

Supportive Courses

The following courses are offered by departments in liberal arts and sciences to graduate students and qualified undergraduates. Graduate students who intend to use them as an integral part of their degree program should consult both their graduate coordinator and the chair of the department concerned.

History

HIS 505, 506 Seminar in Directed

Reading **1-3 hrs. each**
Program of directed readings; analysis, synthesis, and interpretation of materials. Prerequisites: senior or graduate standing; 15 hrs. of college-level history with at least a B average; consent of department chair.

HIS 507, 508 Area Study in Directed

Reading **1-3 hrs. each**
Projects and readings in area studies; e.g. Asia, Russia, Africa, or South America. Prerequisites: 15 hours of college-level history with at least a B average; consent of department chair.

Mathematics

MTH 501 Topics in Applied Mathematics I **3 hrs.**

Theory, applications, and algorithms for basic problems of modern applied mathematics. Symmetric linear systems, minimum principles, equilibrium equations, calculus of variations, orthogonal expansions, and complex variables. Prerequisite: MTH 224 or 345.

MTH 502 Topics in Applied Mathematics II **3 hrs.**

Continuation of MTH 501. Selected numerical algorithms: Fast Fourier transform, initial value problems, stability, z-transforms, and linear programming. Prerequisite: MTH 501 or consent of instructor.

MTH 510 Numerical Methods I **3 hrs.**

Introduction to numerical and computational aspects of various mathematical topics: finite precision, solutions of non-linear equations, interpolation, approximation, linear systems of equations, and integration. Cross listed as CS 510. Prerequisites: CS 104 or 106; MTH 207 and 223.

MTH 511 Numerical Methods II **3 hrs.**

Continuation of CS/MTH 510: further techniques of integration, ordinary differential equations, numerical linear algebra, nonlinear systems of equations, boundary value problems, and optimization. Cross listed as CS 511. Prerequisites: MTH 224 or 345; CS/MTH 510.

MTH 514 Partial Differential Equations **3 hrs.**

Fourier series and applications to solutions of partial differential equations. Separation of variables, eigenfunction expansions, Bessel functions, Green's functions, Fourier and Laplace transforms. Prerequisite: MTH 224 or 345.

Philosophy

PHL 551, 552 Readings in Philosophy 1-3 hrs. each

Directed individual study. Prerequisites: 6 hours in philosophy; senior or graduate standing; consent of department chair.

Physics

PHY 501 Quantum Mechanics I 3 hrs.

Inadequacies of classical physics when applied to problems in atomic and nuclear physics. Development of mathematical formalism used in basic quantum theory. Applications to simple models of physical systems. Prerequisites: PHY 202, 301, 306; consent of instructor. MTH 207 recommended.

PHY 502 Quantum Mechanics II 3 hrs.

Mathematical formalism of quantum mechanics. Applications to problems of electron spin and many-particle systems. Development of approximation techniques with applications to complex physical systems. Prerequisite: PHY 501.

PHY 541 Physics Basics 2 hrs.

Numerical and graphical analysis of data; basic mechanics including Newton's laws and gas laws; hydrostatics and hydrodynamics; energy conservation principles; thermal physics; electricity and magnetism; and solubility and transport processes. Only students in the Nurse Administered Anesthesia Program may register.

PHY 545 Biophysics 3 hrs.

Applications of physics principles and methods to investigation of biological systems. Emphasis on physical environmental effects on biological systems. Cross listed as BIO 545. Prerequisites: PHY 108 or 201; senior standing; or consent of instructor. PHY 345 recommended.

PHY 555 Independent Readings 1-3 hrs.

Individually assigned reading assignments of relevant topics in physics or astronomy. Prerequisites: senior or graduate student standing; background appropriate to the study; consent of instructor.

PHY 563 Special Problems in Physics 1-3 hrs.

Qualified students work on an individually assigned problem and prepare oral and written reports on the problem solution. Approved for off-campus programs when required. May be repeated for a maximum of 6 hours credit. Prerequisites: physics preparation sufficient for the problem; consent of instructor and department chair.

PHY 568 Condensed Matter Physics 3 hrs.

Introduction to the physics of the solid state and other condensed matter especially for students of physics, materials science, and engineering; structure of crystals; molecular binding in solids, thermal properties, introduction to energy band structure and its relation to charge transport in solids; semiconductors; superconductivity. Prerequisites: PHY 202 or 303; MTH 224; consent of instructor.

Political Science

PLS 583, 584 Reading in Political Science

1-3 hrs. each

Individual in-depth work on a subject approved and supervised by a PLS faculty member. For highly qualified students. Prerequisites: senior standing; political science major; consent of instructor.

Sociology

SOC 571 Field Studies

1-3 hrs.

Individual research. Prerequisite: senior or graduate standing and consent of department chair.