Human Physiology (HPHY)

Courses

HPHY 105. Principles of Nutrition. 4 Credits.
Explores the fundamentals of nutrition and its application to culture, lifestyle, and health as they relate to humans across the lifespan. Course will be taught once or more per academic year.
Additional Information:
Science Area

HPHY 199. Special Studies: [Topic]. 1-4 Credits.
Experimental course - topic varies.
Repeatable 99 times

HPHY 211. Medical Terminology. 3 Credits.
Explore and develop skills in language and terminology specific to the medical sciences with an emphasis on derivation, meaning, and pronunciation.

HPHY 212. Scientific Investigation in Physiology. 4 Credits.
Explores the process of conducting and communicating scientific research, and how data and statistics help us build and understand scientific knowledge about physiology and medicine.
Additional Information:
Science Area

HPHY 321. Human Anatomy I. 5 Credits.
Introduction to the human body and histology; nerves; central, autonomic, and peripheral nervous systems; cranial nerves; regional anatomy of the head; special senses. Includes cadaver laboratory.
Requisites: Prereq: HPHY 211; BI 222Z or BI 282H; CH 223Z or CH 226H.

HPHY 322. Human Physiology I. 5 Credits.
Neuro- and muscular physiology: action potentials; synapses and receptors; skeletal muscle; central, peripheral, and autonomic nervous systems; special senses. Includes human-based laboratory. Sequence with HPHY 321, HPHY 323, HPHY 324, HPHY 325.
Requisites: Prereq: HPHY 212; BI 222Z or BI 282H; CH 223Z or CH 226H.

HPHY 323. Human Anatomy II. 5 Credits.
Heart, lungs, and vasculature in addition to regional exploration of the musculosketetal system. Includes cadaver laboratory. Sequence with HPHY 321, HPHY 322, HPHY 324, HPHY 325.
Requisites: Prereq: HPHY 321.

HPHY 324. Human Physiology II. 5 Credits.
Cardiovascular system; respiratory system; immunology. Includes human-based laboratory. Sequence with HPHY 321, HPHY 322, HPHY 323, HPHY 325.
Requisites: Prereq: HPHY 322.

HPHY 325. Human Anatomy and Physiology III. 5 Credits.
Anatomy and physiology of the digestive, reproductive, and renal systems; endocrinology. Includes combination of cadaver laboratory and human-based laboratory. Sequence with HPHY 321, HPHY 322, HPHY 323, HPHY 324.
Requisites: Prereq: HPHY 323, HPHY 324.

HPHY 333. Motor Control. 4 Credits.
Introduction to the processes of control and coordination in the performance of motor skills. Neurophysiological, mechanical, and cognitive bases of motor skill acquisition.
Requisites: Prereq: [HPHY 321, HPHY 322] or PSY 304.

HPHY 362. Tissue Injury and Repair. 4 Credits.
Exploration of the physiology of injury and trauma. Emphasis on inflammation and healing of connective tissue injury, tissue biomechanics, mechanisms of injury, and clinical orthopedic evaluation techniques.
Requisites: Prereq: HPHY 323, HPHY 324.

HPHY 371. Physiology of Exercise. 4 Credits.
Physiology of exercise, physical conditioning, and training; mechanisms and significance of these effects for health and performance.
Requisites: Prereq: HPHY 323, HPHY 324.

HPHY 374. Clinical Electrocardiography and Exercise. 4 Credits.
Overview of pathophysiology, diagnostic testing, exercise prescription and rehabilitation of cardiovascular diseases. Incorporated throughout the course, students will learn the fundamentals of electrocardiography and how this tool is applied in both the diagnostic and rehabilitative settings.
Requisites: Prereq: HPHY 371.

HPHY 375. Metabolism and Nutrition. 4 Credits.
Exploration of cellular, tissue, and whole body integrated metabolic processes as the basis of physiologic function. Integrating the metabolism of macronutrients at the cellular, tissue, and whole body systems level in the context of human growth, function, and disease.
Requisites: Prereq: HPHY 325, HPHY 371.

HPHY 381. Biomechanics. 4 Credits.
Fundamental principles of physics applied to the analysis of human movement. Emphasis on developing abilities to analyze human movement quantitatively.
Requisites: Prereq: HPHY 323, PHYS 201.

HPHY 399. Special Studies: [Topic]. 1-4 Credits.
Experimental course - topic varies.
Repeatable 99 times

HPHY 401. Research: [Topic]. 1-15 Credits.
Disciplined inquiry of a topic with varying techniques and assignments suited to the nature and conditions of the problem being investigated. Often pursued in relation to a dissertation or thesis.
Repeatable 99 times

HPHY 403. Thesis. 1-4 Credits.
For honors students during the terms in which they conduct research or write a thesis.
Repeatable 99 times

HPHY 404. Internship: [Topic]. 1-16 Credits.
Field experience in an agency, institution, or business. Practice knowledge from courses: planning, organizing, directing, evaluating, and developing professional competence.
Repeatable 99 times

HPHY 405. Special Problems: [Topic]. 1-12 Credits.
Reading and assignments in connection with other courses for extra credit. Honors readings.
Repeatable 99 times

HPHY 406. Practicum: [Topic]. 1-12 Credits.
Assist students learning anatomy or physiology in either the lecture or lab courses.
Repeatable 99 times

HPHY 407. Seminar: [Topic]. 1-5 Credits.
Topics are offered regularly in such areas as health sciences, motor control, biomechanics, and physiology.
Repeatable 99 times

HPHY 408. Workshop: [Topic]. 1-15 Credits.
An intensive experience, limited in scope and time, in which a group of students focus on skills development rather than content mastery.
Repeatable 99 times

HPHY 409. Terminal Project. 1-12 Credits.
A presentation incorporating the knowledge and skills acquired from course work completed for a degree.
Repeatable 99 times

HPHY 410. Experimental Course: [Topic]. 1-5 Credits.
Experimental course - topic varies.
Repeatable 99 times

HPHY 411. Scientific Teaching. 1 Credit.
For students currently completing the human anatomy and physiology core sequence; focuses on how people learn, evidence-based teaching practices, and strategies to improve student inclusion and representation.

Requisites: Prereq: HPHY 211, HPHY 212.
Additional Information:
General Limitation applies: Applied, skills, career, or professional development course

HPHY 412. Sleep Physiology. 4 Credits.
Fundamental principles of sleep and how physiology is affected by sleep.
Requisites: Prereq: HPHY 325.

HPHY 413. Muscle Structure, Function, and Plasticity. 4 Credits.
Physiologic basis for skeletal muscle adaptation to increased and decreased use and injury. Emphasizes how structure dictates function relevant to rehabilitation.
Requisites: Prereq: HPHY 323, HPHY 324.

HPHY 414. Muscle Metabolism. 4 Credits.
Metabolic basis for skeletal muscle adaptation to increased and decreased use, and injury models. Emphasizes interorgan communication; uses clinical models.
Requisites: Prereq: HPHY 371.

HPHY 420. Human Anatomy Dissection. 2 Credits.
Dissection of one region of a preserved donated human cadaver and preparation of the specimen for the HPHY 321/HPHY 323/HPHY 325 laboratory experience. Students are accepted by application, which are due early February.
Requisites: Prereq: HPHY 323.

HPHY 422. Physiology of Obesity. 4 Credits.
Explores potential causes of the obesity epidemic, cellular mechanisms linking obesity to insulin resistance and metabolic diseases, and interventions in treatment of metabolic disease and obesity.
Requisites: Prereq: HPHY 325, HPHY 371.

HPHY 423. Physiology of Aging. 4 Credits.
Examines changes that occur to cells and organs in old age and the causes of age-related disease and dysfunction (cardiovascular disease, diabetes, osteoporosis, Alzheimer's); interventions to increase longevity.
Requisites: Prereq: HPHY 325.

HPHY 432. Neural Development. 4 Credits.
Exploration of development of the cells in the nervous system. We will discuss the importance of "critical periods" in development and how interventions or dysfunction during critical periods can lead to neurodevelopmental disorders using the respiratory system as a model system.
Requisites: Prereq: HPHY 321, HPHY 322.

HPHY 433. Neurophysiology of Concussion. 4 Credits.
Investigate diagnosis, deficits, and treatment of mild traumatic brain injury and neurophysiological effects.
Requisites: Prereq: HPHY 325, HPHY 333.

HPHY 434. Movement Disorders. 4 Credits.
Discusses the clinical manifestations and underlying physiological mechanisms of selected movement disorders. Emphasizes the role of scientific experiment in diagnosis and treatment.
Requisites: Prereq: HPHY 321, HPHY 322.

HPHY 436. Clinical Neuroscience. 4 Credits.
This course covers neurological diseases and disorders from a neuroscience perspective. The focus will be on applying basic neuroscience principles to better understand clinical practices including patient diagnosis and treatments.
Requisites: Prereq: HPHY 321, HPHY 322.

HPHY 462. Therapeutic Techniques. 4 Credits.
Clinical application of therapeutic techniques including modalities and rehabilitation for soft-tissue orthopedic injuries. Offered alternate years.
Requisites: Prereq: HPHY 362.

HPHY 470. Environmental Physiology. 4 Credits.
Examination of physiological adaptations to acute and chronic exposure to extreme heat, cold, and high altitude.
Requisites: Prereq: HPHY 371.

HPHY 473. High Altitude Physiology and Medicine. 4 Credits.
Explores major physiologic responses to high altitude (hypoxia), both adaptive and maladaptive, from systems to molecular level, as well as pathophysiologic conditions at high altitude. Offered alternate years.
Requisites: Prereq: HPHY 325, HPHY 371.

HPHY 503. Thesis. 1-16 Credits.
A written document resulting from study or research and submitted as a major requirement for a degree.
Repeatable 99 times

HPHY 507. Seminar: [Topic]. 1-5 Credits.
Topics are offered regularly in such areas as health sciences, motor control, biomechanics, and physiology.
Repeatable 99 times

HPHY 508. Workshop: [Topic]. 1-15 Credits.
An intensive experience, limited in scope and time, in which a group of students focus on skills development rather than content mastery.
Repeatable 99 times

HPHY 510. Experimental Course: [Topic]. 1-5 Credits.
Experimental course - topic varies.
Repeatable 99 times

HPHY 512. Sleep Physiology. 4 Credits.
Fundamental principles of sleep and how physiology is affected by sleep.

HPHY 513. Muscle Structure, Function, and Plasticity. 4 Credits.
Physiologic basis for skeletal muscle adaptation to increased and decreased use and injury. Emphasizes how structure dictates function relevant to rehabilitation.

HPHY 514. Muscle Metabolism. 4 Credits.
Metabolic basis for skeletal muscle adaptation to increased and decreased use, and injury models. Emphasizes interorgan communication; uses clinical models.

HPHY 520. Human Anatomy Dissection. 2 Credits.
Dissection of one region of a preserved donated human cadaver and preparation of the specimen for the HPHY 321/HPHY 323/HPHY 325 laboratory experience. Students are accepted by application, which are due early February.

HPHY 522. Physiology of Obesity. 4 Credits.
Explores potential causes of the obesity epidemic, cellular mechanisms linking obesity to insulin resistance and metabolic diseases, and interventions in treatment of metabolic disease and obesity.

HPHY 523. Physiology of Aging. 4 Credits.
Examines changes that occur to cells and organs in old age and the causes of age-related disease and dysfunction (cardiovascular disease, diabetes, osteoporosis, Alzheimer's); interventions to increase longevity.

HPHY 532. Neural Development. 4 Credits.
Exploration of development of the cells in the nervous system. We will discuss the importance of "critical periods" in development and how interventions or dysfunction during critical periods can lead to neurodevelopmental disorders using the respiratory system as a model system.

HPHY 533. Neurophysiology of Concussion. 4 Credits.
Investigate diagnosis, deficits, and treatment of mild traumatic brain injury and neurophysiological effects.

HPHY 534. Movement Disorders. 4 Credits.
Discusses the clinical manifestations and underlying physiological mechanisms of selected movement disorders. Emphasizes the role of scientific experiment in diagnosis and treatment.

HPHY 536. Clinical Neuroscience. 4 Credits.
This course covers neurological diseases and disorders from a neuroscience perspective. The focus will be on applying basic neuroscience principles to better understand clinical practices including patient diagnosis and treatments.

HPHY 570. Environmental Physiology. 4 Credits.
Examination of physiological adaptations to acute and chronic exposure to extreme heat, cold, and high altitude.

HPHY 573. High Altitude Physiology and Medicine. 4 Credits.
Explores major physiologic responses to high altitude (hypoxia), both adaptive and maladaptive, from systems to molecular level, as well as pathophysiologic conditions at high altitude. Offered alternate years.

HPHY 601. Research: [Topic]. 1-16 Credits.
Disciplined inquiry of a topic with varying techniques and assignments suited to the nature and conditions of the problem being investigated. Often pursued in relation to a dissertation or thesis.
Repeatable 99 times

HPHY 603. Dissertation. 1-16 Credits.
A written document resulting from study or research and submitted as a major requirement for a degree.
Repeatable 99 times

HPHY 605. Reading and Conference: [Topic]. 1-16 Credits.
A particular selection of material read by a student and discussed in conference with a faculty member.
Repeatable 99 times

HPHY 606. Practicum: [Topic]. 1-16 Credits.
Selected problems in the field of human physiology.
Repeatable 99 times

HPHY 607. Seminar: [Topic]. 1-9 Credits.
Topics are offered regularly in such areas as health sciences, motor control, biomechanics, and physiology.
Repeatable 99 times

HPHY 608. Workshop: [Topic]. 1-16 Credits.
An intensive experience, limited in scope and time, in which a group of students focus on skills development rather than content mastery.
Repeatable 99 times

HPHY 609. Terminal Project. 1-12 Credits.
A presentation incorporating the knowledge and skills acquired from course work completed for a degree.
Repeatable 99 times

HPHY 610. Experimental Course: [Topic]. 1-5 Credits.
Experimental course - topic varies.
Repeatable 99 times

HPHY 611. Professional Skills I: Effective Teaching. 1 Credit.
Development of professional skills for academic careers related to human physiology. Sequence with HPHY 612, HPHY 613.

HPHY 612. Professional Skills II: Responsible Research. 1 Credit.
Development of professional skills for academic careers related to human physiology. Sequence with HPHY 611, HPHY 613.

HPHY 613. Professional Skills III: Career Development. 1 Credit.
Development of professional skills for academic careers related to human physiology. Sequence with HPHY 611, HPHY 612.

HPHY 621. Systems Physiology I. 4 Credits.
Advanced overview of neural physiology, neural control of human movement, and the biomechanical constraints underlying that control. Sequence with HPHY 622, HPHY 623.

HPHY 622. Systems Physiology II. 4 Credits.
Advanced overview of cardiovascular physiology and skeletal muscle cell physiology and metabolism.

HPHY 623. Systems Physiology III. 4 Credits.
Advanced overview of renal and respiratory physiology.

HPHY 631. Human Performance and Sports Products. 3 Credits.
Exploration of sciences of human performance: physiology and kinesiology, which inform the Sports Product Industry at the level of product development, product design and marketing. Available to non-majors only.
Equivalent to: HPHY 631M, SPM 631M

HPHY 631M. Human Performance and Sports Products. 3 Credits.
Exploration of sciences of human performance: physiology and kinesiology, which inform the Sports Product Industry at the level of product development, product design and marketing. Multilisted with SPM 631M.
Equivalent to: HPHY 631, SPM 631M

HPHY 632. Human Biomechanics and Sports Product Design. 2 Credits.
Exploration of sciences of human biomechanics, which inform the Sports Product Industry at the level of product development, product design and marketing. Sequence with HPHY 631.
Requisites: Prereq: HPHY 631.

HPHY 662. Manual Therapy: Spine, Lower Quadrant. 2 Credits.
Advanced skills in muscle energy, mobilization, and trigger-point release techniques for the spine and lower quadrant. For certified athletic trainers. Offered alternate years.

HPHY 670. Advanced Respiratory Physiology. 4 Credits.
Explores advanced concepts in respiratory physiology; includes exercise adaptations and examples of pathophysiology. Offered alternate years.
Requisites: Prereq: HPHY 623.

HPHY 676. Human Cardiovascular Control. 4 Credits.
Cardiovascular physiology, including central control of blood pressure and flow regulation. An integrative approach toward how the cardiovascular system is coordinated with overall body function. Offered alternate years.
Requisites: Prereq: HPHY 623.

HPHY 684. Kinematics of Human Movement. 4 Credits.
Theory and application of kinematic analysis of human motion. Emphasis on 2D and 3D kinematics, including data collection, analysis and modeling. Offered alternate years.
Requisites: Prereq: HPHY 621.

HPHY 685. Kinetics of Human Movement. 4 Credits.
Experimental methods and mechanical theories associated with the analysis of joint forces and movements during human motion. Offered alternate years.
Requisites: Prereq: HPHY 621.