

**Descriptions – Physics and Astronomy
of
Courses**

**861. General Relativity and
Cosmology II**

Winter of odd-numbered years. 3(3-0)
PHY 860. Interdepartmental with and administered by Physics.

Relativistic cosmology: the model universes; steady-state theory; observational evidence and possibilities for decision among models; current problems.

**984. Advanced Readings in Physics or
Astronomy**

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Interdepartmental with and administered by Physics.

989. Electrodynamics of Plasmas II

Winter of odd-numbered years. 3(3-0)
E E 850. Interdepartmental with Electrical Engineering, and Physics. Administered by Electrical Engineering.

One fluid plasma model, magnetohydrodynamics, Maxwell's stress tensor, low frequency waves, transport phenomena, Landau damping, collision and rate coefficients. Diffusions in a magnetic field; investigation of dc, rf and microwave discharges.

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

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

Spring. 4(4-0) PSL 431 or approval of department.

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

435. Mammary Physiology

(444.) Fall. 4(3-2) PSL 241, BCH 200 or BCH 401. Interdepartmental with and administered by the Department of Animal 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.

**455. Principles of Animal
Reproduction**

(445.) Winter. 4(5-0) PSL 241, BCH 200 or BCH 401. Interdepartmental with and administered by the Department of Animal 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.

465. Avian Physiology

(440.) Spring. 4(3-3) Approval of department. Interdepartmental with and administered by the Department of Animal Science.

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

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**

Spring. 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.

**500D. Introductory Physiology for
Medicine**

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

Concepts and problems in physiology germane to the practice of medicine.

**500E. Introductory Physiology for
Medicine**

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

Continuation of PSL 500D.

503. Introduction to Medical 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 medical biology for medical students.

801. Advanced Cell Physiology

Fall. 5(6-0) PSL 431, PSL 432 or PSL 401, PSL 402; BCH 451, BCH 452, BCH 453 or concurrently; or approval of department; calculus recommended.

Concepts in advanced cellular physiology, including bioenergetics, transport, regulation of metabolic reactions, and specialized cell functions including nerve, muscle, secretory, epithelial and lymphocyte.

802. Advanced Systemic Physiology I

Winter. 5(6-0) PSL 801 or approval of department.

Physiology of the respiratory, nervous, and cardiovascular systems. Principles of physiological control systems.

**803. Advanced Systemic Physiology
II**

Spring. 5(6-0) PSL 802 or approval of department.

Physiology of the renal, gastrointestinal, endocrine, and reproductive systems.

804A. Neuroscience Laboratory I

Winter. 4(2-4) Approval of instructor. Interdepartmental with Biophysics and the departments of 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 Biophysics and the departments of Psychology, and Zoology. Administered by the Department of Psychology. Continuation of PSL 804A.

808. Neuroendocrinology

Winter of even-numbered years. 3(3-0) Approval of department. Anatomical, biochemical and physiological aspects of neuroendocrinology. Control systems and interaction among endocrine glands will be emphasized.

809. Physiology of Aging

Winter of odd-numbered years. 3(3-0) Basic course on elements of physiology. Theories of aging; vital statistics; changes in cellular, tissue and organ functions; pathology; integrative mechanisms; longevity and life prolongation; neuroendocrines; immunology; brain function; chronological versus individual aging.

836. Physical Principles of Biological Systems

Winter of even-numbered years. 3(3-0) Application of laws and methods of physics to measurement and description of physiological phenomena.

837. Radiobiology

Fall of even-numbered years. 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

(BIM 865.) Spring. 4(4-0) BPY 827. Interdepartmental with Biophysics and the departments of Anatomy, 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.

875. Advanced Physiology Laboratory

Summer of odd-numbered years. 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

(PSY 885.) Winter of even-numbered years. 5(3-4) ANT 815, ANT 865 recommended. Interdepartmental with the departments of Anatomy, Psychology and Zoology. Administered by the Department of Anatomy. 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

(ZOL 886.) Spring of even-numbered years. 5(3-4) ANT 885. Interdepartmental with the departments of Anatomy, Psychology, and Zoology. Administered by the Department of Anatomy.

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.

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 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. 3(3-0) Major aspects of national government with emphasis on the policy-making process.

140. Comparative Politics

Fall, Winter, Spring. 3(3-0) Comparison of political systems in western and non-western nations.

160. International Relations

Fall, Winter, Spring, Summer. 3(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. 3(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. 3(3-0) Acquaints the student with the theories, methods and concepts of political science. Emphasis is on ideology and interests in the political process.

251. Human Values and Politics: On Liberty (S)

Fall. 4(4-0) Liberty as a basic value underlying public issues of life or death: right to live; rights of women and children; slavery; justification of war and terrorism; capital punishment; biological planning.

252. Human Values and Politics: Equality and Justice (S)

Winter. 4(4-0) Equality and justice as basic values underlying major public issues in areas such as crime and punishment, education, family and employment. Effect of public policy on equal opportunity.

253. Human Values and Politics: Authority and the Individual (S)

Spring. 4(4-0) Individualism and authority as basic values underlying public issues; free speech; rights of minorities; right of privacy; community norms and individual preferences.

IDC. Introduction to Contemporary China

For course description, see Interdisciplinary Courses.

290. Methods of Political Research

Fall, Winter, Spring, Summer. 3(3-0) Design and execution of research in political behavior and institutions. Major emphasis on logic underlying various types of political research, on identification of appropriate data sources and field methods.

291. Methods of Political Research

Fall, Winter, Spring. 4(4-0) PLS 290. Analysis of political data, with major emphasis on quantitative techniques.

301. American State Government

Fall, Winter, Spring, Summer. 3(3-0) Major aspects of policy-making process at the state government level. Comparison of state political systems.

302. American Urban Government

Fall, Winter, Spring, Summer. 3(3-0) Urban political process in America. Politics of policymaking for urban functions; politics of intergovernmental relations.