PHI 370I Analytic Philosophy
An historical approach to twentieth-century linguistic philosophy. This course will begin with logical atomism, continue through the era of logical positivism, and end with ordinary language analysis. Extensive reading of primary sources and major commentators. Prerequisite: any PHI 100-level course. Cr 3.

PHI 380I Postmodernism
The course presents a survey of central movements within continental philosophy in the 20th century: phenomenology, structuralism, hermeneutics, and deconstruction. Possible figures of study are: Foucault, Derrida, Levinas, Gadamer, Barthes, Lacan, Irigary, Cixous, and Lyotard. Prerequisite: any PHI 100-level course. Cr 3.

PHI 390I Hermeneutics
How do we go about interpreting something that is foreign to us? What does it mean to understand a person or a text? Hermeneutics is a tradition of philosophical inquiry into the dynamics of interpretation and understanding. The course examines the historical roots of hermeneutics in the works of Friedrich Schleiermacher and Wilhelm Dilthey, and it proceeds with the close analysis of several 20th century thinkers—for example, Hans-Georg Gadamer and Martin Heidegger—whose works extend and develop the hermeneutical tradition. Prerequisite: any PHI 100-level course. Cr 3.

PHI 398 Independent Study
This course provides students with an opportunity to design a set of readings and learning objectives concerning a topic in the history of philosophy or a specific issue in philosophy. Students must complete an independent study proposal, and obtain permission of a faculty mentor and the Department chair. Students must meet regularly with the faculty mentor. May be repeated for credit. Prerequisite: a minimum of two 300-level philosophy courses plus written permission of the instructor involved. Cr 3.

PHI 400 Seminar in Philosophy
These numbers are used to indicate seminar courses dealing with a specific topic or person in philosophy. Topics or individual philosophers will change from year to year and may or may not be repeated. The prerequisite for any 400-level seminar course is two (2) 300-level courses in philosophy, or permission of the instructor. Cr 3.

PHI 409 Research Seminar
A research seminar designed to provide senior level students an opportunity to participate in the research efforts of individual faculty and collaborate with each other in the design, methodology and completion of their tutorials. Prerequisites: advanced standing as a philosophy major and permission of the Department. Cr 3.

PHI 410 Senior Thesis
Designed to furnish senior philosophy majors with extensive training, under tutorial supervision, in analysis of a philosophical problem or system or philosopher, with a view to producing and presenting a senior paper for oral defense. Prerequisites: advanced standing as a philosophy major and permission of the Department. Cr 3.

Physics

Chair of the Department: Gerald LaSala, 229 Science Building, Portland
Associate Professors: Coakley, LaSala, Nakroshis, Walkling

The field of physics is concerned with the study of matter, energy, motion, and the interaction of material particles. It is a cornerstone science that attempts to explain at a fundamental level the concepts underlying phenomena important to the other physical sciences, to the biological sciences, and to engineering. The Physics Department provides elementary courses to introduce students to the field, general and topical courses that support the other science departments and engineering, and a four-year program leading to a B.A. degree in physics. The physics major covers the traditional areas of modern and classical physics, and is intended to prepare graduates for careers in physics and related technical areas or for graduate school.

Programs and Requirements

Bachelor of Arts in Physics

The minimum number of credits in physics and related areas (exclusive of the University's Core curriculum) required for the physics major: 61. A student majoring in physics must take 37 credit hours of physics courses including some requirements and some electives as outlined below. In addition, the major requires 16 credits of mathematics courses, 8 credits of chemistry courses, and a demonstration of competency in computer programming.

1. Required courses

PHY	114K, 116	Introductory Physics Laboratory I and II
PHY	121K, 123	General Physics I and II (PHY 111K may replace PHY 121K with Departmental permission.)

PHY	211, 213	Nonclassical Physics I and II
PHY	221, 223, 225	Classical Physics I, II, and III
PHY	240	Intermediate Laboratory I
CHY	373	Physical Chemistry II

2. Electives. In addition to the required courses, the student must take a minimum of 6 credits of physics courses numbered 200 or higher: three credits from each of groups A and B below.

Group A

PHY	251	Principles of Electronics
PHY	261	Computational Physics
PHY	281	Astrophysics
PHY	375	Optics

Group B

PHY	242	Intermediate Laboratory II
PHY	311	Quantum Mechanics

The physics major must also complete the following courses:

MAT	152D	Calculus A
MAT	153	Calculus B
MAT	252	Calculus C
MAT	350	Differential Equations
CHY	113K & 114K	Principles of Chemistry I with Lab
CHY	115 & 116	Principles of Chemistry II with Lab

Suggestions for demonstrating competency in computer programming include:

COS	160 & 170	Structured Problem Solving: Java
COS	141	Visual Basic
PHY	261	Computational Physics

To graduate as a physics major, a student must maintain a minimum GPA of 2.0 in all courses which satisfy the major requirement, and a minimum overall GPA of 2.0.

Minor in Physics

The minimum number of credits (exclusive of the University's Core curriculum) required for the minor: 19. The required courses are PHY 121K, 123 or PHY 111K, 112; PHY 114K, 116; PHY 211, PHY 240; at least 3 credits of physics courses numbered 200 or higher.

PHY 101K Introduction to Physics
An elementary approach to the study of mechanics, heat, sound, electricity, magnetism, light, and modern physics, intended for the student who desires a one-semester introduction to the subject with emphasis on concepts as opposed to problem solving. Students desiring laboratory work should also register for PHY 102K. Students planning to major in any of the natural sciences are not directed to this course but rather to a more advanced introductory course. Prerequisite: high school algebra. Cr 3.

PHY 102K Introduction to Physics Laboratory
Laboratory experiments and additional material designed to supplement the topics considered in PHY 101K. Prerequisite: concurrent registration in PHY 101K or permission of the instructor. Cr 1.

PHY 111K Elements of Physics I
The first of a two-semester non-calculus sequence in introductory physics, intended particularly for life-science majors. Topics to be covered include mechanics, waves, sound, and thermal physics. Lectures, demonstrations, and problem solving will help the student develop an understanding of physical phenomena. Mathematical treatment is at the level of algebra and trigonometry. This course is not recommended for students planning to major in the physical sciences or engineering. It should be taken concurrently with PHY 114K, Introductory Physics Laboratory I. Prerequisite: successful completion of the University's minimum proficiency requirement in mathematics. Three hours of lecture and one hour of recitation per week. Cr 4.

PHY 112 Elements of Physics II
A continuation of PHY 111K, intended particularly for life-science majors. Topics to be covered include electricity, magnetism, optics, and modern physics. Lectures, demonstrations, and problem solving will help the student develop an understanding of physical phenomena. Mathematical treatment is at the level of algebra and trigonometry. This course is not recommended for students planning to major in the physical sciences or engineering. It should be taken concurrently with PHY 116, Introductory Physics Laboratory II. Prerequisite: PHY 111K or equivalent. Three hours of lecture and one hour of recitation per week. Cr 4.

PHY 114K Introductory Physics Laboratory I
Experiments designed to illustrate the concepts studied in PHY 111K and PHY 121K. Prerequisite: concurrent registration in PHY 111K or 121K. Two hours per week. Cr 1.

PHY 116 Introductory Physics Laboratory II
Experiments designed to illustrate the concepts studied in PHY 112 and PHY 123. Prerequisite: concurrent registration in PHY 112 or PHY 123. Two hours per week. Cr 1.

PHY 121K General Physics I
The first of a two-semester sequence introducing the fundamental concepts of physics, using calculus. Topics to be covered include mechanics, waves, sound, and thermal physics. This course is recommended for students who plan further study in physical sciences, mathematics, or engineering. It should be taken with PHY 114K, Introductory Physics Laboratory I. Prerequisite: prior or concurrent registration in MAT 152D or equivalent experience. Three hours of lecture and one and one-half hours of recitation per week. Cr 4.

PHY 123 General Physics II
A continuation of PHY 121K, introducing the fundamental concepts of physics, using calculus. Topics to be covered include electricity, magnetism, and light. This course is recommended for students who plan further study in physical sciences, mathematics, or engineering. It should be taken concurrently with PHY 116, Introductory Physics Laboratory II. Prerequisites: PHY 121K or equivalent and one semester of calculus. Three hours of lecture and one and one-half hours of recitation per week. Cr 4.

PHY 211 Nonclassical Physics I
The first of a two-semester sequence covering the principal topics which show the departure of physics from its classical roots. Topics will include relativity and atomic structure. Prerequisite: PHY 123 or PHY 112, and MAT 152D. Cr 3.

PHY 213 Nonclassical Physics II
A continuation of PHY 211, covering the principal topics which show the departure of physics from its classical roots. Topics will include quantum physics, nuclear physics, and particle physics. Prerequisite: PHY 211. Cr 3.

PHY 221 Classical Physics I
The first of a three-semester sequence offering an intermediate-level treatment of the principal topics of classical physics. The focus for this course is mechanics, including particle motion, oscillations, and noninertial reference systems. Prerequisite: PHY 121K and prior or concurrent registration in MAT 252. Cr 3.

PHY 223 Classical Physics II
A continuation of PHY 221, offering an intermediate-level treatment of the principal topics of classical physics. This course will continue a study in mechanics and start a study in electrostatics. Prerequisite: PHY 123, PHY 221, and MAT 252. Cr 3.

PHY 225 Classical Physics III
A continuation of PHY 223, offering an intermediate-level treatment of the principal topics of classical physics. Topics will continue through magnetism and electrodynamics, leading to Maxwell's equations. Prerequisite: PHY 223. Cr 3.

PHY 240 Intermediate Laboratory I
A selection of experiments designed to illustrate the more important principles of classical and modern physics. Prerequisites: prior or concurrent registration in a 200-level physics course and two semesters of calculus. Six hours per week. Cr 3.

PHY 242 Intermediate Laboratory II
A selection of experiments illustrating the important principles of classical and modern physics. Prerequisite: prior or concurrent registration in a 200-level physics course and two semesters of calculus. Cr 3.

PHY 251 Principles of Electronics
An introduction to electronics including DC and AC circuits, transistors, operational amplifiers, and combinatorial and sequential logic devices. The laboratory will cover the use of electronic instrumentation as well as illustrate principles. Prerequisite: MAT 152D or equivalent, or permission of instructor. Cr 3.

PHY 261 Computational Physics
This course is a project-oriented course which introduces methods of computer simulation and their diverse applications in the physical world. Examples of projects include projectile motion, planetary systems, chaotic systems, and thermal systems. Methods include numerical solutions to differential equations and Monte Carlo techniques. The course emphasizes structured programming, although no background in computer programming is required. Prerequisite: PHY 121K and prior or concurrent registration in MAT 153, or permission of instructor. Two laboratory sessions and one discussion session per week. Cr 3.

PHY 281 Astrophysics
An intermediate-level course in the physics of the astronomical universe. Topics covered include classical astronomy, celestial mechanics, the structure and evolution of stars and gaaxies, and cosmology. No previous background in astronomy is required. Prerequisite: PHY 221. Cr 3.

PHY 311 Quantum Mechanics
A study of the quantum physics of atoms, nuclei, and particles. Topics covered include wave particle duality; the Schrordinger Wave Equation and its application to a variety of quantum systems, three-dimensional and time-dependent systems, and photons. Prerequisite: PHY 213 and PHY 221. Cr 3.

PHY 375 Optics
An intermediate-level study of the more important principles of geometric and physical optics, with illustrations of both classical and modern applications. Prerequisites: PHY 223 and two semesters of calculus. Cr 3.

PHY 390 Independent Laboratory Study in Physics
An independent study involving primarily laboratory work. Prerequisite: permission of instructor. Cr 1-3.

PHY 410 Independent Study in Physics
Reading and discussion of advanced subjects or instruction in special topics or research. Prerequisite: permission of instructor. Cr 1-3.

PHY 440 Advanced Physics Laboratory I
This course may involve a series of experiments in physics or, by permission of the instructor, an advanced project in experimental physics. Prerequisites: PHY 240, and at least one 300-level physics course. Cr 3.

AST 100K Astronomy
A descriptive survey of modern astronomy. Topics include theories about the origin and development of the universe, stellar evolution, the solar system, galaxies, observational methods and recent discoveries. No prerequisite. Cr 3.

AST 103K Activities and Experiments
A one-credit course meeting weekly for two hours. May be taken concurrently with AST 100K to fulfill requirements for a science laboratory experience. Includes exercises on the Moon's orbit, Earth's orbital motion, rotation of Saturn's rings, the Sun, the Crab Nebula, variable stars, pulsars, Hubble's law, and galaxies. Two planetarium sessions. Prerequisite: AST 100K. Cr 1.

Political Science

Chair of the Department: Lynn Kuzma, 126 Bedford St., Portland
Professors: Faksh, Hamilton, Maiman, Pattenaude; *Associate Professors:* Kuzma, Schmidt; *Assistant Professors:* Klotz, Vassallo

Political science is the systematic study of politics and government and is widely recognized as one of the core disciplines within the liberal arts curriculum. The study of political science provides substantive and analytic background that can lead to a variety of professions; it is not intended to prepare students directly for any specific career. Most obviously it serves those with an interest in entering politics and government. Political science majors go on to become civic leaders, town managers, city planners, budget specialists, foreign service officers, policy researchers, and to hold a variety of management positions in local, state, national, and international organizations. Beyond government, a political science degree leads naturally to graduate training, including law school. Many journalists and broadcasters were political science majors. Business has recognized the analytic and management skills obtained through training in political science. Some studies have estimated that perhaps one-third of undergraduate political science majors undertake careers in business. Political science training is useful in other rapidly developing fields such as polling, communications, campaign management, consulting, private and public interest group activity, and data analysis. College teaching has been a traditional career for the political scientist. Demographics now suggest that entering freshmen can look forward to good job prospects by the time they have completed their graduate educations.

Programs and Requirements

Bachelor of Arts in Political Science

The minimum number of credits (exclusive of the University's Core curriculum) required for the major: 39.

Each major must complete POS 101J, POS 104J, POS 203, POS 205, and POS 290. Introducing ideas that are fundamental to the discipline, these required courses should be the first priority for students upon entering the major. Students may choose from any of the Department's other offerings to fulfill remaining credit hours, with the requirement that at least 12 hours be completed at or above the 300-level. A grade of C- or better is required to receive major credit in the Department.

Students interested in an international studies major should consult the International Studies Program section in this catalog.

The Department administers an elaborate, carefully structured internship program, open to majors and non-majors alike. Political science majors are especially encouraged to take advantage of the variety of internship opportunities as part of their undergraduate program.

The Political Science Department strongly urges its majors to take courses in economics, history, sociology, and computer science. For a number of majors, courses in geography-anthropology, psychology, philosophy, and communication would also be useful. All political science majors are encouraged to undertake at least one