

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 magnetonic media; plasma sheath; radiation of electric source in incompressive and compressive plasmas; electroacoustic waves; magnetohydrodynamics; research topics in plasmas.
999. **Doctoral Dissertation Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

431. **Human Physiology**
(331.) Winter. 4(4-0) ANT 316 or one year of biological science, CEM 132 or approval of department.
432. **Human Physiology**
(332.) Spring. 4(4-0) PSL 431.
440. **Avian Physiology**
Spring. 4(3-3) Approval of department. Interdepartmental and administered jointly with the Department of Poultry Science.
A survey of the systemic physiology of birds emphasizing digestion, metabolism, 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.

801. **Advanced Physiology**
Winter. 4(3-2) PSL 432 or PSL 402 or approval of department; courses in anatomy, histology, biochemistry and calculus recommended.
Principles of physiological control systems. Physiology of the nervous system including, neuromuscular, reflex, sensory and autonomic nervous function. Physiology of respiration; acid-base, regulation of body fluids.
802. **Advanced Physiology**
Spring. 4(3-2) PSL 432 or PSL 402 or approval of department; courses in anatomy, histology, biochemistry and calculus recommended.
Physiology of kidney and micturition, blood and cardiovascular system.
803. **Advanced Physiology**
Fall. 4(3-2) 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.

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. 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 BS 212 and CEM 132. 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. 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

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.
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**
(500.) 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.

- 804A. **Neuroscience Laboratory I**
Winter. 4(2-4) Approval of instructor. Interdepartmental with the departments of Biophysics, Psychology and Zoology and 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 and 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. 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.
835. **Neurophysiology**
Winter of odd-numbered years. 4(2-4) Approval of department.
Functions and properties of the peripheral and central nervous systems.
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.

Descriptions – Physiology

of

Courses

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 and 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 and 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 and 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. 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.

IDC. The Politics of Ecology
For course description, see Interdisciplinary Courses.

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. Continuing Revolution in China: Problems and Approaches
For course description, see Interdisciplinary Courses.

290. Methods of Political Research
Fall, Winter. 4(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
Winter, Spring. 4(3-0) PLS 290.

Analysis of political data, with major emphasis on quantitative techniques.

301. American State Government
Fall, Winter, Spring, Summer. 4(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. 4(3-0)

Urban political process in America. Politics of policymaking for urban functions; politics of intergovernmental relations.

303. Michigan Government
Spring. 4(3-0)

How Michigan government is organized and conducted and how policies are made; sources of executive-legislative conflict; politics of taxation; role of the state in local affairs; balance of political forces in the state.