and Application Security (3 Credit Hours)***Pre-requisites:* COMP 348 AND (COMP 264 or COMP 271)

This course considers the safety, security, reliability, and privacy concerns of the embedded devices and cloud-based resources of the Internet of things. The course discusses methods for addressing these concerns.

*Outcomes:*

Design/implement secure software for embedded systems and the IoT; Establish safety, security, reliability, privacy goals for IoT-based systems; Understand security and privacy concerns of embedded systems and the IoT

**COMP 446 Telecommunications (3 Credit Hours)***Pre-requisites:* COMP 271 or COMP 264

This course introduces the fundamental concepts of telecommunication networks. Underlying engineering principles of telephone networks, computer networks and integrated digital networks are discussed.

*Outcomes:*

Students will learn how telephone and data networks work; They will also learn voice networks, analog versus digital transmission, data link protocols, SONET, ATM, cellular phone systems, and the architecture of the current telephone system

**COMP 447 Intrusion Detection and Computer Forensics (3 Credit Hours)***Pre- or co-requisites:* COMP 271

This course will cover techniques for detecting the unusual usage patterns that typically signal a break-in. The course will also consider differences in detection of local intruders versus intrusion over networks. Finally issues in the prosecution of those breaking in to computers, particularly evidentiary issues are explored.

*Outcomes:*

Students will learn to configure ID systems (eg, snort) and analyze their output; They will also understand both network-based and host-based monitoring techniques

**COMP 448 Network Security (3 Credit Hours)***Pre-requisites:* COMP 271 or COMP 447

This course will involve a discussion of the methods and tactics used to keep attackers at bay as well as the mechanisms by which we can identify and potentially stop potential intruders. The course covers topics such as Encryption, authentication, firewalls, NAT/PAT, restricted access policies, intrusion detection and other security frameworks.

*Outcomes:*

Students will gain an understanding of how to secure computers and network environments

**COMP 449 Wireless Networking and Security (3 Credit Hours)**

*Pre-requisites:* COMP 271

This course will explore the wireless standards, authentication issues, common configuration models for commercial versus institution installs and analyze the security concerns associated with this ad-hoc method of networking.

*Outcomes:*

Students will gain an understanding of wireless networking, protocols, and standards and security issues

**COMP 451 Enterprise Networking (3 Credit Hours)**

*Pre-requisites:* COMP 271

Management of complex, high-speed, heterogeneous computer networks. Device management using SNMP and related protocols. Configuration and use of Network Management Systems. Data-flow management using LARTC and similar tools.

*Outcomes:*

Ability to interpret SNMP network data, ability to implement a Network Management System and use it to identify bottlenecks, familiarity with traffic-control principles and mechanisms

**COMP 452 Introduction to Computer Vulnerabilities (3 Credit Hours)**

*Pre-requisites:* COMP 264 and COMP 347

This course will introduce students to computer vulnerabilities at the machine-code level, including viruses, browser vulnerabilities, buffer and heap overflows, return-to-libc attacks and others.

*Outcomes:*

Describe some recent computer software vulnerabilities; Describe how vulnerabilities can be leveraged into an attack; Describe a vulnerability or attack at the machine-code level

**COMP 453 Database Programming (3 Credit Hours)**

This course will cover advanced concepts in database access and programming including SQL, JDBC, SQLJ, JSP and servlets. Oracle 10g is used for projects.

*Outcomes:*

Students will learn application development using the latest software tools; Students will also learn techniques for web based data retrieval and manipulation

**COMP 458 Big Data Analytics (3 Credit Hours)**

*Pre-requisites:* At least a C in the following courses (COMP 405 or COMP 453) AND (COMP 406 or COMP 479 or STAT 338 or STAT 408)

In this course, large data sets will be leveraged to solve challenging analytics problems. With more samples, analytics can use more complex learning models to automate more feature combinations for more robust model tuning, selection, and validation. Parallel, distributed processing will be performed with Apache Spark and Hadoop.

*Outcomes:*

Python or R will be used with parallel frameworks to perform proper model selection when testing large combinations of features, models, hyperparameters, and ensembles, with additional emphasis on deep learning

**COMP 460 Algorithms & Complexity (3 Credit Hours)**

This course will focus both on presenting general techniques for designing correct and efficient algorithms, as well as on formal methods for proving the correctness and analyzing the complexity of such algorithms.

*Outcomes:*

Students learn: the ability to design and analyze efficient algorithms; understanding of the necessary models and mathematical tools; understanding of a variety of useful data structures and fundamental algorithms; exposure to the classification of computational problems into different complexity classes

**COMP 462 Advanced Computer Architecture (3 Credit Hours)**

This course presents key principles underlying the design of modern digital computers. The course introduces quantitative techniques used to guide the design process. It describes CPU performance issues and introduces instruction set architectures. The course then uses a hypothetical computer design, with a simple RISC architecture, to show how modern digital computers are implemented, first using a simple non-pipelined implementation, followed by a higher-performance pipelined implementation.

*Outcomes:*

Students gain an understanding of the design of the memory hierarchy in modern digital computers, caching and virtual storage techniques, multiprocessor systems, and distributed shared memory systems

**COMP 464 High-Performance Computing (3 Credit Hours)**

This course will use a blend of foundational understanding as well as a set of practical tools to gain insight into performance engineering of software. The course introduces techniques to gain performance boost in Java programs and C++ (or C) programs by discussing the use of multiple processors.

*Outcomes:*

Students will learn shared memory, message passing and hybrid models of programming in both tightly-coupled and loosely-coupled computer systems

**COMP 468 Database System Design (3 Credit Hours)**

The course covers both relational and object databases. Issues of physical storage and use of indexes as well as optimization of queries are discussed. The course also covers transaction processing, concurrency, data warehousing, data mining, and distributed databases.

*Outcomes:*

Students learn the theory and practice of advanced database design and implementation; They will also gain an understanding of using commercial database environments such as Oracle

**COMP 469 Physical Design and Fabrication (3 Credit Hours)**

This course explores how things are made, including: physical design vs. design on non-physical things; rapid prototyping; 3D printing; 2D conceptualization and sketching; modeling.

*Outcomes:*

Student will be able to: Visualize ideas via sketching basic shapes; Create 3D models using 3D modeling software; Use a 3D Printer; Give constructive feedback in peer review sessions

**COMP 470 Software Quality and Testing (3 Credit Hours)**

*Pre-requisites:* COMP 163 or COMP 271 or permission of Instructor

In this programming intensive course, students will learn effective automation, testing, and use of software metrics through the practices of Test Driven Development and Continuous Deployment.

*Outcomes:*

Students will be able to perform rigorous testing techniques that contribute to operational reliability, and identify programming practices that both contribute to software maintainability and help to avoid errors

**COMP 471 Theory of Programming Languages (3 Credit Hours)**

There are over two thousand programming languages. This course studies several languages that represent the much smaller number of underlying principles and paradigms.

**COMP 472 Compiler Construction (3 Credit Hours)**

This course covers the basics of writing a compiler to translate from a simple high-level language to machine code. Topics include lexical analysis, top-down and LR parsing, syntax-directed translation, and code generation and optimization. Students will write a small compiler.

*Outcomes:*

Students will learn the theory and practice of how to build a compiler

**COMP 473 Advanced Object Oriented Programming (3 Credit Hours)**

Object-orientation continues to be a dominant approach to software development. This advanced programming-intensive course studies object-oriented analysis, design, and implementation from a design patterns perspective.

*Outcomes:*

Proficiency in the use of object-oriented languages, frameworks, and patterns; advanced understanding of key language mechanisms such as delegation, inheritance, polymorphism, and reflection; familiarity with object-oriented modeling and development tools and test-driven development

**COMP 474 Software Engineering (3 Credit Hours)**

The course discusses real-world theory and techniques organizations use to create high-quality software on time. Students work on a large programming team to create plans, review progress, measure quality, and make written and oral analyses of their project.

*Outcomes:*

Students will experience process based development, understand the dynamics of a professional software organization, and develop skills for implementing software with others

**COMP 476 Automata & Formal Languages (3 Credit Hours)**

*Pre-requisites:* MATH 201 or MATH 212 or COMP 163

This course introduces formal language theory, including such topics as finite automata and regular expressions, pushdown automata and context-free grammars, Turing machines, undecidability, and the halting problem.

*Course equivalencies:* X-COMP476/MATH476

*Outcomes:*

An understanding of the theoretical underpinnings of computability and complexity in computer science

**COMP 477 IT Project Management (3 Credit Hours)**

This course is an introduction to the philosophy and practice of project management. The course involves a student group project to investigate and plan a 'real world' IT project that specifies project objectives, schedules, work breakdown structure, and responsibilities, an written interim report, and a final oral and written report.

*Outcomes:*

Students will learn time management, work-flow management, and team dynamics to design, implement and test large-scale software projects

**COMP 479 Machine Learning (3 Credit Hours)**

Topics include a wide variety of supervised learning methods, both regression and classification, with an emphasis on those that perform well on large feature sets.

*Outcomes:*

Students in this course will learn how to apply sophisticated algorithms to large data sets to make inferences for prediction or decision making

**COMP 480 Computer Graphics (3 Credit Hours)**

This course introduces advanced topics in modern theory and practices in 3-D computer graphics, stressing real-time interactive applications using libraries like OpenGL.

*Outcomes:*

Student will learn how to program real-time interactive applications using libraries like OpenGL

**COMP 483 Computational Biology (4 Credit Hours)**

*Pre-requisites:* BIOL 488

This course presents an algorithmic focus to problems in computational Biology. As such it is built on earlier courses on algorithms and bioinformatics. Current algorithmic approaches, software tools, and scientific literature are discussed.

*Outcomes:*

Students will learn, in detail, foundational methods and algorithms in bioinformatics

**COMP 484 Artificial Intelligence (3 Credit Hours)**

This course advanced artificial intelligence concepts including theory, search techniques and programming.

*Outcomes:*

Student will learn the theory of artificial intelligence, search techniques, and be able to build small applications based on it

**COMP 486 Computational Neuroscience (3 Credit Hours)**

*Pre-requisites:* COMP 150 or COMP 170 or COMP 180 or Permission of Instructor

Introduces computational methods to understand neural processing in the brain. Levels of representation from low-level, temporally precise neural circuits to systems-level rate-encoded models, to information-theoretic approaches. Emphasis on sensory systems, primarily vision and audition, most readily demonstrating the need for such computational techniques.

*Outcomes:*

Students will be able to adeptly apply mathematical and computational frameworks in the various domains of neuroscience

**COMP 487 Deep Learning (3 Credit Hours)**

*Pre-requisites:* COMP 479

Deep learning is part of a broader family of machine learning methods based on artificial neural networks. This course will include key concepts of neural network algorithms as well as their applications in computer vision and natural language processing.

*Outcomes:*

Students will analyze popular modern neural architectures such as convolutional and recurrent neural networks, design and evaluate their own neural networks, and apply neural network models to a practical task

**COMP 488 Computer Science Topics (1-4 Credit Hours)**

This course is used to introduce emerging topics in computer science that do not yet have a regular course number. Content of the course varies.

*Outcomes:*

Understanding of an emerging area of Computer Science

**COMP 490 Independent Project (1-6 Credit Hours)**

*Pre-requisites:* Approval of the Computer Science faculty member supervisor

An independent project in computer science or related disciplines, under the supervision of a member of the faculty.

**COMP 499 Internship (1-6 Credit Hours)**

An opportunity to obtain experience in software development, design, networks, or related activities in computer science in a professional setting. The student must obtain the approval of the Graduate Program Director and the student's work supervisor. A final report from the student and the supervisor are required.

**COMP 501 Equitable and Inclusive Computer Science Pedagogy (3 Credit Hours)**

*Pre-requisites:* COMP 400C; Graduate standing

This class covers the design of computer science courses through an equity and inclusion lens, and covers evidence-based best practices as applied to specific student concerns. Includes basics of teaching and learning theory and pedagogical techniques, and equity, diversity, and justice concerns.

*Outcomes:*

Ability to explain justice-centered CS education; understand pedagogical frameworks; understand assessment approaches; understand Active Learning and Peer Instruction

**COMP 502 Structure of Research Management and Funding (3 Credit Hours)**

*Pre-requisites:* COMP 400C; Graduate standing

This class covers grant-proposal development, University compliance regulations, and laboratory and research management.

*Outcomes:*

Ability to create successful grant proposals and to understand research management

**COMP 503 Technology Entrepreneurship (3 Credit Hours)**

*Pre-requisites:* COMP 400C; Graduate standing

This course provides aspiring researchers with the skills to pursue new ventures and technology commercialization. Students learn how to transition an innovation from the lab to the marketplace.

**COMP 595 Thesis Supervision (0 Credit Hours)**

Supervision for students working on a thesis while not for other classes. Restricted to students enrolled in the MS in Computer Science.

**COMP 605 Master of Science Study (0 Credit Hours)**

Course for continuing master's degree students engaged in study.

**Computer Science and Education (CSED)****CSED 401 Intro to Programming & Computer Science (3 Credit Hours)**

This course provides an introduction to programming with an overview of other topics in computer science.

*Outcomes:*

Basic programming skills in a computer language such as VB.NET or Logo that may be suitable for teaching to young programmers; understanding of other fundamentals of how computer hardware and software tools work

**CSED 430 Technical Administration of PC Cluster (3 Credit Hours)**

This course covers technical knowledge and practical skills needed to administer a PC cluster in a school or similar environment, focusing on security issues such as firewalls, viruses, and external and internal attacks, and also covers server and LAN configuration and storage management.

*Outcomes:*

Students will be familiar with the procedures and design tradeoffs involved in configuring a computer lab

**CSED 431 Management of PC Cluster (3 Credit Hours)**

Further topics in management of school-based PC clusters are covered: purchasing, staffing, troubleshooting, configuration, copyright and software licensing, facilities and resource management, use of IT outsourcing, acceptable-use policies, account management, content filtering, and reliability.

*Outcomes:*

Students will be familiar with issues and conflicts, both technical and social, that arise in school lab management, and with ways of addressing them

**Computer Science & Information Systems (CSIS)****CSIS 484 Project Management (3 Credit Hours)**

The art and science of project management as applied to a variety of large and small project situations, in commercial, public, and private sectors. Coverage includes project life cycle management, project organization and leadership, proposals and contracts, and techniques for project planning, estimating, scheduling, and control.

*Course equivalencies:* X-CSIS484/ISOM484

**CSIS 498 Telecommunications for Managers (3 Credit Hours)**

This course introduces the basic concepts of data communications, telecommunications networks, and business applications of telecommunications technology, from a managerial perspective. Basic concepts covered include data communications hardware and software, transmission media, and network topology, with an emphasis on local area networks (LANs) and client server applications. Issues related to the management of LANs, wide area networks, and international telecommunications networks will be presented. The course will address technical and managerial issues related to the use of telecommunications for strategic advantage and its role in business organizations. Business cases involving the planning, designing, implementation, and management of communications networks in business organizations will be discussed.

*Course equivalencies:* X-CSIS498/ISOM498

**Criminal Justice & Criminology (CJC)****CJC 401 Politics and Policies in the Criminal Justice System (3 Credit Hours)**

This course examines the interactional processes within and among the criminal justice system's components and their relationships to other public and private institutions. The role of politics in policy formulation, the policy making process, and the consequences of current policies on the operation of the criminal justice system are discussed.

**CJC 402 Theories of Criminal Behavior (3 Credit Hours)**

This is a comparative review of dominant contemporary theories and research on the causes of crime and delinquency. Competing theories on the causes of crime are analyzed, and their empirical support and implications for prevention programs and interventions are discussed.

*Outcomes:*

To analyze and discuss contemporary theories of criminal behavior

**CJC 403 Program Evaluation and Research (3 Credit Hours)**

This course provides students with the substantive knowledge to be critical consumers of research studies and program evaluations. Students learn how to critique the internal, construct, and external validity of program evaluations and data collection efforts that seek to understand criminal behavior or the operation of the criminal justice system.

*Outcomes:*

To analyze and critique program evaluations and research designs

**CJC 404 Applied Data Analysis and Interpretation (4 Credit Hours)**

Students learn the skills and knowledge necessary to be critical consumers of statistical information, which is often present in everyday criminal justice practice. Students learn how to generate and interpret statistical output using SPSS-PC, and learn which statistical tools are appropriate for specific measures and research questions.

*Outcomes:*

To select the correct statistical tools and interpret output To write statistical information To conduct SPSS-PC

**CJC 405 Professional Ethics (3 Credit Hours)**

The course defines the ethical responsibilities and explores the ethical dilemmas faced by police, court, and corrections officials. Moral theories are discussed. Students critically analyze their own and others' beliefs. They learn how to think constructively about ethical dilemmas, and how to articulate the inherent ethical issues in the field of criminal justice.

*Outcomes:*

To analyze moral dilemmas and ethical situations that professionals may face

**CJC 408 Applied Research in Criminal Justice and Criminology (2 Credit Hours)**

*Pre-requisites:* CJC 401, CJC 402, CJC 403, and CJC 404

This is a student-initiated research course, supervised by the instructor. Students will conduct applied research that informs the policies or practices of a stakeholder group or criminal justice agency. This course encourages advanced students to approach the multifaceted problem of research as a set of interrelated issues ranging from tasks of concept formation and theory construction through research design and data collection to the assessment and analysis of the generated data.

*Outcomes:*

Students should be able to synthesize criminological theory, criminal justice policy, research methods, and data analysis into a final applied research project

**CJC 410 Advanced Topics in Criminology (3 Credit Hours)**

*Pre-requisites:* Graduate students only

Variable topics on theories or contemporary issues concerning criminal and victim behavior. Examples of topics include: Drugs and Violence; Gender and Crime; Intimate Partner Violence; Sexual Violence; Human Trafficking; Environmental Crime; Victimology; International Criminology; Advanced Criminology; Race, Ethnicity, and Crime.

**CJC 411 Advanced Topics in Policing (3 Credit Hours)**

*Pre-requisites:* Graduate students only

An advanced topics umbrella course for special and contemporary topics in the field of policing, including community- and problem-oriented policing, situational crime prevention, crime analysis, and Comp-Stat approaches to policing practice and management.

**CJC 412 Advanced Topics in Courts (3-6 Credit Hours)**

*Pre-requisites:* CJC 401; Graduate Students Only

Variable topics on contemporary issues in courts. Examples of topics include: International Criminal Law and Anti-Terrorism Enforcement, The American Jury; Death Penalty; International Criminal Law; Public Views of Justice; Media, Culture, and Criminal Law; Legal Rights of Children.

*Outcomes:*

Varies by topic

**CJC 413 Advanced Topics in Corrections (3-6 Credit Hours)**

*Pre-requisites:* Graduate students only

An advanced topics umbrella course for special and contemporary topics in the field of corrections. Examples of graduate courses that will be offered as special topics courses under CJC 413 include: Principles of Punishment, Sentencing Policy, Restorative Justice, Risk Assessment, Re-Entry, What Works in Corrections, Mass Incarceration, and Juvenile Corrections.

**CJC 414 General Special Topics (3 Credit Hours)**

Special topic course titles will vary, and will cover issues that do not fit within the four advanced topics areas of criminology, policing, courts, and corrections. Topics may include: Crime Mapping; Social Psychology and the Criminal Justice System; Prejudice, Hate, and the Justice System.

*Outcomes:*

To analyze and discuss topics in criminal justice

**CJC 415 Mental Illness and Crime (3 Credit Hours)**

*Pre-requisites:* Graduate students only

This course explores the relationship of mental illness to crime and violence, the policies and programs concerning the treatment of individuals with mental illness in the criminal justice system, including the nature, prevalence and consequences of mental disorder among criminal offenders.

**CJC 416 International Criminal Justice (3 Credit Hours)**

This course is an introduction to the nature and scope of international and transnational crime, to the emerging legal framework for its prevention and control, and to its impact on the U.S. criminal justice system. Emphasis will be placed on international aspects of the work of different criminal justice agencies, such as formal and informal police cooperation and the use of mutual assistance and extradition agreements, and on the bilateral, regional, and international structures created for crime prevention, punishment, and control.

**CJC 417 Forensic Science and the Criminal Justice System (3 Credit Hours)**

Graduate Students Only. This course introduces the basic principles and applications of the biological, chemical, physical, medical and behavioral sciences currently practiced and the limitations of the modern crime laboratory. The course then explores uses of forensic science and the applicability to the criminal justice system. Current issues, examples, and presentations are integrated into course material.

*Outcomes:*

Understand the basic concepts, strengths, limitations and challenges of the forensic sciences discipline, the application of the forensic sciences to the management, operations, and policies of criminal justice system, from crime scene processing through adjudication

**CJC 499 Independent Study (1-6 Credit Hours)**

Working with a member of the graduate faculty, this course provides students with the opportunity to examine a specific topic in the field of criminal justice through directed readings, interviews, and the completion of a major research paper related to the topic. Students will gain an in-depth understanding of a specific criminal justice topic through directed readings and independent study.

**CJC 500 Directed Research (1-6 Credit Hours)**

No course description is available

**CJC 501 Thesis Research (2 Credit Hours)**

*Pre-requisites:* Approval of Graduate Program Director and Grade of A in CJC 409 and CJC 407

Supervision and guidance are given as students conduct their independent Masters' thesis research.

*Outcomes:*

Master's Thesis

**CJC 502 Practicum in Criminal Justice (3-6 Credit Hours)**

This course enables the student to apply their knowledge (conceptual, theoretical, and methodological) in a practical agency setting. Students will be able to contribute in a meaningful way to the operation of a specific criminal justice agency, and identify/describe the link between their field experience and prior courses through a research paper.

This course satisfies the Engaged Learning requirement.

**CJC 595 Thesis Supervision (0 Credit Hours)**

This is a non-credit course. Students who are working on approved master's thesis research and are not registered for any course are required to register for thesis supervision.

**CJC 605 Master's Study (0 Credit Hours)**

*Pre-requisites:* Completion of the graduate core courses

This course is a non-credit means of permitting students to be formally enrolled at Loyola while preparing for the written comprehensive examination.

## Data Science (DSCI)

**DSCI 401 Introduction to Data Science (4 Credit Hours)**

*Pre-requisites:* Restricted to Graduate students

This course provides students with an introduction to data science using the R programming language covering such topics as data wrangling, data visualization, interacting with databases, principles of reproducible research, building simple statistical models/machine learning and data science ethics.

*Outcomes:*

Students will obtain an extensive background in the basic tools used in the field

**DSCI 470 Data Science Consulting (2 Credit Hours)**

*Pre-requisites:* STAT 408

Students will work on a research project with a client acting as a consultant on the statistical and computational aspects of the project. Students are required to meet with a client, develop a strategy for addressing their problem, and present their results to the client (and their classmates).

*Outcomes:*

Students will apply methods learned in prior classes to address a real-world problem, gain oral and written presentation skills, and improve collaboration skills

**DSCI 494 Data Science Research Design (2 Credit Hours)**

Restricted to DSCI Graduate students. Research practices, including data collection and management, the experimental design process, and tools for critical analysis and preparation of scientific literature will be discussed.

*Outcomes:*

Students can describe and implement research design practices in data science

**DSCI 499 Data Science Research (1-8 Credit Hours)**

Restricted to DSCI Graduate students. Students will conduct independent hypothesis-driven data science research under faculty guidance.

Research efforts will include literature surveys, research design, algorithm and software development, and data analysis.

*Outcomes:*

Students can develop and utilize techniques for data science research

**DSCI 595 Thesis Supervision (1 Credit Hour)**

*Pre-requisites:* DSCI 499

Research under faculty guidance including training in scientific writing and the production of a thesis and research presentation.

*Outcomes:*

Students will develop skills in scientific writing and presentation; At the conclusion, students will present (written and oral) the results of their research

## Digital Humanities (DIGH)

**DIGH 400 Introduction to Digital Humanities Research (3 Credit Hours)**

Enrollment in DIGH 400 is the prerequisite for DIGH 401, 402, 500, 595.

An introduction to the digital humanities, work in a variety of humanities disciplines—literature, art, philosophy, theology, and history—that involves computer assistance in conducting or presenting research. This includes, for example, digitizing, markup, editing, publishing, archiving, analyzing, visualization, modeling, interpretive gaming, and instructional and interface design. This course will emphasize research questions and methods from a range of humanities disciplines—not computer technology per se but ways that computing can further humanities research agendas.

*Outcomes:*

Knowledge of how computing affects research in humanities, critical thinking about technology and humanities, awareness of broad social and ethical questions surrounding old and new, print and digital, media in contemporary culture

**DIGH 401 Introduction to Computing (3 Credit Hours)**

*Pre-requisites:* DIGH 400 co-enrollment

Primarily for DH students, the course combines historical study with a hands-on approach to computers their growing role in academic research, publishing, libraries, and the arts. Topics will include the structure of computers, the relation of hardware and software, text and image markup and publishing, database theory and design, modeling and visualization, text analytics, procedural logic, and the basic concepts of programming, artificial intelligence, and the social, ethical, and intellectual contexts for computing.

*Outcomes:*

Procedural literacy, historical knowledge of hardware and software platforms, ability to be a scholar-programmer or to collaborate fruitfully with scholar-programmers

**DIGH 402 Digital Humanities Design (3 Credit Hours)**

Introduces students to design and human computer interaction.

*Outcomes:*

Students gain practical experience with design, testing, and building ethical digital projects

**DIGH 403 Introduction to Web Application Development (3 Credit Hours)**

*Pre-requisites:* DIGH 400, DIGH 401, DIGH 402

This course studies the concepts, methods, and tools used in the analysis, design, implementation, testing, and deployment of typical multi-tier web applications.

*Course equivalencies:* X- DIGH403/CPST342/COMP342

*Outcomes:*

Experience with commonly used web application development frameworks

**DIGH 405 Special Topics in Digital Humanities (3 Credit Hours)**

Special topics in Digital Humanities or new approaches of current interest to the instructor.

*Outcomes:*

Dependent upon course topic; must be approved by GPD

**DIGH 499 Independent Study in Digital Humanities (1-3 Credit Hours)**

Students work under the direction of a faculty member on a particular area of interest within Digital Humanities.

*Outcomes:*

Students advance their research projects with direct and regular input from a faculty member

**DIGH 500 Digital Humanities Practicum (3 Credit Hours)**

*Pre-requisites:* DIGH 400 and DIGH 402

This course invites students to learn about and engage in collaborative project-building. Students will contribute to building an active faculty-led digital humanities research project. Work will be informed by weekly readings and seminar-style discussions. Possible work may include coding, data modeling, digitization, proposal-writing, grant-writing, project management, design, and research.

*Outcomes:*

A collaborative contribution to a digital humanities research project run by a faculty or staff member and sponsored by the CTSDH

**DIGH 501 Digital Humanities Project (3 Credit Hours)**

*Pre-requisites:* DIGH 400 and DIGH 402

In this capstone, students will apply skills they've learned throughout the program, and develop new technological and research skills as the project demands. Students will develop their own digital humanities research project that demonstrates their competency in a facet of digital humanities and expertise within their chosen subject area.

*Outcomes:*

A working, practical final digital humanities project published online

**DIGH 605 Master's Study (0 Credit Hours)**

Students register for this course to maintain active enrollment in the Graduate School during the fall or spring semesters if they are not registered for any graduate class at the master's level while finishing up any MA requirements, such as their field examinations and research project.

*Outcomes:*

Advancement to degree completion

## English (ENGL)

**ENGL 400 Intro to Graduate Study (3 Credit Hours)**

The course serves as an introduction to the profession of literary studies for students new to the graduate programs in English. It offers a review of current critical theories and methodologies, research techniques, bibliographic methods, and issues in textual criticism.

**ENGL 402 Teaching College Composition (3 Credit Hours)**

The course deals with practical matters related to the teaching of college composition. It is organized around an examination of recent theories, methods, and materials used in the teaching of writing.

**ENGL 403 Composition Theory (3 Credit Hours)**

This course examines major and current advances in composition theory and reviews current scholarship in the teaching of writing, with some attention to the relationship between composition and literary theory.

**ENGL 404 Pedagogy: Theory and Practice (3 Credit Hours)**

*Pre-requisites:* ENGL 402

This course is designed to help students integrate theory and practice in teaching literature and cultural studies courses at the college level.

*Outcomes:*

Students will demonstrate an understanding of pedagogical theories by writing a teaching philosophy in which they explain and defend their theoretical approach; students will put their theory into practice by preparing a course proposal for a literature course, which includes a description and goals, syllabus and guidelines, classroom format, and assignments and evaluations procedures

**ENGL 406 History of the English Language (3 Credit Hours)**

The course is a study of the causes, mechanisms and consequences of language variation over time, with prominent examples taken from the history of English and its parent languages. All major areas of linguistic theory are considered: phonology, lexis, morphology, syntax, and semantics.

*Course equivalencies:* X-ENGL426/WOST406/WSGS406

**ENGL 410 Contemporary Literary Criticism (3 Credit Hours)**

This course presents studies in major contemporary theoretical and critical issues through a survey of major types of critical analysis, such as formalism, structuralism, semiotics, reader-response, deconstruction, psychoanalysis, and feminist criticism.

**ENGL 412 History of the Book to 1800 (3 Credit Hours)**

*Pre-requisites:* Graduate status

This course will examine the history of written and printed texts from their beginnings to 1800, including such topics as book production and distribution, early ideas about textual editing, literacy, copyright, and censorship.

*Outcomes:*

Students will be able to relate textual forms to cultural practices

**ENGL 413 Textual Criticism (3 Credit Hours)**

An introduction to major textual theories and their history. Topics may include such issues as analytic and descriptive bibliography, theories of copy-text, theoretical and practical issues in editing, and forms of textuality, including manuscript, print and digital.

**ENGL 415 Media and Culture (3 Credit Hours)**

This course examines the important and evolving roles that media plays in the construction, reformulation, and critique of contemporary culture. Topics will vary but may include digital textuality; visual culture studies; information technologies; postcoloniality and globalization; and web-based communities.

**ENGL 419 Contemporary Issues in Literature and Culture (3 Credit Hours)**

The course is an intensive study of a particular cultural issue in relation to literature.

**ENGL 420 Topics in Critical Theory (3 Credit Hours)**

Focused study of a particular problem or movement within critical theory—for example, globalization; the "new aesthetics"; high and low culture; psychoanalytic theory; whiteness studies.

**ENGL 422 Postcolonial Theory (3 Credit Hours)**

This course traces the origins, key developments, and practice of postcolonial theory, focusing on classic texts in the field (e.g., Senghor, Fanon, Cabral); issues raised by contemporary theorists (e.g., Said, Spivak, Bhabha, Chatterjee); and current challenges to postcolonial theory.

**ENGL 423 Marxist Literary Theory (3 Credit Hours)**

Intensive study of selected writers and issues within the Marxist tradition of literary and cultural criticism.

**ENGL 424 Cultural Studies (3 Credit Hours)**

An examination of the theory and practice of cultural studies, with special attention to the role of literary and critical theory in its development.

**ENGL 426 Feminist Theory and Criticism (3 Credit Hours)**

An intensive study of recent feminist theory in a range of disciplines—including literature, philosophy, history, and law—and covering a variety of approaches, such as psychoanalysis, post-structuralism, post-colonialism, queer theory, and cultural studies.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* X-ENGL426/WOST406/WSGS406

**ENGL 427 Dramatic Theory (3 Credit Hours)**

This course presents selected theoretical approaches to drama from the Greeks to the present. Readings may include both theoretical works and plays. Topics may include genre, dramaturgies such as realism, epic theatre, and theatre of the absurd, reception, semiotics, feminist dramatic theory, and performance theory.

**ENGL 428 Postmodernism (3 Credit Hours)**

*Pre-requisites:* Graduate status

This course investigates "postmodernism" in its various uses—as a literary period, an aesthetic style, an historical moment, a cultural problematic, and a theoretical imperative. The course includes readings in literature and theory as well as other art forms, such as architecture and the graphic arts.

*Outcomes:*

Students will demonstrate their ability to define postmodernism in relation to modernism and postmodernity and to analyze postmodern literature and art through seminar papers, oral presentations, and exams

**ENGL 430 Topics in Literature Studies (3 Credit Hours)**

The course is an intensive study of a particular problem, genre, theme or body of work in literature.

**ENGL 433 Seminar in Individual Authors (3 Credit Hours)**

Intensive study of a single author. Includes a comprehensive reading of the author's major works, and a review of the critical reception.

**ENGL 436 Women Writers in English (3 Credit Hours)**

This course focuses on significant issues raised in and by women-authored works, including representations of gender roles and sexualities, and the cultural status and uses of women's literature. Authors from any period(s) in British, American and World literature may be included.

**ENGL 437 Topics in Drama (3 Credit Hours)**

This course may deal with topics that cut across historical and national boundaries, such as dramatic genres, women in drama, modern reappropriations of earlier drama; with more specialized topics such as performance or feminist dramatic theory; or with historical movements in drama.

**ENGL 440 Topics in Medieval Literature (3 Credit Hours)**

Studies in a range of Middle English writing serve as a focus for special topics, including mysticism and historical prose from the thirteenth to the fifteenth centuries.

**ENGL 441 Old English Language & Literature (3 Credit Hours)**

This course introduces Old English language and literature through readings in poetry and prose, with attention, as time allows, to major critical issues in texts of the period.

**ENGL 443 Middle English Literature (3 Credit Hours)**

This course may address texts that bridge the Old and Middle English periods or texts (excluding Chaucer) that date from the fourteenth-century, such as Langland, Malory, the Gawain-poet, Gower, and women writers.

**ENGL 444 Medieval Drama (3 Credit Hours)**

The course focuses on English drama from its beginnings to the early Renaissance, including liturgical drama, saints' plays, miracle plays, the cycles, and interludes.

**ENGL 447 Chaucer (3 Credit Hours)**

This course may focus on the Canterbury Tales or Troilus and Criseyde and the dream visions, and may include some of Chaucer's less frequently studied texts (e.g., his translation of the Consolation of Philosophy).

**ENGL 450 Topics in Early Modern Literature & Culture (3 Credit Hours)**

This course presents selected studies in poetry and prose of the English Renaissance.

**ENGL 455 Shakespeare (3 Credit Hours)**

The philosophical, esthetic, and historical problems of Shakespeare's plays are covered in this course, which also focuses on Shakespearean scholarship.

**ENGL 456 Early Modern Drama (3 Credit Hours)**

This course presents English drama of the period 1550 to 1642. Among the topics to be covered are the rise of the permanent theaters; Elizabethan and Jacobean contemporaries of Shakespeare; Caroline plays and masques. Historical background, theatrical developments, and critical approaches are also studied.

**ENGL 457 Seventeenth-Century Literature (3 Credit Hours)**

This course is an intensive study of a particular problem, genre, theme or body of work in seventeenth-century literature. Milton's poetry, prose, ideas, and projects are studied against the background of seventeenth-century events; special problems in Milton scholarship are also examined.

**ENGL 458 Milton (3 Credit Hours)**

Milton's poetry, prose, ideas, and projects are studied against the background of seventeenth-century events; special problems in Milton scholarship are also examined.

**ENGL 460 Topics in Restoration & 18th Century Literature (3 Credit Hours)**

This course is an intensive study of a particular problem, genre, theme or body of work in Restoration and eighteenth-century literature.

**ENGL 466 Eighteenth-Century Novel (3 Credit Hours)**

This course includes prose fiction in the Restoration and earlier eighteenth century; the mid-century novels of Richardson, Fielding, and Smollett; the novel after 1760, including the Gothic novel and the sentimental novel; Sterne and Burney.

**ENGL 470 Topics in Romanticism (3 Credit Hours)**

The course is an intensive study of a particular problem, genre, theme or body of work in Romantic literature.

**ENGL 471 Poetry of Romantic Period (3 Credit Hours)**

The poetry of major and minor Romantic figures is studied in this course, which includes a critical study of their esthetics, philosophical concepts, and critical standards.

**ENGL 475 Topics in Victorian Literature (3 Credit Hours)**

The course is an intensive study of a particular problem, genre, theme, or body of work in Victorian literature.

**ENGL 476 Victorian Poetry (3 Credit Hours)**

This course presents the historical, political, social, and intellectual influences on Victorian poetry and examines its artistic and formal innovations and achievements. The authors studied include: Tennyson, Browning, Arnold, Swinburne, and the Rossettis.

**ENGL 477 Victorian Prose (3 Credit Hours)**

The course examines the major critical and philosophical prose writers of the years 1837-1900: Macaulay, Carlyle, Arnold, Ruskin, Newman, and Pater. It also explores the intellectual, social, and political backgrounds of the period, and identifies Victorian prose styles.

**ENGL 478 Victorian Novel (3 Credit Hours)**

The course examines the major Victorian novelists: Dickens, Thackeray, the Brontes, Trollope, Eliot, Meredith, and Hardy; religious, social, scientific, historical, and philosophical influences on the novel are also explored.

**ENGL 480 Topics in Modernism (3 Credit Hours)**

Topics include modernism, the Symbolist movement, Edwardian Period, and other contextual issues that transcend genre boundaries and address larger concerns of social and intellectual history.

**ENGL 481 Modern Poetry (3 Credit Hours)**

The course examines tradition and experiment in modern poetry and includes English, Irish, and American poets.

**ENGL 482 Modern Drama (3 Credit Hours)**

This course presents selected studies in dramatists from Ibsen on, including British, American, Continental, and Irish dramatists.

**ENGL 483 Modern Novel (3 Credit Hours)**

The course concentrates on selected studies in Conrad, Galsworthy, Bennett, Wells, Joyce, Lawrence, Huxley, Woolf, Maugham, Forster and other novelists, but may include additional American, Irish, and Continental novelists.

**ENGL 484 Literature and Culture of the Jazz Age (3 Credit Hours)**

Taking an interdisciplinary approach to a crucial era, this course will consider such topics as the construction of race in literature and popular culture, the rise of the New Woman, the Harlem Renaissance, and the relationship of jazz to aesthetic modernism.

**ENGL 485 Contemporary Literature (3 Credit Hours)**

This course concentrates on literature and literary movements of the second half of the twentieth century. Possible topics include postcolonialism (Achebe, Jhabvala, Naipaul, Soyinka, Walcott), postmodernism (Acker, Calvino, Pynchon, Reed), and African-American writing (Baldwin, Morrison, Walker).

**ENGL 487 Postcolonial Literature (3 Credit Hours)**

This course examines the issues of modern-day colonization as depicted in selected fiction, drama, and poetry from Africa, South Asia, the West Indies, and Australia.

**ENGL 488 20th Century Literature in English (3 Credit Hours)**

Focusing on the relation between texts and their literary and cultural contexts, this course may include any twentieth-century text written in English and may address a particular theme, literary movement, period, nation, or historical event. We may also interrogate the foundation of such categories.

**ENGL 489 Magic Realism (3 Credit Hours)**

Fusing realistic and symbolic forms, "Magic Realism" raises boundary issues of many kinds, between history and myth, empirical and non-empirical experience, objective and subjective knowledge. This course examines magic realism from its modernist origins to contemporary postmodern and postcolonial fiction in many countries.

**ENGL 490 Topics in American Literature (3 Credit Hours)**

This course is an intensive study of a particular problem, genre, theme, or body of work in American literature.

**ENGL 491 Early American Literature (3 Credit Hours)**

This course examines Hispanic, native American, Puritan, colonial, and early nationalist literature in the United States, and explores its American and European backgrounds.

**ENGL 492 American Romanticism (3 Credit Hours)**

The course includes selected studies in Poe, Emerson, Thoreau, Hawthorne, Melville, Whitman, and others.

**ENGL 493 American Realism (3 Credit Hours)**

The course features selected studies in American realism, tracing its origins and development as a national literary movement, and reviewing its regional variations and sub-genres, with special attention to Twain, Howells, and James.

**ENGL 494 American Literature Since 1914 (3 Credit Hours)**

The course is composed of selected studies in representative American writers of poetry, fiction, drama, and prose in the twentieth century.

**ENGL 495 Latino/a Literature (3 Credit Hours)**

*Pre-requisites:* Graduate standing and consent of the GPD in English  
Latino/a literature has become an important focus in American literary studies because of its unique relation to questions of language, cultural hybridity, and borders. This course takes an interdisciplinary approach to Latino/a fiction, poetry, and drama, including analysis of Latino/a genres like corridos, testimonios, and teatro campesino. Topics include identity politics, transnationalism, cultural traditions and literary forms, textual recovery, gender and sexuality, and (im)migration.

*Outcomes:*

Students will gain an understanding of the diversity of forms, politics, themes, and identities in Latino/a Literature and the scholarly criticism about it; Students will learn how to teach and write about this literature through oral and written assignments

**ENGL 496 African American Literature (3 Credit Hours)**

This course focuses on African-American literature over a range of periods and genres including 19th-century slave narratives (Douglass, Jacobs), the fiction and poetry of the Harlem Renaissance (Hurston, Hughes, McKay) and contemporary literature (Ellison, Shange, Morrison).

**ENGL 501 Directed Readings (3 Credit Hours)**

An independent study course supervised by a faculty member with the approval of the program director. Readings are initiated by the student.

**ENGL 502 Independent Study-Doctoral Qualification (3 Credit Hours)**

The course is composed of special readings in the field of the student's specialization under the supervision of a faculty member with the approval of the chair. Normally the director will be the professor with whom the student plans to write the dissertation. The written outcome of the course will be a draft of a proposal for the dissertation. The course is graded on a credit/no-credit basis.

**ENGL 540 Newberry Seminar (3 Credit Hours)**

Special topics in literary study offered by the Newberry Library.

**ENGL 595 Thesis Supervision (0 Credit Hours)**

Directed studies for students working toward a master's thesis.

**ENGL 600 Dissertation Supervision (0 Credit Hours)**

Directed studies for students working toward a doctoral dissertation.

**ENGL 605 Master's Study (0 Credit Hours)**

Directed studies for students working toward a master's thesis.

**ENGL 610 Doctoral Study (0 Credit Hours)**

Directed studies for students working toward a doctoral dissertation.

**Erikson Institute (ERIK)****ERIK E421 Social and Emotional Development I (3 Credit Hours)**

This course focuses on the study of social and emotional development in children from birth through age eight. It primarily considers how children experience themselves and others; the role of relationships in development; and the interaction of biological, psychological and social forces. Restricted to Erikson Institute Graduate Students.

*Course equivalencies:* ERIKE121 / ERIKE21 / ERIKE421

**ERIK E426 Cognitive Development (3 Credit Hours)**

This course provides students with a basic knowledge of cognitive development in children from birth through age eight and fosters awareness of the application of this knowledge to children with diverse abilities and varying cultural and linguistic backgrounds. Restricted to Erikson Institute Graduate Students.

*Course equivalencies:* ERIKE126 / ERIKE26 / ERIKE426

**ERIK E477 Seminar Children-At-Risk (3 Credit Hours)**

This course examines the concept of risk and how it impacts child development. We will use multiple frameworks to examine risk, including public health, developmental psychopathology, and education. Attention will be focused on biological/genetic (such as prematurity and temperament), family (such as parent mental health and child maltreatment), and environmental (such as poverty and neighborhood violence) factors. The consequences of growing up in the context of chronic adversity will be explored, as well as the factors that lead some children to cope with and show resilience in these circumstances. The challenges of understanding risk in current research, as well as the implications of this research for programs and policy will also be discussed.

*Course equivalencies:* ERIKE477 / ERIKE77

**ERIK E479 Teaching & Learning: Linking Theory & Research to Practice (3 Credit Hours)**

An understanding of the two domains of learning and teaching is fundamental to the field of child development and education. This course examines these issues through investigating and analyzing exemplary models of recent and influential theory and research. A dialogue-based approach to learning will be used throughout the course to encourage personal involvement in exploring and explaining the science of learning and teaching. Students will also engage in fieldwork, such as on-site observations, conversations with practitioners, and a research project, to gain first-hand experience of these issues.

*Course equivalencies:* ERIKE479 / ERIKE79

**ERIK E481 Seminar Social & Cultural Contexts (3 Credit Hours)**

Through an examination of current theory and multidisciplinary social science research, this course explores the influence of contextual factors on the development of children. Socially and culturally constructed factors (such as gender, race, ethnicity and social class) and institutions (such as family, schools, and organized child care) will be discussed in terms of their influence on child rearing and child development. Through course lectures, discussion, and assignments, students will gain an understanding of the variability of child rearing strategies and outcomes across cultural communities; the role of historical and ecological factors in child rearing and family functioning; identity development in complex societies; and sources of possible tensions between different cultural communities and societal institutions (such as schools, social service providers, and child care programs).

*Course equivalencies:* ERIKE481 / ERIKE81

**ERIK E482 Program Evaluation and Implementation Science (3 Credit Hours)**

This course provides an advanced introduction to evaluating social services and education programs, including the study of factors leading to better program outcomes (i.e., implementation science). Restricted to Erikson graduate students.

*Course equivalencies:* ERIKE482 / ERIKE82

**ERIK E485 Research Internship (3 Credit Hours)**

The student will work either with an Erikson faculty member, research scientist, or research associate, or on a research project at another institution.

*Course equivalencies:* ERIKE485 / ERIKE85

**ERIK E486 Teaching Internship (3 Credit Hours)**

The student will teach or assist in teaching a college course in child development or a related topic.

*Course equivalencies:* ERIKE486 / ERIKE86

**ERIK E489 Special Topics in Child Development (3 Credit Hours)**

Enrollment for this course should be considered in close consultation with the faculty advisor. This course allows doctoral students to select from a range of applied child development courses at Erikson Institute that are taught by a member of the doctoral program faculty. Examples include Physical Growth and Development; Language Development; and Working with Adults. Students will gain deep understanding of the theories, research, and issues with regard to a special content area in child development and early education.

**ERIK E497 Doctoral Study (0 Credit Hours)**

Course for continuing doctoral students engaged in study for comprehensive or qualifying examinations.

*Course equivalencies:* ERIKE497 / ERIKE97

**ERIK E499 Dissertation Supervision (0 Credit Hours)**

Course for continuing students engaged in dissertation research under advisor's supervision.

*Course equivalencies:* ERIKE499 / ERIKE99

**ERIK E501 First Year Doctoral Seminar (0 Credit Hours)**

This course is designed to help graduate students be exposed to various issues in graduate study in the field Child Development and provide them with support and guidance for their success in graduate school.

*Outcomes:*

- 1) Be introduced to a life as a graduate student; learn major milestones of the graduate program;
- 2) Maintain social-emotional well-being and sanity; seek related resources when needed;
- 3) Learn how to read and find research articles and be prepared to develop a program of research;
- 4) Implement a writing plan and establish a writing routine; and
- 5) Explore various career paths both in academia and non-academia

**ERIK E502 First Year Doctoral Seminar (1 Credit Hour)**

*Pre-requisites:* Graduate students only

This course is designed to help graduate students be exposed to various issues in graduate study in the field Child Development and provide them with support and guidance for their success in graduate school.

*Outcomes:*

1) Be introduced to a life as a graduate student; learn major milestones of the graduate program; 2) Maintain social-emotional well-being and sanity; seek related resources when needed; 3) Learn how to read and find research articles and be prepared to develop a program of research; 4) Implement a writing plan and establish a writing routine; 5) Explore various career paths both in academia and non-academia

**Graduate School Seminar (GSSM)****GSSM 501 Teaching Effectiveness Seminar (0 Credit Hours)**

*Pre-requisites:* Approval of the Graduate School

This seminar provides pedagogical support to funded graduate students serving as teachers of record.

*Outcomes:*

To enhance students' abilities to teach undergraduate courses and deepen their pedagogical toolkit

**Greek (GREK)****GREK 412 Readings in Hellenistic Authors (3 Credit Hours)**

This course centers on works in Greek of the Hellenistic period, particularly at the intellectual center of Alexandria.

*Outcomes:*

Students should demonstrate knowledge in detail about the authors, works, and literary enterprise pursued; They should engage critically with current scholarship concerned with the authors and works and with the historical, social, and intellectual contexts and influences pertaining to them

**GREK 415 The Greek Fathers (3 Credit Hours)**

This course centers on the writings of the early church fathers such as Athanasius, Basil, and John Chrysostom, through which it looks to the historical background of Eastern patristic thought.

*Outcomes:*

Students should demonstrate knowledge in detail of the writings, their authors and their times; They should engage critically with current scholarship concerned with the authors and works and with the historical, social, cultural, theological, and intellectual contexts and influences pertaining to them

**GREK 425 The Attic Orators (3 Credit Hours)**

This course examines the works of Attic orators such as Antiphon, Lysias, and Demosthenes, amid the political and historical context of later Classical Athens.

*Outcomes:*

Students should demonstrate knowledge in detail of the genre, the authors and their times; They should engage critically with current scholarship concerned with the authors and works and with the historical, social, political, legal, and intellectual contexts and influences pertaining to them

**GREK 431 Herodotus (3 Credit Hours)**

This course focuses on the Histories of Herodotus, the events about which he writes, and the intellectual, social, literary, and historical contexts in which his work was produced.

*Outcomes:*

Students should demonstrate knowledge in detail of the work, its author, and its historical and political contexts and significances; They should engage critically with current scholarship relating to Herodotus, his project, and his milieu

**GREK 435 Thucydides (3 Credit Hours)**

This course focuses on the History of the Peloponnesian War by Thucydides, the events about which he writes, and the intellectual, social, literary, and historical contexts in which his work was produced.

*Outcomes:*

Students should demonstrate knowledge in detail of the work, its author, and its historical and political contexts and significances; They should engage critically with current scholarship relating to Thucydides, his project, and his milieu

**GREK 441 The Iliad (3 Credit Hours)**

This course centers on Homer's Iliad, the ancient Greek genre of epic poetry, and the importance of this mythology and this literary form for ancient Greek society and thought ever after.

*Outcomes:*

Students should demonstrate detailed knowledge of the author, the poem, its contents, and their meanings; They should engage critically with current scholarship relating to the poem, its transmission, and the accomplishment of its composition

**GREK 442 The Odyssey (3 Credit Hours)**

This course centers on Homer's Odyssey, the ancient Greek genre of epic poetry, and the importance of this mythology and this literary form for ancient Greek society and thought ever after.

*Outcomes:*

Students should demonstrate detailed knowledge of the author, the poem, its contents, and their meanings; They should engage critically with current scholarship relating to the poem, its transmission, and the accomplishment of its composition

**GREK 443 Pindar (3 Credit Hours)**

This course centers on Pindar and on ancient Greek lyric poetry more generally, potentially including consideration of additional authors such as Archilochus, Sappho, Alcaeus, and Anacreon.

*Outcomes:*

Students should demonstrate knowledge in detail about the authors, their works, and ancient lyric; They should engage critically with current scholarship relating to ancient lyric's historical, social, literary, and intellectual contexts

**GREK 451 Greek Comedy (3 Credit Hours)**

This course may focus on the comedic poetry of Aristophanes, set against the backdrop of Athens in the late fifth century B.C.E., or consider the development of New Comedy from Old in the more broadly cosmopolitan Hellenistic world.

*Outcomes:*

Students should demonstrate knowledge in detail about authors, plays, and the comedic forms; They should engage with current scholarship addressing Greek comedy's historical, social, and intellectual contexts and influences

**GREK 453 Aeschylus (3 Credit Hours)**

This course focuses on selected tragedies of Aeschylus, set against the backdrop of fifth century B.C.E. Athens.

*Outcomes:*

Students should demonstrate knowledge in detail about the author, his plays, and the tragic forms; They should engage with current scholarship addressing Greek tragedy's historical, social, and intellectual contexts and influences

**GREK 454 Sophocles (3 Credit Hours)**

This course focuses on selected tragedies of Sophocles, set against the backdrop of fifth century B.C.E. Athens.

*Outcomes:*

Students should demonstrate knowledge in detail about the author, his plays, and the tragic forms; They should engage with current scholarship addressing Greek tragedy's historical, social, and intellectual contexts and influences

**GREK 455 Euripides (3 Credit Hours)**

This course focuses on selected tragedies of Euripides, set against the backdrop of fifth century B.C.E. Athens.

*Outcomes:*

Students should demonstrate knowledge in detail about the author, his plays, and the tragic forms; They should engage with current scholarship addressing Greek tragedy's historical, social, and intellectual contexts and influences

**GREK 462 Plato (3 Credit Hours)**

This course centers on translation, evaluation and interpretation of selections from Plato's Republic and/or other philosophical dialogues.

*Outcomes:*

Students should demonstrate knowledge in detail about the author and his work; They should engage critically with current scholarship concerned with Platonic thought and the historical, social, and intellectual contexts and influences pertaining to it

**GREK 473 New Testament Language (3 Credit Hours)**

This course centers on study of the language and literary expression of selections from the New Testament.

*Outcomes:*

Students should demonstrate knowledge and understanding of the texts; They should engage critically with current scholarship exploring the linguistic, historical, social, literary, and intellectual contexts of the New Testament

**GREK 488 Readings in Greek Literature I (3 Credit Hours)**

This course offers extensive and in-depth study of selected works of ancient Greek literature. The course includes consideration of these works in their social, historical, and literary contexts—that is, both as part of a tradition and as responses to particular moments of Greek societies in history.

*Outcomes:*

Students should demonstrate detailed understanding of the authors studied and their work; They should engage critically with scholarship concerning each author/work and their various contexts

**GREK 489 Readings in Greek Lit II (3 Credit Hours)**

This course offers extensive and in-depth study of selected works of ancient Greek literature. The course includes consideration of these works in their social, historical, and literary contexts—that is, both as part of a tradition and as responses to particular moments of Greek societies in history.

*Outcomes:*

Students should demonstrate detailed understanding of the authors studied and their work; They should engage critically with scholarship concerning each author/work and their various contexts

**GREK 499 Directed Study (3 Credit Hours)**

This course frames extensive and in-depth study of a selected author or topic involving ancient Greek language or literature, for graduate students to pursue under the direction of a faculty member of the department.

*Outcomes:*

Students will engage with current scholarship in the field of the investigation, and will demonstrate significant learning

## Hebrew (HEBR)

**HEBR 499 Directed Study (3 Credit Hours)**

*Pre-requisites:* Graduate Status; Department Consent required

Independent/directed study of Modern Hebrew, spoken and written.

*Outcomes:*

Phonetics, grammar, syntax, vocabulary of Modern Hebrew will be learned

## History (HIST)

**HIST 400 Twentieth Century Approaches to History (3 Credit Hours)**

The course focuses on twentieth-century historical writing, emphasizing changing interpretive paradigms and innovative methodologies, and will introduce students to the range of topics and influences that now shape the discipline.

*Outcomes:*

Students will demonstrate their ability to analyze historical interpretations, while honing their skills in writing and oral presentation

**HIST 403 Professional Lives of Historians (3 Credit Hours)**

This course explores pedagogical, professional, and ethical issues of importance to historians. We will examine the many identities of historians and the relationship between training in history and career pathways. Students will explore the history of the historical profession, approaches to teaching history, ethical issues in history as well as the diverse pathways available to those with training in history. Each student will complete a pedagogical activity, a career exploration report, and a professionalizing project. Required of all first year PhD students. Open to all other students as an elective.

*Outcomes:*

Recognize the application of historical training in many arenas; Understand the ethical challenges facing historians

**HIST 410 Topics (3 Credit Hours)**

Topics vary as this course allows for the offering of specialized topics designed to enhance the graduate curriculum. Students will be demonstrate knowledge of the key features of the topic, analyze and debate the various historical themes concerning it, and complete a historiographical or research paper related to the theme of the class.

**HIST 433 Modern European Nations (3 Credit Hours)**

This course will analyze selected topics in the political, international, social, economic, and cultural history of particular European nations from the late eighteenth century to the present.

*Outcomes:*

Students will gain familiarity with the history and historiography of a single country within the larger context of modern European history and will sharpen their writing and analytical skills

**HIST 441 Women's & Gender History: Europe (3 Credit Hours)**

This course provides an introduction to the major themes and scholarship in women's and gender history. It examines a variety of debates about and methodological approaches to the historical construction of gender, ranging from histories of the body and sexuality to analyses of culture, politics, and the economy. It explores how gender identities were produced and contested at specific historical moments and in different locations.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* X-HIST441/WOST441/WSGS441

**HIST 442 Women's & Gender History: U.S.A. (3 Credit Hours)**

The course explores the literature on women and gender in US history with attention to theoretical issues, a broad chronological scope, and cultural diversity. Students will demonstrate their ability to analyze a body of historical literature on women and gender in US history while honing their skills in writing and oral presentation.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* X-HIST442/WOST442/WSGS442

*Outcomes:*

Students will demonstrate their ability to analyze a body of historical literature on women and gender in US history, while honing their skills in writing and oral presentation

**HIST 450 Nineteenth Century America (3 Credit Hours)**

This course focuses on major historiographical questions reflecting the diversity of inquiry in the field of nineteenth century U.S. history. Students will be introduced to the major historiographical debates concerning the development of American society and politics during the nineteenth century. Students learn to critique recent historical literature through discussion and reflective essays.

*Outcomes:*

Students will be introduced to the major historiographical debates concerning the development of American society and politics during the nineteenth century; Students learn to critique recent historical literature through discussion and reflective essays

**HIST 451 History of The American West (3 Credit Hours)**

This class focuses on the historiography of western and frontier history from the late 1980s to the present.

*Outcomes:*

Students will be introduced to the major contemporary historians of the western frontier; They will develop a perspective on the frontier process from 1500 into the 20th century and become familiar with major field sub-themes

**HIST 456 US and Canadian Education 20th Century (3 Credit Hours)**

A historical analysis of US education in the twentieth century with special emphasis on the forces and movements affecting American education examined through comparison with educational change in selected other countries.

*Course equivalencies:* X-ELPS445/HIST456

*Outcomes:*

Students will be able to explain changes in educational practice and educational knowledge over the twentieth century

**HIST 459 Environmental History (3 Credit Hours)**

Environmental history expands the customary framework of historical inquiry, incorporating such actors as animals, diseases, and climate alongside more familiar human institutions and creations. This course will expose students to the major concepts, tools, and sources in the field. It will equip students to describe major changes in approaches to environmental history. It will prepare students to write, teach, and develop research projects on environmental history.

*Outcomes:*

1) Exposure to the major concepts, tools, & sources in the field; 2) Ability to describe major changes in approaches to environmental history

**HIST 460 Urban America (3 Credit Hours)**

This course examines the evolution of the United States from a rural and small-town society to an urban and suburban nation. Cities, and especially Chicago, have long offered some of the best laboratories for the study of American history, social structure, economic development and cultural change. This colloquium will provide a historiographical introduction to the major questions and issues in the culture and social life of American cities.

**HIST 461 Twentieth Century America (3 Credit Hours)**

Reading and discussion seminar. Students will read monographs and articles in 20th century U.S. history, including social, cultural, intellectual, and other approaches. The final assignment will be a long historiographic paper.

**HIST 464 Transnational Urban History (3 Credit Hours)**

This class exposes students to the history of cities across a broad spectrum of time and place. The level of analysis is both more global and more local than traditional narratives of the nation state. This course explores the recurring challenges and possibilities of urban life and urban governance across cultures and time. An emphasis on reading and writing will help students develop the skills of critical analysis. Restricted to Graduate Students.

*Outcomes:*

Appreciation for the recurring challenges and possibilities of urban life and urban governance across cultures and time; An emphasis on reading and writing will help students develop the skills of critical analysis

**HIST 479 Public History Media (3 Credit Hours)**

An introduction to the field of digital humanities and public media. Through a series of assignments and in-class labs centered around common Digital Humanities tools and platforms, the class will explore current and historical conversations in digital humanities and new media and address theoretical and practical problems involved in digital humanities-based methods and methodology. The final product of each assignment will be a collaborative digital public humanities project.

**HIST 480 Public History: Method & Theory (3 Credit Hours)**

This course explores the field of public history with special emphasis on the theoretical and methodological challenges faced when preserving or presenting history outside of a formal classroom environment. Also under consideration will be the professional and ethical responsibilities of the historian both inside and outside of the university setting. Students will be able to understand the theoretical and methodological issues of importance to the field of public history, reflect upon ethical issues involved in the collection, curation, and presentation of history, and participate in applied projects drawing upon public history methodologies and presentation modes.

**HIST 481 Management of Historic Resources (3 Credit Hours)**

This class is an introduction to historic preservation. The class will review the way public historians work to protect the material culture of the built environment on a local, state, and national level. The class will consist of lectures on aspects of historic preservation, the discussion of weekly readings, and the execution of a preservation project. The project will be to prepare a National Register of Historic Places nomination on a single property or historic district.

**HIST 482 Archives & Record Management (3 Credit Hours)**

This course introduces basic archival theory and methodology. Particular emphasis will be placed on ethics, best practices, and the relationship of archives to allied fields.

**HIST 483 Oral History: Method and Practice (3 Credit Hours)**

This course will give students a basic understanding of oral history by asking several questions of the discipline, including: What exactly is oral history and what sets it apart from other historical research methodologies? What are the ethical issues involved in undertaking oral history? How does one conduct, record, and archive an interview? What steps are necessary in constructing an oral history project? What are the merits of the various products that can be derived from oral history in both texts and multimedia? In addition to reading oral historical texts and theory, students will conduct at least two interviews and participate in an ongoing oral history project. Students will learn how to develop, conduct, and evaluate an oral history interview and prepare oral history interviews for archival disposition.

*Outcomes:*

Students learn how to develop, conduct, and evaluate an oral history interview and prepare oral history interviews for archival disposition

**HIST 484 Material Culture (3 Credit Hours)**

This class is restricted to Graduate students. This course is an introduction to approaches to the study of American material culture in its many forms, including decorative arts and mass-produced consumer objects; urban form, vernacular architecture, commemorative landscapes; the body and dress; foodways; and the material culture of childhood. The course will consider the ways scholars use material culture to "do" history, with an emphasis on artifacts as evidence.

*Outcomes:*

1) Students will understand the theory and practice of material culture study; 2) Students will gain experience in artifact analysis; 3)

Students will research and interpret material culture

**HIST 487 Management of History Museums (3 Credit Hours)**

This course introduces graduate students to issues involved in the management of history museums while considering many questions about the role and function of museums in American society. What does it mean to say that museums serve the public? How can museums become more diverse, equitable, accessible, and inclusive institutions? How do museums tell stories and who gets to decide what stories to tell? How and why do museums collect, care for, and display some objects and not others? Why do people visit museums, what do they experience there, and what do those visits mean to them? What does "success" look like and how does one measure it? What financial, administrative, and ethical issues do museums face? How can museums critically address today's complex political, cultural, and social realities?

**HIST 496 Latin American History to 1810 (3 Credit Hours)**

This course introduces students to major themes in the colonial history of the region known today as Latin America from conquest to independence.

*Outcomes:*

Students will demonstrate an understanding of the broad themes in the area's history as well as an understanding of the major historiographical debates

**HIST 497 Latin Amer Hist Since 1810 (3 Credit Hours)**

This course introduces students to the major themes and trends in the development of Latin America from the Wars of Independence to the present.

*Outcomes:*

Students will demonstrate an understanding of the broad themes in the area's history as well as the major historiographical debates

**HIST 498 Dissertation Research (3 Credit Hours)**

Students register for this course once they begin work on their dissertation and have not yet completed the sixty hours required for the PhD degree. If necessary, this course can be taken up to three times.

**HIST 499 Directed Study (3 Credit Hours)**

This course provides students with the opportunity to work under the direction of a faculty member on a particular area of interest. There is a form that must be completed and submitted prior to course registration. There are limits on how many of these can be taken over the course of a student's career: MA (2 times) and PhD (3 times).

**HIST 510 Research Seminar - Special Topics (3 Credit Hours)**

Research seminar using primary sources in cultural, social, technological, intellectual, and institutional history. Topics vary according to the interest of the instructor. Students will learn how to locate and analyze archival material to develop an original article-length research paper. Students will learn how to locate and analyze archival materials to develop an original article-length research paper.

**HIST 523 Seminar in Medieval History (3 Credit Hours)**

The topics and descriptions of this course vary according to interest of the instructor.

*Outcomes:*

Students will produce a major research paper related to the themes of the class

**HIST 533 Topics in Modern European History (3 Credit Hours)**

This course will introduce students to historical research using primary documents. The topics and themes of the research seminar will vary according to the interest of the instructor but will focus on Modern Europe.

*Outcomes:*

Students will produce a major research paper related to the themes of the course

**HIST 555 US Social & Intellectual History (3 Credit Hours)**

Research seminar that focuses on different topics relating to the social and intellectual history of the United States. Students learn how to locate and analyze archival materials to develop an original article-length research paper.

**HIST 558 Studies in American Cultural History (3 Credit Hours)**

Research seminar focused on primary sources in American cultural history. Students will learn how to locate and analyze archival materials to develop an original article-length research paper.

**HIST 561 Seminar-Gender & Women's History (3 Credit Hours)**

This seminar focuses on the use of gender as a category of analysis in history and is particularly appropriate for those who have taken courses in Women's and Gender History or Women's Studies. Students will produce a research paper; they may choose any topic relevant to issues of gender or women for any time period or society, as long as adequate primary sources are available.

**HIST 581 Practicum in Public History (3 Credit Hours)**

Practicums provide students with specific exposure to an aspect of the practice of public history. Practicums are undertaken either under the direct supervision of Loyola faculty or the joint supervision of a Loyola faculty member and a cooperating off-campus supervisor.

**HIST 582 Public History Internship (1-3 Credit Hours)**

The internship will provide an extended practical experience in the field of public history. Internships are tailored to fit the needs of the individual student and the needs of the off-campus agency involved. As part of their program, all public history students must undertake an internship either doing public history in the private sector or with a public agency. The internship is available during any semester and its timing is related to an individual student's progress in the program. This is a variable credit course. Students in the MA Public History program take a 1-hour internship (50 hours minimum). Students in the PhD program, the MA Program or the dual MAPH/MILS Program take a 3-hour internship (150 hours).

**HIST 583 Quantitative Methods in Social History (3 Credit Hours)**

This course is an introduction to the use of social science theory and quantitative methodology in social history. It includes hands-on instruction in computer database and statistical analysis programs and has an individual research component.

*Outcomes:*

Students will demonstrate their ability to read critically works using quantitative techniques and will use these methods in their own research

**HIST 584 U.S. Local History (3 Credit Hours)**

Research Seminar that explores the nature and practice of local history and explores various methods and approaches central to local history research. This course will introduce students to the literature on local history, acquaint them with the methodology critical to local history research, and have them conduct original research on a local history topic.

*Outcomes:*

This course has three objectives: 1. to introduce students to the literature on local history; 2. to acquaint students with the methodology critical to local history research, 3. to conduct original research on a local history topic

**HIST 585 Career Diversity Internship (3 Credit Hours)**

An elective course that allows PhD and MA students explore a career pathway and have the opportunity to see how the skills gained in History can be applied to diverse career settings. Students will gain an exposure to a non-academic career, develop new skills, and gain experience in communication, collaboration, and intellectual self-confidence.

*Outcomes:*

Exposure to a non-academic career; development of new skills; gain experience in communication, collaboration, & intellectual self-confidence

**HIST 598 Dissertation Proposal Seminar (3 Credit Hours)**

Students work closely with an advisor to prepare their dissertation proposal.

**HIST 599 Directed Primary Research (3 Credit Hours)**

Students work under the direction of an advisor on a specific research project and produce a Master's Essay in lieu of the seminar requirement. There is a form that must be completed and submitted prior to course registration.

**HIST 600 Dissertation Supervision (0 Credit Hours)**

Students take this course once they complete all requirements for the PhD except the dissertation. The purpose of this course is to maintain active enrollment in the Graduate School during the fall and spring semesters. No credit hours are associated with this course and students receive a grade of CR.

**HIST 605 Master's Study (0 Credit Hours)**

Students register for 605 to maintain active enrollment in the Graduate School during the fall or spring semesters if they are not registered for any graduate class at the master's level while finishing up their requirements, such as field examinations and the research project. No credit hours are associated with this course and students receive a grade of CR.

**HIST 610 Doctoral Study (0 Credit Hours)**

Students register for 605 to maintain active enrollment in the Graduate School during the fall or spring semesters if they are not registered for any graduate class at the master's level while finishing up their requirements, such as field examinations and the research project. No credit hours are associated with this course and students receive a grade of CR.

## Infectious Disease & Immunology (IDIM)

**IDIM 400 Infections and Immunology (3 Credit Hours)**

IDIM 400 integrates basic knowledge of infectious microorganisms with an understanding of innate and adaptive immune systems that react against them. Following a review of infections caused by specific infectious organisms, IDIM 400 will focus on specific aspects of immune systems and how they interact to remove these infectious microorganisms.

*Outcomes:*

1) Explain the cellular basis of immune development; 2) Differentiate between the mechanisms of activation of immune systems; 3) Analyze the mechanisms involved in combating bacterial and viral infections

**IDIM 401 Conceptual Bases of Infectious Diseases (2 Credit Hours)**

IDIM 401 integrates a basic science understanding of microorganisms with an understanding of their role in human health. Following a review of bacterial physiology and gene expression, the focus will be on bacterial disease, including basic strategies used to cause disease and details of pathogenesis by medically important bacterial pathogens.

*Outcomes:*

1) Describe differences between bacteria and eukaryotes; 2) Understand mechanisms by which bacteria cause disease; 3) Understand limitations of current antimicrobial therapies; 4) Differentiate between similar diseases with different causes

**IDIM 403 Parasitology and Virology (2 Credit Hours)**

*Pre-requisites:* IDIM 400

The Parasitology and Virology course IDIM 403 is designed to describe infections caused by microorganisms and animal diseases transmissible to man, with a primary focus on parasites and viruses. We will emphasize the pathophysiology of these diseases in humans of various ages. This course will promote an understanding of how the properties of certain infectious agents can in some cases avoid an adequate immune response.

*Outcomes:*

- 1) Explain the mechanisms of pathogenicity of various infectious agents;
- 2) Analyze the mechanisms by which emerging viruses arise;
- 3) Apply knowledge to viral vaccine development

**IDIM 418 Presentation skills (1 Credit Hour)**

Scientists must communicate their work in numerous venues, from giving oral presentations in seminars and conferences to writing papers and grant proposals. This course is designed to train students in the design and delivery of effective oral presentations, a skill that can be readily adapted to serve as a starting point for written communications.

*Course equivalencies:* IDIM418/BMSC418

*Outcomes:*

- 1) Identify elements of an effective oral presentation;
- 2) Deliver an effective oral presentation;
- 3) Judge the effectiveness of oral presentations

**IDIM 492 Research (1-8 Credit Hours)**

A major component of the M.S. degree in Infectious Disease and Immunology is the successful completion of a research project integrating basic and clinical science. IDIM 492 is designed to give credit for the research efforts that will result in the Master's thesis.

**IDIM 501 Seminar (1 Credit Hour)**

IDIM 501 is designed to help students stay abreast of current topics in infectious disease and immunology. Students will attend weekly seminars and are encouraged to interact with invited seminar speakers by asking questions and contributing to group discussions. Upon completion students will have enhanced their understanding of current research.

*Outcomes:*

- 1) Describe the results or conclusions from a given seminar presentation;
- 2) Understand how research is advancing knowledge in a given field covered by a representative seminar;
- 3) Question new data or their interpretation

**IDIM 502 Special Topics in Infectious Disease and Immunology (5 Credit Hours)**

IDIM is designed to immerse students in current literature, with new topics chosen each year. Students will read the primary literature and participate in discussion sessions. The course will enhance the ability of the student to critically read and interpret scientific literature in infectious disease and immunology.

*Outcomes:*

- 1) Critically read and discuss scientific literature in the area covered by the course;
- 2) Discuss experimental approaches, their limitations, and the conclusions that can be drawn from observed results

**IDIM 595 Thesis Supervision (0 Credit Hours)**

A major component of the M.S. degree in Infectious Disease and Immunology is the successful completion of a research project integrating basic and clinical science. This course is similar to IDIM 492, except that students are expected to perform at an advanced level in all aspects.

*Outcomes:*

- 1) Understand the significance and clearly communicate the research problem;
- 2) Describe the approaches used and results obtained;
- 3) Draw conclusions and identify future directions

## **Integrative Cell Biology (ICB)**

**ICB 401 Gross Anatomy (6 Credit Hours)**

The student develops a knowledge and understanding of the basic concepts and facts of human gross anatomy as it relates to function and clinical problems. Lectures, clinical case-based and problem-based learning, computer-aided instructional materials, and cadaver dissection serve as guides to laboratory study.

**ICB 403 Histology (3 Credit Hours)**

The course is designed to provide the student with a basic knowledge and understanding of the structure and function of the human body at the light and electron microscopic level. The interdependence between structure and function in the different tissues and organs of the body is emphasized. Clinical and research application of the course material are also stressed.

**ICB 411 Advanced Gross Anatomy (2 Credit Hours)**

The study of the gross structure of the human body at an advanced level presented at conference sessions. Registrants for this course may include graduate students, advanced medical students, as well as those who hold the M.D. degree and are concurrently registered for advanced work in one of the clinical departments.

**ICB 445 Scientific Literature: Review & Critique (1 Credit Hour)**

Students are taught critical evaluation of scientific literature, hypothesis testing and presentations. This course involves attendance at scientific presentations by students and outside speakers and a journal club component. Both staff and students participate and the class is only offered during the fall semester. This course alternates with Review and Seminar 446.

**ICB 446 Review Seminar (1 Credit Hour)**

The student participates in a series of seminars and journal clubs that provide a forum for intensive review of scientific topics. Research progress reports of the students is incorporated into this course as a part of the scientific presentation. This course alternates with the Scientific Literature Course 445 and is only offered during the spring semester.

**ICB 459 Research (1-8 Credit Hours)**

Independent research for thesis or dissertation under the supervision of an appointed faculty adviser. Credit various upon assigned effort and time spent in the laboratory. Requires a written report.

**ICB 462 Teaching of Anatomy I (2 Credit Hours)**

A practical experience in the teaching of Gross Anatomy to graduate and medical students. Students assist in the planning, preparation, and teaching of laboratory sessions. The course allows students to place the experience of teaching gross anatomy on their transcripts as a graded course indicating to future employers that they have gained teaching experience.

**ICB 463 Teaching Anatomy II (2 Credit Hours)**

A practical experience in the teaching of histology to graduate and medical students. Students assist in the planning, preparation and teaching of laboratory sessions. The course allows students to place the experience of teaching histology on their transcripts as a graded course indicating to future employers that they have gained teaching experience.

**ICB 501 Special Topics in Anatomy (1-2 Credit Hours)**

Occasionally specific faculty members may offer a specialized seminar course. The purpose of such courses is to further graduate student's knowledge in a specialized current scientific research area. The graduate students explore in detail one or more areas of special interest through seminars, conferences, library and laboratory work.

**ICB 595 Thesis Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the masters of science thesis and degree.

**ICB 600 Dissertation Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the Ph.D. dissertation and degree.

**Interdisciplinary Studies (INDS)****INDS 400X TBA-Foreign Study (15 Credit Hours)**

Temporary indicator course for the duration of the study abroad program.

**International Affairs (INTA)****INTA 420 Comparative Political Systems (3 Credit Hours)**

This course examines political institutions and political behavior in various political systems. Restricted to Graduate School students.

*Course equivalencies:* X-INTA 420/PLSC 420

*Outcomes:*

Students will master the literature on comparative politics, including the methodology of comparative analysis

**INTA 430 Theories of International Politics (3 Credit Hours)**

This course analyzes theories and major issues of international politics. Restricted to Graduate School students.

*Course equivalencies:* X-INTA 430/PLSC 430

*Outcomes:*

Students will master the literature in major research areas and theoretical frameworks in international relations

**INTA 470 Fieldwork in PLSC-Internship (1-3 Credit Hours)**

This is a graduate level course that allows students to get experience through internships. Restricted to Graduate School students.

*Course equivalencies:* X-PLSC 470/INTA 470

*Outcomes:*

Students will be able to demonstrate an understanding of models of leadership and public service by working with supervisors who are normally leaders in their fields

**INTA 475 Political Analysis I (3 Credit Hours)**

This course provides an introduction to the use of inferential statistics in political science. Restricted to Graduate School students.

*Course equivalencies:* X-INTA 475/PLSC 475

*Outcomes:*

Students will master the basic statistical techniques used in political science

**Italian (ITAL)****ITAL 401 Italian Language and Culture (3 Credit Hours)**

This course offers advanced students the opportunity to undertake an in-depth study of cultural debates that have emerged in Italy over the centuries. It examines transformations in Italian culture, and the challenges Italy has confronted in the face of societal changes through the study of a variety of written and visual texts. The course may examine other sources and media.

*Outcomes:*

By the end of the course, students will formulate their own hypotheses on the transformative periods and the role played by cultural figures and forces in promoting change; Students will explore a topic of their choice guided by the faculty member and will conduct a research project that will result in a final paper; ACTFL\* achievement level desired: Advanced Mid to High

**Latin (LATN)****LATN 415 The Latin Fathers (3 Credit Hours)**

This course examines the writings of the early church fathers such as Ambrose, Jerome, and Augustine, looking through them to the historical and intellectual background of Western patristic thought.

*Outcomes:*

Students should demonstrate knowledge in detail of the texts, their authors, and their times; They should engage critically with current scholarship of the field

**LATN 418 St Augustine (3 Credit Hours)**

This course focuses on selected works of Augustine, set against the backdrop of Roman society and Mediterranean Christianity in the later Roman period.

*Outcomes:*

Students should demonstrate knowledge in detail about Augustine, his world, and his works; They should engage with current scholarship addressing Augustine's religious, intellectual, literary, social, and historical contexts and influences

**LATN 431 Caesar (3 Credit Hours)**

This course focuses on Julius Caesar's Commentaries on his Gallic War and the Civil War against Pompey the Great. It examines the texts within multiple frameworks in order to understand the political, military, intellectual, and historical contexts of Caesar's writing.

*Outcomes:*

Students should demonstrate detailed understanding of Caesar, his texts, and contexts; Additionally, students should engage critically with scholarship relating to Caesar and his place in the world

**LATN 432 Livy (3 Credit Hours)**

This course focuses on Livy's *Ab Urbe Condita* and the historical, intellectual, literary, and cultural contexts of this work. It considers Livy's place in Rome's historiographical tradition and the relationship of his work to the emerging imperial government.

*Outcomes:*

Students should demonstrate detailed understanding of Livy and his historical and cultural context; Additionally, students should engage critically with scholarship on Livy and his work

**LATN 435 The Annals of Tacitus (3 Credit Hours)**

This course focuses on the historical writings of Tacitus and the historical, intellectual, literary, and cultural contexts of their production. It considers Tacitus's place in the Roman historiographical tradition and the relationship of his work to the Roman imperial administration and socio-political systems of power.

*Outcomes:*

Students should demonstrate detailed understanding of Tacitus, his texts, and contexts; They should engage critically with scholarship relating to Tacitus, his project, and his world

**LATN 436 The Histories of Tacitus (3 Credit Hours)**

This course focuses on the historical writings of Tacitus and the historical, intellectual, literary, and cultural contexts of their production. It considers Tacitus's place in the Roman historiographical tradition and the relationship of his work to the Roman imperial administration and socio-political systems of power.

*Outcomes:*

Students should demonstrate detailed understanding of Tacitus, his texts, and contexts; They should engage critically with scholarship relating to Tacitus, his project, and his world

**LATN 438 Suetonius (3 Credit Hours)**

This course focuses on Suetonius's Lives and the historical, intellectual, literary, and cultural contexts of his writing. It examines the genre of biography in the ancient historiographical tradition and explores Suetonius's depiction of the Roman Emperors as both biographical and literary creations.

*Outcomes:*

Students should demonstrate detailed understanding of Suetonius and his historical and cultural context; They should engage critically with current scholarship on Suetonius, his project, and his milieu

**LATN 441 The Aeneid of Virgil (3 Credit Hours)**

This course centers on Vergil's Aeneid. It examines the poem's place in the tradition of Latin epic poetry with attention to Vergil's literary technique. It explores the poem's participation in and resistance to the Augustan imperial political program. It will touch on the enduring influence of the poem.

*Outcomes:*

Students should demonstrate detailed understanding of Vergil and the Aeneid; They should engage critically with scholarship concerned with Vergil's social, cultural, and literary contexts and influences

**LATN 442 Earlier Works of Virgil (3 Credit Hours)**

This course centers on Vergil's Eclogues and/or Georgics. It examines the genre(s) of bucolic and/or didactic poetry, focusing on Vergil's developing technique, especially his commitment to Alexandrian and Neoteric principles. It will explore how these poems respond to the uncertainty of the political moment and emergence of Imperial rule.

*Outcomes:*

Students should demonstrate detailed understanding of Vergil and his early poems; They should engage critically with scholarship concerned with Vergil's social, cultural, and literary contexts and influences

**LATN 443 Catullus (3 Credit Hours)**

This course centers on Catullus, the literary genres and traditions in which he worked, and the particular moment of late-Republican neoteric poetry. It considers Catullus' importance as an innovator in Latin poetry, his place in the social fabric of aristocratic Roman culture and how his poetry reflects that culture.

*Outcomes:*

Students should demonstrate detailed understanding of Catullus' works, literary technique, and world; They should engage critically with scholarship relating to Catullus' historical, social, literary, and intellectual contexts

**LATN 444 Roman Elegy (3 Credit Hours)**

This course focuses on Latin elegiac poetry through selections from Catullus, Tibullus, Propertius, and/or Ovid. The course explores elegy as a peculiarly Roman literary tradition linked closely to the Late Republic and Early Empire. It examines the recurrent themes and techniques of Latin Elegy.

*Outcomes:*

Students should demonstrate detailed understanding of Latin elegy; They should engage critically with scholarship concerned with the historical, social, intellectual, and literary contexts of this genre

**LATN 445 Ovid (3 Credit Hours)**

This course centers on the poetry of Ovid, the genres in which he wrote, and the cultural, social, and historical contexts in which he worked. It explores Ovid's role as both a continuator and innovator within the Roman literary tradition and how his poetry responds to his socio-political moment.

*Outcomes:*

Students should demonstrate detailed understanding of Ovid and his work; They should engage critically with scholarship concerned with Ovid's social, cultural, and literary contexts and influences

**LATN 446 The Odes of Horace (3 Credit Hours)**

This course centers on the Odes of Horace, their relationship with traditions of lyric poetry and Roman Alexandrianism, and the cultural, social, and historical contexts to which Horace responded. The course examines Horace's poetic technique and his engagement with the emerging Augustan imperial regime.

*Outcomes:*

Students should demonstrate detailed understanding of Horace's Odes and their place in Roman poetry; They should engage critically with scholarship addressing Horace's work and various contexts

**LATN 451 Roman Comedy (3 Credit Hours)**

This course focuses on Roman comedy, including selected plays of Plautus and/or Terence. It examines the place of these works in the traditions of New Comedy more generally, exploring how they are produced in Latin as theater in the context of Roman Republican society.

*Outcomes:*

Students should demonstrate detailed understanding of the authors, the comedies, and their traditions; They should engage critically with scholarship addressing the plays multiple contexts and influences

**LATN 455 Tragedies of Seneca (3 Credit Hours)**

This course focuses on selected tragedies of Seneca. It examines these works in light of the traditions of ancient tragic drama and Latin literature more generally. It also explores the connection of these plays to Seneca's Stoic philosophy and the imperial regimes of Claudius and Nero.

*Outcomes:*

Students should demonstrate detailed understanding of Seneca's tragedies; They should engage critically with scholarship addressing Seneca's literary, philosophical, cultural, and historical contexts and influences

**LATN 461 Lucretius (3 Credit Hours)**

This course centers on the *De Rerum Natura* of Lucretius. It examines Lucretius' literary technique and his place in the Roman tradition of hexametric poetry. It also explores Lucretius as a major exponent of Epicurean philosophy and the scientific world view of that philosophical tradition.

*Outcomes:*

Students should demonstrate detailed understanding of Lucretius' work and its significance; They should engage critically with scholarship addressing Lucretius' literary, philosophical, cultural, and historical contexts and influences

**LATN 462 Philosophy of Cicero (3 Credit Hours)**

This course focuses on the philosophical works of Cicero and the Roman reception of Greek philosophical thought. It explores Cicero's role as a conduit into the Roman world for Greek ideas, including his contribution to the establishment of a philosophical vocabulary, and the enduring influence of his work.

*Outcomes:*

Students should demonstrate detailed understanding of individual works and Cicero's greater project; They should engage critically with scholarship addressing the various contexts and influences of Cicero's treatises

**LATN 488 Readings in Latin Literature I (3 Credit Hours)**

This course offers extensive and in-depth study of selected works of ancient Roman literature. The course includes consideration of these works in their social, historical, and literary contexts—that is, both as part of a tradition and as responses to particular moments in Roman social history.

*Outcomes:*

Students should demonstrate detailed understanding of the authors studied and their work; They should engage critically with scholarship concerning each author/work and their various contexts

**LATN 489 Readings in Latin Literature II (3 Credit Hours)**

This course offers extensive and in-depth study of selected works of ancient Roman literature. The course includes consideration of these works in their social, historical, and literary contexts—that is, both as part of a tradition and as responses to particular moments in Roman social history.

*Outcomes:*

Students should demonstrate detailed understanding of the authors studied and their work; They should engage critically with scholarship concerning each author/work and their various contexts

**LATN 499 Directed Study (3 Credit Hours)**

This course frames extensive and in-depth study of a selected author or topic involving Latin language or literature written in Latin, for graduate students to pursue under the direction of a faculty member of the department.

*Outcomes:*

Students will engage with current scholarship in the field of the investigation, and will demonstrate significant learning

**LATN 546 Seminar in Roman Satire (3 Credit Hours)**

This course investigates Roman verse satire and its traditions through selections from Horace, Persius, and/or Juvenal, considered in their social, historical, and literary contexts. The Romans claimed satire as the one truly Roman genre: this course will explore the key themes and techniques animating the genre and its tradition. They should engage critically with scholarship concerned with the historical, social, intellectual, and literary contexts of this genre.

*Outcomes:*

Students should demonstrate detailed understating about Roman Satire

## Mathematical Sciences (MATH)

**MATH 401 Introduction to Graduate Study in Mathematics (1 Credit Hour)**

*Pre-requisites:* Graduate Student status

This is a professional development seminar for the beginning graduate student. Through short lectures, faculty panels, career panels, regular reading and writing assignments, and assorted workshops, it provides the student with the tools they need to succeed in the program, and beyond.

*Outcomes:*

Students will: gain practice reading, writing, listening to, and summarizing advanced mathematics; learn the pedagogical, ethical, and DEI matters associated with careers in the mathematical sciences; gain practice giving lectures, writing problem-sets, and grading mathematics; explore possible career trajectories

**MATH 404 Probability & Statistics I (3 Credit Hours)**

As the first part in a two-semester sequence, this course introduces basic principles of probability including combinatorial methods, probability and cumulative density and mass functions, moment generating functions and applications, expected values and variance and other moments, and order statistics. This course emphasizes related theorems and proofs.

*Course equivalencies:* X-MATH404/STAT404

**MATH 405 Probability & Statistics II (3 Credit Hours)**

As the second part in a two-semester sequence, this course thoroughly explores the central limit theorem and its variants and uses, estimation, hypothesis testing, sufficiency, efficiency, uniformly most powerful methods, information, and asymptotic methods. Time permitting, Bayesian topics may also be explored and discussed.

*Course equivalencies:* X-MATH405/STAT405

**MATH 406 Stochastic Processes (3 Credit Hours)**

This course addresses topics such as finite-state Markov processes and Markov chains, classification of states, long-run behavior, continuous time processes, birth and death processes, random walks, and Brownian motion.

*Course equivalencies:* X-MATH406/STAT406

**MATH 409 Advanced Numerical Analysis (3 Credit Hours)**

Introduction to computational methods and error analysis. Topics include numerical solution of equations, interpolation and approximation, numerical differentiation and integration, numerical solution of ordinary and partial differential equations. Numerical methods in linear algebra, such as approximate solutions to the eigenvalue problem, will also be covered.

*Course equivalencies:* X-COMP409/MATH409

**MATH 413 Algebra I (3 Credit Hours)**

As the first part in a two-semester sequence, this course covers basic algebraic structures, focused mainly on groups. Topics include normal subgroups, isomorphism theorems, actions on sets, and Sylow theorems. Additional topics chosen from linear groups, category theory, homological algebra, and representation theory.

**MATH 414 Algebra II (3 Credit Hours)**

As the second part in a two-semester sequence, this course covers basic algebraic structures, focused mainly on rings and fields. Topics include integral domains, vector spaces, modules, etc., Additional topics chosen from Galois theory, Dedekind domains, category theory, tensor products, homological algebra, and representation theory.

**MATH 415 Topics in Linear Algebra (3 Credit Hours)**

An abstract approach to the study of finite- and infinite-dimensional vector spaces and their transformations. Selected topics may include similarity, duality, canonical forms, singular value decomposition, inner products, discrete Fourier transform, bilinear forms, Hermitian and unitary spaces.

**MATH 416 Survey of Algebra (3 Credit Hours)**

*Pre-requisites:* Graduate Student status

A survey course in three parts. I: the theorems of Burnside, Sylow, and Jordan-Holder, toward the classification of finite simple groups. II: (noncommutative) rings and modules over PIDs, including applications to classification problems. III: additional topic chosen by instructor, e.g., category theory, homological algebra, division rings, and representation theory.

*Outcomes:*

Students will demonstrate facility with standard proof techniques in abstract algebra, and the ability to work with algebraic structures (including actions, morphisms, and quotients; concretely and abstractly); Students will recognize the common theme of classification uniting the course topics

**MATH 418 Combinatorial Mathematics (3 Credit Hours)**

An introduction to the basic methods of counting and generation, including: induction, pigeon-hole principle, permutations, combinations, recurrence relations, generating functions, and inclusion-exclusion principle. Topics drawn from partitions, graph theory, graph coloring, and combinatorial design, Polya's theory, Ramsey's theorem, and optimization problems.

*Course equivalencies:* X-COMP418/MATH418

**MATH 420 Topics in Mathematical Logic (3 Credit Hours)**

*Pre-requisites:* MATH 313 or MATH 351 or permission of the instructor  
This course will be a mathematical study of the concepts of truth and proof and how they relate to each other. The main topics to be covered are propositional logic, first order predicate logic, computability and undecidability results.

*Outcomes:*

Students will develop proof writing skills, expand mathematical literacy, understand the expressive power and limitations of propositional and predicate logics and learn the mathematical meaning of "truth" and "proof"

**MATH 422 Advanced Topics in Number Theory (3 Credit Hours)**

*Pre-requisites:* MATH 201 or the equivalent or permission of the instructor

Topics chosen from: Pythagorean triples, Fermat's Last Theorem, Pell's equation, Fermat descent, primes in arithmetic progressions, Mersenne primes, perfect numbers, primitive roots, primality testing, Carmichael numbers, RSA encryption, quadratic residues, quadratic reciprocity, integers as the sum of squares, Gaussian integers, continued fractions, the distribution of primes, Diophantine approximation, elliptic curves; others.

*Outcomes:*

Understand the importance of historically significant concepts and problems in number theory; Understand the proofs of related theorems; Solve problems and prove theorems from topics covered in class

**MATH 428 Algebraic Coding Theory (3 Credit Hours)**

Codes with algebraic structure for error control are examined. Block codes including Hamming codes and Reed-Muller codes, BCH codes, quadratic residue codes, and other cyclic codes and their implementation are treated. Other topics may include: convolutional codes, efficiency considerations, and Shannon's fundamental theorem of information theory.

*Course equivalencies:* X-COMP428/MATH428

**MATH 431 Cryptography (3 Credit Hours)**

This course introduces the formal foundations of cryptography and also investigates some well-known standards and protocols, including private and public key cryptosystems, hashing, digital signatures, RSA, DSS, PGP, and related topics. Additional topics may include more modern cryptosystems, such as those based on elliptic curve and lattices.

*Course equivalencies:* X-COMP431/MATH431

**MATH 443 Intro to Algebraic Topology (3 Credit Hours)**

In the study of topology, algebraic constructions (called "invariants") are used to help determine whether two differently presented topological spaces are indeed different. In this course, we introduce various topics related to this endeavor, including homotopy equivalence of topological spaces, group presentations, homomorphisms of spaces and of groups, covering spaces, the fundamental group, and homology theories. Time permitting, the cohomology ring of a space will also be introduced.

**MATH 444 Topics in Geometry (1-3 Credit Hours)**

An axiomatic approach to the study of geometry. While Euclidean geometry will be the main focus, elliptic and hyperbolic geometries will also be studied in detail. Additional non-Euclidean geometries (including projective, metric, and finite) and additional approaches (such as transformations and synthetic treatments) will also make an appearance.

**MATH 445 Financial Math Derivatives (3 Credit Hours)**

A first course in the mathematics of derivatives pricing. Topics include options markets, Black-Scholes pricing formulas, stochastic calculus, hedging schemes, binomial option pricing, exotic options, and more general derivatives.

**MATH 451 Analysis I (3 Credit Hours)**

A first course in the foundations of analysis. Topics include measure theory, Lebesgue integration, Hilbert and Banach spaces, and complex analysis.

**MATH 452 Analysis II (3 Credit Hours)**

A second course in the foundations of analysis. Topics include the Fubini Theorem, differentiation, and linear and nonlinear functional analysis.

**MATH 453 Complex Analysis (3 Credit Hours)**

*Pre-requisites:* Graduate Student Status

An introduction to functions of a single complex variable. Topics include analytic functions, contour integrals, Cauchy integral formula, harmonic functions, Liouville's theorem, Laurent series, analytic continuation, and conformal mapping. Additional topics may include theorems of Picard and Rouché, the Riemann mapping theorem, Riemann surfaces, and the fast Fourier transform.

*Outcomes:*

Students will be able to: analyze limits and continuity for complex functions; evaluate contour integrals (by the fundamental theorem, by Cauchy integral formula, and by the residue theorem); and represent functions as Laurent series, classifying singularities and poles

**MATH 454 Survey of Analysis (3 Credit Hours)**

*Pre-requisites:* Graduate Student status

An introduction to advanced topics in analysis, including measure theory, functional analysis and partial differential equations. Measurable sets; the Lebesgue integral in  $\mathbb{R}^n$ ;  $L_p$  and other function spaces; weak convergence; Lax-Milgram Theorem; and the calculus of variations. These topics are then applied to the study of linear PDEs. Students will be able to apply these concepts to study PDEs.

*Outcomes:*

Students will understand the central elements of Lebesgue integration (from measurable sets to the fundamental theorem of calculus for Lebesgue integrals) and of  $L_p$  spaces (including Minkowski and Hölder inequalities)

**MATH 456 Introduction to Mathematical Modeling (3 Credit Hours)**

A course in modelling. Mathematics has the power to describe the world and predict future events. This can be seen through its use in physics, economics, and biology. In this course students will learn how to harness the power of mathematics to model real world phenomenon. This will mainly be done using calculus and differential equations, but other mathematical tools will be used as well.

**MATH 458 Topics in Optimization (3 Credit Hours)**

This course presents the study of selected mathematical models and their application to applied problems. Topics in linear and mathematical programming, optimization theory, and game theory are examined.

*Course equivalencies:* X-MATH458/STAT458/428

**MATH 460 Theory of Games (3 Credit Hours)**

The noncooperative and cooperative theories of games. Two person zero sum matrix games, nonzero sum  $N$ -person games, Nash equilibria of games with a continuum of strategies, auctions, duels. Cooperative game theory, including the theory of bargaining, the theory of fair allocation of rewards using the nucleolus and using the Shapley value.

**MATH 464L History of Math with Science Contributions for Middle Grades (3 Credit Hours)**

This course will provide a thematic approach to the history of mathematics with emphasis on contributions by noted mathematicians, mathematical societies and scientists highlighting women and under-represented populations. The history of numbers and numerals, computation, geometry, algebra, trigonometry, calculus, and science patterns will be explored emphasizing the contributions of the Babylonian, Egyptian, Chinese, and Roman civilizations as well as such individuals as Euclid, Fermat, Archimedes, Kepler, Pythagoras, Euler, Hypatia, Sonja Kovalevsky, Emmy Noether and others as appropriate. The influence of technology and its applications will also be presented as appropriate.

*Outcomes:*

Students will obtain a unique historical perspective on the various areas of mathematics in the middle grades

**MATH 465 Introduction to Partial Differential Equations (3 Credit Hours)**

This course is an introduction to the subject of partial differential equations. Focus will be on studying linear partial differential equations, such as the wave equation, that appear ubiquitously in nature. To solve these equations we will use techniques such as separation of variables and Fourier series. We will also discuss different boundary conditions, and their physical interpretation.

*Course equivalencies:* X-MATH465/STAT465

**MATH 466L Geometry with Science Applications for the Middle Grades (3 Credit Hours)**

*Pre-requisites:* This course is limited to graduate education students only; it is not accepted for other Mathematics and Statistics graduate degree programs

No course description is available

**MATH 468L Probability and Statistics with Science Applications for Middle Grades (3 Credit Hours)**

*Pre-requisites:* School of Education Graduate Program

Data collection and display, simulations, surveys, probability and elementary statistics such as mean, median, mode, standard deviation, etc. will be the focus of this course (Illinois Learning Standard Goal 10) Appropriate techniques for graphing (scatter plots, histograms, regression, correlation) with and without technology will be a focus of this course.

*Outcomes:*

Students will obtain a background in the fundamentals of descriptive and inferential statistics

**MATH 469L Mathematics and Science Applications for Middle Grades (3 Credit Hours)**

Mathematical concepts such as rates, ratios and proportions, probability and statistics and measurement that support scientific investigation and analysis will provide the focus for this course. Hands-on activities that illustrate the connections be used. Hands-on activities that illustrate the connections between Science and Math and appropriate use of technology will be emphasized.

*Outcomes:*

Students will acquire knowledge of mathematics that supports scientific investigation for the middle grades

**MATH 475 Functional Analysis (3 Credit Hours)**

Metric, normed, Banach, Hilbert, and sequence spaces. Linear operators and Fourier analysis. Hahn-Banach extension principle, Baire category, and uniform boundedness. Selected applications to economics, physics, engineering, and quantum theory.

**MATH 476 Automata & Formal Languages (3 Credit Hours)**

*Pre-requisites:* MATH 201 or MATH 212 or COMP 163

No course description is available

*Course equivalencies:* X-COMP476/MATH476

**MATH 486 General Topology (3 Credit Hours)**

General theory of topological and metric spaces, compact spaces, convergence and completeness in metric spaces, connected spaces.

**MATH 488 Special Topics in Mathematics (1-4 Credit Hours)**

Selected topics in mathematics not covered in the department's regular course offerings. May be repeated for credit.

**MATH 495 Graduate Practicum in Mathematics (2 Credit Hours)**

*Pre-requisites:* MATH 401 and (MATH 414 or MATH 452 or MATH 416 or MATH 454); Graduate Student status

A project-based course. Under faculty consultation, students will design and independently carry out a research project devoted to the development, pedagogy, or application of mathematics. To earn credit for this course, the student will deliver both an oral presentation and technical paper at the level expected in the professional workplace.

*Outcomes:*

Students will have: analyzed professional literature from multiple sources, resulting in a motivating question for the project; gained practice communicating clearly, concisely, and in-step with discipline norms; and contributed to the learning, teaching, or application of mathematics through their findings

**MATH 498 Independent Study (1-6 Credit Hours)**

This is a directed study course undertaken by advanced students and supervised by a member of the graduate faculty.

**MATH 595 Thesis Supervision (6 Credit Hours)**

Research under faculty guidance including training in scientific writing and the production of a thesis and research presentation.

**MATH 605 Master's Study (0 Credit Hours)**

This course is a non-credit means of permitting students to be formally enrolled at Loyola while preparing for the final practicum.

## Microbiology and Immunology (MIIM)

**MIIM 402 Microbes & Hosts (3 Credit Hours)**

*Pre-requisites:* Cell Biology BMSC 412, and Molecular Biochemistry BMSC 410 or permission from the instructor

Microbes & Hosts conveys important concepts in bacteriology, virology and immunology as well as the interactions of microbes with host organisms. Through a combination of didactic lectures and group discussions, students will come to appreciate fundamental processes which influence microbe-host interactions.

*Outcomes:*

Students will have a strong understanding of basic principles of microbiology, virology and immunology as well as an understanding of key concepts related to microbe-host interactions

**MIIM 411 Basic Molecular Microbiology (2-3 Credit Hours)**

This course is an introduction to fundamental concepts in microbiology

*Outcomes:*

Students will be able to demonstrate an understanding of the morphology, growth, division, development, molecular biology, genetics and physiology of microorganisms

**MIIM 413 Basic Concepts of Immunology (2 Credit Hours)**

This course is an introduction to the concepts of host immunity and defense.

*Outcomes:*

Students will be able to understand the fundamental principles of immunobiology, immunochemistry and immunogenetics, host immunity and defense, and the basic concepts of normal host defense versus the untoward responses (hypersensitivity) and their consequences

**MIIM 414 Virology (3 Credit Hours)**

This is a survey course that examines animal viruses and their interactions with host cells.

*Course equivalencies:* X-MBIO414/MIIM414

*Outcomes:*

Students will be able to demonstrate an understanding of viral structure and multiplication, and molecular interactions of important animal viruses with their host cells

**MIIM 415 Medical Immunology (2 Credit Hours)**

*Pre-requisites:* General Biology and/or Cell Biology Course is open to all Integrated Program in Biomedical Sciences PhD and MS students, graduate Nursing students, medical students, and advanced undergraduate students

The medical immunology course provides an in depth description of the components of the innate and adaptive immune system and how they interact to protect humans against infectious microorganisms. The course will have two 3 hour sessions per week for 8 weeks as well as 2 written exams.

*Outcomes:*

Be able to describe the development and mechanism(s) of activation of the innate and adaptive immune systems, their regulation and outcomes of their inability to do so

**MIIM 420 Methods & Techniques in Microbiology Research (1 Credit Hour)**

This course is an introduction to the theory of techniques used for research in microbiology and immunology.

*Outcomes:*

Students will be able to demonstrate competency with various research techniques including spectrophotometry, centrifugation, chromatography, photography, as well as other methods necessary for the study of microbiology, immunology or virology

**MIIM 431 The Molecular Biology of Viruses (3 Credit Hours)**

*Pre-requisites:* Include undergraduate or graduate-level courses in cell biology and biochemistry, graduate course 402 Microbes and Hosts, and / or prior approval from the course director(s)

The course will cover molecular biology and biochemistry of virus infections. Current understanding of virus-cell entry, replication, and assembly will be prominent themes. Course will include lectures on viral evolution, ecology, pathogenesis and viral immunology. The interactive course will include lectures, review of current virology literature, and student-led presentations.

*Course equivalencies:* MBIO431/MIIM431

*Outcomes:*

Detailed understanding of virology; be able to integrate concepts in this field with chemistry and health science; comprehend and appreciate current literature; be prepared for lab studies

**MIIM 441 Immunology-Immunochemistry (3 Credit Hours)**

This is an advanced immunology course that emphasizes structural concepts in immunology. Review and discussion of current literature exemplifies concepts presented in lecture.

*Outcomes:*

Students will demonstrate an understanding of the chemical definition of antigens, immunogens, structural concepts in immunology, immunoglobulin structure, structure of antigens and their interactions, and recognition of antigen by T-cells and B-cells

**MIIM 442 Cell & Molecular Immunology (3 Credit Hours)**

This is an advanced immunology course that examines the cellular and molecular basis of the immune response.

*Outcomes:*

Students will be able to demonstrate an understanding of the cellular and molecular basis of the immune response, as well as the cellular cooperation essential to the nature of immunology

**MIIM 443 Molecular B-Cell Immunology (4 Credit Hours)**

This is an advanced molecular immunology course with emphasis on proteins, genes and molecular interactions within the B-lymphocyte compartment of the immune system. Course includes critical evaluation of recent literature.

*Outcomes:*

Students will demonstrate an understanding of proteins, genes and molecular interactions within the B-lymphocyte compartment of the immune system

**MIIM 461 Microbiological Cytology & Ultrastructure (3 Credit Hours)**

This is an advanced course that presents the principles and application of light and electron microscopes for the study of cell structure and function.

*Outcomes:*

Students will demonstrate an understanding of the principles of light and electron microscopes and their use as tools in cellular and molecular biology

**MIIM 471 Molecular Microbial Genetics (4 Credit Hours)**

This course introduces advanced students to the importance of genetics to a wide range of biological problems.

*Outcomes:*

Students will demonstrate an ability to read, think, write, and speak critically about various genetic approaches used to identify essential genes, mutagenesis and recombination, transcription, development, symbiosis, and pathogenesis

**MIIM 490 Molecular Biology of Oncogenesis (2 Credit Hours)**

This course is an advanced course that provides a detailed analysis of molecular events that result in the tumorigenic transformation of eukaryotic cells.

*Outcomes:*

Students will demonstrate an understanding of oncogenesis by DNA and RNA tumor viruses, the role of oncogenesis and their relationship to normal genes, hormonal effects, and chromosomal abnormalities

**MIIM 492 Research (1-9 Credit Hours)**

Independent research for thesis or dissertation under the supervision of a faculty research advisor. Credit varies based upon assigned effort and time spent in the laboratory. Students receive a letter grade from their research advisor.

**MIIM 501 Seminar (0 Credit Hours)**

This course provides opportunities for students to hear about cutting-edge research being conducted nationally and internationally.

*Outcomes:*

Students will be able to demonstrate a general awareness of current research in the area of microbiology, immunology and virology

**MIIM 502 Special Topics (1-4 Credit Hours)**

This course covers a specific topic in microbiology, immunology or virology.

*Outcomes:*

Students will be able to articulate a general understanding of the selected topic

**MIIM 503 Current Literature (1 Credit Hour)**

This course is a paper-driven course in which papers of current interest are read and discussed.

*Outcomes:*

Students will demonstrate an ability to identify, critically analyze and articulate key concepts of scientific papers

**MIIM 595 Thesis Supervision (0 Credit Hours)**

This course allows the student to pursue a research topic under the mentorship of a faculty advisor.

*Outcomes:*

Students will contribute to the existing body of scientific knowledge and/or methodology in their thesis area; They will defend their results to their committee members

**MIIM 600 Dissertation Supervision (0 Credit Hours)**

This course allows the student to pursue a research topic under the mentorship of a faculty advisor. They will defend their results in a public forum.

*Course equivalencies:* BMSC600/MIIM600/PIOL600

*Outcomes:*

Students will add new knowledge to the existing body of scientific knowledge in their dissertation area

## Neuroscience (NRSC)

**NRSC 410 Cellular & Molecular Neurobiology (3 Credit Hours)**

This course will review current knowledge of the morphological, biophysical and biochemical properties of neurons. Fundamental neuronal network processes such as stimulus transduction, neuronal plasticity, information processing, and learning and memory will be reviewed.

*Outcomes:*

An advanced knowledge of the biophysical and biochemical properties of nerve cells and fundamental aspects of more global central nervous system function

**NRSC 415 Neurochemistry (3 Credit Hours)**

This course is a team-taught neurochemistry course that integrates basic biochemical mechanisms of neurotransmitter synthesis, storage, reuptake, and inactivation with applied correlates to central and peripheral nervous system neurodegenerative disorders. Organic chemistry and neurobiology/neurophysiology are required prerequisite courses. Emphasis is placed on student participation including a student-held lecture series covering a contemporary neurochemical topic of their choosing.

*Interdisciplinary Option:* Neuroscience

**NRSC 421 Neuroscience Teaching (1 Credit Hour)**

This course consists in serving as a Teaching Assistant in the medical Neuroscience course labs and proctoring the medical neuroscience course exams. It also includes a weekly pre-lab meeting in which the material for that week's lab is discussed.

*Outcomes:*

Experience in teaching neuroanatomy for Neuroscience Graduate Program students

**NRSC 422 Behavioral Neuroscience (2 Credit Hours)**

This course discusses the brain's role in sensory perception, higher perceptual functions, attention, learning and memory, executive function, and emotion. It consists of weekly lectures given by the professor or by one or two students.

*Outcomes:*

An understanding of higher brain function and experience giving presentations

**NRSC 423 Special Topics in Neuroscience (3 Credit Hours)**

Restricted to Graduate level students. This course explores a wide spectrum of neuroscience-related topics, and the subject matter will vary with each offering.

*Outcomes:*

Measures include exam performance, in-class participation, and student presentation

**NRSC 499 Research (1-9 Credit Hours)**

Independent research for thesis or dissertation under the supervision of a faculty research advisor. Credit varies based upon assigned effort and time spent in the laboratory. Students receive a letter grade from their research advisor.

**NRSC 502 Neuroscience Journal Club (1 Credit Hour)**

*Pre-requisites:* Must be member of the Neuroscience Graduate Program. One hour weekly course during which all students in the Neuroscience Graduate Program meet to discuss and critically evaluate recent, high impact journal articles covering varied neuroscience topics under the direction of two faculty mentors with neuroscience expertise.

*Outcomes:*

Students advance their knowledge of new neuroscience concepts and methods, gain experience in presenting in front of a group, and gain confidence in their abilities to critically evaluate experimental design and statistical methods.

**NRSC 503 Neuroscience Seminar (1 Credit Hour)**

In both the fall and spring this course includes monthly Neuroscience seminar presentations by internal and external speakers. In the fall, the course also includes weekly journal club presentations by the graduate students; in the spring the course also includes weekly research progress reports by the graduate students.

*Outcomes:*

A broad overview of current topics in the field and experience giving research presentations.

**NRSC 595 Thesis Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the masters of science thesis and degree.

**NRSC 600 Dissertation Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the Ph.D. dissertation and degree.

## Pharmacology (PHAR)

**PHAR 405 Pharmacology Journal Club (1 Credit Hour)**

This course involves students in reading and presenting the scientific literature in journal club format with the goals of learning to, i) evaluate the pharmacological literature and voice a critique in a constructive manner, ii) present such literature in a peer-context, and iii) assimilate information presented by other speakers and formulate, ask, and discuss around relevant appropriate questions.

**PHAR 406 Special Problems in Pharmacology (1-4 Credit Hours)**

This course covers a specific topic in pharmacological or biomedical sciences. The topics can vary among different special topics courses.

**PHAR 407 Fundamentals of Drug Discovery and Development (3 Credit Hours)**

This course introduces the process of drug discovery, and students will explore the theoretical and practical aspects of the entire process from concept to clinical trials. Topics include selection, design and use of disease models, current methods and strategies of drug target identification, lead molecule identification, the clinical trial process and pre- and post-market safety.

*Outcomes:*

Upon completion of this course, the students will have sufficient understanding of the drug discovery process to: 1) Discuss the methods and strategies used to identify potential drug targets; 2) Describe approaches used to screen for lead molecules; 3) Articulate the general FDA regulatory requirements encountered in bringing a new drug to market; 4) Identify requirements for pre-clinical assessment of potential compounds; 5) Define and describe the steps of the clinical trials process; and 6) Articulate and discuss ethical aspects in drug development, including, but not limited to, animal use, clinical trials, intellectual property and research design and integrity.

**PHAR 408 Molecular Basis of Disease and Therapeutics (3 Credit Hours)**

The course focus is on understanding contemporary research in the pathophysiology of major human diseases and in the development of respective therapeutic treatment strategies. Emphasis will be on cutting edge studies in molecular medicine, including topics in cardiology, endocrinology, oncology, inflammatory diseases and in the neurosciences. There are no prerequisites, but students should have a solid understanding of cell and molecular biology, biochemistry and systems physiology.

*Outcomes:*

Understand contemporary research strategies applicable to investigating the molecular basis of disease and therapeutics and develop critical thinking and writing skills in hypothesis testing, experimental design and data analyses.

**PHAR 409 Principles of Pharmacology (3 Credit Hours)**

This course introduces students to the fundamental principles of pharmacology and the clinical use of the major classes of drugs currently used with a focus upon fundamental concepts. Topics include drugs and their receptors, molecular aspects of drug targets and drug action, pharmacodynamics and the quantitative aspects of drug-receptor interactions, pharmacokinetic properties of drugs influencing drug distribution and drug dosing, drug metabolism and the effects of genetics on drug action, mechanisms of drug toxicity, and scientific approaches to the discovery of new drugs. Finally, the pharmacology and clinical uses of the major classes of drugs, including drugs used to treat diseases of various systems including cardiovascular, central nervous system, endocrine/reproductive systems, and cancer are covered.

**PHAR 410 Signal Transduction (3 Credit Hours)**

This course is open to all Ph.D., M.D./Ph.D., and M.S. students. Students will gain a theoretical and practical understanding of how extracellular signals are transduced through receptors into metabolic events. It is designed for second year PhD students who have completed the Biomedical Sciences core curriculum. The format is one lecture followed by one research paper discussion for each topic. Students will also gain in-depth knowledge of the signal transduction topics covered in the course.

*Outcomes:*

Students will be able to interpret data and design experiments examining signal transduction pathways.

**PHAR 415 Current Topics in Pharmacology and Epidemiology of Disease (2 Credit Hours)**

This advanced graduate level course will cover an up-to-date overview of topics directly relevant to pharmacovigilance, pharmacoepidemiology, and the factors that play a role in success or failure of approved therapeutic agents.

*Outcomes:*

Students who complete this course will gain knowledge of major epidemiology concepts and statistical principles used in epidemiology and pharmacovigilance.

**PHAR 420 Pharmacovigilance: A Practical Approach (4 Credit Hours)**

This advanced graduate level course will provide an up-to-date and in-depth understanding of pharmacovigilance in the context of modern pharmaceutical drug development and pharmacology. Pharmacovigilance is the pharmacological science relating to the detection, collection, assessment, monitoring, and prevention of adverse effects associated with pharmaceutical products. Enrollment Condition: Drug Discovery (PHAR 407), recommended but not required. Students will be able to identify and describe the regulatory environment and product safety as it pertains to the collection, assessment, reporting and analysis of adverse events.

*Outcomes:*

Upon completion of this course, students will demonstrate an understanding of pharmacovigilance and patient safety

**PHAR 453 The Teaching of Pharmacology (1 Credit Hour)**

This course teaches the practice and pedagogy of graduate level teaching. Students work under supervision to prepare and present a didactic lecture which is reviewed by faculty and students.

**PHAR 499 Research (1-12 Credit Hours)**

Independent research for thesis or dissertation under the supervision of a faculty research advisor. Credit varies based upon assigned effort and time spent in the laboratory. Students receive a letter grade from their research advisor.

**PHAR 595 Thesis Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the masters of science thesis and degree.

**PHAR 600 Dissertation Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the Ph.D. dissertation and degree.

## Philosophy (PHIL)

**PHIL 400 Philosophy Research Tools (3 Credit Hours)**

This course introduces students to several methodological approaches to philosophical issues.

**PHIL 401 Plato (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Plato

*Course equivalencies:* X-PHIL401/CLST412

**PHIL 402 Aristotle (3 Credit Hours)**

Prepares students for advanced work on some aspect of the philosophical thought of Aristotle.

**PHIL 403 Ancient Philosophy (3 Credit Hours)**

Prepares students for advanced work on a particular philosophical theme or problem in ancient philosophy.

**PHIL 405 Augustine (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Augustine.

**PHIL 406 Aquinas (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Aquinas.

**PHIL 407 Medieval Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in medieval philosophy.

**PHIL 408 Late Medieval Philosophy (3 Credit Hours)**

Prepares students for advanced work on one or more late medieval philosophers such as Scotus and Ockham.

**PHIL 410 Descartes (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Descartes.

**PHIL 411 Classical Rationalism (3 Credit Hours)**

Introduces students to a specialized topic in early modern rationalism, typically with reference to Descartes, Leibniz, and/or Spinoza.

**PHIL 412 Classical Empiricism (3 Credit Hours)**

Introduces students to a specialized topic in early modern empiricism, typically with reference to Locke, Berkeley, and/or Hume.

**PHIL 415 Kant (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Kant.

**PHIL 416 17th-18th Century Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in early modern philosophy from Descartes to Kant.

**PHIL 417 Classical German Philosophy (3 Credit Hours)**

*Pre-requisites:* Graduate student status

Classical German Philosophy begins with Kant and his immediate predecessors, and extends to the early mid-19th century, including figures such as Herder, Fichte, Schelling, Goethe, Schiller, and Hegel, Feurebach, and Marc, among others. This course may include critiques of developments out of classical German philosophy. Students will become conversant with the major projects and schools of thought in the wake of Kant's Critical Philosophy. Students will also become competent in engaging basic research in the philosophy of this era.

*Outcomes:*

Students will become conversant with the major projects and schools of thought in the wake of Kant's Critical philosophy

**PHIL 419 Aesthetics (3 Credit Hours)**

Prepares students for advanced work in philosophical issues and/or figures in aesthetics.

*Outcomes:*

Students will become conversant with the major projects and schools of thought in the field of aesthetics; Students will also gain knowledge of contemporary scholarship and develop basic research skills in this field

**PHIL 420 Hegel (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Hegel.

**PHIL 421 Marx (3 Credit Hours)**

Prepares students for advanced work on Marx and Marxist philosophy.

**PHIL 422 Nietzsche (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Nietzsche.

**PHIL 425 19th Century Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in nineteenth century philosophy.

**PHIL 430 Husserl (3 Credit Hours)**

Prepares students for advanced work on the phenomenology of Husserl.

**PHIL 431 Marxism (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Marx and/or philosophers working in the Marxist tradition.

**PHIL 432 Heidegger (3 Credit Hours)**

Prepares students for advanced work on the thought of Heidegger.

**PHIL 433 Phenomenology/Existentialism (3 Credit Hours)**

Introduces students to a specialized topic in either phenomenology and/or existential philosophy.

**PHIL 434 Hermeneutics & Critical Theory (3 Credit Hours)**

Introduces students to a specialized topic in either philosophical hermeneutics and/or the critical theory of the Frankfurt School.

**PHIL 436 Contemporary French Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in recent French philosophy.

**PHIL 437 Contemporary German Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in recent German philosophy.

**PHIL 438 Topics in Continental Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in some aspect of European philosophy from Kant to the present.

**PHIL 439 Chinese Philosophy (3 Credit Hours)**

Prepares students for advanced work on Chinese philosophy.

**PHIL 440 American Philosophy (3 Credit Hours)**

Prepares students for advanced work on the American philosophical tradition.

**PHIL 441 Wittgenstein (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Wittgenstein.

**PHIL 442 Anglo-American Philosophy (3 Credit Hours)**

Prepares students for advanced work on some aspect of the pragmatist and/or analytic philosophical traditions.

**PHIL 443 Anglo-American Epistemology (3 Credit Hours)**

Introduces students to a specialized topic in analytic epistemology.

**PHIL 444 Studies in Logic (3 Credit Hours)**

Introduces students to some aspect of formal logic, such as formal systems, axiomatic set theory, mathematical logic, modal logic, tense logic, epistemic logic, deontic logic, formal semantics, and philosophical logic.

**PHIL 445 Philosophy of Mind (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning the problem of consciousness and the nature of mental functions.

**PHIL 446 Philosophy of Perception (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to perception.

**PHIL 447 Issues in Cognitive Science (3 Credit Hours)**

Introduces students to specialized topics in the philosophy of cognitive sciences.

**PHIL 449 Philosophy of Language (3 Credit Hours)**

Prepares students for advanced work on philosophical issues about the relationship between language, thought, meaning, and reference.

**PHIL 450 Epistemology (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning the nature of belief and knowledge.

**PHIL 451 Metaphysics (3 Credit Hours)**

Prepares students for advanced work on philosophical issues about the nature of reality.

**PHIL 452 Philosophy of Science (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to the natural sciences.

**PHIL 454 Philosophy of Religion (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning religious practices and beliefs.

**PHIL 455 Philosophical Theology (3 Credit Hours)**

Prepares students for advanced work in philosophical issues and/or figures in philosophical theology.

**PHIL 457 Aesthetics (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to the nature of art and aesthetic judgment.

**PHIL 458 Philosophy of History (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to history and historiography.

**PHIL 459 Philosophy of Law (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning legal institutions and practices.

**PHIL 462 Kant's Moral Philosophy (3 Credit Hours)**

Prepares students for advanced work on the practical philosophy of Kant.

**PHIL 463 Virtue Ethics (3 Credit Hours)**

Prepares students for advanced work on classical and/or contemporary themes in the virtue tradition in moral philosophy.

**PHIL 464 Utilitarianism (3 Credit Hours)**

Introduces students to classical and contemporary formulations of utilitarian ethics.

**PHIL 466 Major Authors in Moral Philosophy (3 Credit Hours)**

Prepares students for advanced work on the ethical theories of one or more key figures in the history of philosophy.

**PHIL 467 Contemporary Ethical Theories (3 Credit Hours)**

Prepares students for advanced work on issues in contemporary moral philosophy.

**PHIL 468 Topics in Ethics (3 Credit Hours)**

Introduces students to specialized topics in ethical theory.

**PHIL 469 Ethics and Rationality (3 Credit Hours)**

Introduces students to philosophical issues concerning the relationship between rationality and moral thinking.

**PHIL 470 Ethics & Economic Justice (3 Credit Hours)**

Prepares students for advanced work on ethical and social-political issues concerning economic practice and theory.

**PHIL 474 Principles of Business Ethics (3 Credit Hours)**

Introduces students to philosophical approaches to ethical issues concerning the relationship between business and society.

**PHIL 475 Philosophy of Nursing: Nursing as a Moral Practice (3 Credit Hours)**

This course provides an opportunity for students to analyze ethical issues and personal, institutional/organizational, societal and global values and beliefs that have an impact on nursing practice, the nursing profession, and healthcare delivery. Students will clearly and carefully articulate their thinking and approach to moral reasoning about various contemporary issues and justify their responses. Presuppositions about clinical practice, education, administration, and their impact will be explored. The realities of the social context and the effects on moral/ethical practice will be discussed.

*Course equivalencies:* X-GNUR540/PHIL475

**PHIL 477 Social Health Care Ethics (3 Credit Hours)**

Prepares students for advanced work in philosophical approaches to social issues in health care.

**PHIL 478 Research Methods in Social Justice (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course looks at several different methodological approaches to social justice issues: broad ethical frameworks; specific ethical issues, such as intent and volition; quantitative analysis; US law; and international law.

*Outcomes:*

Students are expected to know how to conduct literature reviews, how to use these approaches in analyzing social justice issues, and how to write up and present their research

**PHIL 479 Issues in Applied Ethics (3 Credit Hours)**

Introduces students to specialized topics in applied ethics.

**PHIL 480 Social & Political Philosophy (3 Credit Hours)**

Introduces students to specialized topics in social and political philosophy, such as theories of justice, social contract theory, human rights, and issues pertaining to race, class, and gender.

**PHIL 481 Philosophy of Action (3 Credit Hours)**

This course deals with the distinction between action and mere behavior. Related topics: causal vs. teleological views, intention, reasons for action (as distinct from causes of action), practical identity, free agency, practical reason, deliberation and choice, the relationship between emotional capacities and responsible agency.

*Outcomes:*

Students will understand the basic features of human agency

**PHIL 482 Philosophy of Social Science (3 Credit Hours)**

Introduces students to philosophical issues concerning the social sciences.

**PHIL 483 Philosophical Questions in Human Rights (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course addresses questions in human rights such as the concept of rights and its critics, sovereignty and its relation to global governance, the role of intent, and how human rights are gendered.

*Outcomes:*

Students are expected to have an overview of the major legal frameworks for human rights, as well as an understanding of several of the major philosophical issues and related literature

**PHIL 484 Philosophical Anthropology (3 Credit Hours)**

Prepares students for advanced work about philosophical conceptions of human existence.

*Interdisciplinary Option:* Women & Gender Studies

**PHIL 485 International Ethics (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course is intended to give students an overview of some of the major frameworks for addressing ethical issues in the international arena. This includes Just War doctrine, economic rights, and global governance.

*Outcomes:*

Students are expected to be familiar with the major treaties, international law doctrines, and institutions relevant to international ethics, as well the pertinent secondary literature

**PHIL 487 Moral and Legal Issues of Economic Sanctions (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course will provide an introduction to economic sanctions in the context of foreign relations and global governance. We will look closely at the issues of effectiveness and humanitarian impact. We will also look at legal issues, such as the problem of extraterritoriality.

*Outcomes:*

It is expected that students will have an overview of how sanctions interact with international law, institutions of global governance, and human rights law

**PHIL 490 Current Philosophical Issues (3 Credit Hours)**

Introduces students to specialized topics in some area of contemporary philosophy.

**PHIL 500 Directed Readings and Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 501 Directed Readings & Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 502 Directed Readings & Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 503 Directed Readings & Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 505 Teaching Internship I (3 Credit Hours)**

This course introduces students to best practices in philosophical pedagogy.

**PHIL 510 Clinical Ethics Practicum (3 Credit Hours)**

This course will include some combination of academic and non-academic work, involving some aspect of clinical ethics. The student and the faculty supervisor will agree on the scope of the project and the nature of the work.

**PHIL 511 Social Ethics Practicum (3 Credit Hours)**

This course will include some combination of academic and non-academic work, involving some aspect of social ethics. The student and the faculty supervisor will agree on the scope of the project and the nature of the work.

**PHIL 550 Integrative Seminar (3 Credit Hours)**

This course prepares students for advanced work in philosophy, and emphasizes ways in which philosophy can play an integrative role.

**PHIL 590 Dissertation Proposal Seminar (0 Credit Hours)**

This semester-long, non-credit, pass/non-pass course is intended for Ph.D. students in their third or fourth years. Our purpose consists in taking students from their initial, general ideas on a dissertation to a developed proposal.

*Outcomes:*

The class will culminate in producing a final dissertation proposal and a community of researchers who are able and willing to support each other in the development and writing up of dissertation proposals

**PHIL 595 Thesis Supervision (0 Credit Hours)**

This course allows continuing master's students to continue work on their master's thesis or paper. Please consult with philosophy department graduate program director before registering.

**PHIL 600 Dissertation Supervision (0 Credit Hours)**

This course is intended for students who have completed their dissertation proposal and are currently working on their dissertation. Please consult with department graduate program director before registering.

**PHIL 605 Master's Study (0 Credit Hours)**

This course allows continuing master's students to continue work on their master's thesis or paper. Please consult with philosophy department graduate program director before registering.

**PHIL 610 Doctoral Study (0 Credit Hours)**

This course is intended primarily for students who are currently working on their dissertation proposal. Please consult with philosophy department graduate program director before registering.

## Physics (PHYS)

**PHYS 473 Energy and Sustainability (4 Credit Hours)**

A course that investigates the role of energy in physical systems such as the atmosphere and also various sources of energy.

*Outcomes:*

Ability to apply laws of thermodynamics to physical systems and apply material to high school science class

**PHYS 495 AP Physics Workshop (3 Credit Hours)**

This graduate level course offers pedagogical content knowledge training for in-service high school teachers preparing to teach AP Physics.

## Physiology (PIOL)

**PIOL 401 Physiology (4 Credit Hours)**

This course integrates the contents of two sections of the medical school (M1) course Function of the Human Body course (PIO L301); with additional meetings to present discuss papers at graduate level (2 paper presentations per graduate student). In the Fall semester, students will review cell physiology and autonomic neuroscience, and will learn cardiovascular and renal physiology in depth. The course topics will include introductory cell & neurophysiology, skeletal and smooth muscle, cardiac electrophysiology, EKG, cardiac muscle mechanics, circulation, special circulations, and renal physiology. In the Spring semester, students will learn pulmonary, acid-base balance, gastrointestinal, endocrine, and reproductive physiology. Instructor Consent Required.

*Outcomes:*

Students familiar with introductory physiology are expected to learn and understand cardiovascular, reproductive and endocrine systems in an integrative fashion in this course; Emphasis will be placed on understanding key concepts of normal physiological and biochemical systems in healthy humans; Selected aspects of pathophysiological processes will be discussed to illustrate how an understanding of normal function can be applied to clinical medicine

**PIOL 410 Intro to Research (1-3 Credit Hours)**

This course provides an introduction to a wide variety of commonly used techniques in cell and molecular physiology research, with concomitant laboratory rotations to learn those techniques.

**PIOL 412 Research (1-6 Credit Hours)**

Independent research for thesis or dissertation under the supervision of a faculty research advisor. Credit varies based upon assigned effort and time spent in the laboratory. Students receive a letter grade from their research advisor.

**PIOL 414 Graduate Colloquy (1-8 Credit Hours)**

Special advanced topics course with variable credit. Paper discussion and instructor-led presentations.

**PIOL 416 Research Seminar (1 Credit Hour)**

Seminar presentation on PhD candidate's dissertation topics advance.

**PIOL 417 Cellular Physiology (3 Credit Hours)**

*Pre-requisites:* Restricted to Master of Physiology Program students

The major goal of the Cellular Physiology course is to define the molecular and cellular basis of systems Physiology and Pathophysiology. The course consists in distinct sessions of teaching, problem solving, and reviews.

*Outcomes:*

- Understand the relationships among molecular, cellular and systems physiology; - Understand membrane structure and function; - Understand distinct metabolic and signaling pathways

**PIOL 420 Methods/Technical in Physiological Research (2 Credit Hours)**

This course is intended for students seeking advanced knowledge of cutting-edge experimental approaches currently used in cardiovascular, metabolic, and neuroscience research. These topics will be discussed in both a technical/methodological sense, and in the context of the current scientific literature.

**PIOL 421 Function of the Human Body I (4 Credit Hours)**

This course will present the basic concepts and principles of human physiology. The course topics will include: introductory cell & neurophysiology, skeletal and smooth muscle, cardiac electrophysiology, EKG, cardiac muscle mechanics, circulation, special circulations and pulmonary physiology. The format will be lectures, simulations, small group problem sessions and scheduled reviews. Small group problem sessions will be held after each subject area and will focus on clinical application and integration of conceptual information presented in lectures. Small group sessions and reviews also will provide the student with the opportunity to obtain clarification from instructors of any outstanding questions and are designed to encourage active learning, as well as develop critical thinking and problem solving skills. Students will be evaluated by multiple choice and essay exams given after each of the 5 major topic areas. Course material will be geared toward non-thesis Masters students. Given that physiology is the basis of medicine, this course will prepare students with the basic science knowledge to successfully continue their professional development in future biomedical programs.

*Outcomes:*

Students will be able to describe the cellular mechanisms responsible for cardiac, skeletal and smooth muscle contraction and the factors that regulate their activity

**PIOL 422 Function of the Human Body II (4 Credit Hours)**

Enrollment limited to Masters of Science in Physiology students. This course presents the basic concepts and principles of human physiology. The course will be presented over one semester and the topics include: renal, acid-base balance, gastrointestinal, endocrine, and reproductive physiology. The format will be lectures, small group problem sessions and scheduled reviews.

*Outcomes:*

Students will be able to explain the cellular mechanisms responsible for normal renal, acid-base, endocrine, gastrointestinal and reproductive physiology

**PIOL 423 Biochemical Physiology (3 Credit Hours)**

Biochemical Physiology will give students knowledge of foundational processes that dictate cellular physiologic processes. Topics include the structure and properties of nucleic acids, amino acids, protein structure and folding, enzyme kinetics, metabolic pathways and intracellular signal transduction. The course will present the biochemical physiology.

*Outcomes:*

Student completing this course should: - Understand the biochemical mechanisms which underlie physiological processes; - Understand protein structure dynamics and how these structures are dictated by second

**PIOL 430 Basic Human Anatomy (2 Credit Hours)**

Enrollment limited to Masters of Science in Physiology students. This course will provide students with the basic concepts and facts of human gross anatomy as they related to physiology and function. Specific sections include the musculo-skeletal components of the extremities, trunk and head, the peripheral nervous system to include both the somatic and autonomic systems, the cardiovascular system, respiratory system, digestive system, urinary system and reproductive system. Each system will integrate embryology, radiology and basic clinical applications.

*Outcomes:*

Students will be able to describe and integrate basic human anatomy of the major organ systems to physiology and clinical medicine

**PIOL 446 Cardiovascular Journal Club (1 Credit Hour)**

Presentation and discussion of original research papers with focus on cardiovascular physiology topics.

**PIOL 450 Fundamentals Of Neurophysiology (4 Credit Hours)**

This course imparts the basic concepts and fundamentals of Neurophysiology, with emphasis on concepts relevant to human neuroscience. Students will learn Neurophysiology fundamentals at the cellular, structural and physiological levels of various complex systems in the brain, with specific discussion of clinical correlates of Pathophysiological conditions.

*Outcomes:*

Students successfully completing this course will be able to understand and explain neurophysiological mechanisms relevant to normal and abnormal conditions

**PIOL 461 Introduction to Human Pathophysiology (5 Credit Hours)**

Restricted to students in the Masters of Science in Physiology program. This course presents the basic concepts and principles of human pathophysiology. The course will be presented over one semester and the topics include: clinical evaluation of cardiac structure and function followed by a review of the major disorders of cardiovascular function.

*Outcomes:*

Students will be able to critically evaluate basic pathophysiological mechanisms underlying the most common forms of adult human cardiovascular disease

**PIOL 468 Neurophysiology Journal Club (1 Credit Hour)**

Presentation and discussion of original research papers with focus on neurophysiology topics.

**PIOL 470 Excitability & Ion Transport (1-4 Credit Hours)**

The course focuses on basic concepts of the physical movement of ions during activation of voltage- and ligand- gated ion channels.

**PIOL 472 Structure/Function Membrane Proteins (3 Credit Hours)**

The course explores basic and advanced concepts of membrane proteins structure, cell biology and function.

**PIOL 500 Professional Development I (3 Credit Hours)**

Must be enrolled in the MSP program. Professional Development will meet once/month throughout the one-year MSP program. Students will receive information about the options available for a career in the health sciences and will enhance their professional portfolio by participating in a variety of workshops designed to better equip them for a health science career.

*Outcomes:*

Students will be able to understand the curriculum and admission requirements of the various professional health programs and gain an understanding of the interview process

**PIOL 501 Professional Development II (1 Credit Hour)**

*Pre-requisites:* PIOL 500

Professional Development will meet and have self-directed study time throughout the spring semester of the MSMP program. Students will receive bi-weekly, specific individualized one-on-one mentoring from their academic advisors and also meet with the course director for specific lectures on their AMCAS and AACOMAS applications for medical and DO schools. Students will continue to enhance their knowledge of the admissions process by having general lectures and individual sessions discussing their motivation, enhancing their self-awareness, writing their personal statements, their selection of appropriate medical schools, selection of activities (community and medical volunteering, health care exposure (shadowing, scribing, etc.), research for their application, overall discussions on writing their secondary statements, choice of letters of recommendation, etc. MSMP students only.

*Outcomes:*

Following successful completion of this course, the MSMP student will: 1) Demonstrate enhanced ability for self-awareness and analysis regarding their medical school application; 2) Demonstrate self-reflection in the selection of target medical schools, discussing their fit in terms of each medical school's mission statement; 3) Continue working with their academic advisor to prepare a well-written personal statement appropriately tailored to the professional program of choice; 4) Demonstrate understating of the application process and preparation of application forms

**PIOL 595 Thesis Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the masters of science thesis and degree.

**PIOL 600 Dissertation Supervision (0 Credit Hours)**

Supervised research and writing leading to the completion of the Ph.D. dissertation and degree.

*Course equivalencies:* BMSC600/MIIM600/PIOL600

**PIOL 605 Physiology Study (0 Credit Hours)**

Must be enrolled during fall semester of MS program in Physiology. Holding course to keep the student active in the program while completing MS degree requirements.

## Political Science (PLSC)

### PLSC 400 Scope and Methods of Political Science (3 Credit Hours)

This is a broad course that lays out the main approaches to political science.

### PLSC 401 Intro to Research Design & Method (3 Credit Hours)

This course is an introduction to principles of research design in political science. The main objective of this course is to familiarize students with the social scientific approach to studying politics.

#### *Outcomes:*

Students will learn how to ask empirical questions about the political world, how to develop theories and generate testable hypotheses, how to collect appropriate types of evidence, how to answer research questions scientifically using such evidence, and how to clearly convey their evidence and argument to others

### PLSC 402 Seminar on Empirical Analysis (3 Credit Hours)

The course allows students to develop additional methods to empirical analysis.

### PLSC 404 Selected Problems in American Politics (3 Credit Hours)

This course focuses on selected problems in the study of American politics and the American Political system.

#### *Outcomes:*

Gain an in-depth understanding of selected problems in American politics and the American Political system

### PLSC 405 American Executive Branch (3 Credit Hours)

This course relies on historical and contemporary scholarly literature on the American presidency to analyze the development and scope of rhetorical and party leadership, legislative relations, the commander-in-chief and diplomatic roles as well as the growth of the institutionalized presidency.

#### *Outcomes:*

Students will master the key literature on the American presidency as well as conduct research on a particular aspect of the US presidency

### PLSC 406 American Legislative Branch (3 Credit Hours)

This course focuses on the organization of and decision-making in the US legislative branch.

#### *Outcomes:*

Students will fully understand how the US Congress is structured and legislates, as well as its interactions with other US institutions and with American society

### PLSC 407 Public Policy-Making & Implementation (3 Credit Hours)

This course examines the process and dynamics of US policy-making systems.

#### *Outcomes:*

Students will understand the development of the public sector agenda, the policy formation and legitimation processes, and the role of implementation functions, as these relate to substantive issues or policy arenas

### PLSC 409 Organizational Theory (3 Credit Hours)

The course offers a broad approach to the various theoretical and practical approaches to the study of organizations.

### PLSC 410 Urban Politics (3 Credit Hours)

This course addresses the major theories, studies and issues of urban politics.

#### *Outcomes:*

Students will understand "political machines", parties, interest groups, voting, protests, minority and ethnic groups, city councils, mayors, bureaucrats and community power structures

### PLSC 411 American Political Parties/Electoral Process (3 Credit Hours)

This course analyzes the roles and functions of the party system and voting behavior in the United States.

#### *Outcomes:*

Students will understand the role of mass communication and issues in elections, the impact of party identification, and the impact of the electoral system on behavior of party and voter

### PLSC 412 Constitutional Politics (3 Credit Hours)

This course examines constitutional policy-making in the United States.

#### *Outcomes:*

Students will understand the political role of the Supreme Court, judicial values in constitutional adjudication, and the impact of court decisions

### PLSC 417 The American Legal System (3 Credit Hours)

This course examines the structure, functions, interrelationships, dynamics, and decision-making processes of the US legal system.

#### *Outcomes:*

Students will understand the major components of the American legal system - legislatures, administrative agencies, and courts

### PLSC 418 Political Psychology & Socialization (3 Credit Hours)

This course examines psychological, social and environmental influences on political attitudes and behavior.

#### *Outcomes:*

Students will understand the psychodynamics of political development and socialization as they interact with opinion formation and political participation

### PLSC 419 Managing Urban Government (3 Credit Hours)

This course studies the politics of urban government management.

#### *Outcomes:*

Students will understand the environments in which the urban manager functions

### PLSC 420 Comparative Political Systems (3 Credit Hours)

This course examines political institutions and political behavior in various political systems.

*Course equivalencies:* X-INTA 420/PLSC 420

#### *Outcomes:*

Students will master the literature on comparative politics, including the methodology of comparative analysis

### PLSC 421 Democratic Political Systems (3 Credit Hours)

This course examines selected democratic political systems.

#### *Outcomes:*

Students will understand how selected democratic systems operate, focusing on their similarities and differences

### PLSC 422 Authoritarian Political Systems (3 Credit Hours)

This is a graduate-level seminar on authoritarian political systems. The course explores theoretical perspectives on authoritarianism, political institutions in non-democracies, and paths to democratization.

#### *Outcomes:*

Students will become familiar with concepts and theories of authoritarianism, gain knowledge about different types of authoritarian rule, and learn about how authoritarian governments work and perpetuate power

### PLSC 423 Soviet & Post-Soviet Politics (3 Credit Hours)

This course analyzes the development of Soviet and post-Soviet politics since 1917.

#### *Outcomes:*

Students will understand the emergence and development of Soviet politics, as well as its decline in the mid-1980s

**PLSC 424 Politics of Developing Areas (3 Credit Hours)**

This course examines the politics of the "developing world."

*Outcomes:*

Students will understand the methods used to analyze politics in the developing and underdeveloped nation-states

**PLSC 425 Sub-Saharan Africa (3 Credit Hours)**

This course examines politics in Africa from the pre-colonial period to the present.

*Outcomes:*

Students will understand issues relating to decolonization, ethnicity, class, political economy, democratization, and regime transition in Sub-Saharan Africa

**PLSC 426 Latin American Politics (3 Credit Hours)**

This course examines important themes in the study of politics in Latin America.

*Outcomes:*

Students will understand the current scholarship and methodologies in the study of Latin American politics

**PLSC 427 Politics of the Middle East (3 Credit Hours)**

Enrollment Conditions: Permission of the instructor required. This course offers a historical and thematic approach to study the society and politics of the contemporary Middle East. Two central aims of the course are to cultivate critical perceptions regarding widespread images and descriptions of the region and to bolster students' historical, socioeconomic and political knowledge of the region.

*Outcomes:*

Students will master important political science literature on the Middle East and be well positioned to pursue original research

**PLSC 428 Political Violence (3 Credit Hours)**

This course offers a thematic approach to the study of political violence with a particular focus on armed conflicts involving non-state actors (i.e., civil wars). It addresses a wide variety of questions informed by the cutting-edge research in political science and other disciplines.

*Outcomes:*

Students will develop an understanding of the causes of different forms of violence in different parts of the world, motivations of people who participate in violence, and solutions to armed conflicts

**PLSC 429 Comparative Politics Selected Problems (3 Credit Hours)**

This course examines selected issues in comparative politics.

*Outcomes:*

Students will master the literature or conduct research in a particular area of comparative politics

**PLSC 430 Theories of International Politics (3 Credit Hours)**

This course analyzes theories and major issues of international politics.

*Course equivalencies:* X-INTA 430/PLSC 430

*Outcomes:*

Students will master the literature in major research areas and theoretical frameworks in international relations

**PLSC 431 Formulation US Foreign Policy (3 Credit Hours)**

This course examines how US foreign policy is made.

*Outcomes:*

Students will understand the decision-making institutions and their interaction in the formulation and execution of political, military and economic foreign policy

**PLSC 432 Comparative Foreign Policy Analysis (3 Credit Hours)**

This course examines contemporary policy positions of major blocs of nations as well as specific nations.

*Outcomes:*

Students will understand how foreign policy is made in countries other than the United States, as well as the policy of blocs of nations

**PLSC 433 International Organization (3 Credit Hours)**

This course examines the development and role of international organizations.

*Outcomes:*

Students will understand the political and administrative principles and problems of various types of international organizations, including the United Nations, the World Trade Organization, the World Bank, the International Monetary Fund and other key global and regional organizations

**PLSC 435 International Political Economics (3 Credit Hours)**

This course examines global economic systems.

*Outcomes:*

Students will understand global political-economic relations in the post-WWII period, including international monetary relations, international trade, regional integration, direct investment, debt, and development assistance

**PLSC 436 International Conflict (3 Credit Hours)**

This course focuses on concepts and approaches related to the causes of war, conflict and peace in the international system.

**PLSC 437 Selected Problems International Law (3 Credit Hours)**

This course examines selected issues or problems in international law.

*Outcomes:*

Students will understand contemporary theories of international law and the relationships among the various traditional and contemporary areas of international law

**PLSC 439 Selected Problems in International Politics (3 Credit Hours)**

This course examines important themes and theories in international politics.

*Outcomes:*

Students will master a specific body of literature or conduct research in a particular area of international relations

**PLSC 440 Ancient Political Thought (3 Credit Hours)**

This course examines the major works of the most important theorists within the classical tradition.

*Outcomes:*

Students will master key writings of Thucydides, Plato, Aristotle, and other theorists

**PLSC 442 Modern Political Thought (3 Credit Hours)**

This course examines major modern political thinkers.

*Outcomes:*

Students will master key works of from the Italian Renaissance to the French Revolution

**PLSC 444 Great Authors (3 Credit Hours)**

This course focuses on the works of political theorists in the western tradition.

*Outcomes:*

Students will master key works of theorists in the western tradition

**PLSC 446 Political Ethics (3 Credit Hours)**

This course surveys classic debates on ethics - such as utilitarianism and deontological ethics - to provide students with analytical tools to answer the deceptively simple question "What is the right thing to do?" The course draws on classical readings of political philosophy, while seeking to make those abstract problems tangible by applying them to real world cases and examples.

**PLSC 447 American Political Thought to Civil War (3 Credit Hours)**

This course examines pre-Civil War US political thought.

*Outcomes:*

Students will master the works of key thinkers from the American founding to the Civil War

**PLSC 449 19th Century Political Thought (3 Credit Hours)**

This course examines key theorists in the nineteenth century.

*Outcomes:*

Student will master the works of key theorists beginning with the French Revolution and through the nineteenth century

**PLSC 470 Fieldwork in Political Science-Internship (1-3 Credit Hours)**

This is a graduate level course that allows students to get experience through internships. Restricted to Graduate School students.

*Course equivalencies:* X-PLSC 470/INTA 470

*Outcomes:*

Students will be able to demonstrate an understanding of models of leadership and public service by working with supervisors who are normally leaders in their fields

**PLSC 475 Political Analysis I (3 Credit Hours)**

This course provides an introduction to the use of inferential statistics in political science.

*Course equivalencies:* X-INTA 475/PLSC 475

*Outcomes:*

Students will master the basic statistical techniques used in political science

**PLSC 476 Political Analysis II (3 Credit Hours)**

This is an intermediate course in data analysis methods in political science.

*Outcomes:*

Students will master intermediate research and quantitative methods in political science

**PLSC 499 Directed Readings (3-6 Credit Hours)**

This course involves specialized study under the supervision of a faculty member.

*Outcomes:*

Students will master a particular segment of academic literature or conduct in-depth research on a specific topic

**PLSC 502 Seminar in Political Behavior (3 Credit Hours)**

This course examines selected topics in the development and shaping of political behavior.

*Outcomes:*

Students will master the political behavior literature and conduct research in specific areas of the discipline

**PLSC 503 Seminar: Law & Political Behavior (3 Credit Hours)**

This course analyzes selected topics concerning the relationship between legal processes, policies, and politics.

*Outcomes:*

Students will understand a particular topic in law and political behavior

**PLSC 504 Seminar: American Public Policy (3 Credit Hours)**

This seminar analyzes the American public policy.

*Outcomes:*

Students will understand the formation, implementation, and evaluation of public policies in the United States

**PLSC 505 Seminar in Urban Problems (3 Credit Hours)**

This course analyzes selected policies in urban and state politics.

*Outcomes:*

Students will understand the politics of specific urban and state policies

**PLSC 506 Seminar State & Urban Policy Analysis (3 Credit Hours)**

This course examines current perspectives and techniques in the analysis of state and urban policies.

*Outcomes:*

Students will understand contemporary policy analysis perspective and techniques as well as methods in policy analysis

**PLSC 515 Seminar-Public Administration (3 Credit Hours)**

This is an upper-level seminar on complex questions related to public administration.

**PLSC 520 Seminar: Comparative Politics (3 Credit Hours)**

This course examines an important, contemporary area of research in comparative politics.

*Outcomes:*

Students will master a specific body of literature and conduct research in a specific area in comparative politics

**PLSC 521 Seminar Western European Politics (3 Credit Hours)**

This course examines contemporary politics in Western European countries.

*Outcomes:*

Students will understand political and policy developments in Western Europe, as well as the structures of the European Union and the North Atlantic Treaty Organization

**PLSC 531 Seminar: International Politics (3 Credit Hours)**

This course examines various research topics in international politics.

*Outcomes:*

Students will master a particular body of work or conduct research in a specific area of international politics

**PLSC 532 Soviet/Post-Soviet Foreign Policy (3 Credit Hours)**

This course examines the foreign policies of the Soviet Union and the post-Soviet states.

*Outcomes:*

Students will understand the formulation and application Soviet and post-Soviet foreign policies

**PLSC 533 U.S. National Security (3 Credit Hours)**

This course examines the U.S. security establishment and the national security process.

*Outcomes:*

Students will understand how US security policy is made, including the defense budget, US force structure, intelligence, covert operations, and the role of Congress

**PLSC 543 Liberalism (3 Credit Hours)**

This course analyzes liberal political thought.

*Outcomes:*

Students will master key works and theorists focusing on equality, liberty, natural rights, utilitarianism, and idealistic bases of modern liberal society

**PLSC 546 Political Philosophy Selected Problems (3 Credit Hours)**

This course examines a selected theoretical issue in the history of political thought.

*Outcomes:*

Students will master the writings and theories in a particular theme of political theory

**PLSC 595 Thesis Supervision (0 Credit Hours)**

This is the first course in a two-course sequence for researching a thesis towards earning a Master's degree.

**PLSC 596 Thesis Research (3 Credit Hours)**

This is the second course in a two-course sequence for researching a thesis towards earning a Master's degree.

**PLSC 597 Dissertation Research (3-6 Credit Hours)**

The course is for students researching a thesis topic towards writing a dissertation prospectus.

**PLSC 598 Teaching Internship (3 Credit Hours)**

The course allows students to complete an internship focused on teaching.

**PLSC 600 Dissertation Supervision (0 Credit Hours)**

The course is for students researching a dissertation towards earning a PhD.

**PLSC 605 Master's Study (0 Credit Hours)**

The course is for students researching a thesis towards earning a Master's degree.

**PLSC 610 Doctoral Study (0 Credit Hours)**

The course is for students researching a dissertation towards earning a PhD.

## Psychology (PSYC)

**PHIL 400 Philosophy Research Tools (3 Credit Hours)**

This course introduces students to several methodological approaches to philosophical issues.

**PHIL 401 Plato (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Plato

*Course equivalencies:* X-PHIL401/CLST412

**PHIL 402 Aristotle (3 Credit Hours)**

Prepares students for advanced work on some aspect of the philosophical thought of Aristotle.

**PHIL 403 Ancient Philosophy (3 Credit Hours)**

Prepares students for advanced work on a particular philosophical theme or problem in ancient philosophy.

**PHIL 405 Augustine (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Augustine.

**PHIL 406 Aquinas (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Aquinas.

**PHIL 407 Medieval Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in medieval philosophy.

**PHIL 408 Late Medieval Philosophy (3 Credit Hours)**

Prepares students for advanced work on one or more late medieval philosophers such as Scotus and Ockham.

**PHIL 410 Descartes (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Descartes.

**PHIL 411 Classical Rationalism (3 Credit Hours)**

Introduces students to a specialized topic in early modern rationalism, typically with reference to Descartes, Leibniz, and/or Spinoza.

**PHIL 412 Classical Empiricism (3 Credit Hours)**

Introduces students to a specialized topic in early modern empiricism, typically with reference to Locke, Berkeley, and/or Hume.

**PHIL 415 Kant (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Kant.

**PHIL 416 17th-18th Century Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in early modern philosophy from Descartes to Kant.

**PHIL 417 Classical German Philosophy (3 Credit Hours)**

*Pre-requisites:* Graduate student status

Classical German Philosophy begins with Kant and his immediate predecessors, and extends to the early mid-19th century, including figures such as Herder, Fichte, Schelling, Goethe, Schiller, and Hegel, Feurbach, and Marc, among others. This course may include critiques of developments out of classical German philosophy. Students will become conversant with the major projects and schools of thought in the wake of Kant's Critical Philosophy. Students will also become competent in engaging basic research in the philosophy of this era.

*Outcomes:*

Students will become conversant with the major projects and schools of thought in the wake of Kant's Critical philosophy

**PHIL 419 Aesthetics (3 Credit Hours)**

Prepares students for advanced work in philosophical issues and/or figures in aesthetics.

*Outcomes:*

Students will become conversant with the major projects and schools of thought in the field of aesthetics; Students will also gain knowledge of contemporary scholarship and develop basic research skills in this field

**PHIL 420 Hegel (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Hegel.

**PHIL 421 Marx (3 Credit Hours)**

Prepares students for advanced work on Marx and Marxist philosophy.

**PHIL 422 Nietzsche (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Nietzsche.

**PHIL 425 19th Century Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in nineteenth century philosophy.

**PHIL 430 Husserl (3 Credit Hours)**

Prepares students for advanced work on the phenomenology of Husserl.

**PHIL 431 Marxism (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Marx and/or philosophers working in the Marxist tradition.

**PHIL 432 Heidegger (3 Credit Hours)**

Prepares students for advanced work on the thought of Heidegger.

**PHIL 433 Phenomenology/Existentialism (3 Credit Hours)**

Introduces students to a specialized topic in either phenomenology and/or existential philosophy.

**PHIL 434 Hermeneutics & Critical Theory (3 Credit Hours)**

Introduces students to a specialized topic in either philosophical hermeneutics and/or the critical theory of the Frankfurt School.

**PHIL 436 Contemporary French Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in recent French philosophy.

**PHIL 437 Contemporary German Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in recent German philosophy.

**PHIL 438 Topics in Continental Philosophy (3 Credit Hours)**

Introduces students to a specialized topic in some aspect of European philosophy from Kant to the present.

**PHIL 439 Chinese Philosophy (3 Credit Hours)**

Prepares students for advanced work on Chinese philosophy.

**PHIL 440 American Philosophy (3 Credit Hours)**

Prepares students for advanced work on the American philosophical tradition.

**PHIL 441 Wittgenstein (3 Credit Hours)**

Prepares students for advanced work on the philosophical thought of Wittgenstein.

**PHIL 442 Anglo-American Philosophy (3 Credit Hours)**

Prepares students for advanced work on some aspect of the pragmatist and/or analytic philosophical traditions.

**PHIL 443 Anglo-American Epistemology (3 Credit Hours)**

Introduces students to a specialized topic in analytic epistemology.

**PHIL 444 Studies in Logic (3 Credit Hours)**

Introduces students to some aspect of formal logic, such as formal systems, axiomatic set theory, mathematical logic, modal logic, tense logic, epistemic logic, deontic logic, formal semantics, and philosophical logic.

**PHIL 445 Philosophy of Mind (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning the problem of consciousness and the nature of mental functions.

**PHIL 446 Philosophy of Perception (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to perception.

**PHIL 447 Issues in Cognitive Science (3 Credit Hours)**

Introduces students to specialized topics in the philosophy of cognitive sciences.

**PHIL 449 Philosophy of Language (3 Credit Hours)**

Prepares students for advanced work on philosophical issues about the relationship between language, thought, meaning, and reference.

**PHIL 450 Epistemology (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning the nature of belief and knowledge.

**PHIL 451 Metaphysics (3 Credit Hours)**

Prepares students for advanced work on philosophical issues about the nature of reality.

**PHIL 452 Philosophy of Science (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to the natural sciences.

**PHIL 454 Philosophy of Religion (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning religious practices and beliefs.

**PHIL 455 Philosophical Theology (3 Credit Hours)**

Prepares students for advanced work in philosophical issues and/or figures in philosophical theology.

**PHIL 457 Aesthetics (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to the nature of art and aesthetic judgment.

**PHIL 458 Philosophy of History (3 Credit Hours)**

Prepares students for advanced work on philosophical issues pertaining to history and historiography.

**PHIL 459 Philosophy of Law (3 Credit Hours)**

Prepares students for advanced work on philosophical issues concerning legal institutions and practices.

**PHIL 462 Kant's Moral Philosophy (3 Credit Hours)**

Prepares students for advanced work on the practical philosophy of Kant.

**PHIL 463 Virtue Ethics (3 Credit Hours)**

Prepares students for advanced work on classical and/or contemporary themes in the virtue tradition in moral philosophy.

**PHIL 464 Utilitarianism (3 Credit Hours)**

Introduces students to classical and contemporary formulations of utilitarian ethics.

**PHIL 466 Major Authors in Moral Philosophy (3 Credit Hours)**

Prepares students for advanced work on the ethical theories of one or more key figures in the history of philosophy.

**PHIL 467 Contemporary Ethical Theories (3 Credit Hours)**

Prepares students for advanced work on issues in contemporary moral philosophy.

**PHIL 468 Topics in Ethics (3 Credit Hours)**

Introduces students to specialized topics in ethical theory.

**PHIL 469 Ethics and Rationality (3 Credit Hours)**

Introduces students to philosophical issues concerning the relationship between rationality and moral thinking.

**PHIL 470 Ethics & Economic Justice (3 Credit Hours)**

Prepares students for advanced work on ethical and social-political issues concerning economic practice and theory.

**PHIL 474 Principles of Business Ethics (3 Credit Hours)**

Introduces students to philosophical approaches to ethical issues concerning the relationship between business and society.

**PHIL 475 Philosophy of Nursing: Nursing as a Moral Practice (3 Credit Hours)**

This course provides an opportunity for students to analyze ethical issues and personal, institutional/organizational, societal and global values and beliefs that have an impact on nursing practice, the nursing profession, and healthcare delivery. Students will clearly and carefully articulate their thinking and approach to moral reasoning about various contemporary issues and justify their responses. Presuppositions about clinical practice, education, administration, and their impact will be explored. The realities of the social context and the effects on moral/ethical practice will be discussed.

*Course equivalencies:* X-GNUR540/PHIL475

**PHIL 477 Social Health Care Ethics (3 Credit Hours)**

Prepares students for advanced work in philosophical approaches to social issues in health care.

**PHIL 478 Research Methods in Social Justice (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course looks at several different methodological approaches to social justice issues: broad ethical frameworks; specific ethical issues, such as intent and volition; quantitative analysis; US law; and international law.

*Outcomes:*

Students are expected to know how to conduct literature reviews, how to use these approaches in analyzing social justice issues, and how to write up and present their research

**PHIL 479 Issues in Applied Ethics (3 Credit Hours)**

Introduces students to specialized topics in applied ethics.

**PHIL 480 Social & Political Philosophy (3 Credit Hours)**

Introduces students to specialized topics in social and political philosophy, such as theories of justice, social contract theory, human rights, and issues pertaining to race, class, and gender.

**PHIL 481 Philosophy of Action (3 Credit Hours)**

This course deals with the distinction between action and mere behavior. Related topics: causal vs. teleological views, intention, reasons for action (as distinct from causes of action), practical identity, free agency, practical reason, deliberation and choice, the relationship between emotional capacities and responsible agency.

*Outcomes:*

Students will understand the basic features of human agency

**PHIL 482 Philosophy of Social Science (3 Credit Hours)**

Introduces students to philosophical issues concerning the social sciences.

**PHIL 483 Philosophical Questions in Human Rights (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course addresses questions in human rights such as the concept of rights and its critics, sovereignty and its relation to global governance, the role of intent, and how human rights are gendered.

*Outcomes:*

Students are expected to have an overview of the major legal frameworks for human rights, as well as an understanding of several of the major philosophical issues and related literature

**PHIL 484 Philosophical Anthropology (3 Credit Hours)**

Prepares students for advanced work about philosophical conceptions of human existence.

*Interdisciplinary Option:* Women & Gender Studies

**PHIL 485 International Ethics (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course is intended to give students an overview of some of the major frameworks for addressing ethical issues in the international arena. This includes Just War doctrine, economic rights, and global governance.

*Outcomes:*

Students are expected to be familiar with the major treaties, international law doctrines, and institutions relevant to international ethics, as well the pertinent secondary literature

**PHIL 487 Moral and Legal Issues of Economic Sanctions (3 Credit Hours)**

*Pre-requisites:* Limited to graduate students only

This course will provide an introduction to economic sanctions in the context of foreign relations and global governance. We will look closely at the issues of effectiveness and humanitarian impact. We will also look at legal issues, such as the problem of extraterritoriality.

*Outcomes:*

It is expected that students will have an overview of how sanctions interact with international law, institutions of global governance, and human rights law

**PHIL 490 Current Philosophical Issues (3 Credit Hours)**

Introduces students to specialized topics in some area of contemporary philosophy.

**PHIL 500 Directed Readings and Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 501 Directed Readings & Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 502 Directed Readings & Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 503 Directed Readings & Research (3 Credit Hours)**

This course is a directed reading focused on an advanced topic in philosophy. The student and the faculty supervisor will agree on the topic and nature of the work.

**PHIL 505 Teaching Internship I (3 Credit Hours)**

This course introduces students to best practices in philosophical pedagogy.

**PHIL 510 Clinical Ethics Practicum (3 Credit Hours)**

This course will include some combination of academic and non-academic work, involving some aspect of clinical ethics. The student and the faculty supervisor will agree on the scope of the project and the nature of the work.

**PHIL 511 Social Ethics Practicum (3 Credit Hours)**

This course will include some combination of academic and non-academic work, involving some aspect of social ethics. The student and the faculty supervisor will agree on the scope of the project and the nature of the work.

**PHIL 550 Integrative Seminar (3 Credit Hours)**

This course prepares students for advanced work in philosophy, and emphasizes ways in which philosophy can play an integrative role.

**PHIL 590 Dissertation Proposal Seminar (0 Credit Hours)**

This semester-long, non-credit, pass/non-pass course is intended for Ph.D. students in their third or fourth years. Our purpose consists in taking students from their initial, general ideas on a dissertation to a developed proposal.

*Outcomes:*

The class will culminate in producing a final dissertation proposal and a community of researchers who are able and willing to support each other in the development and writing up of dissertation proposals

**PHIL 595 Thesis Supervision (0 Credit Hours)**

This course allows continuing master's students to continue work on their master's thesis or paper. Please consult with philosophy department graduate program director before registering.

**PHIL 600 Dissertation Supervision (0 Credit Hours)**

This course is intended for students who have completed their dissertation proposal and are currently working on their dissertation. Please consult with department graduate program director before registering.

**PHIL 605 Master's Study (0 Credit Hours)**

This course allows continuing master's students to continue work on their master's thesis or paper. Please consult with philosophy department graduate program director before registering.

**PHIL 610 Doctoral Study (0 Credit Hours)**

This course is intended primarily for students who are currently working on their dissertation proposal. Please consult with philosophy department graduate program director before registering.

## Sociology (SOCL)

**SOCL 403 Sociological Perspectives I (3 Credit Hours)**

Important theoretical and methodological concerns will be discussed with particular attention paid to how these concerns affect substantive areas in sociology.

*Outcomes:*

Students will gain familiarity with major themes that will shape their graduate education in sociology

**SOCL 404 Sociological Perspectives II (3 Credit Hours)**

Faculty will discuss their intellectual biographies and work that is of current interest to them.

*Outcomes:*

Students will gain familiarity with the range of substantive, theoretical and methodical concerns of the department's faculty

**SOCL 405 History Sociological Thought (3 Credit Hours)**

This course looks at the intellectual roots and expressions of the foundations of sociological theory in the 19th and early 20th century.

*Outcomes:*

Students will gain familiarity with the classical texts in sociological theory that established some of the basic perspectives, issues and debates that inform contemporary social theory and research

**SOCL 406 Modern Sociological Theory (3 Credit Hours)**

This course examines some of the dominant perspectives and trends of modern social theory.

*Outcomes:*

Students will develop familiarity with the primary sources that represent current trends in modern and postmodern theories

**SOCL 410 Logic of Sociological Inquiry (3 Credit Hours)**

This course explores the structures of sociological research, analyses, and explanations. Several major types of data collection will be examined and evaluated.

*Outcomes:*

Students will be able to formulate sociological problems, understand the relationship between problem formulation and data collection, measurement and analyses and develop the capacity to utilize different social scientific methods

**SOCL 412 Qualitative Methods in Social Research (3 Credit Hours)**

This course is an introduction to the major qualitative methods of social inquiry and the ethical issues raised by qualitative research.

*Outcomes:*

Students learn the skills of participant observation, interviewing, historical analysis, building theory from qualitative data, coding and content analysis

**SOCL 413 Sociological Practicum (3 Credit Hours)**

The class examines theoretical issues and past research relating to a particular social topic and then designs and completes a collective research project. Topics vary.

*Outcomes:*

Students gain facility with research design and group research practices

**SOCL 414 Statistical Methods Analysis I (3 Credit Hours)**

After a review of bivariate regression and cross-tabular analysis, the course provides an extended treatment of the general linear model. Topics include model construction, interpretation of results, partitioning of variance, tests of statistical significance and interactions.

*Outcomes:*

Students will be able to employ general linear models in original research and critically evaluate existing empirical research

**SOCL 415 Statistical Methods of Analysis II (3 Credit Hours)**

The course extends the applications of the general linear model to topics including path analysis, logistic regression, factor analysis and spatial and cluster analysis.

*Outcomes:*

Student will: understand the techniques with enough clarity to recognize when they are appropriate research tools; gain sufficient expertise to apply the techniques to moderately complex research problems; be able critically review the relevant literature

**SOCL 418 Demography (3 Credit Hours)**

This course examines the basic techniques used to assemble, analyze, and present demographic information. It also examines U.S. and world demographic trends and the causes and consequences of such demographic change.

*Outcomes:*

Students will gain an in-depth knowledge of demographic trends and an understanding of the sources, limitations, and advantages of various types of demographic data

**SOCL 421 Theories Social Change (3 Credit Hours)**

The course will critically appraise major theories of social change and examine different methodologies on both the macro- and micro-sociological levels.

*Outcomes:*

Students will gain a working knowledge of the major theoretical and methodological issues in the field

**SOCL 423 Social Movements (3 Credit Hours)**

This course will use case studies of contemporary social movements to examine collective efforts to promote social or cultural change. They will gain an understanding of the recursive relationship between empirical research and theory development.

*Outcomes:*

Students will be able to apply major theoretical perspectives on social movements to a variety of historical cases

**SOCL 425 Inequality and Society (3 Credit Hours)**

This is an empirical and theoretical inquiry into the causes, consequences, and dynamics of social inequality in modern societies.

*Outcomes:*

Student will be able to explain the distribution of economic, political, and social resources in society; the processes of class formation and the role of race and gender

**SOCL 426 Sociology of Gender (3 Credit Hours)**

This course surveys sociological and related scholarship on women and gender relations.

*Outcomes:*

Students will come to understand the social construction of gender and its centrality to studies of identity and sexuality, the division of labor, families and reproduction, violence, poverty, race, class and globalization

**SOCL 427 Political Sociology (3 Credit Hours)**

The course examines major theories of political action and change. Particular attention is paid to policy development.

*Outcomes:*

Students will develop an empirical and theoretical knowledge of the working of political systems and to be able to apply that knowledge to the development of social policy

**SOCL 428 Poverty and Social Welfare (3 Credit Hours)**

This course examines the development of poverty and social welfare efforts over time in the United States, with some comparisons to other industrial societies.

*Outcomes:*

Students will understand the character and consequences of poverty and social welfare policies in the United States, emphasizing current conditions and possibilities for the future

**SOCL 431 Social Structure and Personality (3 Credit Hours)**

This course examines the relationships between the individual and larger social structure and social trends.

*Outcomes:*

Students will gain familiarity with current research and theory concerning the relationship of self identity and personal narratives to socialization and structural factors, and the ways in which social class, work, race and nation construct age, gender and sub-cultural forms of subjectivity

**SOCL 432 Socialization Thru Life Cycle (3 Credit Hours)**

This course traces the nature of socialization and development of the individual through the life cycle.

*Outcomes:*

Students will become familiar with research and theory concerning the processes by which persons are socialized into sexual, racial, religious, occupational, marital, and parental social roles, identities and patterns of interactions at various stages of life

**SOCL 435 Adult Development and Aging (3 Credit Hours)**

The older adult population and adult development is examined from social and cultural perspectives.

*Outcomes:*

Students will develop a knowledge of gerontological theories and research which pertain to the family, the community, political life, the economy, work and retirement, religious life, and other social institutions

**SOCL 438 The Family (3 Credit Hours)**

This course explores families, their changing internal structures, and their roles in contemporary societies.

*Outcomes:*

Students will develop an understanding of the household division of labor, mothering, the shifting character of marriage, the paid and unpaid work of care, dual career families, single parent households, racial/ethnic families, adoption, blended families, welfare policies, families in the class structure, and global issues

**SOCL 439 Community Change (3 Credit Hours)**

Contemporary communities are examined from a sociological perspective. Both geographic communities and communities of interest are studied.

*Outcomes:*

Students gain an understanding of how research can be used to facilitate social change in community settings; and an awareness of how community organizations, informal networks, and broader social forces shape the character and sustainability of particular communities

**SOCL 440 Organizations & Organizational Change (3 Credit Hours)**

This course examines the structures and processes that typify contemporary organizations, with particular attention to how organizations change.

*Outcomes:*

Students will be able to apply sociological methods to analyze organizations, and will develop an understanding of bureaucracy and alternative structures; the effect of organizational structure on administrators, workers, and clients; and how organizations are affected by their social environment

**SOCL 441 Sociology of Religion (3 Credit Hours)**

This course studies the relationship between religion and society, and explores central topics in the sociology of religion.

*Outcomes:*

Students will learn to define and explain religious organizations, beliefs, and practices as distinctly social phenomena, and understand how social processes both shape the form and content of religious life and in turn are shaped by them

**SOCL 442 Religious Conflict & Change (3 Credit Hours)**

This course will explore the complex reciprocal relationship between religion and historical processes of social change.

*Outcomes:*

Students will be able to analyze historical instances of religious conflict and change in the U.S. and other regions of the world; They will gain an understanding of how religion both affects and is affected by historical, political, and social change

**SOCL 446 Knowledge, Power & Expertise (3 Credit Hours)**

This course focuses on the relationship between knowledge, expertise and power in societies and how this relationship has consequences for the structure of knowledge and the organization of society.

*Outcomes:*

Students will be able to demonstrate a sociological understanding of the construction of knowledge and the organization of authority and expertise

**SOCL 447 Sociology of Culture (3 Credit Hours)**

This course will examine the relationship between social phenomena and cultural expressions, and the various ways sociologists have conceived of those relationships.

*Outcomes:*

Students will learn to apply sociological theories and methods to an analysis of cultural fields and understand the diversity of contemporary cultural objects and expressions, and how they are produced and used in social action

**SOCL 448 Technology & Material Culture (3 Credit Hours)**

This course will serve as an introduction to the sociology of things, most notably the sociology of technology, design and the built environment.

*Outcomes:*

Students will develop an understanding of both cultural, constructivist and political-economic approaches to the construction of technology and artifacts, and of a variety of theoretical approaches to the study of their impact and audience-response

**SOCL 452 Complex Organizations (3 Credit Hours)**

Formal organizations treated comparatively and systematically as major components of modern social organization are featured.

*Outcomes:*

Students will develop an understanding of leading theoretical traditions, historical and cross-national variation, organization-environment relations, and selected internal processes in the field of complex organizations

**SOCL 453 Occupations and Professions (3 Credit Hours)**

This course focuses on the structure of paid work in modern society, and its relationship to unpaid work and to self-employment. Special attention is given to the role of skills and knowledge in the structuring of work.

*Outcomes:*

Students will develop an understanding of how both macro and micro factors structure work; from capitalism, industrialism, gender, race and globalization to workplace interaction and culture

**SOCL 461 Race & Ethnicity (3 Credit Hours)**

This course explores the construction, meaning, uses and consequences of racial and ethnic identity in American society over time.

*Outcomes:*

Students will understand the role of migration and immigration on the construction of identity; analyze prejudice, discrimination, and inter-group conflict; and explore how social movements have and are changing these group relationships

**SOCL 462 The Urban Metropolis (3 Credit Hours)**

This course examines urbanization and its consequences through social theory and empirical studies emphasizing the modern European and American experience.

*Outcomes:*

Students will understand ecological and political economy perspectives on metropolitan development; changing regional patterns of population, housing, and employment; and urban governance, planning, and policies for the future

**SOCL 463 Sociology & Natural Environment (3 Credit Hours)**

This course examines the relationship between social life and the natural environment.

*Outcomes:*

Students will be able to demonstrate a sociological understanding of the relationship of humans to the natural environment and draw connections between basic ecological understandings of nature and the human impact on the natural world

**SOCL 471 Sociology of Deviance & Control (3 Credit Hours)**

This course is a socio-historical look at definitions of forms of deviant behavior and the identification of individuals as deviant.

*Outcomes:*

The student will learn how history and philosophy shape the definitions of deviant behavior and the methods used to control it; They will develop a sociological imagination to perceive the meaning of deviance beyond the superficialities of today's headlines

**SOCL 473 Criminology (3 Credit Hours)**

This course examines modern and traditional theories of criminology and their implications for social control, with emphasis on current work in criminology theory, social planning, and evaluation research.

*Outcomes:*

The student will acquire knowledge of the relationship between the various explanations of crime patterns and how these theories work to reduce or fail to reduce the level of criminal behavior

**SOCL 481 Medical Sociology (3 Credit Hours)**

This course will examine critical factors affecting mortality and morbidity; mental health; health services; community health; cross-cultural differences; aging and the strategy and conduct of socio-medical research.

*Outcomes:*

The student will be able to critically analyze the social components of illness and of health and to integrate theory and research in the study of health care institutions globally

**SOCL 490 Workshop: Applied Sociology (1 Credit Hour)**

This focuses on special issues for methods used by applied sociologists, and topics vary from semester to semester. Most workshops involve presentations by faculty or applied sociologists from outside the university.

*Outcomes:*

Students will develop expertise in, for example: survey research, evaluation research, use of population data in policy making, focus groups, and developing community leadership

**SOCL 491 Sociological Discourse (3 Credit Hours)**

The course examines the nature of sociological argumentation in existing scholarly and popular literature and in the students' own writing.

*Outcomes:*

Students will be able to formulate and present sociological arguments in both oral and written forms, and to demonstrate their understanding of the relationship between problem formulation, data collection and measurement and analysis in their own and others' work

**SOCL 494 Internship (3 Credit Hours)**

Placements are typically in non-academic settings, e.g., government agencies, community organizations, businesses, or labor organizations. Students are expected to work a minimum of 100 hours and write an internship report.

*Outcomes:*

Students will develop skills in applying sociological methods and theoretical perspectives to the understanding and ameliorating of social issues in real world settings

**SOCL 497 Independent Research (3 Credit Hours)**

Students registered for independent study will meet as a workshop, under the guidance of a faculty member, at least three times per semester. These skills are important for expeditious completion of proposals, theses, and dissertations.

*Outcomes:*

Students will develop the skills and dispositions necessary to be successful and productive in independent work

**SOCL 498 Independent Research (3 Credit Hours)**

Work on an individual research project under the supervision of a faculty member.

**SOCL 499 Directed Study (3 Credit Hours)**

Develop a reading list and paper under the supervision of a faculty member.

**SOCL 500 Seminar-Applied Sociology & Social Policy (3 Credit Hours)**

This course examines the use of sociology in determining and selecting alternative social policies.

*Outcomes:*

Students will develop knowledge about the roles that applied sociologists play in society; the relationship between sociologists and clients or organizations; the social research process and how it affects the research product; and ethical considerations of applied sociologists

**SOCL 505 Controversery Current Social Thought (3 Credit Hours)**

This is a seminar in which students and faculty will examine in detail particular controversies that are emerging in theoretical approaches to sociology. Topics will vary.

*Outcomes:*

Students will develop advanced skills in theoretical discourse

**SOCL 510 Research Special Areas (3 Credit Hours)**

Advanced methodology seminar in special topics.

*Outcomes:*

Students will develop advanced skills in the special area

**SOCL 520 Topics in Contemporary Society (3 Credit Hours)**

Various topics in the study of modern society

*Outcomes:*

Students will develop advanced skills in the particular area

**SOCL 525 Seminar in Comparative Studies (3 Credit Hours)**

The seminar will expose participants to comparative approaches in defining issues, topics or institutions, researched by comparative sociologists and cultural anthropologists. Specific topics for consideration will vary.

*Outcomes:*

Students will acquire knowledge of the utility of comparative approaches to cultural and social structures in developing greater definition and clarity, and a deeper understanding of a given topic

**SOCL 540 Issues: Sociology of Religion (3 Credit Hours)**

Focused study on a variable topic in the sociology of religion.

**SOCL 560 Seminar-Issues in Communities & Urban Sociology (3 Credit Hours)**

This course explores current issues in cities and in the sociological study of cities.

*Outcomes:*

Students will become familiar with current debates in urban sociology and apply sociological theories and analysis to contemporary issues in cities

**SOCL 580 Seminar: Issues in Medical Sociology (3 Credit Hours)**

This course explores a specialized topic in the sociology of health and medicine. Restricted to Graduate Students.

*Outcomes:*

Ability to analyze individual, social and institutional effects on health and medicine

**SOCL 595 Thesis Supervision (0 Credit Hours)**

Write a thesis under the supervision of a faculty member.

**SOCL 600 Dissertation Supervision (0 Credit Hours)**

Write a dissertation under the supervision of a faculty member.

**SOCL 605 Master's Study (0 Credit Hours)**

Develop a reading list and paper for an MA project under faculty supervision.

**SOCL 610 Doctoral Study (0 Credit Hours)**

This course can only be taken two times during a doctoral student's career.

## Spanish (SPAN)

**SPAN 402 Methods of Teaching Spanish (3 Credit Hours)**

This graduate course introduces an overview of major theories and current issues in second/foreign language acquisition in both classroom and natural/non-instructed settings while providing guidance and practice with their applications to teaching. Students will explore theoretical, investigative, and practical issues of communicative language teaching that will help them develop communicative classroom environments that blend listening, speaking, reading, and writing. The material in this course should encourage students to question assumptions and begin to formulate their own ideas about what goes on in their classrooms and in second language learning in general.

**SPAN 403 Structure of Modern Spanish (3 Credit Hours)**

An introduction to Spanish linguistics to provide a general understanding of phonology, morphology and syntax, as well as a history of Spanish grammar including variation and change.

*Outcomes:*

Students will understand the rules that govern sounds, word and sentence structure, and the dynamic interaction between Spanish and its neighboring languages

**SPAN 405 Critical Methods (3 Credit Hours)**

This course provides training in the application of contemporary critical methods with attention to the development of greater proficiency in literary analysis and written expression.

*Outcomes:*

Students will be able to discuss and write about knowledgeably works from the major literary genres: drama, prose fiction, essay, and poetry

**SPAN 410 General Linguistics & Romance Languages (3 Credit Hours)**

This graduate course introduces an overview of major theories and current issues in heritage language acquisition in both classroom and natural/non-instructed settings while providing guidance and practice with their applications to teaching. The material in this course should encourage students to question assumptions and begin to formalize their own ideas about what goes on in their classrooms and in heritage language learning in general.

*Course equivalencies:* X-SPAN410/CLST410/FREN410

**SPAN 415 Medieval Spanish Literature (3 Credit Hours)**

This course studies the development of Spanish medieval literature from the jarchas through the Celestina.

*Outcomes:*

Along with increasing their knowledge of Spanish history in the medieval period, students will be able to appreciate how the literature reflects the culture of the period

**SPAN 416 Golden Age of Spanish Literature (3 Credit Hours)**

This course is a graduate seminar whose primary focus is the literary production of the Spanish Golden Age, which dates from the second half of the sixteenth century to the end of the seventeenth. Students will analyze works of various genres - autobiography, prose, drama, poetry and the novel - by the most prominent authors of the time, including Teresa of Ávila, John of the Cross, Miguel de Cervantes, Baltasar Gracián, Francisco de Quevedo, Luis de Góngora, Félix Lope de Vega, Pedro Calderón de la Barca, Tirso de Molina and María de Zayas. We will give special attention to the historical, social and cultural context of early modern Spain, and students will gain exposure to the major critical trends and interpretation of Golden Age literature. The authors to be studied confront readers with the complex social fabric of pre-modern Spain and immerse us in the religious and economic realities of the Iberian Peninsula, the Mediterranean world and Europe. Our close reading of the texts will allow us to explore how early modern Spanish writers reflect the spiritual, intellectual and political currents of their time, especially as they shed light upon the network of institutions, practices, and beliefs that constituted Spanish culture.

**SPAN 419 Romanticism in Spanish Literature (3 Credit Hours)**

This course is a survey of Romanticism as a literary movement including its influence upon nineteenth-century culture.

*Outcomes:*

Students will be able to understand the philosophical, artistic, and esthetic tenets of Romanticism and their representation in a series of Hispanic texts from prose fiction to poetry and drama

**SPAN 420 Realism & Naturalism (3 Credit Hours)**

This course focuses on the various political, ideological, and intellectual trends that have shaped nineteenth-century Spanish literature and emphasizes the aesthetic and cultural influences that made the Spanish literary universe unique. It also takes up the question of the ways in which the literature of nineteenth-century Spain might be compared to that of Latin America and of the Western world generally. It will provide an overview of the key topics, writers, and literary genres of nineteenth-century Spanish literature, with particular emphasis on novels, poetry, folletines, short stories and, to a lesser extent, visual art. We will discuss the complexities of Spanish modernity using current theoretical perspectives in addition to various historical approaches, while emphasizing the way in which these texts offer multiple views of Spanish national identity and the construction of different models of the modern self.

**SPAN 421 Theatre of Twentieth Century (3 Credit Hours)**

The evolution of theatrical modes in 20th Century Spain. Authors: M. Mihura, Benavente, Valle Inclán, Arniches, García Lorca, Buero Vallejo, etc.

*Outcomes:*

Students will be able to explain how theater has dealt with contemporary experiences such as the Spanish Civil War, civil war, the polarization of society, group thinking, dictatorship, the inception of new mores and the inevitability of change

**SPAN 426 Theater of The Golden Age (3 Credit Hours)**

This course is a graduate seminar with a primary focus on theatrical works written in the Spanish Golden Age, which began in the mid-sixteenth century with the dramatist Lope de Rueda and ended in the late seventeenth century with the death of Calderón de la Barca. It combines the study of shorter works, entremeses, and full-length plays, or comedias, written by the most renowned playwrights of early modern Spain, including Cervantes, Lope de Vega and Tirso de Molina. Through the reading of these authors, students will explore the themes and social factors which shaped the plays of the Golden Age and will become familiar with the theatrical tradition that impacted Spanish society at all levels. Attention will also be given to the role of gender, religion, and socio-economic status in pre-modern Spanish society. We will use these texts in order to understand the historical context and the main currents of thought in early modern Spain.

**SPAN 431 Poetry of The 20th Century (3 Credit Hours)**

This course traces developments in Spanish poetry through a study of the works of selected poets, with special emphasis on the writers of the Generation of 1927.

*Outcomes:*

Students will understand the relationship between modernism and the avant garde, as well as the turn toward free verse and social poetry in the post-war period

**SPAN 436 Poetry of The Golden Age (3 Credit Hours)**

This course covers poetic theory and practice from Garcilaso to Góngora. It presents the classic modes as they were imitated and transformed to create a new poetic language.

*Outcomes:*

Students will be able to recognize the distinct styles and forms of Golden Age poetry

**SPAN 437 Golden Age-Spanish Mysticism (3 Credit Hours)**

This course is a survey of the most prominent authors of the Spanish Golden Age mystics - Ignatius of Loyola, Teresa of Avila, and John of the Cross, whose writings reflect the religious, spiritual, and intellectual currents of Counter-Reformation Spain. In the form of an independent study, students will examine the ascetical, mystical, and Illuminist trends of the sixteenth and seventeenth centuries, as well as the most important themes these writers developed in early modern Iberia: conversion and authority, vice and virtue, penance and pilgrimage, devotion and humor. These themes will be explored in the majors works (primary sources) of these authors, which will be complemented by secondary source readings and each student's independent research. The writers studied in this course and their texts will also be viewed in the context of the greater literary and artistic production of the Spanish Golden Age.

**SPAN 441 Prose of The 20th Century (3 Credit Hours)**

This course studies the development of Spanish prose from the Generation of 1898/ Modernism through Post-modernism, with emphasis on the novel, short story, and essay.

*Outcomes:*

Students will better appreciate and understand the complex literature of modern Spain

**SPAN 446 Prose of The Golden Age (3 Credit Hours)**

The course studies representative selections from the pastoral and the picaresque novel, the short novel, and didactic works of the period (Gracián and Quevedo).

*Outcomes:*

Students will understand how these authors expressed colliding sensibilities, and incorporated traditional themes-love, knowledge, deception, violence-through parody and satire

**SPAN 447 Don Quijote (3 Credit Hours)**

This course is a graduate seminar and its primary focus is the literary masterpiece of Miguel de Cervantes, *El ingenioso hidalgo don Quijote de la Mancha* (1605, 1615). Students will analyze the work that has come to be known as the first modern novel of Europe, and, through a close reading of the text, study the novel in relation to the literary traditions of the Renaissance: novella, the pastoral romance, the romance of chivalry, the humanist dialogue, the picaresque novel, including poetry and the comedia. We will give special attention to the historical, social and cultural context of Cervantes' world, and students will gain exposure to the major critical trends and interpretations surrounding his novel. Cervantes confronts readers with the complex social fabric of early modern Spain, and immerses us in the religious and economic realities of the Iberian Peninsula and the Mediterranean world. Our close reading of *Don Quijote* will explore its links to the network of institutions, practices, and beliefs that constituted early modern Spanish culture.

**SPAN 470 Hispanic-American Poetry (3 Credit Hours)**

The course traces the development of Latin American poetry in such representative poets as Rubén Darío, Gabriela Mistral, and Octavio Paz.

*Outcomes:*

Students will recognize the major themes and forms of Latin American poetry with a special emphasis on the 19th and 20th centuries

**SPAN 480 Hispanic-American Novel (3 Credit Hours)**

*Pre-requisites:* graduate standing

Analyzes salient themes and formal features of twentieth-century novel. Taught in Spanish. Prerequisite: graduate standing.

*Outcomes:*

Students will identify stylistic and thematic contours of the modern Latin American novel and draw connections between works of literature and the broader culture

**SPAN 487 La Novela De La Revolucion Mexico (3 Credit Hours)**

*Pre-requisites:* graduate standing

An analysis of representative works and themes of the Mexican Revolution, its mystique, critique, and legacy. Taught in Spanish.

*Outcomes:*

Students will comprehend main features of literature of the Revolution and draw relationships to contemporary Mexican cultural themes

**SPAN 489 Cuento Hispano-Americano (3 Credit Hours)**

The development of the Hispanic short story is studied in this course. Authors included are Quiroga, Cortázar, García Márquez, Castellanos, Valenzuela, and Ferré.

*Outcomes:*

Students will be able to contextualize the stories, analyze them both formally and thematically, and recognize the different types of short story written in Latin American: realist, fantastic, folkloric, indigenist, humorous, detective, metaphysical, social protest, feminist, etc

**SPAN 490 Hispanic Culture & Civilization (3 Credit Hours)**

*Pre-requisites:* graduate standing

Interdisciplinary seminar brings to bear perspectives of literary intellectuals, anthropologists, sociologists, educators, and theologians on the topic. Visions of America. Taught in Spanish.

*Outcomes:*

Students will understand significance and many facets of theme of cultural identity in Latin America as expressed in various disciplines

**SPAN 499 Graduate Internship (1-6 Credit Hours)**

A course designed to provide students with the opportunity to make a connection between Hispanic Studies and its praxis in a professional work environment.

**SPAN 500 Directed Readings (3 Credit Hours)**

The course is composed of special readings undertaken only by highly qualified students and supervised by a member of the department.

*Outcomes:*

Students will be able to work individually on a research project of their own selection

**SPAN 501 Thesis Research (3 Credit Hours)**

*Pre-requisites:* Completion of initial thesis forms appearing on the GS website; permission of thesis director

Designed for graduate students who wish to write an M.A. thesis, and therefore conduct, and receive credit for, thesis-related research under the direction of the thesis director.

*Outcomes:*

To advance the student's knowledge in the area of focus; to enhance research skills and allow the student to develop bibliographies and a research paper

**SPAN 595 Thesis Supervision (0 Credit Hours)**

This course provides ongoing guidance and supervision, with a view to project completion, for students writing their MA thesis.

**SPAN 599 Directed Primary Research (3 Credit Hours)**

*Pre-requisites:* Students must have the permission of the Instructor of Record to enroll in this course

This course will culminate in the completion and presentation of a well-polished article-length paper in modern languages, literatures and linguistics to faculty members in the form of an oral defense. This course fulfills the Masters Essay.

*Outcomes:*

To refine and articulate a specific article-length research project in Hispanic Studies, and to research, write and defend this successfully completed project

**SPAN 605 Master's Study (0 Credit Hours)**

This course provides ongoing guidance and supervision, with a view to project completion, for students writing their Masters' essay.

## Statistics (STAT)

**STAT 401 Introduction to Applied Statistics Using R (1 Credit Hour)**

*Pre-requisites:* Limited to Graduate Students Only

This course covers the basics of applied statistics including descriptive statistics and visualization (including graphing), univariate methods, inference, hypothesis testing and confidence intervals, two-sample and paired analyses, simple and multiple linear regression, ANOVA and logistic regression. The course introduces and uses the R freeware package.

*Outcomes:*

Upon completion of this course, it is expected that students will skillfully and accurately perform real-time data analysis using R and R/Studio

**STAT 403 SAS Program & Applied Statistics (3 Credit Hours)**

While simultaneously reviewing basic statistical methods (t tests, regression, ANOVA, interaction, etc.), this course introduces statistical modelling using the SAS program, involving the DATA step and various SAS procedures. Working on hands-on projects using real datasets, students present their final project results.

**STAT 404 Probability & Statistics I (3 Credit Hours)**

As the first part in a two-semester sequence, this course introduces basic principles of probability including combinatorial methods, probability and cumulative density and mass functions, moment generating functions and applications, expected values and variance and other moments, and order statistics. This course emphasizes related theorems and proofs.

*Course equivalencies:* X-MATH404/STAT404

**STAT 405 Probability & Statistics II (3 Credit Hours)**

As the second part in a two-semester sequence, this course thoroughly explores the central limit theorem and its variants and uses, estimation, hypothesis testing, sufficiency, efficiency, uniformly most powerful methods, information, and asymptotic methods. Time permitting, Bayesian topics may also be explored and discussed.

*Course equivalencies:* X-MATH405/STAT405

**STAT 406 Stochastic Processes (3 Credit Hours)**

This course addresses topics such as finite-state Markov processes and Markov chains, classification of states, long-run behavior, continuous time processes, birth and death processes, random walks, and Brownian motion.

*Course equivalencies:* X-MATH406/STAT406

**STAT 407 Statistical Design (3 Credit Hours)**

This course provides students with a thorough introduction to statistical experimental design and to the statistical methods used to analyze the resulting data. The concepts of comparative experiments, ANOVA and mean separation procedures will be reviewed; blocking (complete and incomplete) will be discussed, as will be factorial designs, fractional factorial designs, and confounding. The course will focus on biometric applications such as clinical trials, HIV studies, and environmental and agricultural research, but industrial and other examples will occasionally be provided to show the breadth of application of experimental design ideas.

**STAT 408 Applied Regression Analysis (3 Credit Hours)**

This course provides students with a thorough introduction to applied regression methodology. The concept of simple linear regression will be reviewed and discussed using matrices, and multiple linear regression, transformations, diagnostics, polynomial regression, indicator variables, model building and multicollinearity will be discussed, as will be nonlinear and generalized linear regression. The course will focus on applications such as those from biometry and biostatistics (clinical trials, HIV studies, etc.), sports, engineering, agriculture and environmental science.

**STAT 410 Categorical Data Analysis (3 Credit Hours)**

This course provides an introduction to modern-day extensions of simple linear regression and ANOVA to the chi-square test including logistic regression and log-linear modeling techniques based on generalized linear models. Specialized methods for ordinal data, small samples, multi-category data, and matched pairs will also be discussed. The focus throughout this course will be on applications and real-life data sets.

**STAT 411 Applied Survival Analysis (3 Credit Hours)**

Modern statistical methods are covered to analyze data that is right, left and/or interval-censored. Nonparametric approaches such as the Kaplan-Meier estimation technique, log-rank test and proportional-hazards model are considered as are parametric methods such as those based on the Exponential and Weibull distribution. Accelerated failure time models and nonlinear models are also discussed.

**STAT 421 Math Modeling & Simulation (3 Credit Hours)**

This course uses SAS, R and high-level languages to perform statistical modelling by conducting statistical simulations to assess linear, generalized linear, nonlinear and complex models and experimental designs. Students will gain practical experience and knowledge in real-world statistical situations for which underlying theory is cumbersome or otherwise intractable.

*Course equivalencies:* X-COMP421/MATH421/STAT421

**STAT 426 Advanced Statistical Inference (3 Credit Hours)**

This course presents the role of likelihood methods in a whole range of statistical problems. The course reviews theoretical developments such as efficiency, completeness, and the Cramer-Rao lower bound, and shows how the likelihood approach is used to surpass these methods and to analyze regression problems, to deal with nuisance parameters by using marginal likelihood methods, and to deal with complex data structures such as censored and spatial data.

**STAT 436 Topics in Biostatistics (3 Credit Hours)**

This course covers experimental design (including interaction, analysis of covariance, and crossover designs) and the analysis of designed studies, simple and multiple linear regression, generalized linear and nonlinear regression, bioassay, relative potency and drug synergy, multivariate analysis (including MANOVA and multivariate regression), repeated measures (designs and analysis), and survival analysis (Cox proportional odds, log-rank tests, Kaplan-Meier estimation) of censored data. The emphasis of the course will be on applications instead of statistical theory, and students will be required to analyze real-life datasets using popular statistical packages.

**STAT 437 Quantitative Bioinformatics (3 Credit Hours)**

This course explores recently developed mathematical, probabilistic and statistical methods currently used in the fields of bioinformatics and DNA microarray and protein array data analysis. These include stochastic processes, (hidden and traditional) Markov chains, tree- and clustering techniques (including principal components analysis and biplots), discriminant analysis, experimental design strategies and ANOVA methods. Our focus in this course is on the application of these techniques and on meaningful interpretation of results.

**STAT 438 Introduction to Predictive Analytics (3 Credit Hours)**

*Pre-requisites:* Graduate students only

This course focuses on finding patterns, associations, and relationships in data. In examining real-world datasets, this course highlights, develops and applies methods in simple and multiple linear and logistic regression, classification and discriminant analysis, resampling methods, model selection, additive models and splines, tree-based methods, support vector machines, and unsupervised learning techniques such as clustering and PCA.

*Outcomes:*

Upon completion of this course, it is expected that students will master applied methods in predictive analytics (using R and/or Python) with applications to real data-sets

**STAT 444 Longitudinal Data Analysis and Mixed Modeling (3 Credit Hours)**

*Pre-requisites:* Graduate Students only

This course focuses on repeated measures, longitudinal, hierarchical and mixed modeling data analysis with an eye to applications, model identification, software implementation, and interpretation of computer results.

*Outcomes:*

Upon completion of this course, it is expected that students will master applied mixed-modelling methods (using R and/or SAS) with applications to real data-sets

**STAT 451 Applied Nonparametric Methods (3 Credit Hours)**

*Pre-requisites:* Graduate Students only

Many basic statistical techniques are based upon normal or binomial distributional assumptions which may not be appropriate in practice. This course introduces and illustrates rank-based methods, permutation tests, bootstrap methods, and curve smoothing useful to analyze data when normal and/or binomial assumptions are not valid.

*Outcomes:*

Upon completion of this course, it is expected that students will master applied nonparametric statistical methods (using R and/or SAS) with applications to real data-sets

**STAT 465 Actuarial Theory I (0 Credit Hours)**

This course provides an introduction to the models and methods used in actuarial mathematics and risk theory. Students are expected to gain a broad understanding of frequency and severity modelling, pricing, and accumulated risk. This course includes a blend of theory and applications.

*Course equivalencies:* X-MATH465/STAT465

**STAT 466 Actuarial Theory II (0 Credit Hours)**

With an introductory background in the field provided in STAT 465, this course thoroughly explores modelling and estimation techniques in actuarial mathematics and risk theory.

*Course equivalencies:* X-STAT466/MATH466

**STAT 468 Risk Theory (0 Credit Hours)**

With a focus on insurance, pensions and investments, this course provides an overview of the theory of risk, emphasizing the statistical challenges and assumptions inherent in models and methods.

*Course equivalencies:* X-STAT468/MATH468

**STAT 488 Topics in Statistics (1-3 Credit Hours)**

This topics course provides the means for new courses on current or 'hot' topics to be offered to students, with the topics being crafted to the given topic at hand. As such, the course may be taken repeatedly.

**STAT 495 Statistical Consulting Capstone (2 Credit Hours)**

*Pre-requisites:* Graduate Students only

Students enrolled in this course will be introduced to statistical consulting techniques useful for work with researchers and decision-makers in university, medical, financial and industrial settings; students will engage in actual hands-on statistical consulting with administrators, researchers, or students at one of Loyola's lakeside campuses or remotely.

*Outcomes:*

Upon completion of this course, it is expected that students will master the soft-skills of statistical consulting, communication, active listening, and real-time data analysis

**STAT 498 Independent Study Statistics (1-6 Credit Hours)**

Working with a statistics faculty member on a one-on-one or small group format, this course affords students the opportunity to thoroughly explore a statistical topic at greater depth. Generally, it involves a good deal of outside reading and/or programming, and weekly meetings with the professor.

## Theology (THEO)

**THEO 401 Tutorial in Biblical Studies (3 Credit Hours)**

A reading course with variable content and readings in the area of biblical studies.

**THEO 403 Topics in Rabbinic & Medieval Literature (3 Credit Hours)**

Topics in post-biblical Jewish literature and thought, covering texts from approximately 200 to 1600.

**THEO 404 History of Israel (3 Credit Hours)**

A study of the history of ancient Israel, with particular attention to the principal features of its religion and its historical evolution, in the context of the ancient Near East.

*Course equivalencies:* IPS 440/THEO 404

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 405 Formation of The Pentateuch (3 Credit Hours)**

An in-depth examination of the first five books of the Hebrew Bible and the Christian Old Testament, in their unity and discreteness, with a view to articulating the principal themes of the Pentateuch and the history of its composition.

*Course equivalencies:* IPS441/THEO 405

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 406 Basic Hebrew Grammar (3 Credit Hours)**

Study of the fundamental elements of classical Hebrew.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 407 Hebrew Exegesis (3 Credit Hours)**

Introduction to the fundamentals of classical Hebrew, including the Hebrew alphabet, basic syntax, and the basic grammatical forms of the language, designed to advance reading knowledge of the Old Testament.

**THEO 418 Theological Prophets-Ancient Israel (3 Credit Hours)**

This course examines the prophetic literature of ancient Israel, in its ancient historical context and as it can be illuminated by contemporary sociological and anthropological perspectives. Standard historical-critical methods will be used throughout.

*Course equivalencies:* IPS 442/THEO 418

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 420 Seminar (3 Credit Hours)**

No course description is available

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 421 Directed Reading in Bible Studies (1-3 Credit Hours)**

No course description is available

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 422 Directed Reading in Bible Studies (3 Credit Hours)**

Independent research in topics in bible studies according to program developed jointly by the student & faculty director.

**THEO 424 The Synoptic Gospels (3 Credit Hours)**

Study of the diversity of early Christianity as represented in the Synoptic Gospels, particularly the commonalities and contrasts in the worldviews operative in Mark, Luke, and Matthew.

*Course equivalencies:* IPS 445/THEO 424

**THEO 425 Luke-Acts & New Testament Church (3 Credit Hours)**

This course examines the material on the early church in the Gospel of Luke and the Acts of the Apostles from a historical and critical point of view.

*Course equivalencies:* IPS 446/THEO 425

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 427 St Paul's Contribution to Christianity (3 Credit Hours)**

Examination of Paul's thought through exacting analysis of Pauline passages; an attempt to formulate what is uniquely Pauline in the New Testament witnesses; and an awareness of how deeply Paul affected the formation of Christianity.

*Course equivalencies:* IPS 448/THEO 427

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 429 Person of Jesus in New Testament (3 Credit Hours)**

In this course, attention will be given to the presentation of the meaning of Jesus Christ within the earliest Christian communities.

*Course equivalencies:* IPS 449/THEO 429

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 436 Christology (3 Credit Hours)**

This course will study the speculations and formulations concerning the person of Christ and the redemptive incarnation from the early fathers and councils up to and including modern times.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 437 Mystery of God in Christian Theology (3 Credit Hours)**

The Christian church has insisted, from the beginning, that Jesus Christ is decisive in humanity's access to, and understanding of, God. This realization was expressed in the doctrine of the Trinity.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 440 Seminar in Systematic Theology (1-12 Credit Hours)**

No course description is available

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 441 Directed Reading in Systematic Theology (3 Credit Hours)**

Independent research in topics in systematic theology according to program developed jointly by the student & faculty director.

**THEO 447 Philosophical Theology (3 Credit Hours)**

A study of the ways in which philosophical assumptions, systems, and methodologies shape theological reflection.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 449 Phenomenology of Religion (3 Credit Hours)**

This course will examine religion from a phenomenological point of view, allowing the methods and texts of phenomenology to shape our understanding of religious phenomena, such as revelation, givenness, metaphysics, incarnation, etc.. Topics may also include investigations of the borders between phenomenology and theology.

**THEO 459 Contemporary Theology (1-12 Credit Hours)**

Advanced study of readings and themes in contemporary theology, in conversation with a variety of disciplines.

**THEO 460 Seminar in History of Theology (1-12 Credit Hours)**

A consideration of the organizing models characteristic of theology in particular periods. The seminar is organized around a specific doctrinal theme determined, in part, by the specialized interests of the students.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 461 Directed Readings in History of Theology (3 Credit Hours)**

Independent research in topics in history of theology according to program developed jointly by the student and faculty director.

**THEO 464 Religion & Politics in Christian History (3 Credit Hours)**

Exploration of the intersections of religious and political thought in Christian history from the 19th century to today.

**THEO 470 Foundations Critical Issues Theological Ethics (1-12 Credit Hours)**

Devoted to a critical analysis of theological ethics firmly rooted in the historical method, studying the various methodologies, critical issues and the personalities.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 475 Natural Law & Theological Ethics (3 Credit Hours)**

Some of the many theological interpretations of natural law developed in Western Christian thought will be examined. The issue of a specific Christian ethic vis-à-vis a universal humanistic ethic will be investigated.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 477 Feminist Issues in Theology and Ethics (3 Credit Hours)**

Designed around current issues in feminist theology and ethics. Issues include the role of the Bible in feminist theology, hermeneutics, theological education, church and sacraments, as well as normative theory, sexuality and reproduction, and ecology.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* X-THEO477/WOST468/WSGS468

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 478 Issues in Medical Ethics (3 Credit Hours)**

The course will deal with the problems of abortion, genetic engineering, technological reproduction, sterilization of the handicapped, prolonging life, etc.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 480 Seminar in Christian Ethics (1-12 Credit Hours)**

In-depth study of select topics in contemporary Christian ethics. Topics vary from faith and morality, religion and politics, church-state relations, and work to ecology, sexuality, and eschatology.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 481 Directed Readings Christian Ethics (3 Credit Hours)**

Independent research in topics in Christian ethics according to program developed jointly by the student and faculty director.

**THEO 515 Gospels in Early Christianity (3 Credit Hours)**

This course will focus on the study of one or the other of the four gospels.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 517 Early Christian Letters (1-12 Credit Hours)**

This course studies letters from Christian leaders of the first two centuries A.D. in their original Greek language.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 519 Latr Nt-Subapost Writ (3 Credit Hours)**

This course studies New Testament and non-canonical Christian writings in their original Greek language from the late first and early second century A.D.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 523 Cultural-Religious Environment Early Christianity (3 Credit Hours)**

This course examines specific aspects of the cultural and religious environment of the Mediterranean world between 200 B.C. and A.D. 300 relevant to early Christianity. Outcomes A deep level of understanding and of critical thinking with respect to the subject matter of the course.

**THEO 527 Various Community Early Christianity (3 Credit Hours)**

The course will examine the identity, cohesion, and institutions of various communal groups in early Christianity.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 530 Seminar - Variable Titles (1-12 Credit Hours)**

Extensive and in-depth study of selected topic.

**THEO 536 Christian Doctrine-Catholic Theology (3 Credit Hours)**

This course will examine the dialectical relationships between Christian doctrine and theological learning.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 560 Contemporary Authors (1-12 Credit Hours)**

This course will examine the methods, concerns, major issues, achievements, and lasting influence of twentieth century writers whose work has significantly shaped theology today.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 570 Fundamental Issues in Christian Ethics (1-12 Credit Hours)**

Fundamental issues raised in defining Christian ethics, delineating its sources and methods, developing normative theories, and analyzing processes of moral decision-making.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 573 Roman Catholic Ethics (3 Credit Hours)**

This course will concentrate on one or more classic topics in Roman Catholic ethics.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 575 Religious Ethics and Social Theory (3 Credit Hours)**

This course investigates what religious ethics gains from and contributes to basic concerns.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 580 Christian Social Ethics (3 Credit Hours)**

The course will examine the sources, transformation, problematics, and potential directions in developing the middle principles which articulate the interaction of theological ethics and social questions.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 585 Issues Applied Theology Ethics (3 Credit Hours)**

An examination in depth one or more areas which have traditionally engaged religious ethicists.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 590 Directed Readings and Research (3 Credit Hours)**

No course description is available

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 592 Directed Readings (3 Credit Hours)**

Independent research according to program developed jointly by the student and faculty director.

**THEO 593 Directed Readings (3 Credit Hours)**

Independent research according to program developed jointly by the student and faculty director.

**THEO 600 Dissertation Supervision (0 Credit Hours)**

Students who have filed the dissertation paperwork and are currently writing, should be enrolled in this course. You must be enrolled in some course every semester.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 605 Master's Study (0 Credit Hours)**

Students who have completed their Master's level course work and are preparing for the comprehensive exams should enroll in this course, unless they plan to take the exam while taking courses. You must be enrolled in some course every semester.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**THEO 610 Doctoral Study (0 Credit Hours)**

Students who have completed their doctoral level course work and are studying for the written and oral comprehensive exams should be enrolled in this course. You must be enrolled in some course every semester.

*Outcomes:*

A deep level of understanding and of critical thinking with respect to the subject matter of the course

**Women and Gender Studies (WSGS)****WSGS 401 History of Feminist Thought (3 Credit Hours)**

This course surveys the historical development of feminist thought from Mary Wollstonecraft to second wave feminism and beyond and analyzes the impact of feminism on the general culture.

*Course equivalencies:* WOST401/WSGS401

**WSGS 402 Foundations of Women's Studies (3 Credit Hours)**

This course investigates how gender has become a critical category in education and knowledge and traces the institutional and intellectual development of women's and gender studies as a field, focusing on the evolution of WGS in the academy (here and in other countries) and on the changes in concepts of knowledge, in methodologies, and in pedagogy that women's studies scholarship has produced in various fields.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* WOST402/WSGS402

**WSGS 450 Global Feminisms (3 Credit Hours)**

This course is a course that explores feminism and the study of gender in a global dimension. Chosen texts privilege the study of women, gender, and sexuality from an international perspective. The course highlights the intimate relationship between the study of feminism, (post/de)colonialism, and racism.

*Course equivalencies:* WOST450/WSGS450

**WSGS 455 Feminist Pedagogy (3 Credit Hours)**

*Pre-requisites:* Graduate Status

This course will focus on distinctly feminist ways of learning and teaching. As with feminist theory and research methods, feminist pedagogy has been understood to include characteristics like self-reflexivity, de-centered authority, standpoint epistemologies, examinations of power dynamics, and attention to embodied ways of learning and knowing.

*Outcomes:*

Understand the foundational principles of feminist pedagogy and related approaches to teaching; Develop skills to analyze and produce sound teaching practices within a feminist intersectional framework

**WSGS 460 Migration, Identity, Sexuality (3 Credit Hours)**

*Pre-requisites:* Graduate Status

We will explore how crossing borders, identity politics, gender, and sexuality intersect to produce a conversation on contemporary global immigration issues. Focus is on movement from three geographic locations from/to the Global South and North: Latin America to the US and Europe; Africa to Europe; Europe to Latin America and back.

**WSGS 470 Sexual Assault Advocacy (3 Credit Hours)**

*Pre-requisites:* Graduate Status

This course provides specific skills of support and advocacy services to sexual assault survivors. Students will gain an understanding of the impact of sexual assault on victims, the social and cultural context in which sexual assault occurs, and the roles systems play to both support and inhibit survivors recovery.

*Course equivalencies:* WOST370/WSGS370/WSGS470

*Outcomes:*

Students who successfully complete the course may be eligible to serve as Loyola University Chicago sexual assault advocates

**WSGS 475 Masculinity Studies: Equity, Race, Transformation (3 Credit Hours)**

*Pre-requisites:* Graduate Status

This course highlights the intersectional exploration of how masculinity is embodied, experienced, and replicated in the United States and globally. With this transnational lens, students gain a better understanding of contemporary global masculinity sociocultural issues and concerns which include race/racism, "angry white men," and the "crisis of masculinity."

*Course equivalencies:* WSGS 375/WSGS 475

*Outcomes:*

Students will acquire and utilize key theoretical concepts in Masculinity studies from an international lens; Students will apply a wide critical terminology to literary texts and visual/cultural phenomena globally

**WSGS 480 Queer Theory (3 Credit Hours)**

*Pre-requisites:* Graduate status

This graduate level course maps the field of queer theory from an interdisciplinary perspective in order to cover a wide range of theoretical and disciplinary approaches and interpretive applications. Outcome: Students will acquire and utilize theoretical concepts in queer studies, develop cultural competency in queer studies and present information about the field orally and in writing.

*Interdisciplinary Option:* Women & Gender Studies

**WSGS 497 Topics in Women's Studies and Gender Studies (3 Credit Hours)**

This topics course may originate in Women's Studies and Gender Studies or as a cross-listed course and deals with women's and gender topics including identity, sexuality, diversity, relationships of power in national, transnational and international contexts. The ethical and social justice implications of topics include feminist perspectives.

*Course equivalencies:* WOST497/WSGS497

*Outcomes:*

Students understand feminist perspectives on gender in literature; Students connect theory and practice in writing, performance, action or in combined formats

**WSGS 498 Practicum (1-3 Credit Hours)**

WSGS Practicum gives students the option of doing a teaching or research assistantship under the supervision of a faculty member. This practicum counts as an elective credit towards the student's MA degree.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* WOST498/WSGS498

**WSGS 499 Independent Study (1-3 Credit Hours)**

An independent study provides students with the opportunity to work closely and one-on-one with a faculty member. The student can choose her/his/their topic or creative project. The independent study should be comparable to a graduate-level course.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* WOST499/WSGS499

**WSGS 500 Thesis Research (3 Credit Hours)**

A Thesis Research course allows graduate students to fine tune their research skills, academic writing, and independent thought while they are preparing their thesis proposal and/or writing their thesis.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* WOST500/WSGS500

**WSGS 595 Thesis Supervision (0 Credit Hours)**

The focus of a Thesis Supervision is to help students better strategize, structure, and organize themselves as they write their thesis. Students will also be advised about how to prepare for a successful oral defense.

*Interdisciplinary Option:* Women & Gender Studies

*Course equivalencies:* WOST595/WSGS595

**WSGS 599 Capstone Presentation (0 Credit Hours)**

*Pre-requisites:* Successful completion of 12 hours in the MA program in WSGS

WSGS 599 is the culmination of the Master's program in Women's Studies and Gender Studies. Requirements include a 10 page synthesis paper or detailed outline, annotated bibliography, and public presentation at our biannual capstone ceremony.

*Outcomes:*

Synthesis of the students' graduate coursework; performance of the diversity of outcomes in WSGS; celebration of students' achievements; networking

**WSGS 605 Master's Study (0 Credit Hours)**

Continuing work on completion of the Master's Degree in Women's Studies and Gender Studies.

*Interdisciplinary Option:* Women & Gender Studies