

### **340A01 TOPICS IN LEGAL AND POLITICAL PHILOSOPHY: GENDER, EQUALITY, AND THE STATE**

**3 sem. hrs.**

This course will examine gendered division of labor and what role government should or should not play; examine contemporary state of gendered labor; examine theoretical accounts of gender justice; and consider several proposals for political intervention to make society more gender just. Prerequisite: PHI 232 or consent of the instructor.

### **350 TOPICS IN THE HISTORY OF PHILOSOPHY**

**3 sem. hrs.**

Intensive examination of an important figure, movement, or theme in the history of philosophy, e.g. Plato, British Empiricism, freewill/determinism. Multiple enrollments allowed for credit if topic is different. Contact the Department for availability of the following topics. Prerequisites: PHI 254 and 255 or consent of the instructor.

### **350A01 TOPICS IN THE HISTORY OF PHILOSOPHY: KANT**

**3 sem. hrs.**

This course is intended to provide students an opportunity for deeper study of the work of Immanuel Kant. The course will mainly concentrate on his work in metaphysics and epistemology on the one hand and moral theory on the other. Prerequisites: PHI 254 and 255 or consent of the instructor.

### **350A13 TOPICS IN THE HISTORY OF PHILOSOPHY: DAVID HUME'S PHILOSOPHICAL LEGACY**

**3 sem. hrs.**

A close examination of the important sections of Hume's seminal A Treatise of Human Nature along with an examination of the current philosophical significance of Hume's ideas about, e.g., causation and ethical sentimentalism. Prerequisites: PHI 254 and 255 or consent of the instructor.

### **350A14 TOPICS IN THE HISTORY OF PHILOSOPHY: PLATO**

**3 sem. hrs.**

This course will presume a beginning general knowledge of Plato's main contributions to metaphysics and axiology. Following a refresher on the middle books of the Republic the course will cover more deeply some of Plato's most important middle and later dialogues. Prerequisites: PHI 254 and 255 or consent of the instructor.

### **363 TOPICS IN METAPHYSICS AND EPISTEMOLOGY**

**3 sem. hrs.**

Detailed examination of selected issues in contemporary metaphysics and epistemology. Multiple enrollments allowed for credit if topic is different. Prerequisite: PHI 201 or consent of the instructor.

## **PHYSICS (PHY)**

**311 Moulton Hall, (309) 438-8756**

**PHY.IllinoisState.edu**

**Chairperson:** Daniel Holland.

**Graduate Faculty:** Christensen, Grobe, Harris, Holland, Martin, Marx, Rosa, Rosenblatt, Rutherford, Su.

### **Programs Offered**

Graduate degrees are not granted in the Department of Physics, but coursework is available as supplemental study or as electives.

### **Physics Courses**

### **310 READINGS FOR TEACHING HIGH SCHOOL PHYSICS**

**3 sem. hrs.**

Essential background readings for teaching high school physics that center around developing scientific literacy in students. Prerequisites: Completion of 10 hours in Physics.

### **311 TEACHING HIGH SCHOOL PHYSICS**

**3 sem. hrs.**

Strategies, curricula, and resources for the teaching of high school physics. Application of knowledge of physics, adolescent psychology, and pedagogical theory to secondary teaching. Includes Clinical Experience: 10 hours. Prerequisites: PHY 310; 18 hours in Physics; grade of C or better in TCH 216, or concurrent registration.

### **312 PHYSICS TEACHING FROM THE HISTORICAL PERSPECTIVE**

**3 sem. hrs.**

Qualitative overview of the development of classical scientific thought relating to physical phenomena with applications to pedagogy. Prerequisites: Completion of 20 hours in Physics; Admission to Professional Studies.

### **318 METHODS OF COMPUTATIONAL SCIENCE**

**3 sem. hrs.**

Introduction to a wide variety of computational techniques and their application to problems in chemistry and physics. Also offered as CHE 318. Prerequisites: IT 165; CHE 140; PHY 109 or 111; CHE 360 or PHY 220; or concurrent registration; or consent of the instructor.

### **320 MECHANICS II**

**3 sem. hrs.**

Coordinate transformations, nonlinear oscillations, Hamilton's Principle, Lagrangian and Hamiltonian mechanics, rigid body motion. Prerequisites: PHY 220 and MAT 340.

**355 SOLID STATE PHYSICS****3 sem. hrs.**

Crystal structures, X-ray and electron diffraction, lattice vibrations and thermal properties, binding energy, conduction of electrons, band theory, dielectric and magnetic properties, defects, metals, semiconductors, and insulators. Prerequisite: PHY 325.

**375 ELECTRONICS FOR SCIENTISTS****3 sem. hrs.**

DC and AC circuit analysis with an introduction to the electrical properties of semiconductors; theoretical and experimental analysis of semiconductor diode, transistor, and operational amplifier circuits. Lecture and lab. Prerequisite: PHY 111.

**380A80 TOPICS IN CONTEMPORARY PHYSICS: BIOPHYSICS OF NEUROLOGICAL SYSTEMS****3 sem. hrs.**

Biophysical principles of cell signaling and communication, including mathematical modeling, computer simulations and hands-on lab activities. Prerequisites: Completion of 75 hours. Consent of the instructor.

**384 QUANTUM MECHANICS II****3 sem. hrs.**

Operator formalism, Dirac bra and ket notation, angular momentum, perturbation theory, applications to laser physics. Prerequisites: PHY 284 and MAT 340.

**387 METHODS OF MATHEMATICAL PHYSICS****3 sem. hrs.**

Finite- and infinite-dimensional vector spaces, matrices and determinants, Fourier analysis, complex analysis, differential equations, emphasis on physical applications. Prerequisites: PHY 240 and MAT 340 or concurrent registration.

**388 ADVANCED COMPUTATIONAL PHYSICS****3 sem. hrs.**

Application of computational methods to contemporary topics in physics, including nonlinear classical and quantum dynamics or physical problems that involve many degrees of freedom. Prerequisites: PHY 220, 240, 284, and 318, or consent of the instructor.

**400 INDEPENDENT STUDY****1-4 sem. hrs.**

Refer to the Index for General Courses. Prerequisite: Consent of the instructor.

**413 TEACHING HIGH SCHOOL PHYSICS II****3 sem. hrs.**

Employs goal setting, self-assessment, and instructional design as a way of improving the physics teacher's inquiry practice. Prerequisite: Open only to licensed, inservice high school teachers of physics and/or physical science with a minimum of two years teaching experience.

**480 SPECIAL TOPICS IN PHYSICS EDUCATION RESEARCH****3 sem. hrs.**

Investigation of the research literature surrounding specially selected topics in physics education and the implications of this research for teaching. Prerequisites: Enrollment requires experience in physics teaching and consent of the instructor.