

INTEGRATIVE PHYSIOLOGY

Physiology is the field of biology that deals with function in living organisms. The academic foundation of the department is the knowledge of how humans and animals function at the level of genes, cells, organs and systems. Our multidisciplinary curriculum requires students to take foundational courses in anatomy, mathematics, physics, physiology and statistics. With this basic knowledge, students can undertake a flexible curriculum that includes the study of biomechanics, cell physiology, endocrinology, immunology, exercise physiology, neurophysiology and sleep physiology. The department also encourages student participation in research.

Students completing a degree in integrative physiology are expected to acquire the ability and skills to:

- read, evaluate and synthesize information from the research literature on integrative physiology;
- observe living organisms and be able to understand the physiological principles underlying function;
- be able to interpret movement and performance data from laboratory measurements; and
- communicate the outcome of an investigation and its contribution to the body of knowledge on integrative physiology.

These goals are achieved by providing a curriculum that comprises required courses and elective experiences. The required courses establish the foundation of knowledge for the discipline, whereas the elective courses provide opportunities to extend this knowledge on selected topics. The elective courses include seminars, independent study and research projects on such topics as aging, applied biomechanics, applied exercise science, behavioral neuroendocrinology, epidemiology, genetics of substance abuse, integrative physiology of aging, integrative vascular biology, locomotion, molecular biology of neurodegeneration, molecular neurogenetics, molecular signaling of neurological disorders, motor behavior, neuromechanics, neurophysiology of movement, reproductive endocrinology, sleep and chronobiology, sleep and development and stress physiology.

For more information, visit the Integrative Physiology (<http://www.colorado.edu/iphy>) website.

Course code for this program is IPHY.

Bachelor's Degree

- Integrative Physiology - Bachelor of Arts (BA) (catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/integrative-physiology/integrative-physiology-bachelor-arts-ba)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa A. (https://experts.colorado.edu/display/fisid_144736)
Associate Professor; PhD, University of Michigan

Alderete, Tanya Lynn (https://experts.colorado.edu/display/fisid_159723)
Assistant Professor; PhD, University of Southern California

Bustamante, Heidi Margarita (https://experts.colorado.edu/display/fisid_146491)
Senior Instructor; MS, University of Colorado Boulder

Byrnes, William (https://experts.colorado.edu/display/fisid_100643)
Associate Professor; PhD, University of Wisconsin–Madison

Carey, Cynthia
Professor Emerita

Casagrand, Janet L. (https://experts.colorado.edu/display/fisid_100934)
Senior Instructor; PhD, Case Western Reserve University

DeSouza, Christopher A. (https://experts.colorado.edu/display/fisid_107460)
Professor; PhD, University of Maryland, College Park

Eaton, Robert
Professor Emeritus

Ehringer, Marissa A. (https://experts.colorado.edu/display/fisid_126595)
Associate Professor; PhD, University of Colorado Denver

Enoka, Roger M. (https://experts.colorado.edu/display/fisid_110122)
Professor; PhD, University of Washington

Fleshner, Monika R. (https://experts.colorado.edu/display/fisid_103304)
Professor; PhD, University of Colorado Boulder

Foley, Teresa E. (https://experts.colorado.edu/display/fisid_147351)
Senior Instructor; PhD, University of Colorado Boulder

Fowler, John S.
Professor Emeritus

Gleeson, Todd T. (https://experts.colorado.edu/display/fisid_105480)
Professor; PhD, University of California, Irvine

Grabowski, Alena Marie (https://experts.colorado.edu/display/fisid_149727)
Assistant Professor; PhD, University of Colorado Boulder

Heisler, Ruth E. (https://experts.colorado.edu/display/fisid_103195)
Associate Chair, Senior Instructor; MA, University of Colorado Boulder

Hobbs, Steven L. (https://experts.colorado.edu/display/fisid_143724)
Senior Instructor; PhD, University of Colorado Boulder

Hoeffler, Charles Albert (https://experts.colorado.edu/display/fisid_153384)
Assistant Professor; PhD, University of Arizona

Johnson, Thomas E. (https://experts.colorado.edu/display/fisid_104242)
Professor; PhD, University of Washington

LaRocca, Thomas J. (https://experts.colorado.edu/display/fisid_143989)
Instructor; PhD, University of Colorado Boulder

LeBourgeois, Monique Katherine (https://experts.colorado.edu/display/fisid_148411)
Associate Professor; PhD, University of Southern Mississippi

Link, Christopher D. (https://experts.colorado.edu/display/fisid_109073)
Associate Professor; PhD, University of Massachusetts at Amherst

Lowry, Christopher (https://experts.colorado.edu/display/fisid_143371)
Associate Professor; PhD, Oregon State University

Lynch, G. Robert
Professor Emeritus

Mazzeo, Robert (https://experts.colorado.edu/display/fisid_101031)
Associate Professor, Associate Chair; PhD, University of California, Berkeley

McQueen, Matthew B. (https://experts.colorado.edu/display/fisid_143785)
Associate Professor; DSc, Harvard University

Mood, Dale P.
Professor Emeritus

Moore, Russell (https://experts.colorado.edu/display/fisid_105756)
Professor; PhD, Washington State University

Norris, David O.
Professor Emeritus

Olsen, Gay Lynn
Instructor; ND, University of Colorado Health Sciences Center

Opp, Mark R. (https://experts.colorado.edu/display/fisid_158898)
Professor, Chair; PhD, Washington State University

Robichaux, Waldean
Professor Emeritus

Saul, Leif J. (https://experts.colorado.edu/display/fisid_116130)
Senior Instructor; PhD, University of California, Berkeley

Seals, Douglas R. (https://experts.colorado.edu/display/fisid_103375)
Distinguished Professor; PhD, University of Wisconsin–Madison

Sherwood, David
Associate Professor Emeritus

Shi, Jia (https://experts.colorado.edu/display/fisid_143673)
Instructor; PhD, Boston University

Stitzel, Jerry A. (https://experts.colorado.edu/display/fisid_102954)
Associate Professor; PhD, Johns Hopkins University

Stob, Nicole R. (https://experts.colorado.edu/display/fisid_134529)
Instructor; PhD, Colorado State University

Tsai, Pei-San (https://experts.colorado.edu/display/fisid_115292)
Professor; PhD, University of California, Berkeley

Vetter, Céline (https://experts.colorado.edu/display/fisid_159668)
Assistant Professor; PhD, Ludwig-Maximilians-Universität München (Germany)

Wright, Kenneth P. (https://experts.colorado.edu/display/fisid_125586)
Professor; PhD, Bowling Green State University

Courses

IPHY 1181 (2) Biological Probiotic/Drug Discovery Through Hands-on Screens

Provides introduction to research and laboratory experience. Students will work in teams to screen novel mycobacterial strains for use as probiotics or immunoregulatory/anti-inflammatory drugs using THP-1 cells, a human monocytic cell line. Topics covered include the hygiene or "Old Friends" hypothesis, the human microbiome, approaches to screening for new probiotics of therapeutics and statistical analysis of the data.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1181

Grading Basis: Letter Grade

IPHY 1950 (3) Introduction to Scientific Writing in Integrative Physiology

Provides an overview of writing skills and strategies, emphasizing those most important to the sciences, especially physiology. Focuses on fundamental skills, objective analysis, and scientific persuasion, with attention to clear organization and style, academic and scientific mechanics, and distinctions between audiences.

Requisites: Restricted to students with 0-86 credits (Freshmen, Sophomore or Juniors) only.

Additional Information: Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

MAPS Course: English

IPHY 2010 (1-3) Seminar in Integrative Physiology

Introduces a small group of lower-division students to current research topics in integrative physiology. Emphasizes relevant applications to real-world situations.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 2400 (2) Introduction to Medical Terminology for Future Health Professionals

Provides an introduction to medical terminology used within the health professions. Word roots, prefixes and suffixes used in medical records for major body systems will be examined and explained. The structure and functions of the major systems will be defined and described.

Recommended for IPHY students and students interested in pursuing a career in the health professions. No prerequisites required.

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 2420 (3) Nutrition for Health and Performance

Focuses on the basic anatomy, physiology, and chemistry of nutrition. Topics include weight management, the role of diet and lifestyle in disease prevention, specific nutrient deficiencies and toxicities, nutrition standards and guidelines, sports nutrition recommendations, agricultural practices, and food policy issues.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 3400

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 2500 (1) Perspectives in Health and Medicine

Designed to increase awareness of issues that surround international and U.S. health care. Provides broad overview of topics relevant to 21st century medical practice. Includes guest lectures by faculty and practitioners from Denver Metro region, followed by opportunities to integrate new concepts using small group discussion and writing. Topics change each semester and may include: global development and health; socio-cultural issues in health care; health disparities; applied bioethics; health care system reform; narrative medicine.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Pass/Fail

Additional Information: Arts Sci Gen Ed: Distribution-Social Sciences

IPHY 2750 (3) Introduction to Exercise Psychology

Focuses on how psychological factors influence exercise and motor performance in both clinical and sport settings. Major topics include motivation, arousal, stress, imagery, self-confidence, concentration and burnout. Principles of psychological skills training are also discussed.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 2800 (4) Introduction to Statistics

Examines the application of statistics to research relevant to integrative physiology. Includes instruction and hands-on experience with related computer programs and interpretation of the results of their use.

Requisites: Restricted to Integrative Physiology (IPHY) majors only.

Recommended: Prerequisite MATH 1300.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

IPHY 2910 (1-6) Practicum in Integrative Physiology

Offers practical experience in organized situations with direct supervision.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

IPHY 3010 (1-2) Teaching in Integrative Physiology

Provides an opportunity to assist in teaching specific laboratory sections in IPHY under direct faculty supervision. Students must make arrangements with the faculty member responsible for the course in which they plan to assist.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

IPHY 3400 (3) Nutrition for IPHY Majors

Focuses on the science of nutrition, reviewing the basic anatomy, physiology and chemistry of nutrition. Concepts will focus on what the body needs for proper nutrition, how they are obtained, absorbed and processed by the body. Studies will expand to include the following: diet types, nutrition during life stages (i.e. pregnancy), different disease states and real world applications.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 2420

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Recommended: Prerequisite IPHY 3410.

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3410 (3) Human Anatomy

Explores the cells, tissues, and organs that compose the different anatomical systems including integumentary, skeletal, muscular, digestive, respiratory, cardiovascular, lymphatic, nervous, urinary and reproductive. Department enforced prerequisite: one year of general biology (lecture + lab).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3415 (2) Human Anatomy Laboratory

Introduces structures of the human anatomical systems using human cadavers and animal tissue. This laboratory is meant to complement IPHY 3410. Department enforced prerequisites: one year of general biology (lecture + lab) and prerequisite or corequisite: IPHY 3410.

Requisites: Requires prerequisite or corequisite of IPHY 3410 (minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3430 (3) Human Physiology

Introduces the physiology of the nervous, muscular, cardiovascular, respiratory, urinary, immune, endocrine, digestive and reproductive systems. Department enforced requisites: one year: one year of general biology (lecture and lab). Recommended: IPHY 3415.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 3470

Requisites: Requires prerequisite courses of CHEM 1113/1114 or CHEM 1400/1401 or CHEN 1211/CHEM 1221 and IPHY 3410 (all minimum grade C-). Restricted to non-Integrative Physiology (IPHY) majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3435 (2) Physiology Lab

Introduces laboratory experience in selected aspects of human and comparative physiology for students in pharmacy and allied health programs. Department enforced requisites: one year of general biology (lecture + lab); one year of general chemistry (lecture + lab) ; statistics (prereq or coreq). IPHY 3430 and IPHY 3435 may be taken at the same time.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-).

Recommended: Prerequisite IPHY 3415, and recommended corequisite: IPHY 3480 (majors only).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3440 (3) Clinical Nutrition

Exploration of clinical nutrition concepts from a health care provider perspective. Examines how and why diseases develop and what nutritional therapy and intervention is appropriate for disease resolution.

Requisites: Requires prerequisite of IPHY 2420 or IPHY 3400 (both minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3450 (3) Comparative Animal Physiology

Introduces principles of animal physiology and responses to environmental change. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3460 (5) Comparative Vertebrate Anatomy

Introduces major components of the vertebrate body and how they are organized into a whole organism, emphasizing function, evolution, and diversity of these basic features. Laboratories involve dissection of representative groups and demonstrations. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3470 (3) Human Physiology 1

Focuses on scientific thinking, cell physiology, neurophysiology, endocrinology, immunology and musculoskeletal physiology. The first semester of a two-semester sequence for IPHY and NRSC majors only. Department enforced prerequisites: one year of general biology (lecture and lab); statistics equivalent. Recommended course: IPHY 3415. Those who took IPHY 3430 prior to becoming IPHY major, will only receive credit for IPHY 3470.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 3430

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 (all minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3480 (3) Human Physiology 2

Focuses on the physiology of the respiratory, cardiovascular, urinary, digestive and reproductive systems. The second semester of a two-semester sequence for IPHY and NRSC majors. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3410.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Recommended: Prerequisite IPHY 3415, and recommended corequisite: IPHY 3435.

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3490 (3) Introduction to Epidemiology

Examines the history and uses of epidemiology, measures of disease frequency and occurrence, association and causality, analytic epidemiology, evidence-based screening and outbreak investigations.

Recommended: Prerequisites IPHY 2800 and SOCY 2061 and PSYC 3101.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3500 (2) Applied Clinical Research

Introduces fundamental concepts of clinical research to those interested in pursuing a career in medicine or medical research. In addition to lectures introducing students to research design, errors in research and basic biostatistics, there will be significant emphasis on participation in on-going medical research at Denver Health Medical Center and The Children's Hospital. This unique experience will provide students with first-hand exposure to all aspects of clinical research. Department enforced prerequisites: one year of general biology (lecture + lab).

Recommended: Prerequisite CHEM 3111 and premedical focus and/or previous research experience.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3580 (3) Sleep, Circadian Rhythms and Health

Examines the history of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidence-based sleep and circadian interventions/preventions in healthy and clinical samples. Department enforced prerequisites: one year general biology plus labs, and one semester of statistics.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3590 (3) Health and Function over the Adult Lifespan

Examines topics in the field of biomedical aging in the context of public health including: lifespan, changing demographics of aging, healthspan, genetics of aging; physiology of aging (changes in function with age; biological mechanisms of aging); clinical disorders of aging (aging and chronic diseases; clinical syndromes in geriatric medicine); lifestyle and pharmacological strategies for preserving health and function with aging.

Requisites: Prereqs of EBIO 1210/1220 or MCDB 1150/2150

EBIO 1230/1240 or MCDB 1161, 1171, 1181 or IPHY 1181 ANTH 4000 or APPM 4570 or BCOR 1020 or ECON 3818 or GEOG 3023 or GEOL 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or SOCY 2061 (min grade C-

IPHY 3660 (3) Dynamics of Motor Learning

Focuses on information processing approaches and dynamical systems theory as explanations for human motor learning and the coordination of movement. Various topics are discussed from both perspectives including practice organization, attainment of elite performance, and the production of novel movements.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3700 (3) Scientific Writing in Integrative Physiology

Takes a process-based approach to writing. Assignments and classroom experiences emphasize critical thinking, using scientific evidence and reasoning to construct original arguments, and applying conventions and problem-solving skills to craft successful documents. Department enforced prerequisite: IPHY 2800 or equivalent.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Additional Information: Arts Sci Core Curr: Written Communication
Arts Sci Gen Ed: Written Communication-Upper

IPHY 3800 (3) Forensic Biology

Introduces basic concepts of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology, and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 3810 (1) Forensic Biology Laboratory

Introduces basic laboratory techniques and procedures of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Recommended: Corequisite IPHY 3800.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences
Arts Sci Gen Ed: Distribution-Natural Sci Lab

IPHY 4010 (1-3) Seminar in Integrative Physiology

Introduces a small group of students to current research topics in integrative physiology, evaluation of current research and discussion of critical issues. Department enforced prerequisite: IPHY 2800 or equivalent.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4060 (4) Cell Physiology

Lect. and lab. Introduces the biology of eukaryotic systems at molecular, cellular and systems levels of integration, emphasizing the complementarities of structure and function and physiological mechanisms of regulation at the cellular and molecular level. Department enforced prerequisite: one year of general biology (lecture + lab). Formerly IPHY 3060.

Requisites: Requires prerequisite course of IPHY 3430 or IPHY 3470 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5200

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4420 (3) Nutrition and Human Performance

Examines nutrient use during exercise and the nutrient needs of athletes and active individuals, including strategies to improve physical performance and recovery through dietary manipulations and dietary supplements.

Requisites: Requires prerequisite course of IPHY 2420 or IPHY 3400 (minimum grade C-).

IPHY 4440 (4) Endocrinology

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5440

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4470 (3) Biology of Human Reproduction

Anatomy and physiology of human reproduction, including gender determination, embryology, puberty, menstrual cycle, pregnancy, lactation, menopause, sexual behavior, sexual abnormalities and contraception. Open to nonmajors. Department enforced prerequisites: one year of general biology (lecture + lab).

Recommended: Prerequisites IPHY 3470 and IPHY 3480 (majors) or IPHY 3430 or (non-majors) or IPHY 4440.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4480 (3) Comparative Reproduction

Focuses on comparative anatomy and physiology of reproductive system and the evolution of reproductive behavior in vertebrates and invertebrates. Topics include courtship, mating, fertilization, estrous and menstrual cycles and environmental control of seasonal reproduction. Department enforced prerequisite: one year of general biology (lecture + lab).

Recommended: Prerequisite IPHY 3480 (majors) or IPHY 3430 (non-majors).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4490 (3) Case Studies in Public Health

Explores case studies in public health in how they have influenced our approach to disease outbreaks and disease resolution. Examines famous case studies in infectious disease, zoonoses and non-infectious diseases, including environmental and occupational exposure to see how they have changed our understanding of disease and responses by health and medical personnel. Examines special populations within public health, as well as discuss modern public health challenges.

Requisites: Requires prerequisite courses of IPHY 3490 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4540 (5) Biomechanics

Applies the principles of physics and physiology to the analysis of human movement. Quantitative analysis of forces, torque, mechanical energy, power impulses and momentum associated with human movement. Mechanical properties of muscles, tendons, ligaments and bones.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Recommended: Prerequisites (MATH 1300 or MATH 1310 or APPM 1350) and IPHY 3415.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4580 (3) Sleep Physiology

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4600 (3) Immunology

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5600

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY), Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Recommended: Prerequisite IPHY 3060.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4650 (5) Exercise Physiology

Examines physiological and biochemical adjustments that occur in the body with acute and chronic exercise. Topics center on physiological mechanisms pertaining to metabolic, cardiovascular, and hormonal alterations, the role of exercise in health and disease, soreness and fatigue, immune function, as well as exercise during varied environmental conditions. Department enforced prerequisites: IPHY 2800 or equivalent and IPHY 3480. Department enforced corequisite: IPHY 3410.

Requisites: Requires prerequisite course of IPHY 3470 and 3480 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4660 (3) Critical Thinking in Integrative Physiology

Covers specific integrative physiology topics in areas such as animal physiology, endothelial function, neurobiology, exercise immunology and exercise physiology. Department enforced prerequisite: 13-hours of IPHY coursework.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4680 (3) Critical Thinking in Exercise Physiology

Covers specific exercise physiology topics such as cellular cause of fatigue and muscle soreness, heart disease, regulation of blood flow, diabetes, aging, training adaptations, exercise at high altitude, ergogenic aids and excitation-contraction of muscle. Department enforced prerequisite: IPHY 4650.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4720 (4) Neurophysiology

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5720

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4730 (3) Integrative Motor Control

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5730

Recommended: Prerequisites IPHY 3410 and IPHY 3470.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4740 (3) Theory of Motor Skill Learning

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory, and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5740

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4850 (1) Honors Thesis Seminar

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

Recommended: Prerequisite IPHY 3700, minimum 3.3 GPA and a declared IPHY major and approval by departmental honors committee.

Grading Basis: Pass/Fail

IPHY 4860 (1-6) Independent Study: Undergraduate

Students may register for more than one section per term.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

IPHY 4870 (1-3) Honors Thesis

Department enforced prerequisites: IPHY 2800 and IPHY 3700.

Additional Information: Arts Sciences Honors Course

IPHY 4880 (3) Advanced Data Analysis in Biomedical Research

Provides advanced training on statistics and scientific reasoning in laboratory and clinical research. Conceptual foundations of classical and modern statistical techniques is reviewed. Multiple class projects consist of written reports on statistical analysis of data representative of the student's field of interest. The use of statistical packages, primarily R, is required.

Requisites: Requires prerequisite course of IPHY 2800 (minimum grade C).

Grading Basis: Letter Grade

IPHY 4890 (3) Community-Based Primary Health Care

Introduces models of Community-Based Health Care (CBPHC), relevant research regarding the models and methods of implementation in rural low resource settings. This 3 week summer global seminar in Nicaragua also includes public health data collection in a rural area in conjunction with local health promoters. Provides students with practical skills in the implementation of CBPHC in rural low resource settings.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite GEOG 3692.

Grading Basis: Letter Grade

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

IPHY 4930 (1-6) Internship

Provides an opportunity for field/laboratory work in a variety of different settings. Consult with faculty for approval. Department enforced prerequisite: completion of at least two of the major core classes.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 4940 (1-6) Application for Clinical Internship

Provides an opportunity for clinical experience in a clinic or hospital setting with which the University has an established Affiliation Agreement. Consult with faculty for approval. Department enforced prerequisite: completion of two 3000-level courses.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 4950 (1-6) Global Study Abroad Internship

Provides an opportunity to combine international experiential learning and academic theory as a means to gain professional experience and to develop a new perspective on a career field. Contact the Study Abroad office for information on available opportunities and to find out how to enroll in this course.

Repeatable: Repeatable for up to 6.00 total credit hours.