

Descriptions – PHYSICS

of

Courses

947. Solid State Physics I
Fall of odd-numbered years. 3(3-0)
PHY 839 and PHY 840.

Crystal symmetry, crystal binding, lattice vibrations and specific heat, one-electron theory; Hartree-Fock equation, Brillouin zones.

948. Solid State Physics II
Winter of even-numbered years. 3(3-0)
PHY 947.

Effective mass approximation. Exchange and correlation corrections. Theory of conductivity and related effect, metals and semiconductors.

949. Solid State Physics III
Spring of even-numbered years. 3(3-0)
PHY 948.

Ionic crystals. Imperfections in crystals, plastic deformations, color centers. Optical properties. Rectification, transistors, selected topics.

957. Nuclear Physics I
Fall of odd-numbered years. 3(3-0)
PHY 867.

Nucleon-nucleon scattering, nuclear sizes and shapes, multipole moments; shell model; collective states.

958. Nuclear Physics II
Winter of even-numbered years. 3(3-0)
PHY 957.

Experimental methods and instrumentation; nuclear reactions; inelastic scattering and particle transfer.

959. Nuclear Physics III
Spring of even-numbered years. 3(3-0)
PHY 958.

Many-body methods in nuclear physics; Bethe-Goldstone equation; effective interaction; nuclear models.

984. Advanced Readings in Physics or Astronomy
Fall, Winter, Spring, Summer.
Variable credit. Interdepartmental with the Department of Astronomy and Astrophysics.

987. Advanced Topics in Physics
Fall, Winter, Spring, 3(3-0) or 4(4-0)

In any one term this course will be devoted to a single topic, such as advanced quantum theory, quantum electrodynamics, specialized topics in solid state physics, statistical mechanics, relativity theory and cosmology.

989. Waves and Radiations in Plasmas

Winter of even-numbered years. 3(3-0)
E E 850. Interdepartmental with the Department of Astronomy and Astrophysics and Electrical Engineering. Administered by Electrical Engineering.

Plasma oscillation; interaction, electromagnetic fields with plasmas, wave propagation in magnetionic media; plasma sheath; radiation of electric source in incompressible and compressible plasmas; electroacoustic waves; magnetohydrodynamics; research topics in plasmas.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer.
Variable credit. Approval of department.

PHYSIOLOGY PSL

College of Human Medicine College of Natural Science College of Osteopathic Medicine College of Veterinary Medicine

240. Introductory Physiology
Fall, Spring. 4(4-0) Sophomores or approval of department.

Physiology of the cell, nerve and reflex activity, skeletal muscle, brain, and cardiovascular system emphasizing environmental influences such as disease and exercise.

241. Introductory Physiology
Winter, Summer of even-numbered years. 4(4-0) PSL 240 or approval of department.

Continuation of PLS 240. Physiology of respiration, digestion, metabolism, kidney, endocrinology, and reproduction.

323. Physiology, Anatomy, and Hygiene of the Eye

Fall, Summer of even-numbered years. 3(2-2) PSL 240; Elementary Education or Special Education major, or approval of department.

Basic course in anatomy, physiology, and hygiene of the visual system; includes discussion of normal visual functioning and abnormal visual functioning, with methods of correction and education implications.

401. Comparative Physiology I
Fall. 4(3-4) PSL 240 or B S 212; CEM 131 or CEM 141. Interdepartmental with the Department of Zoology.

A comparison of osmoregulation, digestion, respiration, and other physiological processes in a wide range of organisms.

402. Comparative Physiology II
Winter. 4(4-0) PSL 401 or approval of department. Interdepartmental with and administered by the Department of Zoology.

A comparison of sensory, motor, endocrine and other integrative mechanisms in animals.

416. Physiology of the Cell
Fall, Summer of odd-numbered years. 3(3-0) BCH 401 or BCH 451.

Physiologic mechanisms common to all living cells with emphasis on those of the vertebrates. The functions of the cell membrane and cytoplasm are studied as the basis for the physiologic behavior of vertebrate organs and systems.

431. Human Physiology
(331.) Winter. 4(4-0) One year of biological science or ANT 316; CEM 131 or CEM 141.

Physiology of the digestive, endocrine, nervous, and reproductive systems.

432. Human Physiology
(332.) Spring. 4(4-0) One year of biological science or ANT 316; CEM 131 or CEM 141.

Physiology of the autonomic nervous, cardiovascular, renal, and respiratory systems.

440. Avian Physiology
Spring. 4(3-3) Approval of department. Interdepartmental and administered jointly with the Department of Poultry Science.

Systemic physiology of birds emphasizing respiration, circulation, temperature regulation, the endocrines, and reproduction.

444. Mammary Physiology
Winter. 4(3-2) PSL 240, BCH 200. Interdepartmental and administered jointly with the Department of Dairy Science.

Anatomy of mammary gland. Hormonal and nervous control of mammary growth, initiation and maintenance of lactation. Biochemistry of milk secretion. Physiology of milking; physiological, pathological and management factors affecting lactation.

445. Endocrinology and Reproductive Physiology

Fall. 4(5-0) PSL 240. Interdepartmental and administered jointly with the Department of Dairy Science.

Processes of reproduction and endocrinology with special emphasis on anatomy of reproductive systems, folliculogenesis, gametogenesis, reproductive cycle, fertilization, sex determination, gestation and artificial regulation of these reproductive events for economic benefit.

IDC. Biological Membranes
For course description, see Interdisciplinary Courses.

480. Special Problems
Fall, Winter, Spring, Summer. 1 to 5 credits. Approval of department.

481. Honors Research Paper
Fall, Winter, Spring, Summer. 2 credits. PSL 480 and approval of department. Oral and written presentation of undergraduate research project initiated and carried forward under PSL 480.

497. Principles of Endocrinology
Winter. 4(4-0) One year organic chemistry; ZOL 317. Interdepartmental with and administered by the Department of Zoology.

Hormonal principles, illustrated by experimental observations, in vertebrates and invertebrates. Emphasis on cellular endocrinology. Group discussion, background in organic chemistry and cell biology strongly recommended. Term paper required.

500A. Introductory Physiology for Medicine

Fall, Winter. 5(5-0) Admission to the professional program in a college of medicine.

Concepts and problems in physiology to be followed by supplemental physiology instruction during subsequent phases of medical training.

500B. Introductory Physiology for Medicine

Fall. 4(4-0) Admission to the professional program in a college of medicine.

Principles of systemic physiology germane to the practice of medicine with introduction to clinical physiopathology.

500C. Introductory Physiology for Medicine

Winter. 5(5-0) Admission to the professional program in a college of medicine.

Continuation of PSL 500B.

503. Cell Biology

Fall. 5(5-0) Admission to the College of Human Medicine. Interdepartmental with the departments of Biochemistry, Microbiology and Public Health, and Pharmacology and Toxicology. Administered by the Department of Microbiology and Public Health.

Principles of cell biology for medical students.

- 801. Advanced Physiology**
Winter. 5(6-0) PSL 432 or PSL 402 or approval of department; courses in anatomy, histology, biochemistry and calculus recommended.
Principals of physiological control systems. Physiology of respiration including acid base balance. Physiology of nervous system; properties of peripheral nerves, synaptic transmission, reflexes, CNS physiology.
- 802. Advanced Physiology**
Spring. 5(6-0) PSL 432 or PSL 402 or approval of department; courses in anatomy, histology, biochemistry and calculus recommended.
Physiology of kidney, body fluid regulation, heart and peripheral circulation.
- 803. Advanced Physiology**
Fall. 5(6-0) PSL 432 or PSL 402 or approval of department; courses in anatomy, histology, biochemistry and calculus recommended.
Physiology of the digestive system, regulation of metabolism; endocrinology and reproduction.
- 804A. Neuroscience Laboratory I**
Winter. 4(2-4) Approval of instructor.
Interdepartmental with the departments of Biophysics, Psychology, and Zoology. Administered by the Department of Psychology.
Development of skills in the methods, techniques and instrumentation necessary for research in a variety of areas concerned with neuroscience.
- 804B. Neuroscience Laboratory II**
Spring. 4(2-4) PSY 804A.
Interdepartmental with the departments of Biophysics, Psychology, and Zoology. Administered by the Department of Psychology.
Continuation of PLS 804A.
- 808. Neuroendocrinology**
Winter. 3(3-0) Approval of department.
Anatomical, biochemical and physiological aspects of neuroendocrinology. Control systems and interaction among endocrine glands will be emphasized.
- 819. Kidney Physiology and Electrolyte Metabolism**
Summer of even-numbered years. 4(4-0) PSL 802, approval of department.
Critical study of the literature on classical and contemporary principles of renal physiology and related aspects of body fluid and electrolyte metabolism.
- 836. Physical Principles of Biological Systems**
Winter. 3(3-0)
Application of laws and methods of physics to measurement and description of physiological phenomena.
- 837. Radiobiology**
Fall. 3(3-0) Approval of department.
Application of radioactive tracer techniques to study of biological functions. Determination of turnover rates and tissue constituents by isotope dilution. Control of radiation hazards.
- 859. Analysis of Hormone Action**
Spring. 4(4-0) ZOL 317, or approval of department. Interdepartmental with and administered by the Department of Zoology.
Discussion of recent work on the molecular and developmental aspects of hormone action in vertebrates and invertebrates. Selected topics to vary from year to year.
- 865. Advanced Neurobiology**
Spring. 4(4-0) BPY 827.
Interdepartmental with the departments of Anatomy, Biophysics, Psychology, and Zoology. Administered by the Department of Anatomy.
Basic organization, structure and function of neural networks comprising sensory, motor and autonomic systems including examples from invertebrates and vertebrates. Attendance at neuroscience seminar is required.
- 870. Research Problems and Techniques in Pathologic Physiology**
Spring of odd-numbered years. 3(3-0) PSL 801, PSL 802, PSL 803.
Description of mechanisms of human disease states. Stimulation of research where especially needed. Development of animal models to study these disease states. Lecture demonstrations illustrate methods of producing disease models.
- 875. Advanced Physiology Laboratory**
Spring. 4(2-5) PSL 801, PSL 802, PSL 803 and approval of department.
Experiments in animal and human physiology; data collection, analysis and interpretation.
- 885. Vertebrate Neural Systems I**
Fall of odd-numbered years. 5(3-4) Approval of department; ANT 815 and BPY 827 recommended. Interdepartmental with the departments of Zoology, Biophysics, and Psychology. Administered by the Department of Psychology.
Structure and function of major component systems of vertebrate brains, their evolution, ontogeny and comparative analysis in mammals, birds, reptiles, amphibians and fish. Interrelation of behavioral, anatomical and physiological studies.
- 886. Vertebrate Neural Systems II**
Winter of even-numbered years. 5(3-4) PSY 885. Interdepartmental with the departments of Psychology, Biophysics, and Zoology. Administered by the Department of Zoology.
Continuation of PSL 885. Major component systems of vertebrate brains, their evolution, ontogeny, and comparative analysis in mammals, birds, reptiles, amphibians and fish. Interrelation of behavioral, anatomical, and physiological studies.
- 899. Master's Thesis Research**
Fall, Winter, Spring, Summer.
Variable credit. Approval of department.
- 910. Seminar**
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 2 credits for the Master's program and a maximum of 4 additional credits for either the Ph.D. or the diploma program.
- 915. Respiratory Physiology**
Winter of odd-numbered years. 4(3-2) PSL 801, approval of department.
Development of ideas leading to our present state of knowledge in respiration.
- 919. Cardiovascular System**
Fall. 4(3-3) May reenroll for a maximum of 12 credits if different topics are taken. PSL 802.
Classical and current literature on physiology of heart, circulation, and microcirculation. Each fall a different one of these three topics will be discussed. Laboratory work illustrates methodology and special procedures.
- 945. Physiology of Mammalian Reproduction**
Winter of odd-numbered years. 4(5-0) DRY 445 or PSL 445 or approval of department. Interdepartmental with and administered by the Department of Dairy Science.
Chemistry and biosynthesis of reproductive hormones. Gonadal, hypothalamic and pituitary development of reproductive potential. Ovulation, fertilization, implantation and placentation will be studied. Relationships of conceptus, uterus and corpus luteum. Parturition.
- 950. Topics in Physiology**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Classical and modern concepts in selected areas of physiology.
- 980. Problems**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Limited amounts of individual work on selected research problems.
- 999. Doctoral Dissertation Research**
Fall, Winter, Spring, Summer.
Variable credit. Approval of department.

POLITICAL SCIENCE PLS

College of Social Science

- 100. American National Government**
Fall, Winter, Spring, Summer. 4(3-0)
Major aspects of national government with emphasis on the policy-making process.
- 140. Comparative Politics**
Fall, Winter, Spring. 4(3-0)
Comparison of political systems in western and non-western nations.
- 160. International Relations**
Fall, Winter, Spring, Summer. 4(3-0)
Contemporary world affairs surveyed. The struggle for power, the nation-state system; factors creating harmony and hostility among nations. War and peace in our time.
- 170. The Isms**
Fall, Winter, Spring, Summer. 4(3-0)
Introduction to basic contemporary political ideologies; theoretical foundations of democracy, socialism, communism, political elitism, and nationalism. Special attention to ideology underlying contemporary political problems.
- 200. Introduction to Political Science**
Fall, Winter, Spring, Summer. 4(3-0)
Acquaints the student with the theories, methods and concepts of political science. Emphasis is on ideology and interests in the political process.
- IDC. Introduction to Latin America III**
For course description, see Interdisciplinary Courses.