

Third and Fourth Year Pharmaceutical Sciences courses

Third Year Fall Semester

BCMB 3100

PMCY 3000

PMCY 3500

MATH 2260

Third Year Spring Semester

PMCY 3200

PMCY 3300L

PMCY 3800

PMCY 4300

Third Year Fall Semester

Course ID: **BCMB 3100.** 4 hours.
Course Title: **Introductory Biochemistry and Molecular Biology**
Course Description: The structure and function of biological molecules, enzymology, metabolism and bioenergetics, and molecular biology.
Athena Title: Intro Biochem and Molec Biol
Duplicate Credit: Not open to students with credit in BCMB 3100E, BCMB 3100H
Prerequisite: (CHEM 2211 or CHEM 2311H or CHEM 2411) and (CHEM 2211L or CHEM 2311L or CHEM 2411L) and (BIOL 1107 or BIOL 2107H)
Semester Course Offered: Offered fall, spring and summer semester every year.

Course ID: **PMCY 3000.** 4 hours
Course Title: **Human Physiology**
Course Description: Human physiology with an emphasis on cell membranes/transporters and organ systems as targets and modifiers of drug action.
Athena Title: Human Physiology
Prerequisite: BIOL 1107 and BIOL 1107L
Semester Course Offered: Offered fall semester every year.

Course ID: **PMCY 3500. 3 hours.**
Course Title: **Pharmaceutical Analysis**
Course Description: Major techniques applicable for the characterization and determination of pharmaceutical agents.
Athena Title: PHARM ANALYSIS
Prerequisite: CHEM 2212 or permission of department
Semester Course Offered: Offered fall semester every year.

Course ID: **MATH 2260.** 4 hours.
Course Title: **Calculus II for Science and Engineering**
Course Description: Volumes, arclength, work, separable differential equations. Techniques of integration. Sequences and series, convergence tests, power series and Taylor series. Vectors in three-dimensional space, dot product, cross product, lines and planes.
Athena Title: Calc II for Science and Engr
Duplicate Credit: Not open to students with credit in MATH 2310H
Prerequisite: MATH 2250 or MATH 2300H
Semester Course Offered: Offered fall, spring and summer semester every year.

Third Year Spring Semester

Course ID: **PMCY 3200.** 3 hours.
Course Title: **Introduction to the Pharmaceutical Sciences**
Course Description: Presentation of the basic concepts of physical pharmacy and the pharmaceutical sciences with an emphasis on drug delivery systems.
Athena Title: INTRO PHARM SCI
Pre or Corequisite: BCMB(BIOL)(CHEM) 3100 and MATH 2250 or permission of department
Semester Course Offered: Offered spring semester every year.

Course ID: **PMCY 3300L.** 1 hour. 3 hours lab per week.
Course Title: **Pharmaceutical Techniques**
Course Description: Laboratory of major techniques used to support pharmacology and pharmaceutical analysis in drug development. Basic knowledge of cell culture, DNA, protein isolation, and quantitation. Introduction to pharmaceutical analysis instrumentation and application in product quality testing. Understand and apply chemical and biosafety practices and Good Documentation Practices used in the pharmaceutical industry.
Athena Title: Pharmaceutical Techniques
Prerequisite: CHEM 2212 or permission of department
Semester Course Offered: Offered spring semester every year.

Course ID: **PMCY 3800.** 3 hours.
Course Title: **Introduction to Pharmacology**
Course Description: Basic pharmacological principles and specific therapeutic actions of major drug classes commonly used in clinically significant disease states.
Athena Title: INTRO PHARMACOLOGY
Prerequisite: (BMCB(BIOL)(CHEM) 3100 and PMCY 3000) or permission of department
Semester Course Offered: Offered spring semester every year.

Course ID: **PMCY 4300/6300.** 3 hours.
Course Title: **Medicinal Chemistry**
Course Description: Integration of the basic principles of organic chemistry, biology, and biochemistry in order to understand how synthetic and naturally-occurring biologically active compounds function in living organisms.
Athena Title: Medicinal Chemistry
Prerequisite: (CHEM 2212 and BCMB(BIOL)(CHEM) 3100) or permission of department
Semester Course Offered: Offered spring semester every year.

Fourth Year Fall Semester

PMCY 4200

PMCY 4500

PMCY 4500L

PMCY 4960

Fourth Year Fall Semester

PMCY 4510

PMCY 4510L

PMCY 4600

PMCY 4970

ENGL 3590W

Fourth Year Fall Semester

Course ID: **PMCY 4200/6200. 3 hours.**
Course Title: **Pharmacokinetics and Pharmacodynamics**
Course Description: Biopharmaceutical and pharmacokinetic principles with an emphasis on evaluation of dosage formulations and drug development.
Athena Title: Pharmkinetics & Pharmedynamics
Prerequisite: (PMCY 3000 and PHYS 1211-1211L) or permission of department
Semester Course Offered: Offered fall semester every year.

Course ID: **PMCY 4500/6500. 3 hours.**
Course Title: **Pharmaceutical Drug Development**
Course Description: Objective of the course is to understand the various phases in drug development, including drug discovery, dosage form design and excipients, manufacturing, and quality control testing of solid oral dosage forms. U.S. regulatory guidance's and requirements, intellectual property, and medical devices are also discussed. Understand and apply good manufacturing practices used in pharmaceutical industry.
Athena Title: Pharm Drug Development
Prerequisite: (PMCY 3200 and PMCY 3300L and PMCY 3500 and PMCY 3800) or permission of department
Semester Course Offered: Offered fall semester every year.

Course ID: **PMCY 4500L/6500L. 1 hour. 3 hours lab per week.**
Course Title: **Pharmaceutical Drug Development Lab**
Course Description: A focus on pharmaceutical drug development, including material characterization, formulation development (excipient selection and compatibility), manufacturing and quality control, and testing of solid oral dosage forms. Understanding and applying good laboratory/manufacturing practices used in the pharmaceutical industry.
Athena Title: Pharm Drug Development Lab
Prerequisite: PMCY 3300L or permission of department
Semester Course Offered: Offered fall semester every year.

Course ID: **PMCY 4960. 1-4 hours. Repeatable for maximum 6 hours credit.**
Course Title: **Pharmaceutical Sciences Research I**
Course Description: Faculty-directed research-intensive project in the pharmaceutical sciences.
Athena Title: Pharm Sciences Research I
Duplicate Credit: Not open to students with credit in PMCY 4960R
Nontraditional Format: Students will be in lab for 3 hours per week for each credit hour they receive.
Prerequisite: Permission of department
Semester Course Offered: Offered fall, spring and summer semester every year.

Fourth Year Spring Semester

Course ID: **PMCY 4510/6510.** 3 hours.
Course Title: **Advanced Drug Delivery Systems**
Course Description: A continuation of Pharmaceutical Drug Development. Drug substance and drug product stability, tablet coating, and modified release oral dosage forms. Advanced drug delivery systems (transdermal, nanomedicines, gene delivery, protein and peptide delivery, 3D printing) in pharmaceutical and biopharmaceutical drug development. U.S. FDA regulatory submission and approval process for NDA and ANDA will also be discussed.
Athena Title: Adv Drug Delivery Systems
Undergraduate Prerequisite: PMCY 4500/6500 or permission of department
Graduate Prerequisite: PMCY 4500/6500 or permission of department
Semester Course Offered: Offered spring semester every year.

Course ID: **PMCY 4510L/6510L.** 1 hour. 3 hours lab per week.
Course Title: **Advanced Drug Delivery Systems Lab**
Course Description: A continuation of the Pharmaceutical Techniques and Pharmaceutical Drug Development Lab courses. A focus on major techniques involved in drug characterization, including preformulation, drug product manufacturing, tableting, and USP QC testing of solid oral dosage forms. Understanding and applying good laboratory/manufacturing practices used in the pharmaceutical industry.
Athena Title: Adv Drug Delivery Sys Lab
Undergraduate Prerequisite: PMCY 4500L/6500L or permission of department
Graduate Prerequisite: PMCY 4500L/6500L or permission of department
Semester Course Offered: Offered spring semester every year.

Course ID: **PMCY 4600/6600.** 3 hours.
Course Title: **Biological Therapeutics**
Course Description: A focus on emerging areas of medicine using proteins, antibodies, nucleic acids, and cells as drugs. Students will learn the principles and technologies involved for biological drug development, production, modification, delivery, therapeutic assessments, and clinical applications.
Athena Title: Biological Therapeutics

Course ID: **PMCY 4970. 1-4 hours.** Repeatable for maximum 6 hours credit.
Course Title: **Pharmaceutical Sciences Research II**
Course Description: Faculty-directed research-intensive project in the pharmaceutical sciences.
Athena Title: Pharm Sciences Research II
Duplicate Credit: Not open to students with credit in PMCY 4970R
Nontraditional Format: Students will be in lab for 3 hours per week for each credit hour they receive.
Prerequisite: PMCY 4960 or PMCY 4960R or permission of department
Semester Course Offered: Offered fall, spring and summer semester every year.

Course ID:	ENGL 3590W. 3 hours.
Course Title:	Technical and Professional Communication
Course Description:	Writing in the professional domains, with an emphasis on research methods, clear and accurate presentation of ideas and data, and computer-mediated communication.
Athena Title:	TECH AND PROF COMM
Duplicate Credit:	Not open to students with credit in ENGL 3590
Nontraditional Format:	This course will be taught as writing intensive, which means that the course will include substantial and ongoing writing assignments that a) relate clearly to course learning; b) teach the communication values of a discipline—for example, its practices of argument, evidence, credibility, and format; and c) prepare students for further writing in their academic work, in graduate school, and in professional life. The written assignments will result in a significant and diverse body of written work (the equivalent of 6000 words or 25 pages) and the instructor (and/or the teaching assistant assigned to the course) will be closely involved in student writing, providing opportunities for feedback and substantive revision.
Prerequisite:	ENGL 1102 or ENGL 1102M
Semester Course Offered:	Offered every year.