Fall 2020 Course Descriptions as of 04/05/2020 08:13 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: **http://rcs.registrar.arizona.edu/course_descriptions_key**.

Pharmacology (PHCL)

PHCL 392: Directed Research (1 - 6 units)
Description: Individual or small group research under the guidance of pharmacology faculty.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 12 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

PHCL 399: Independent Study (1 - 5 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 5 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

PHCL 399H: Honors Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 12 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

PHCL 412: Introduction to Pharmacology (3 units)
Description: Students will learn about the history of pharmacology, along with the principles of how drugs act to produce changes within the body. Lectures will include the anatomy and physiology of body structures, with special emphasis on the processes that govern drug absorption, distribution, metabolism, and excretion. Other lectures will include the processes that establish and maintain the intracellular electrical charge and the membrane potential, and nerve impulse conduction. Students will learn detailed information about the autonomic nervous system and cardiovascular system, including how these systems are regulated and how they can malfunction. Lectures will include how different drugs act to alter the function of the autonomic nervous system and the cardiovascular system.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Co-convened with: PHCL 512
Course typically offered:
Main Campus: Fall

PHCL 422: Introduction to Toxicology (3 units)
Description: In this course, students will study system-based toxicology and biological processes involved in toxin/toxicant exposure as well as review the types of toxic agents available; the significance of biotransformation with respect to toxicity; and molecular, cellular, and pathophysiological responses of organ systems resulting from exposure to chemical agents relevant to human health. Finally, students will learn about relevant treatments and antidotes to common toxic exposures and receive instruction about common substances that are thought to be toxic but are not harmful. Emerging topics in toxicology will also be covered as they present themselves in the popular media so that we are responsive to current events.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Recommendations and additional information: (4 Units Physiology OR 4 Units Biology) and 4 Units Chemistry.

PHCL 430: Pain/Neuropharmacology (2 units)
Description: Students will be introduced to the basic concepts of pain, neural pathways of touch/pain, and neuropharmacology. Students will be required to read research articles and describe the goal of the experiments and well as the techniques used in the manuscripts. Students will be exposed to current research occurring within the department. Students should interact by asking questions and answering questions during lectures. Concepts will include our current understanding of pain perception, pain pathways, and how pain may be perceived at higher cortical levels of the central nervous system (CNS). Students will be introduced to different categories of pain and medications currently used to inhibit pain. In addition, students will learn other avenues of neuropharmacology including the reward pathways in the CNS and the blood brain barrier. Students will be tested on their ability to explain concepts they have learned in class to other students.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Co-convened with: PHCL 530
Course typically offered:
Main Campus: Fall

Field trip: No
Enrollment requirement: PHCL 412 or 512 and 8 units of Biochemistry (300 or higher) and 8 units of Physiology (300 or higher).

PHCL 442: Human Performance Pharmacology (3 units)
Description: In this course, students can explore the pharmacology of purported performance enhancing drugs and supplements used by athletes and "weekend warriors". Lectures and course material will enable students to review the most discussed and relevant products as well as dismantle public misperception about the actual efficacy and risks associated with these products.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall

Recommendations and additional information: (4 Units Physiology OR 4 Units Biology) and 4 Units Chemistry.

PHCL 444: Human Neurobiology Basics (1 unit)
Description: This course will provide an overview of anatomy, physiology, pathobiology and pharmacology of the human nervous system. The course is intended as an introduction to human neurobiology for students in the biomedical sciences including psychology. The course will provide students planning careers in the pre-health science professions (Medicine, Pharmacy, Nursing, Public Health, etc.), as well as students planning a career in biomedical research, with a valuable grounding in the fundamentals of neurobiology.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Co-convened with:
Course typically offered:
Main Campus: Fall, Spring, Summer

Recommendations and additional information: At least one course in basic human physiology
Field trip: None

PHCL 445: Drugs of Abuse (3 units)
Description: Pharmacology and toxicology of abused drugs with emphasis on mechanisms of drug action, theories of addiction, and treatment approaches.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Co-convened with: PHCL 545
Course typically offered:
Main Campus: Spring

PHCL 450: The Pharmacology of Sex (3 units)
Description: This three-credit online and in-person course will instruct students about pharmacological agents used to prevent and maintain pregnancy, assist with human birth, increase libido and function, and help with gender transformation or transition. We will explore how clinical trials are designed to assess how drugs interact with human sexual function and how we create criteria for safety, efficacy, and risk. Finally, we will cover the underlying mechanisms by which commonly prescribed drugs interfere with human sexual function and desire, and we will explore the current trend of chemsex, which can have lethal consequences.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall, Spring

Honors Course: Honors Course
Honors Course: Honors Course
Writing Emphasis: Writing Emphasis Course

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

PHCL 460: Designing Drugs - from Chemistry to Cure (3 units)
Description: This course, conducted in collaboration with the College of Medicine Department of Pharmacology, will integrate content from the entire curriculum in an advanced course focused on identification of diseases of interest, identification of disease targets, and considerations of the design of drugs targeting these molecules. This will happen at a depth of knowledge greater than that of the introductory drug discovery course (PCOL 410), and will introduce students to computational approaches to designing drug molecules based on a protein target of known 3-dimensional structure using in-class work and homework assignments.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

Enrollment requirement: (BIOC 384 or BIOC 385) and PCOL 360 and PCOL 410.

PHCL 492: Directed Research (1 - 3 units)
Description: Individual or small group research under the guidance of pharmacology faculty.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 12 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

PHCL 499: Independent Study (1 - 6 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 6 units.
Course typically offered:
Main Campus: Fall, Spring

PHCL 499H: Honors Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with faculty who have agreed to supervise such work
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 12 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

PHCL 504: Human Neurosciences (2 units)
Description: introduce students to the human nervous system anatomy and physiology. This course will enhance student's knowledge of how the nervous system functions, communicates and how damage to selective areas of the nervous system result in particular symptoms, as well as how select treatments are in particular diseases and disorders- giving students a view into the clinical practice of neurology.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Summer

Recommendations and additional information: MCB 181R, PSIO 201, PSIO 202

PHCL 512: Introduction to Pharmacology (3 units)
Description: Students will learn about the history of pharmacology, along with the principles of how drugs act to produce changes within the body. Lectures will include the anatomy and physiology of body structures, with special emphasis on the processes that govern drug absorption, distribution, metabolism, and excretion. Other lectures will include the processes that establish and maintain the intracellular electrical charge and the membrane potential, and nerve impulse conduction. Students will learn detailed information about the autonomic nervous system and cardiovascular system, including how these systems are regulated and how they can malfunction. Lectures will include how different drugs act to alter the function of the autonomic nervous system and the cardiovascular system. Graduate-level requirements include presenting in class seminal papers in pharmacology plus quizzes, mid-term and final examination. Graduate-level requirements include an additional investigative writing assignment.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Co-convened with: PHCL 412
Course typically offered:
Main Campus: Fall

PHCL 522: Contrast Agents, Molecular Imaging, and Kinetics (3 units)
Description: Current topics in drug discovery and molecular imaging involve the integration of a series of research modalities. The pharmaceutical Industry uses these modalities in their developmental and regulatory efforts to attain new indications. As well, the medical device community is continually developing new techniques to enhance medical imaging for the earliest detection of disease. Furthermore, kinetic ADME studies (absorbtion, distribution, metabolism, and excretion) are required so as to determine the fate of these agents as an indicator of efficacy and toxicity.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: CBIO 524, PHCL 524
Also offered as: BME 522, CBIO 522, OPTI 522, PCOL 522
Course typically offered:
Main Campus: Spring

Recommendations and additional information: Undergraduate seniors wishing to enroll must have a 3.00 or greater GPA.
Home department: Biomedical Engineering

PHCL 530: Pain/Neuropharmacology (2 units)
Description: Students will be introduced to the basic concepts of pain, neural pathways of touch/pain, and neuropharmacology. Students will be required to read research articles and describe the goal of the experiments and well as the techniques used in the manuscripts. Students will be exposed to current research occurring within the department. Students should interact by asking questions and answering questions during lectures. Concepts will include our current understanding of pain perception, pain pathways, and how pain may be perceived at higher cortical levels of the central nervous system (CNS). Students will be introduced to different categories of pain and medications currently used to inhibit pain. In addition, students will learn other avenues of neuropharmacology including the reward pathways in the CNS and the blood brain barrier. Students will be tested on their ability to explain concepts they have learned in class to other students.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Co-convened with: PHCL 430
Course typically offered:
Main Campus: Fall

Recommendations and additional information: PHCL 512.
Field trip: No

PHCL 544: Human Neurobiology Basics (1 unit)
Description: This course will provide an overview of anatomy, physiology, pathobiology and pharmacology of the human nervous system. The course is intended as an introduction to human neurobiology for students in the biomedical sciences including psychology. The course will provide students planning careers in the pre-health science professions (Medicine, Pharmacy, Nursing, Public Health, etc.), as well as students planning a career in biomedical research, with a valuable grounding in the fundamentals of neurobiology.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Co-convened with:
Course typically offered:
Main Campus: Fall, Spring, Summer

Recommendations and additional information: At least one course in basic human physiology
Field trip: None

PHCL 545: Drugs of Abuse (3 units)
Description: Students will learn about the social, legal, political, and ethical considerations surrounding the use and abuse of alcohol and psychotropic drugs in the U.S. Course emphasizes the pharmacological mechanisms, behavioral manifestation, and clinical utility of drugs of abuse in view of societal expectations. Graduate level requirements include a multimedia presentation on drug of abuse of choice and facilitation of one online discussion.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

Recommendations and additional information: 8 units Biology or Physiology8 units Chemistry are recommended

PHCL 551A: Molecular Targets of Pharmacological Agents (3 units)
Description: This course presents the most cutting edge approaches for studying the molecular pharmacology of intracellular signaling pathways and drug transport mechanisms. A particular emphasis is placed on rational drug design and the discovery and validation of novel drug targets. Currently marketed drugs will be discussed in detail to demonstrate how efficacious concentrations are achieved in a target tissue and to understand how drugs work at the molecular level.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

PHCL 553: Neuropharmacolgy (3 units)
Description: Role of various neurochemicals in the peripheral and central nervous systems and the effects of drugs on the nervous system, including their actions at receptors and their influence on synthesis, storage, and release of neurotransmitters.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: OSH 553, PHL 553
Course typically offered:
Main Campus: Spring

PHCL 555: Cancer Therapeutics (3 units)
Description: This course will provide a comprehensive overview of existing and experimental therapeutic options for cancer treatment. Emphasis is on understanding their mechanisms of action in order to critically evaluate the past, current and future trends in cancer therapeutics.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: CBIO 555
Course typically offered:
Main Campus: Fall

Home department: GIDP on Cancer Biology

PHCL 586A: Introduction to Medical Pharmacology Research (1 unit)
Description: Introduction to basic research techniques in pharmacology through supervised laboratory rotations; student-initiated and faculty-structured lab exercises emphasizing modern pharmacological techniques of importance to medical pharmacology.
Grading basis: Regular Grades
Career: Graduate
Course Components: Laboratory Required
Lecture May Be Offered
Repeatable: Course can be repeated a maximum of 4 times.
Equivalent to: PCOL 586A
Course typically offered:
Main Campus: Fall

PHCL 586B: Introduction to Medical Pharmacology Research (1 unit)
Description: Introduction to basic research techniques in pharmacology through supervised laboratory rotations; student-initiated and faculty-structured lab exercises emphasizing modern pharmacological techniques of importance to medical pharmacology.
Grading basis: Regular Grades
Career: Graduate
Course Components: Laboratory Required
Lecture May Be Offered
Equivalent to: PCOL 586B
Course typically offered:
Main Campus: Spring

PHCL 595B: Scientific Writing, Presentation and Bioethics (2 units)
Description: This course is intended for students enrolled in a PhD program or who have completed a Ph.D. or MD and will need to extensively use writing and presentation skills in their career. The class emphasizes writing; manuscripts, manuscript and grant reviews, scientific presentations, and applications for awards, future employment etc. Significant class participation is mandatory. This course satisfies the bioethics requirement of NIH funded grants. Signature of Course Director is required for individuals who do not meet the pre-requisite requirement.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Equivalent to: BME 595B, CBIO 595B, NRSC 595B, PCOL 595B, PS 595B
Also offered as: CBIO 595B, PS 595B
Course typically offered:
Main Campus: Spring

PHCL 596B: Critical Literature Review (1 unit)
Description: Exchange of scholarly information and/or secondary research for students to critically read and evaluate scientific literature, especially related to medical pharmacology.
Grading basis: Regular Grades
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated a maximum of 10 times.
Course typically offered:
Main Campus: Fall, Spring

PHCL 596C: Critical Literature Review & Research Seminar (1 unit)
Description: To develop skills of students to critically read, evaluate and present scientific literature or laboratory results, especially related to medical pharmacology. Every week, students will present and exchange scholarly information in a small group setting.
Grading basis: Regular Grades
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated a maximum of 7 times.
Course typically offered:
Main Campus: Fall, Spring

PHCL 599: Independent Study (1 - 4 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599,699 and 799.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 17 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

PHCL 601A: Pharmacology: General Principles (2 units)
Description: In Pharmacology 601A, students will be introduced to principles of drug actions including drug-receptor theory and intracellular communication. Topics will include radioligand binding, second messenger assays, drug response and receptor signaling. Students will interpret and construct dose response curves, as well as learn the basics of drug absorption, distribution, metabolism and excretion with an introduction to pharmacokinetics. The course will also focus on pharmacodynamics (mechanism of drug action) in which we will discuss the different receptors that drugs interact with resulting in physiological changes, and the effects of various drugs on the autonomic nervous system. This course is also a prerequisite for those students wishing to take Pharmacology 601B, and/or Pharmacology 601C.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Any course in Biochemistry or Human Physiology.

PHCL 601B: Pharmacology of Chemotherapeutics, Endocrine & Immune System Drugs (2 units)
Description: In Pharmacology 601B, students will introduced to the mechanism of action and side effects of medications used as antibiotics, antivirals, cancer chemotherapeutics and agents used to treat a variety of disorders/diseases involving the pituitary, pancreas, thyroid, parathyroid and adrenal gland. Medications impacting the function of the immune system will also be covered. The side/adverse effects of these drugs will also be emphasized.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Any course in Biochemistry or Human Physiology, and PHCL 601A or instructor consent.

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-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

PHCL 601C: Pharmacology of Cardiovascular, Pulmonary, GI & CNS Drugs (2 units)
Description: In Pharmacology 601C, students will be introduced to the mechanism of action and side effects of drugs affecting the cardiovascular, pulmonary, gastrointestinal, and central nervous system. This will include medications used for the treatment of hypertension, heart arrhythmias, hyperlipidemia, gastrointestinal ulcers, asthma, allergic rhinitis, or to alter the coagulation pathways, as well as agents used for their analgesic and antiinflammatory properties. In the central nervous system section the focus will be on medications used for the treatment of seizures, Parkinson's disease, psychosis, depression, pain, anesthetics and drugs of abuse. The basic pharmacology of ethanol will also be covered.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Any course in Biochemistry or Human Physiology, and PHCL 601A or instructor consent.

PHCL 670: Principles of Perfusion Techniques I (5 units)
Description: An introduction to basic extracorporeal techniques through discussion of blood propelling devices, heat transfer, gas transfer, bio-materials, and perfusion pharmacology.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: PCOL 670, PCOL 670, PHCL 670, SURG 670, SURG 670
Also offered as: PCOL 670, SURG 670
Course typically offered:
Main Campus: Fall

Recommendations and additional information: PHCL 671. Open to majors only.

PHCL 670A: Principles of Perfusion Sciences I (1 unit)
Description: This course is to provide the student with a thorough understanding of the physiological, pharmacological and pathophysiological principles and perfusion techniques related to heart disease, and cardiopulmonary bypass support. Examinations will cover lectures, text readings and lecture notes.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: PCOL 670A, SURG 670A
Course typically offered:
Main Campus: Summer 1 and Summer 2

Field trip: None

PHCL 670B: Principles of Perfusion Sciences I (4 units)
Description: This course is to provide the student with a thorough understanding of the physiological, pharmacological and pathophysiological principles and perfusion techniques related to heart disease, and cardiopulmonary bypass support. The course will run concurrent with PHCL 671 and PHCL 691L Preceptorship. Examinations will cover lectures, text readings and lecture notes.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Also offered as: PCOL 670B, SURG 670B
Course typically offered:
Main Campus: Fall

Field trip: None

PHCL 671: Perfusion Technology Laboratory (1 unit)
Description: An introduction to basic extracorporeal systems.
Grading basis: Regular Grades
Career: Graduate
Course Components: Laboratory Required
Equivalent to: PCOL 671, SURG 671
Also offered as: SURG 671
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Open to majors only.

PHCL 672: Perfusion Technology II (2 units)
Description: This course will provide classroom study of Perfusion technology. The areas of study will provide expanded discussion of the topics covered in PHCL 670 and PHCL 671.
Grading basis: Regular Grades
Career: Graduate
Course Components: Lecture Required
Equivalent to: PCOL 672, SURG 672
Course typically offered:
Main Campus: Spring

PHCL 691L: Perfusion Science (1 - 3 units)
Description: Students register for 3 units for Fall and Spring semesters and 1 unit for Summer Session I and II.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 25 units.
Equivalent to: PCOL 691L
Course typically offered:
Main Campus: Fall, Spring, Summer

Recommendations and additional information: Admission into circulatory sciences option within pharmacology.

PHCL 692: Directed Research (1 - 6 units)
Description: Individual Research under the guidance of Pharmacology Faculty.
Grading basis: Regular Grades
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated for a maximum of 6 units.
Course typically offered:
Main Campus: Fall, Spring, Summer

Field trip: None

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

PHCL 695L: Advanced Topics: Modulation of the Biology of Aging by Inflammation, Infection and Immunity (1 unit)
Description: An interactive graduate-level course focused on how inflammation and immune function/dysfunction contributes to key biological and medical aspects of aging. This course will evaluate the basic biology of aging with a focus on how the aging immune system impacts geriatric principles of care, common geriatric syndromes and aging-associated disease, the biologic basis of health disparities (where known), and other unique issues related to aging research. The course is open to both graduate students and medical students/residents. Graduate students funded through the Training Grant will be required to attend in their 3rd and 4th year in place of Journal Club. The course is comprised of three aspects: literature review, topic discussion, and attendance in the Advances in Aging Lecture Series (Grand Rounds). Students will be assigned relevant literature to review in advance of in-class discussion on topics in aging research. Each discussion will be led by an expert in the field. The Advances in Aging Lecture Series are 1-hour Grand Rounds that meet once per month and will add clinical perspective to the field of aging research. More information on Advances in Aging Lecture Series topics and archived lectures is available at http://aging.arizona.edu/program/advances-aging-lecture-series. Topics that will be covered in the course include: Introduction to Aging Research, Aging Theories, and Model Organisms; Replicative Senescence as a Driver of Age-Associated Inflammation; DNA Damage, Repair, and Oncogenesis; Mitochondrial Aging and Metabolism; Musculoskeletal Changes in Aging and Frailty; Infection and Immunosenescence; Aging with HIV in the age of ART; Microbiota in Aging; Neural Changes, Neurodegeneration, and Alzheimer's Disease; Cardiovascular Aging and Stroke; Stem Cell Aging and Longevity Extension/Rejuvenation Research.
Grading basis: Regular Grades
Career: Graduate
Course Components: Colloquium Required
Repeatable: Course can be repeated a maximum of 2 times.
Also offered as: BIOC 695L, CHEM 695L, CMM 695L, CPH 695L, IMB 695L, NURS 695L, PSIO 695L
Home department: Immunobiology

PHCL 696A: Research Seminar (1 - 12 units)
Description: The development and exchange of scientific information in the small group setting of a laboratory meeting.
Grading basis: Regular Grades
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated for a maximum of 12 units.
Equivalent to: PCOL 696A, TOX 696A
Course typically offered:
Main Campus: Fall, Spring

Recommendations and additional information: PHCL 620; enrolled in Graduate Program in Medical Pharmacology.

PHCL 696E: Current Research in Vision and Neurodegeneration (1 unit)
Description: The goal of this elective is to allow students working with an Ophthalmology faculty to gain experience presenting research to an academic audience.
Grading basis: Regular Grades
Career: Graduate
Course Components: Seminar Required
Repeatable: Course can be repeated for a maximum of 6 units.
Equivalent to: PHCL 696E, PSIO 696E
Also offered as: IMB 696E, OPH 696E, PSIO 696E
Course typically offered:
Main Campus: Fall, Spring

Home department: Ophthalmology & Vision Science

PHCL 699: Independent Study (1 - 6 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring

PHCL 800: Research (1 - 16 units)
Grading basis: Clerkship S,HP,P,F
Career: Medical School
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring

PHCL 899: Independent Study (1 - 16 units)
Description: The goal of this elective is to allow the student to work with a particular faculty member in pursuit of a particular field of study in pharmacology.
Grading basis: Clerkship S,HP,P,F
Career: Medical School
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring

PHCL 900: Research (1 - 12 units)
Description: Individual research, not related to thesis or dissertation preparation, by graduate students
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 11 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

PHCL 910: Thesis (1 - 12 units)
Description: Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 11 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

PHCL 920: Dissertation (1 - 9 units)
Description: Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing). May be repeated unlimited number of times, consult department for details and possible restrictions.
Grading basis: Alternative Grading: S, P, F
Career: Graduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 11 times.
Course typically offered:
Main Campus: Fall, Spring, Summer