

Biopharmaceutical Sciences

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Contact Information:

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Administration:

Department Head: Debra Tonetti
Director of Graduate Studies: Richard Gemeinhart

Program Codes:

20FS1903PHD (PhD)
20FS1903MS (MS)

The Department of Biopharmaceutical Sciences offers work leading to degrees in Biopharmaceutical Sciences. Course work and research are available in the areas of pharmacology, pharmacokinetics, pharmaceuticals, drug delivery, molecular genetics, and pharmacogenomics. Biopharmaceutical Sciences also participates in a joint PharmD/PhD (<http://catalog.uic.edu/gcat/colleges-schools/pharmacy/pharmd-phd>) program (see the *Pharmacy* section of the catalog), the Medical Scientist Training Program (<http://catalog.uic.edu/gcat/colleges-schools/medicine/mstp>) (see the *College of Medicine* section of the catalog), and the Interdepartmental Concentration in Neuroscience (<http://catalog.uic.edu/gcat/graduate-college/neus-conc>).

Admission and Degree Requirements

- MS in Biopharmaceutical Sciences (See listing for PhD in Biopharmaceutical Sciences)
- PhD in Biopharmaceutical Sciences (<http://catalog.uic.edu/gcat/colleges-schools/pharmacy/bps/phd>)

BPS 421. Advanced Dosage Form Design [Compounding]. 1 hour.

Students attend five recitations and ten labs where they make twenty new dosage formulations. Several dosage formulations are of veterinary products used to treat diseases in dogs, cats, horses, cattle and other large animals. Course Information: Prerequisite(s): PHAR 321 and PHAR 322.

BPS 425. College of Pharmacy Colloquium Lecture Series. 1 hour.

Weekly, one-hour, basic-research seminars given by invited lecturers. Course Information: May be repeated for a maximum of 2 hours of credit. Students will not be able to concurrently enroll in BPS 425 and PMPR 355 during the Spring semester.

BPS 430. Principles of Toxicology. 2 hours.

Examines the toxic effects of drugs and chemicals on organ systems. Lectures emphasize basic principles, effects on specific organ systems, major classes of toxic chemicals, and specialized topics such as forensic and industrial toxicology. Course Information: Same as PCOL 430. Credit is not given for BPS 430 if student has credit for EOHS 457.

BPS 480. Application of Science to the Law. 4 hours.

Issues affecting the development, accessibility and admissibility of forensic science services by the criminal justice system; problems which may compromise the quality, fairness and effectiveness of scientific inquiries. Course Information: Same as CLJ 480. Prerequisite(s): CLJ 210 and CLJ 260; or graduate standing.

BPS 494. Special Topics of Current Interest in Biopharmaceutical Sciences. 1-3 hours.

Courses offered by faculty or a visiting Lecturer on a current topic of selected interest. Topics are available on an experimental basis for one offering only. Course Information: May be repeated to a maximum of 6 hours. Prerequisite(s): Consent of the instructor; good academic standing as defined by UIC policies.

BPS 501. Biopharmaceutical Sciences I. 4 hours.

First part of the fundamental didactic core courses in biopharmaceutical sciences including fundamental principles of pharmaceuticals, pharmacokinetics, scientific ethics and research design. Course Information: Prerequisite(s): Graduate standing; or consent of the instructor.

BPS 502. Biopharmaceutical Sciences II. 4 hours.

Second part of fundamental didactic core courses in biopharmaceutical sciences; fundamental principles of cell and molecular biology and pharmacogenomics, pharmacodynamics including toxicology, research communication and regulatory processes. Course Information: Prerequisite(s): BPS 501; and graduate standing in the biopharmaceutical sciences program; or approval of the department.

BPS 506. Industrial Experience. 4-10 hours.

Recommended to graduate students with no industrial experience. Students spend time working in the pharmaceutical, imaging or cosmetic industry under academic supervision to obtain practical experience. Course Information: Satisfactory/Unsatisfactory grading only.

BPS 507. Drug Discovery, Design and Development. 3 hours.

Overview of drug development process from target identification and screening through clinical trials and FDA evaluation. Course Information: Same as MDCH 507 and PMPG 507.

BPS 508. Concepts in Drug Development: From Bench to Bedside. 3 hours.

Designed to give clinicians an overview of the drug development process from bench to bedside. Emphasis will be placed on the regulatory aspects of drug development including clinical trials, FDA approval and post marketing surveillance. Course Information: Offered online only. Prerequisite(s): Consent of the instructor.

BPS 510. Principles of Interfacial Phenomena. 3 hours.

Quantitative and theoretical principles of physical and chemical sciences as applied to pharmacy. Thermodynamics, kinetics, colloid and surface chemistry in evaluation of pharmaceutical formulations. Course Information: Prerequisite(s): MATH 480.

BPS 515. Dissolution and Bioavailability of Dosage Forms. 2 hours.

Theories and testing of the release of drug from solid dosage forms including the effect of dissolution rate on bioavailability. Course Information: Prerequisite(s): PHAR 323; and approval of the department.

BPS 518. Controlled Drug Delivery. 3 hours.

Controlled drug delivery systems utilizing polymers, synthesis of different types of devices, and the delivery expected from these devices, and mathematical modeling of delivery systems. Course Information: Same as BIOE 518. Prerequisite(s): MATH 220 or approval of the department.

BPS 519. Percutaneous Drug Delivery. 2 hours.

Modern methods of drug delivery covering the use of enhancers, prodrugs, iontophoresis and ultrasound are presented. Toxicity testing, regulatory issues for successful marketing and production issues. Course Information: Prerequisite(s): Consent of the instructor.

BPS 520. Lipid Based Drug Delivery Systems. 2 hours.

The preparation, characterization, stability, pharmaceutical cosmetic and diagnostic applications of lipid based drug delivery systems including liposomes, micelles and emulsions prepared with phospholipids. Course Information: Prerequisite(s): PHAR 323; and approval of the department.

BPS 522. Principles of Polymeric Science and Engineering. 3 hours.

Intermediate polymer science, thermodynamics of polymer solutions, phase separations, MW determination, crystallization, elasticity, kinetics and processing. Course Information: Same as BIOE 522. Prerequisite(s): MATH 220 or consent of the instructor.

BPS 539. Biopharmaceutical Sciences Research Rotation. 3 hours.

Research rotation course in which first year students from the BPS program will undertake projects in laboratories affiliated with this program. Course Information: May be repeated to a maximum of 9 hours. Animals used in instruction. Prerequisite(s): Consent of the instructor.

BPS 542. Pharmacodynamics of Substance Abuse. 2 hours.

Considers the mechanisms of action, responses, pharmacokinetics and dependence factors of substance abuse. Emphasis will be placed on research strategies in studying the biological aspects of drug abuse. Course Information: Prerequisite(s): Consent of the instructor and a course in basic pharmacology.

BPS 545. Advanced Pharmacokinetics. 3 hours.

Kinetics of absorption, distribution, metabolism and excretion of drugs factors affecting these kinetics and their relationship to pharmacodynamics. Course Information: Prerequisite(s): Consent of the instructor.

BPS 553. Cancer Biology and Therapeutics. 2 hours.

Fundamentals of cancer biology with emphasis on biological, hormonal and chemotherapeutic drug therapies currently used and in development. Specific treatment approaches to breast, ovarian, prostate and colon cancers will be explored. Course Information: Same as MDCH 553 and PMPG 553. Prerequisite(s): Consent of the instructor. Recommended background: Molecular and Cellular Biology.

BPS 555. Principles of Pharmacogenomics. 2 hours.

Concept and application of pharmacogenomics in disease diagnosis, prevention, and treatment. Course Information: Prerequisite(s): BPS 502 or consent of the instructor.

BPS 570. Foundations of Forensic Toxicology. 2 hours.

Survey of forensic toxicology, with emphasis on analytical and interpretive aspects; unique characteristics, underlying philosophies, ethics; analytical methods, nontraditional matrices, interpreting the significance of results. Course Information: Prerequisite(s): Consent of the instructor.

BPS 573. Drug Identification Chemistry. 4 hours.

In-depth treatment of classes of commonly encountered drugs of abuse and the analytical methods used in their screening, identification and quantitation. Course Information: Prerequisite(s): Consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

BPS 574. Forensic Toxicology. 4 hours.

In-depth treatment of techniques used in forensic toxicology, including specimen preparation, drug or toxin isolation, and analytical methods for screening, identification and quantitation; interpretation, reporting and testifying as to results. Course Information: Prerequisite(s): Consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Lecture and one Laboratory.

BPS 580. Forensic Science: Survey and Foundations. 2 hours.

Survey course for forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, pattern evidence. Course Information: Same as CLJ 580. Prerequisite(s): Approval of the department.

BPS 581. Forensic Analysis of Biological Evidence. 4 hours.

Forensic blood and physiological fluid identification; DNA typing of biological evidence; report writing; expert testimony. Course Information: Prerequisite(s): Consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

BPS 582. Forensic Chemistry and Trace Evidence Analysis. 4 hours.

Trace evidence: hairs, fibers, glass, soil, paint and miscellaneous; nature, chemical, instrumental, microscopical methods of analysis; interpretation and significance of trace similarities; expert testimony. Course Information: Prerequisite(s): Consent of the director of graduate studies. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

BPS 583. Physical Pattern Evidence Analysis. 4 hours.

Pattern evidence: individualization, reconstruction; fingerprint classification; questioned documents; handwriting comparison; firearms and toolmarks comparisons; scene patterns and reconstruction will be studied in depth. Course Information: Prerequisite(s): Consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

BPS 584. Forensic Drug Analysis and Toxicology. 4 hours.

Analysis of commonly abused drugs in their solid-dosage form and in biological media, with emphasis on modern instrumental methods and interpretation of results. Course Information: Prerequisite(s): Consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

BPS 585. Ethical, Quality, Practice, and Legal Issues in Forensic Science. 3 hours.

A topical presentation-discussion of ethical, quality control, admissibility and practice topics emanating from the law-science interface integral to forensic sciences.

BPS 586. Topics in Specialty Forensic Examinations. 1-4 hours.

Topics may vary but will revolve around specialty forensic examinations, covering specific evidentiary classes (e.g. drug identification, DNA typing, fingerprints), including forensic laboratory methods, approaches and data interpretation. Course Information: May be repeated if topics vary. Students may register in more than one section per term. Prerequisite(s): BPS 581 or BPS 582 or BPS 583 or BPS 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

BPS 587. Forensic Science Seminar. 1 hour.

Weekly seminar series on forensic science research and topics, especially those outside the core requirements. Presentations by students, faculty, and guests. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): Graduate or professional standing.

BPS 588. Expert Witness Testimony and Courtroom Demeanor. 3 hours.

Trials, hearings, grand jury; expert versus lay witness; personal and behavioral characteristics on the stand; results, reports and courtroom testimony; simulated trial testimony. Course Information: Prerequisite(s): Approval of the department.

BPS 589. Special Topics in Forensic Science. 3 hours.

Content may vary but will revolve around the philosophic, moral, and managerial problems associated with criminalistics practice. Topics may include evidence collection, analysis, reporting, and testimony to non-criminalistics fields. Course Information: Same as CLJ 589. May be repeated if topics vary. Prerequisite(s): Consent of the instructor.

BPS 590. Forensic Science Residency. 1-8 hours.

In-depth training for casework analysis in a specific forensic discipline (e.g. drug identification, DNA typing, fingerprints) in an approved forensic science laboratory. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 24 hours. Prerequisite(s): BPS 581 or BPS 582 or BPS 583 or BPS 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

BPS 591. Topics in Forensic Microscopy. 1-4 hours.

Topic may vary but will revolve around microscopical characterization of various materials, with emphasis on forensic laboratory methods and approaches, and interpretation of materials comparisons as evidence. Course Information: May be repeated if topics vary. Students may register in more than one section per term. Prerequisite(s): BPS 582 and consent of the instructor.

BPS 592. Forensic Science Internship. 2-4 hours.

Placement in a forensic science or toxicology laboratory or setting, under the supervision of a faculty member, with an accepted research project or paper required. Course Information: May be repeated to a maximum of 4 hours. Students may register in more than one section per term. Prerequisite(s): BPS 580; and consent of the instructor and a minimum of 15 hours of credit earned in the M.S. in Forensic Science program.

BPS 593. Research in Biopharmaceutical Sciences. 0-16 hours.

Research in biopharmaceutical sciences with the guidance of a faculty mentor. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): Approval of the department.

BPS 594. Special Topics in Biopharmaceutical Sciences. 1-4 hours.

Content varies. Special topics in biopharmaceutical sciences not covered in regular core or elective offerings. Course Information: May be repeated to a maximum of 4 hours if topics vary. Prerequisite(s): Consent of the instructor.

BPS 595. Departmental Seminar. 1-2 hours.

Weekly seminar series on research and experimental techniques in biopharmaceutical sciences. Also consists of journal club at which students will present an article once a year. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Weekly seminar and journal club meet separately from one another. Prerequisite(s): Approval of the department.

BPS 596. Independent Study in Forensic Science. 1-8 hours.

Supervised projects may consist of extensive reading or laboratory work, or both, on topics not covered in regular course offerings. Research undertaken for this course may not duplicate that being done for BPS 597 or BPS 598. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

BPS 597. Forensic Science Project Research. 3 hours.

Supervised research in forensic science; a research project to be designed and completed within one semester. Course Information: Satisfactory/Unsatisfactory grading only. Prerequisite(s): BPS 580; and at least the core course in the M.S. in Forensic Science program covering the subject area in which the research is to be conducted and consent of the instructor.

BPS 598. M.S. Thesis Research. 0-16 hours.

For students doing M.S. thesis research or thesis writing. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 10 hours. A minimum of 6 hours is required. Prerequisite(s): Consent of the instructor.

BPS 599. Dissertation Research. 0-16 hours.

Ph.D. thesis research. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): Consent of the instructor.