

**Descriptions—Physics
of
Courses**

854. 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.
QA: PHY 868, PHY 869

871. Condensed Matter Physics

Spring. 3(3-0)
P: PHY 852.
Structure and vibrations of solids. Electrons in solids, electron gas, Bloch's theorem. Cohesion. Electron states in solids. Electronic properties of solids, electron transport, conductivity, semiconductors. Cooperative phenomena.
QP: PHY 839 QA: PHY 883

881. Subatomic Physics

Fall. 3(3-0)
P: PHY 851.
Application of conservation laws and physical principles to basic quantum mechanical problems in MeV energy range and femtometer size range. Application to nuclear data.
QP: PHY 838 QA: PHY 881

891. Elementary Particle Physics

Spring. 3(3-0)
P: PHY 853.
Nonabelian gauge theory, spontaneously broken gauge theory, electroweak interaction, QCD, W and Z boson coupling to quarks and leptons, charm, top and bottom quarks, particle generations.
QP: PHY 867 QA: PHY 927, PHY 928

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 899

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, and macroscopic systems.
QP: PHY 883 QA: PHY 941

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.

QA: PHY 984

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 852, PHY 881.
Heavy ion reactions or nuclear structure.
QP: PHY 881, PHY 839 QA: PHY 951, PHY 952

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 927 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.
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.
QA: PSL 323

410. Computational Problem Solving in Physiology

Fall, Spring. 3(3-0)
P: PSL 432. 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 432 QA: PSL 410

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.
QP: BS 210, BS 211 QA: PSL 431

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.
QP: PSL 431 QA: PSL 432

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 of mammalian cell physiology including cell biophysics, molecular biology of the cell.
QP: PSL 431, PSL 432

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 Cardiovascular Physiology

Fall. 2(2-0)
P: PSL 432. R: Open only to Physiology majors.
Selected topic in blood flow physiology.
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 physiology of gas exchange and lung mechanics.
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

PSL

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 of 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

450. 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

475. Capstone Laboratory in Physiology

Spring. 2(1-3)
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

480. Special Problems

Fall, Spring, Summer. 1 to 3 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.
QA: PSL 480

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.
QA: PSL 500B, PSL 500C

811. Cellular and Neurophysiology

Fall. 6(6-0) Interdepartmental with Zoology.
P: BCH 462, PSL 432.
Advanced bioenergetics, transport, regulation of metabolic reactions, specialized cell functions, and neurophysiology.
QP: PSL 431, PSL 432 or PSL 401, PSL 402 QA: PSL 811, PSL 812

812. Advanced Systems Physiology

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

841. Advanced Endocrine Physiology and Pharmacology
Fall. 4(4-0) Interdepartmental with Animal Science, Pharmacology and Toxicology, and Psychology.
P: BCH 461, PSL 432. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources. Basic and advanced concepts of endocrine and reproductive physiology and pharmacology.
QA: PSL 841

890. Readings in Biophysics
Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Individual study of membrane phenomena or other topics in biophysics.
QA: PSL 890

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.
QA: PSL 899

919. Cardiovascular System
Fall. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
R: Approval of department.
Classical and current literature on the physiology of the heart, circulation or microcirculation.
QA: PSL 919

950. 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.
R: Approval of department.
Classical and modern concepts in selected areas of physiology.
QA: PSL 950

980. 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.
R: Approval of department.
Individual research problems in physiology.
QA: PSL 980

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
QA: PSL 999

POLITICAL SCIENCE PLS

Department of Political Science College of Social Science

100. 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.
QA: PSL 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 analyses of political systems.
QA: PSL 140

160. Introduction to International Relations
Fall, Spring, Summer. 3(3-0)
R: Not open to students with credit in MC 220 or MC 221.
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.
QA: PSL 160

170. 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.
QA: PSL 170

200. 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.
QP: PSL 290 QA: PSL 200

201. Introduction to Methods of Political Analysis
Fall, Spring, Summer. 4(4-0)
P: PSL 200.
Philosophy of social science. Principles of research design, measurement, hypothesis testing, measures of association, cross tabulations, and regression analysis.
QP: PSL 200 QA: PSL 290, PSL 291

301. American State Government
Spring. 3(3-0)
P: PSL 100.
Structure and processes of American state government. Interstate differences. Constitutions, elections, political parties, interest groups, and intergovernmental relations. Policy focus on education, welfare, and criminal justice.
QP: PSL 100 QA: PSL 301

310. Public Bureaucracy in the Policy Process
Fall, Spring. 3(3-0)
P: PSL 100.
Role of public bureaucracy in the U.S. Theories of administrative behavior and the impact of hierarchy on policymaking. Relations with the president, Congress, interest groups, and the public. Administrative functions, responsiveness, and ethics.
QP: PSL 100 QA: PSL 310

313. Public Policy Analysis
Fall, Spring, Summer. 3(3-0)
P: PSL 100, EC 201 or EC 202 or approval of department.
Political and economic concepts for evaluating the consequences of government decision making. Issues of problem identification, policy adoption, and implementation affecting program evaluation.
QP: PSL 100 QA: PSL 313

320. The American Judicial Process
Fall, Spring. 3(3-0)
P: PSL 100. R: Not open to freshmen and sophomores.
Analysis of the structure and functions of judicial systems. Organization, administration, and politics of judicial bureaucracies. Roles of judges, juries, counsel, litigants, and interest groups in the adjudication process.
QP: PSL 100 QA: PSL 320

321. American Constitutional Law
Fall, Spring. 3(3-0)
P: PSL 100. R: Not open to freshmen and sophomores.
U.S. Supreme Court policy making and its effect on issues of current importance, including First Amendment freedoms, due process, race relations, sex discrimination, and privacy.
QP: PSL 100 QA: PSL 321

324. American Legislative Process
Spring. 3(3-0)
P: PSL 100.
The design of Congress. Rules, structures, and procedures affecting policy making. Impact of regular elections on legislative behavior.
QP: PSL 100 QA: PSL 324

325. American Executive Process
Fall. 3(3-0)
P: PSL 100.
Role of the president in the U.S. political system. Constitutional questions, presidential selection, presidential power, interbranch relations, and presidential policy making.
QP: PSL 100 QA: PSL 325

331. Political Parties and Interest Groups
Spring of odd-numbered years. 3(3-0)
P: PSL 100.
Origins, structure, and activities of political parties. Role of parties and interest groups in elections and in government. Internal politics of parties and of private associations.
QP: PSL 100 QA: PSL 331, PSL 332

333. Political Socialization and Public Opinion
Fall, Spring. 3(3-0)
P: PSL 100.
Role of public opinion in political systems and its impact on the political process. Group differences, political socialization, development and change of political attitudes and behavior patterns. Methods of studying public opinion.
QP: PSL 100 QA: PSL 333, PSL 339

334. Campaigns and Elections
Fall, Spring. 3(3-0)
P: PSL 100.
The nominating process. Recruitment of candidates and the formation of electoral coalitions. Analysis of election results. Trends in electoral support for officeholders and parties.
QP: PSL 100 QA: PSL 334

342. Comparative Political Economy
Spring. 3(3-0)
P: PSL 140, EC 201 or EC 202.
Democratic politics and the linkages among political, social, and economic conceptions of equality in developed and developing countries.
QP: PSL 140 QA: PSL 338

344. Politics in the Third World
Fall, Spring. 3(3-0)
P: PSL 140.
Politics of modernization, democratic and authoritarian regimes, and class and ethnicity in developing countries.
QP: PSL 140 QA: PSL 344

351. African Politics
Fall. 3(3-0)
P: PSL 140.
Political institutions and governmental processes in Sub-Saharan Africa.
QP: PSL 140 QA: PSL 347

354. Politics of Asia
Fall of even-numbered years, Spring of odd-numbered years. 3(3-0)
P: PSL 140.
Political institutions, political actors, and policy-making processes in selected Asian countries.
QP: PSL 140 QA: PSL 354

356. West European Politics
Fall, Summer. 3(3-0)
P: PSL 140.
Governmental institutions and processes, political socialization, and political culture in Western Europe, including Great Britain.
QP: PSL 140 QA: PSL 356

357. Politics of English Speaking Democracies
Summer. 3(3-0) Given only in London, England.
P: PSL 140 or approval of department.
Political institutions, political actors, and political culture in Britain, Australia, or Canada.
QP: PSL 140 QA: PSL 349

358. Politics of the U.S.S.R. and Its Successor States
Spring. 3(3-0)
P: PSL 140.
Political history, communist ideology, state institutions and political processes in the Soviet Union and its successor states.
QP: PSL 140 QA: PSL 358