884. Quantum Electrodynamics
Spring of even-numbered years. 3(3-0)
P: PHY 853.
Application of quantum field theory to the interaction of electrons and photons, pair annihilation, Compton scattering. Bound states, renormalization theory. QP: PHY 983 QA: PHY 983

871. Condensed Matter Physics
Spring. 3(3-0)
P: PHY 852.
tive phenomena. QP: PHY 983 QA: PHY 883

881. Subatomic Physics
Fall. 3(0-0)
P: PHY 881.
Application of conservation laws and physical principles to basic quantum mechanical problems in MeV energy range and femtometer size range. Application to nuclear data.

891. Elementary Particle Physics
Spring. 3(3-0)
P: PHY 893.
Nonabelian gauge theory, spontaneously broken gauge theory, electroweak interactions, QCD, W and Z boson coupling to quarks and leptons, charm, top and bottom quarks, particle generations. QP: PHY 987 QA: PHY 988

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.
R: Open only to graduate students in Physics. QA: PHY 989

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 831, PHY 852, PHY 871.
Advanced topics in many-body problems, disordered solids, superfluidity, superconductivity, magnetism, or macroscopic systems. QP: PHY 983 QA: PHY 941

990. 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. QA: PHY 984

992. 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. QP: PHY 981, PHY 899 QA: PHY 981, PHY 982

992. Quantum Chromodynamics (MTC)
Fall. 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. QP: PHY 987 QA: PHY 928, PHY 929

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. QA: PHY 999

PHYSIOLOGY

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

250. Introductory Physiology
Fall, Spring. 4(4-0)
R: Not open to students in Physiology.
tive phenomena. QP: PHY 983 QA: PHY 883

260. Anatomy and Physiology
Fall, Spring. 3(3-0)
P: PHY 872. R: Open only to Physiology majors.
tive phenomena. QP: PHY 983 QA: PHY 883

310. Computer Problem Solving in Physiology
Fall. Spring. 3(3-0)
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.
QP: PSL 420 QA: PSL 410

311. Human Physiology I
Fall. 3(0-0)
P: BS 111, CEM 142.
Neural function including autonomic nervous system, physiological control systems, endocrinology, reproduction and digestive function.
QB: BS 210, BS 211 QA: PSL 491

332. Human Physiology II
Spring. 3(0-0)
P: PSL 475.
Continuation of PSL 331. Function and regulation of the cardiovascular, respiratory, and renal systems. Control of tissue blood flow, blood pressure, blood gases, body fluid volume and electrolytes.
QP: PSL 420 QA: PSL 442

440. Topics in Cell Physiology
Fall, Spring. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Critical discussion and evaluation of a selected problem in the area of cellular biology, physiology, and physiology.
QP: PSL 432 QA: PSL 442

441. Topics in Endocrinology
Fall, Spring. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic on the role of hormones in the regulation of growth, metabolism, differentiation.
QP: PSL 431, PSL 432

442. Topics in Cardiopulmonary Physiology
Fall of odd-numbered years. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic on the role of hormones in the circulation of growth, metabolism, differentiation.
QP: PSL 431, PSL 432

443. Topics in Respiratory Physiology
Fall of odd-numbered years. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic in the function of the kidney, regulation of salt and water balance.
QP: PSL 431, PSL 432

444. Topics in Renal Physiology
Spring of odd-numbered years. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic in the function of the kidney, regulation of salt and water balance.
QP: PSL 431, PSL 432

445. Topics in Environmental Physiology
Spring of even-numbered years. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic in environmental physiology with an emphasis on thermoregulation.
QP: PSL 431, PSL 432

446. Topics in Visual Physiology
Fall of even-numbered years. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic in the functioning of the visual system in health and disease.
QP: PSL 431, PSL 432

447. Topics in Brain Function
Fall. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic on the functioning of the mammalian brain.
QP: PSL 431, PSL 432

448. Topics in Gastrointestinal Physiology
Fall. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic in the physiology of the digestive system.
QP: PSL 431, PSL 432

449. Developmental Neurophysiology
Fall. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Development of the nervous system in invertebrate and vertebrate animals.
QP: PSL 431, PSL 432

500. Laboratory in Human Physiology
Fall. 2(1-3)
P: PSL 432. R: Open only to Physiology majors.
Demonstration of fundamental physiological processes. Sensory input response, data collection and analysis.
QP: PSL 431, PSL 432 QA: PSL 433

545. Capstone Laboratory in Physiology
Spring. 3(3-0)
P: PSL 432. R: Open only to Physiology majors.
Laboratory exercises in animal physiology including osmoregulation, receptor mediated regulation, nervous and hormonal control of function.
QP: PSL 431, PSL 432

546. Special Problems
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course.
P: PSL 432. R: Open only to Physiology majors.
Independent study under the auspices of a faculty member.
QP: PSL 490

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

511. Veterinary Physiology
Fall, Spring. 3(3-0)
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.
QP: PSL 500B, PSL 500C

511. Cellular and Neurophysiology
Fall, Spring. 3(3-0)
R: Interdepartmental with Zoology.
P: BCH 492, PSL 432.
Advanced bioenergetics, transport, regulation of metabolic reactions, specialized cell functions, and nerve physiology.
QP: PSL 431, PSL 432 or PSL 401, PSL 402 QA: PSL 811, PSL 812

512. Advanced Systems Physiology
Spring. 6(6-0)
P: PSL 431.
Cardiovascular, renal, respiratory, endocrine, reproductive, and gastrointestinal physiology.
QP: PSL 811 QA: PSL 812, PSL 813

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POLITICAL SCIENCE

Department of Political Science
College of Social Science

100. Introduction to American National Government
Fall, Spring, Summer. 3(3-0)
The political processes in national government, with emphasis on political participation, the presidency, Congress, Supreme Court, bureaucracy, and civil rights and civil liberties.
QA: PLS 100

140. 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 analysis of political systems.
QA: PLS 140

232. American Legislative Process
Spring. 3(3-0)
P: PLS 100
American political process, with emphasis on the relationship between Congress and the executive branch. Policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 324

233. American Constitutional Law
Fall, Spring. 3(3-0)
P: PLS 100
P: Not open to freshmen and sophomores. The law of the United States. Focus on case law, statutes, regulations, and administrative agencies. This course meets the University's General Education Requirement in the discipline of Political Science.
QP: PLS 100 QA: PLS 329

234. American Executive Process
Fall. 3(3-0)
P: PLS 100
Public opinion and the American political process. Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 334

331. Political Parties and Interest Groups
Fall. 3(3-0)
P: PLS 100
The politics of power and decision making. Focus on political parties and interest groups and their impact on the political process.
QP: PLS 100 QA: PLS 335

332. Political Socialization and Public Opinion
Fall. 3(3-0)
P: PLS 100
Public opinion and the American political process. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 336

333. Comparative Political Economy
Spring. 3(3-0)
P: PLS 100
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 337

344. Politics in the Third World
Fall, Spring. 3(3-0)
P: PLS 140
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 338

351. African Politics
Fall, Spring. 3(3-0)
P: PLS 140
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 339

352. African Political Parties
Fall, Spring. 3(3-0)
P: PLS 140
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 340

355. West European Politics
Fall, Summer. 3(3-0)
P: PLS 140
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 341

357. Politics of English Speaking Democracies
Summer. 3(3-0)
P: PLS 140
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 342

358. Politics of the U.S.S.R. and Its Successor States
Spring. 3(3-0)
P: PLS 140
Focus on the relationship between the president and the public. Focus on policy-making and its effects on the legislative branch and the presidency.
QP: PLS 100 QA: PLS 343