972. **Topics in Condensed Matter Physics (MTC)**
Fall, Spring. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. P: PHY 431, PHY 882, PHY 871. Advanced topics in many-body problems, disordered solids, superfluidity, superconductivity, magnetism, or macroscopic systems.

980. **Advanced Reading in Physics**
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Approval of department.

982. **Topics in Nuclear Physics (MTC)**
Fall, Spring. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. P: PHY 882, PHY 891. Heavy ion reactions or nuclear structure.

992. **Quantum Chromodynamics (MTC)**
Fall, Spring. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. P: PHY 891. Hadron-hadron interactions, interaction of hadrons with leptons.

999. **Doctoral Dissertation Research**
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to graduate students in Physics.

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**PHYSIOLOGY**

**Department of Physiology**

**College of Human Medicine**

**College of Natural Science**

**College of Osteopathic Medicine**

**College of Veterinary Medicine**

**101. Current Issues in Physiology**
Fall. 2(2-0) R: Not open to students with credit in PSL 250 or PSL 431 or PSL 432. Physiological bases of health issues of broad social significance, and new approaches for the treatment of specific disorders.

250. **Introductory Physiology**
Fall, Spring. 4(4-0) R: Not open to students in Physiology. Function, regulation and integration of organs and organ systems of higher animals emphasizing human physiology.

323. **Physiology and Hygiene of the Eye**
Fall of odd-numbered years, Summer of even-numbered years. 3(3-0) R: Not open to Physiology majors. Basic anatomy, physiology, and hygiene of the visual system: normal and abnormal visual function, methods of correction, and educational implications.

410. **Computational Problem Solving in Physiology**
Fall, Spring. 3(3-0) P: PSL 422. R: Approval of department. Quantitative analysis of physiological data: mathematical models, curve fitting, data analysis and interpretation. Problem solving involving exponential and logistic growth. Cerebral blood flow, convective cooling, oxygen consumption, thermoregulation, other applications.

421. **Hormones and Development**

431. **Human Physiology I**
Fall. 3(3-0) P: BS 111, CEM 142. Neural function including autonomic nervous system, physiological control systems, endocrinology, reproduction and digestive function.

432. **Human Physiology II**
Spring. 3(3-0) P: PSL 431. Continuation of PSL 431. Function and regulation of the cardiovascular, respiratory, and renal systems. Control of tissue blood flow, blood pressure, blood gases, body fluid volume and electrolytes.

440. **Topics in Cell Physiology**
Fall, Spring. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic on the role of hormones in the regulation of growth, metabolism, differentiation.

442. **Topics in Cardiovascular Physiology**
Fall. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic in blood flow physiology.

443. **Topics in Respiratory Physiology**
Fall of odd-numbered years. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic in the physiology of gas exchange and lung mechanics.

444. **Topics in Renal Physiology**
Spring of even-numbered years. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic in the physiology of regulation of salt and water balance.

445. **Topics in Environmental Physiology**
Fall of even-numbered years. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic in environmental physiology with an emphasis on thermoregulation.

446. **Topics in Visual Physiology**
Fall of odd-numbered years. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic in the functioning of the visual system in health and disease.

447. **Topics in Brain Function**
Fall. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic on the functioning of the mammalian brain.

448. **Topics in Gastrointestinal Physiology**
Fall. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Selected topic in the physiology of the digestive system.

449. **Developmental Neurophysiology**
Fall. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Development of the nervous system in invertebrate and vertebrate animals.

450. **Laboratory in Human Physiology**
Fall. 2(1-3) P: PSL 432. R: Open only to Physiology majors. Completion of Tier I writing requirement. Demonstration of vertebrate and invertebrate physiological processes. Sensory input response. Data collection and analysis.

475. **Capstone Laboratory in Physiology**
Spring. 2(2-0) P: PSL 432. R: Open only to Physiology majors. Independent study under the auspices of a faculty member.

483. **Environmental Physiology**
Spring. 4 credits. Interdepartmental with Zoology. Administered by Zoology. P: ZOL 328 or ZOL 355. R: Completion of Tier I writing requirement. Aspects of physiology important to the environmental relations of vertebrates and invertebrates: energetics, thermal relations, osmotic-ionic relations, and exercise physiology.

501. **Introductory Medical Physiology**
Fall. 3(3-0) R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Physiological basis of medical practice.

511. **Veterinary Physiology**
Spring. 5(5-0) R: Open only to graduate-professional students in College of Veterinary Medicine. Physiology of the nervous, cardiovascular, renal, respiratory, digestive, endocrine, and reproductive systems. Homeostasis.

552. **Medical Neuroscience**
Spring. 4(3-2) Interdepartmental with Anatomy and Radiology. Administered by Anatomy. R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Correlation of normal structure and function of the human nervous system with clinical testing, classical lesions, and common diseases.

611. **Research Problems in Physiology**
Clerkship Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: PSL 511. R: Open only to graduate professional students in College of Veterinary Medicine. Individual work on a research problem.
899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course.

900. Investigating the Lung
Fall of even-numbered years. 3(3-0) Interdepartmental with Large Animal Clinical Sciences and Pathology. Administered by Large Animal Clinical Sciences.
R: Open only to M.S. and Ph.D. students in Large Animal Clinical Sciences. Small Animal Clinical Sciences, Physiology, and Pathology. Approval of department.

901. Cellular and Molecular Physiology
Fall. 3(3-0) Interdepartmental. R: Approval of department.

902. Cardiovascular System
Fall. 3(3-0) Interdepartmental with Physiology or Pharmacology and Toxicology. R: Approval of department.

903. Topics in Physiology
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course.

904. Problems in Physiology
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.

905. Research Topics in Physiology
Spring. 1 credit.

906. Research in Biophysics
Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
R: Approval of department.

907. Readings in Biophysics
Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
R: Approval of department.

908. Vertebrate Neural Systems
Spring of odd-numbered years. 3(2-2) Interdepartmental with Anatomy. Administered by Anatomy. Comparative analysis of major component systems of vertebrate brains. Evolution, ontogeny, structure, and function in fish, amphibians, reptiles, birds and mammals.

909. Readings in Biophysics
Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
R: Approval of department.

910. Introduction to American National Government
Fall, Spring, Summer. 3(3-0)
The policymaking process in national government, with emphasis on political participation, the presidency, Congress, Supreme Court, bureaucracy, and civil rights and civil liberties.

911. Introduction to Comparative Politics
Fall, Spring, Summer. 3(3-0) Comparative analysis of political systems in first, second, and third-world countries. Alternative methods for comparative cross-cultural analyses of political systems.

912. Introduction to International Relations
Fall, Spring, Summer. 3(3-0)
R: Not open to students with credit in MC 220 or MC 222. Dynamics of conflict and cooperation. Processes of foreign policy decision making. Major international economic issues. Basic future trends. Primary analytical approaches for studying world politics.

100. Introduction to Political Philosophy
Fall, Spring, Summer. 3(3-0) Basic questions of political philosophy as considered from ancient to modern times. Primary focus on the origins, defense, and radical critiques of modern liberal democracy.

101. Introduction to Political Science
Fall, Spring, Summer. 4(4-0) The science of politics. Theory construction, model building, empirical testing, and inductive inference. Examples from American, international and comparative politics.

102. Introduction to Methods of Political Analysis
Fall, Spring, Summer. 4(4-0)

103. Introduction to Political Analysis
Fall, Spring, Summer. 4(4-0)

104. Urban Politics
Fall. 3(3-0)

105. Environmental Politics
Fall. 3(3-0)

106. Public Bureaucracy in the Policy Process
Fall, Spring. 3(3-0)

107. Public Policy Analysis
Fall, Spring, Summer. 3(3-0)

108. The American Judicial Process
Fall, Spring. 3(3-0)

109. Research in Political Science
Fall, Spring, Summer. 3(3-0) Interdepartmental with Political Science. Administered by Political Science. Original investigations in all five kingdoms.

110. Readings in Political Science
Spring. 3(3-0) Interdepartmental. R: Approval of department.

111. Political Science
Fall, Spring, Summer. 4(4-0) Interdepartmental with Political Science. Administered by Political Science. Original investigations in all five kingdoms.

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