MEDICAL PHARMACOLOGY & TOXICOLOGY (PHA)

School of Medicine

PHA 092 — Internship in Pharmacology (1-12 units)

Course Description: Supervised work experience in pharmacology and related fields.
Prerequisite(s): Lower division student with good academic standing; approval of project prior to period of internship.
Learning Activities: Internship 3-36 hour(s).
Grade Mode: Pass/No Pass only.

PHA 099 — Special Study for Undergraduates (1-5 units)

Course Description: Special study for undergraduates.
Prerequisite(s): Consent of instructor; lower division standing.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.

PHA 192 — Internship in Pharmacology (1-12 units)

Course Description: Supervised work experience in pharmacology and related fields.
Prerequisite(s): Consent of instructor; upper division standing; approval of project prior to period of internship.
Learning Activities: Internship 3-36 hour(s).
Grade Mode: Pass/No Pass only.

PHA 198 — Directed Group Study (1-5 units)

Course Description: Directed group study.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.

PHA 199 — Special Study for Advanced Undergraduates (1-5 units)

Course Description: Special study for advanced undergraduates.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable 1-5 hour(s).
Grade Mode: Pass/No Pass only.

PHA 205 — Problem Solving in Pharmacology (1 unit)

Course Description: Introduction to a current biomedical problem that would benefit from a developing drug and will develop an experimental strategy for addressing the issue. Develop model systems for testing various classic and recent pharmacological approaches.
Learning Activities: Lecture/Discussion 1 hour(s).
Enrollment Restriction(s): Restricted to Graduate Students in Pharmacology and Toxicology, Chemistry and Clinical Research Graduate Groups; other students may be accepted with consent of instructor.
Repeat Credit: May be repeated 12 time(s) as subject changes every quarter; each course is unique and may be taken as often as desirable; certain students (Trainees of the Training Program in Pharmacological Sciences) must take course for at least three years.
Grade Mode: Letter.

PHA 207 — Drug Discovery & Development (3 units)

Course Description: Survey of the process by which a drug is discovered, developed and made available to the public. Topics include drug identification and optimization, safety testing, clinical evaluation, regulatory issues, intellectual property, formulation, and the global pharmaceutical industry.
Prerequisite(s): An equivalent course in general pharmacology, or knowledge of basic pharmacology.
Learning Activities: Lecture/Discussion 2 hour(s), Extensive Writing 1 hour(s).
Enrollment Restriction(s): Intended for graduate students in Pharmacology and Toxicology, Chemistry and Clinical Research Graduate Groups; other students, including undergraduates, may be accepted with consent of instructors.
Repeat Credit: May be repeated.
Grade Mode: Letter.

PHA 208 — Advanced Cardiac Physiology & Pharmacology (3 units)

Course Description: Detailed characterization of the mechanisms involved in cardiac excitation–contraction coupling, alterations that occur in heart disease and pharmacological interventions. Topics include cardiac contractile apparatus, action potential, Ca cycling, excitation–transcription coupling, cardiac inotropy, heart failure and arrhythmias.
Prerequisite(s): An equivalent course in general pharmacology or physiology (example, BIM 204), or knowledge of basic pharmacology/physiology.
Learning Activities: Lecture 2 hour(s), Lecture/Discussion 1 hour(s).
Enrollment Restriction(s): Open to graduate students from the Pharmacology and Toxicology, Molecular, Cellular and Integrated Physiology, Biomedical Engineering and Clinical Research Graduate Groups; other students (including undergraduates) may be accepted upon consultation with the instructors.
Grade Mode: Letter.

PHA 225 — Gene & Cellular Therapies (3 units)

Course Description: Gene therapy from basic concepts to clinical applications. Topics include the human genome and genetic variation, genetic diseases, methods to manipulate gene expression, viral and non-viral delivery vectors, history and progress of gene therapy, case studies, and ethical issues.
Learning Activities: Lecture/Discussion 3 hour(s).
Cross Listing: GGG 225.
Grade Mode: Letter.

PHA 234 — Advances in Computational Physiology & Pharmacology (2 units)

Course Description: Multi-scale biomedical modeling methodologies and applications, with emphasis on ion channel structure-function, computer-aided drug design, and membrane excitability. State-of-the-art techniques used for multi-scale modeling of biomedical systems and their applications.
Prerequisite(s): No formal requirements; basic knowledge of mathematics, physics, chemistry, and biology helpful.
Learning Activities: Lecture 2 hour(s).
Cross Listing: HPH 234.
Grade Mode: Letter.

PHA 291 — Pharmacology Research Seminar Series (1 unit)

Course Description: Research seminars on current topics in Pharmacology.
Prerequisite(s): Consent of instructor; upper division or graduate standing.
Learning Activities: Seminar 1 hour(s), Discussion 1 hour(s).
Repeat Credit: May be repeated when topic differs.
Grade Mode: Satisfactory/Unsatisfactory only.

PHA 298 — Group Study (1-5 units)

Course Description: Group study.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Letter.

PHA 299 — Research (1-12 units)

Course Description: Research.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Satisfactory/Unsatisfactory only.

PHA 400A — Pharmacology (2 units)

Course Description: Principles in pharmacology, including pharmacokinetics, drug metabolism and the actions, uses and toxicities of the major classes of drugs.
Prerequisite(s): Approval by School of Medicine Committee on Student Progress.
Learning Activities: Lecture 1 hour(s), Discussion/Laboratory 0.30 hour(s).
Enrollment Restriction(s): Restricted to Medical student only.
Grade Mode: Pass/Fail only.

PHA 400B — Pharmacology (1.5 units)

Course Description: Principles in pharmacology, including autonomic pharmacology, general anesthetics, neuropharmacology and sedative/hypnotics.
Prerequisite(s): Approval by School of Medicine Committee on Student Progress; medical students only.
Learning Activities: Lecture 1 hour(s), Discussion 0.25 hour(s).
Grade Mode: Pass/Fail only.

PHA 400C — Pharmacology (3.5 units)

Course Description: Treatment of respiratory and cardiovascular disease, central nervous system drugs, GI, Toxicology and chemotherapy. Specific topics include: asthma, chronic obstructive pulmonary disease, hypertension, congestive heart failure, and the treatment of arrhythmias. Pain Management, depression, psychosis, acid reflux, IBS and toxicology.
Prerequisite(s): PHA 400A; PHA 400B; approval by School of Medicine Committee on Student Progress; medical students only.
Learning Activities: Lecture 2 hour(s), Discussion 0.50 hour(s).
Grade Mode: Pass/Fail only.

PHA 445 — Introduction to Integrative Medicine (1 unit)

Course Description: Basic principles of alternative medical systems (e.g., traditional Chinese, Ayurvedic, Tibetan), alternative practices (e.g., chiropractic, osteopathy, naturopathy, homeopathy, herbalism, guided imagery/meditation, massage therapy), and mind/body connection are presented as introduction to integrating alternative treatments into traditional medicinal practice.
Prerequisite(s): Medical student in good standing.
Learning Activities: Lecture/Discussion 1 hour(s).
Grade Mode: Honors/Pass/Fail.

PHA 490 — Seminar in Pharmacology for Medical Students (1 unit)

Course Description: Seminar in pharmacology for medical students.
Prerequisite(s): Consent of instructor.
Learning Activities: Seminar 1 hour(s).
Grade Mode: Honors/Pass/Fail.

PHA 497T — Tutoring in Pharmacology (1-5 units)

Course Description: Assist instructor by tutoring medical students in preparation for one of the departmental courses that is a component of the required curriculum of the School of Medicine.
Prerequisite(s): Advanced standing or consent of instructor.
Learning Activities: Tutorial 3-15 hour(s).
Grade Mode: Honors/Pass/Fail.

PHA 498 — Special Study for Medical Students (1-5 units)

Course Description: Special study in pharmacology for medical students.
Prerequisite(s): Consent of instructor.
Learning Activities: Lecture, Discussion.
Grade Mode: Honors/Pass/Fail.

PHA 499 — Directed Research for Medical Students (1-12 units)

Course Description: Directed research in pharmacology for medical students.
Prerequisite(s): Consent of instructor.
Learning Activities: Laboratory 3-36 hour(s).
Repeat Credit: May be repeated.
Grade Mode: Honors/Pass/Fail.