Human Physiology Courses

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.

HPHY 199. Special Studies: [Topic]. 1-4 Credits.
Repeatable.

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.

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. Prereq: HPHY 211, BI 212 or BI 282H, CH 223 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. Prereq: HPHY 212; BI 212 or BI 282H; CH 223 or CH 226H.

HPHY 323. Human Anatomy II. 5 Credits.
Heart, lungs, and vasculature in addition to regional exploration of the musculoskeletal system. Includes cadaver laboratory. Sequence with HPHY 321, HPHY 322, HPHY 324, HPHY 325. 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. Prereq: HPHY 321, 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. 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. Neuropsychophysical, mechanical, and cognitive bases of motor skill acquisition. 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. 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. Prereq: HPHY 323, HPHY 324.

HPHY 374. Clinical Electrocardiography and Exercise. 4 Credits.
Overview of pathophysiologic, 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. 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. Prereq: HPHY 325, HPHY 371.

HPHY 381. Biomechanics. 4 Credits.

HPHY 399. Special Studies: [Topic]. 1-4 Credits.
Repeatable.

HPHY 401. Research: [Topic]. 1-15 Credits.
Repeatable.

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

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

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

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

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

HPHY 408. Workshop: [Topic]. 1-15 Credits.
Repeatable.

HPHY 409. Terminal Project. 1-12 Credits.
Repeatable.

HPHY 410. Experimental Course: [Topic]. 1-5 Credits.
Repeatable.
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.
Prereq: HPHY 211, HPHY 212.

HPHY 412. Sleep Physiology. 4 Credits.
Fundamental principles of sleep and how physiology is affected by sleep.
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.
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.
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.
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.
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.
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.
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.
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.
Prereq: HPHY 325, HPHY 333.

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.
Prereq: HPHY 321, HPHY 322.

HPHY 444. Clinical Anatomy. 4 Credits.
Through case-based learning, students have the opportunity to apply the knowledge of anatomy and physiology in the context of clinical practice and diagnosis.
Prereq: HPHY 325.

HPHY 462. Therapeutic Techniques. 4 Credits.
Clinical application of therapeutic techniques including modalities and rehabilitation for soft-tissue orthopedic injuries. Offered alternate years.
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.
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.
Prereq: HPHY 325, HPHY 371 with a grade of C or better.

HPHY 503. Thesis. 1-16 Credits.
Repeatable.

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

HPHY 508. Workshop: [Topic]. 1-15 Credits.
Repeatable.

HPHY 510. Experimental Course: [Topic]. 1-5 Credits.
Repeatable.

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

PHY 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.

PHY 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.

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

PHY 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.

PHY 601. Research: [Topic]. 1-16 Credits.
Repeatable.

PHY 603. Dissertation. 1-16 Credits.
Repeatable.

PHY 605. Reading and Conference: [Topic]. 1-16 Credits.
Repeatable.

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

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

PHY 608. Workshop: [Topic]. 1-16 Credits.
Repeatable.

PHY 609. Terminal Project. 1-12 Credits.
Repeatable.

PHY 610. Experimental Course: [Topic]. 1-5 Credits.
Repeatable.

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

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

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

PHY 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 PHY 622, PHY 623.

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

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

PHY 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.

PHY 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. Multliisted with SPM
631M.

PHY 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 PHY 631.
Prereq: PHY 631.

PHY 660. Basic Science in Clinical Decisions. 4 Credits.
Literature-based investigation into the basic science and clinical research
underlying clinical decisions in athletic medicine.

PHY 661. Manual Therapy: Movement Patterns, Core Stability. 2
Credits.
Advanced skills in proprioceptive neuromuscular facilitation (PNF)
movement patterns, and both pilates principles and manual therapy to
improve core stability. For certified athletic trainers. Offered alternate
years.

Advanced skills in muscle energy, mobilization, and trigger-point release
techniques for the spine and lower quadrant. For certified athletic
trainers. Offered alternate years.

PHY 669. The Female Athlete. 4 Credits.
Literature-based investigation of the unique anatomy and physiology,
as well as social-cultural issues, of the female athlete related to sports
medicine.

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

PHY 671. Therapeutic Restoration of Biomotor Abilities. 3 Credits.
Exploration of advanced rehabilitation techniques for athletic trainers,
including advanced program design, evaluation, and movement-sport
analysis.
Pre- or coreq: certification as an athletic trainer or physical therapist.

PHY 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.
Prereq: PHY 623.

PHY 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.
Prereq: PHY 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.
Prereq: HPHY 621.