

Regina Souza, Ph.D., Massachusetts Institute of Technology, 1990

Bonnie Spence, M.A., University of Tulsa, 1991

Emeritus Professors

William R. Ballard, Ph.D., University of Chicago, 1957

Richard W. Billstein, Ed.D., The University of Montana, 1972

Charles A. Bryan, Ph.D., University of Arizona, 1963

William R. Derrick, Ph.D., Indiana University, 1966

Rudy A. Gideon, Ph.D., University of Wisconsin, 1970

Stanley I. Grossman, Ph.D., Brown University, 1969

Gloria C. Hewitt, Ph.D., University of Washington, 1962

Don O. Loftsgaarden, Ph.D., Montana State University, 1964

Johnny W. Lott, Ph.D., Georgia State University, 1973

Robert W. McKelvey, Ph.D., University of Wisconsin 1954

William M. Myers, Jr., Ph.D., Ohio State University, 1952

Howard E. Reinhardt, Ph.D., University of Michigan, 1959

George F. Votruba, Ph.D., University of Michigan, 1964

I. Keith Yale, Ph.D., University of California, Berkeley, 1966

Department of Military Science

- Requirements for a Minor
- Courses
- Faculty

Reserve Officers Training Corps, Micheal Swinson, Chair

Army ROTC (Reserve Officers' Training Corps) offers college students the opportunity to serve as commissioned officers in the U.S. Army, the Army National Guard, or the U.S. Army Reserve upon graduation. ROTC enhances a student's education by providing unique leadership and management training, along with practical leadership experience. Students develop many of the qualities basic to success while earning a college degree and an officer's commission at the same time.

The Margin of Difference. Army ROTC cadets learn to be leaders and receive hands-on experience in managing physical, financial, and human resources. They develop self-confidence and superior decision-making skills. Employers value these leadership qualities and recognize the associated potential in ROTC graduates.

Four-Year Program. The four-year Army ROTC program consists of two parts, the Basic Course and the Advanced Course.

Basic Course. The basic course is normally taken during the first two years of college and may be taken without incurring any military obligation. This course covers such subjects as management principles, national defense, military history, and leadership development. Basic course classes include adventure training such as squad tactics and small arms marksmanship. Additional opportunities are also available to conduct small unit training exercises throughout Western Montana. In addition, a variety of outside social and professional enrichment activities are available. All necessary ROTC textbooks, uniforms, and other essential materials for the basic course are furnished to students at no cost. After completing the basic course, students who have demonstrated the potential to become officers and who have met the physical and scholastic standards are eligible to enroll in the Advanced Course. Compression of the Basic Course into two semesters may be arranged for those students who did not take military science courses during their

Freshman year.

Advanced Course. The Advanced Course is usually taken during the final two years of college. Instruction includes organization and management, tactics, ethics, critical thinking, creative problem solving and further leadership development. Uniforms and equipment in the Advanced Course are furnished to students at no cost. During the summer between their junior and senior years of college, Advanced Course cadets attend the Leader Development and Assessment Course (LDAC), a fully paid four-week leadership practicum. LDAC gives cadets the chance to apply what they have learned in the classroom and introduces them to Army life while also receiving academic credit. Completion of the Advanced Course requires two years of study. Each cadet in the Advanced Course receives a subsistence allowance of up to \$4,500 for each year of attendance.

Two-Year Program. The two-year program applies to incoming juniors and community college graduates, students at four-year colleges who did not take ROTC during their first two years of school, and students entering a two-year postgraduate course of study. To enter the two-year program, students must attend a fully paid four-week Leadership Training Course (LTC), normally held during the summer between their sophomore and junior years of college. At LTC, students learn to challenge themselves physically and mentally, and to build their confidence and leadership skills. After successfully completing LTC, students who meet all the necessary enrollment requirements may participate in the Advanced Course.

Scholarships and Financial Assistance. Army ROTC scholarships are offered for four, three and two years and are awarded on a competitive basis. Each scholarship pays 100% of student's tuition and fees, \$1200 a year for textbooks and supplies, and a monthly stipend totaling up to \$4,500 per year while the scholarship is in effect. Four-year scholarships are awarded to students who will be entering college as freshmen. Two and three-year scholarships are awarded to students already enrolled in college and to Army enlisted personnel on active duty. Additionally, students who attend LTC (see two-year program) may compete for two-year scholarships while at the course. Scholarship recipients can pursue degrees in any accredited four year program at the University of Montana. Students who receive scholarships are required to attain undergraduate degrees in the fields in which their scholarships were awarded.

Veterans. Veterans may apply their military experience as credit toward the ROTC Basic Course. If eligible, a veteran may enroll directly into the Advanced Course.

Simultaneous Membership Program. This program allows students to be members of the Army National Guard or the Army Reserve and to enroll in Army ROTC at the same time. Students participating in the Simultaneous Membership Program receive up to \$4,500 per year in tuition assistance \$4,500 per year in monthly stipends and an additional \$20,000 per year in other benefits. There are also scholarships available for students participating in the Simultaneous Membership Program that are interested in staying in the Army National Guard or the Army Reserve upon graduation that pay up to \$8,500 per year for living expenses and \$1,200 per year for textbooks, supplies and other equipment. These scholarships are in addition to many of the current benefits students receive as part of the Simultaneous Membership Program.

Service Obligation. There is no military service obligation for basic course students, unless on scholarship. Advanced course and scholarship (contracted) students incur an obligation to serve in the active Army, Army Reserve or National Guard.

Commission Requirements. In order to earn a commission as a Second Lieutenant in the United States Army, each student must:

1. Complete all required Military Science instruction while attending college as a full-time student, and obtain a baccalaureate or higher degree.
2. Complete a PMS approved US History course.
3. Meet medical and physical fitness standards.
4. Be a U.S. citizen.
5. Successfully complete the Leadership Development and Assessment Course.

6. Be recommended by the Professor of Military Science.

Requirements for a Minor

Foundational Courses: In order to enroll in courses leading to the Military Science minor, students should complete MSL 101, 102, 201, and 202. The department may waive the Basic Course requirements for following situation courses: prior military service, Advanced Individual Training (AIT), Leader's Training Course (LTC) or Accelerated Cadet Commissioning Training (ACCT).

Grade Requirements: Obtain a grade of "C" or better in all courses used toward the minor, and a cumulative GPA of 2.5 for Military Science courses.

Credit Hour Requirements: A minimum of 19 hours in Military Science courses as outlined below.

Required Courses (19 hours)

- MSL 301 Adaptive Team Leadership *with Lab* (4)
- MSL 302 Leadership in Changing Environments *with Lab* (4)
- MSL 401 Developing Adaptive Leaders *with Lab* (4)
- MSL 402 Leadership in a Complex World *with Lab* (4)
- HSTA 333 (HIST 368) American Military History (3)

Or

- HSTA 316 (HIST 355) American Civil War Era (3)

History/Political Science Requirement: A minimum of a combined 6 credits in History and Political Science. Students must complete at least 3 credits from each discipline with at least 3 credits of upper division coursework in addition to the required history course. Students may choose from the following courses:

- HSTR 272E (HIST 226E) Terrorism: Violence in the Modern World (3)
- HSTR 301 (HIST 302H) Political Ancient Greek Social History (3)
- HSTR 304 (HIST 303H) Ancient Rome (3)
- HSTR 374E (HIST 334E) War, Peace, and Society (3)
- HSTA 316 (HIST 355) American Civil War Era (3)
- HSTA 333 (HIST 368) American Military History (3)
- PSCI 230X (PSC 130E) Introduction to International Relations (3)
- PSCI 335 (PSC 335) American Foreign Policy (3)

Military Science Leadership (MSL)

A total of 24 credits are allowed toward the bachelor degree for contracted students. A total of 12 credits are allowed toward the bachelor degree for non-contracted students.

Suggested Course of Study

| | |
|---|------------|
| First Year | A S |
| MSL 101 Leadership and Personal Development | 3 - |
| MSL 102 Introduction to Tactical Leadership | - 3 |
| MSL 106 Army Physical Fitness | 1 1 |
| Second Year | A S |
| MSL 201 Innovative Team Leadership | 3 - |
| MSL 202 Foundations of Tactical Leadership | - 3 |
| MSL 106 Army Physical Fitness | 1 1 |
| For Advanced Course Military Science Students: | |
| Third Year | A S |
| MSL 301 Adaptive Team Leadership | 3 - |
| MSL 302 Applied Team Leadership | - 3 |
| MSL 303 Leadership Laboratory | 1 1 |

| | |
|--|------------|
| MSL 106 Army Physical Fitness Drill & Conditioning | 1 1 |
| Fourth Year | A S |
| MSL 401 Adaptive Leadership | 3 - |
| MSL 402 Leadership in a Complex World | - 3 |
| MSL 303 Leadership Laboratory | 1 1 |
| MSL 106 Army Physical Fitness | 1 1 |

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Military Science Leadership (MSL) - Course Descriptions

101, 102, 195, 201, 202, 203, 204, 295, 296, 301, 302, 303, 315, 391, 401, 402, 492

Faculty

Professor

Micheal Swinson, M.A., U.S. Naval War College, 2009 (Chair)

Senior Military Instructor

Travis Hambrick, US Army Sergeant Major Academy, 2010

Assistant Professors

Thomas Luhrsen, M.A., Webster University 2011

Tracy Mitchell, B.A., Carroll College, 2000

Galen Bisel, US Army Senior Leaders Course, 2009

Department of Modern and Classical Languages Literatures

- Major Degree Requirements
- Minor Degree Requirements
- Courses
- Faculty

Elizabeth Ametsbichler and Jannine Montauban, Co-Chair

Instruction is offered in the following languages and literatures: Chinese, French, German, Classical Greek, Italian, Japanese, Latin, Russian and Spanish, as well as in linguistics, foreign literatures in English translation, film, and the study of foreign cultures. Undergraduate courses have been planned to meet the needs of students who began studying a language in high school as well as those who undertake such study for the first time at the University.

The courses are intended to serve several purposes: (1) Contribute to the general education of students by giving them an opportunity to gain insight into patterns of living and thinking which are different from their own; (2) Enable students to gain proficiency in the language; (3) Prepare candidates for careers in research and college teaching by providing a solid basis for graduate studies in the various languages; (4) Prepare future teachers of foreign languages; (5) Give language training requisite to careers in government, foreign commerce, and library work; (6) Enable students to read foreign publications and to meet graduate foreign language requirements in their field.

The Department of Modern and Classical Languages and Literatures offers undergraduate majors in Classics (Greek and Latin), French, German, Japanese, Russian, and Spanish. Within Classics, it is possible to elect options in Classical Languages (Latin and Greek), Classical Civilization, and Latin. There is an undergraduate minor in Chinese. The Master of Arts degree in Modern Languages and Literatures is offered with options in French, German, and Spanish. A master's

degree with a concentration in any of the languages in which we offer a major may be obtained by means of the Master of Interdisciplinary Studies program.

High School Preparation: Credit is automatically granted for Advanced Placement scores of 3, 4, or 5. At each UM Orientation, the department offers a computerized placement/assessment examination in French, German, and Spanish. Students also can arrange individually to take the CLEP exam, administered by Testing Services in French, German, or Spanish.

These exams are not required, but serve one or more of three purposes:

1. **Exemption from the General Education Competency Requirement in Foreign Language:** if the student achieves a score that indicates a competence equivalent to the completion of French, German, or Spanish 102 (second semester). (See the General Education Requirements section of this catalog.)
2. **Placement for further study in the language:** the score achieved on this test is an accurate indicator of the course level at which language study should be resumed at the University (e.g. 102, 201, 202).
3. **Credit by examination:** A student with extensive language study may score high enough on the placement exam to qualify for University credits if she or he places into 202 or 301. By taking the course into which she or he placed (202 or 301) and receiving a B (3.00) or better, the student may then receive four by-pass credits (Pass grade only) for the preceding course (201 or 202).

Students who elect not to take this exam may:

1. Satisfy the General Education Competency Requirement in Foreign Language by successfully completing a University foreign language 102 (second semester) course.
2. Estimate their placement level for further study by the approximate equating of one year of high school study to one semester of university study. Students should consult with the department in making this estimate.

Foreign Study Programs. The Department of Modern and Classical Languages and Literatures offers programs of accredited study in Austria, China, Germany, Italy, Spain, Mexico, and Russia. Each program is supervised by a departmental faculty member, and is open to any student who meets the respective foreign language prerequisites. (There is no language prerequisite for the Study Abroad in Italy, but Italian is recommended.) Details concerning individual programs are available from the Department of Modern and Classical Languages and Literatures. The department also sponsors student exchanges with universities in France as well as work/study internships abroad for students in Japanese.

Major Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

Total credits required for a major in a modern or classical language vary with the student's high school preparation or language credit transferred from another college or university. Requirements for academic majors are set forth below under the various languages. Requirements for teaching majors and minors also are listed under Curriculum and Instruction.

Courses submitted in fulfillment of major or minor requirements must be taken for a traditional letter grade.

Students are required to maintain a minimum overall GPA of 2.5 in all upper-division courses within their major language presented in fulfillment of requirements for the language major.

All majors must register in the department and be assigned a departmental major advisor. A student is not considered a major in the Department of Modern and Classical Languages and Literatures until he or she has registered with the department.

Classics

Classical Languages Option:

1. 1a. Emphasis in Latin: twelve credits in Latin beyond Latin 102, plus six credits in Greek beyond Greek 102.
- 1b. Emphasis in Greek: twelve credits in Greek beyond Greek 102, plus six credits in Latin beyond Latin 102.

2. CLAS 155L, CLAS 160L and either CLAS 251L or CLAS 252L.
3. Twelve credits from HSTR 301, 302, 304 (HIST 302H, 301H, 303H) CLAS 320, 360H or ARTH 407 (ART 381H), or PHL 261Y (PHIL 251H) or PHL 363 (PHIL 362).
4. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division courses presented in fulfillment of requirement for the Classics/Classical Languages major.
5. The upper-division Writing Expectation will be met by successfully completing HSTR 301, 302, 304 (HIST 302H, 301H, 303H) CLAS 320, 365 or PHL 363 (PHIL 362) with the consent of instructor.

Classical Civilization Option:

1. LATN 201 (LAT 211) or equivalent or GRK 201 (GRK 211) or equivalent or LATN 101-102 and GRK 101-102 or equivalent.
2. CLAS 155L, CLAS 160L, and either CLAS 251L or CLAS 252L.
3. Twelve credits from HSTR 301, 302, 304 (HIST 302H, 301H, 303H), CLAS 320, 360H, ARTH 407 (ART 381H) or PHL 261Y (PHIL 251H) or PHL 363 (PHIL 362). Students are encouraged to spread these credits among courses focusing on classical history, philosophy, art and literature.
4. Nine additional credits from recommended or specially approved courses. Recommended courses are CLAS 365 (MCLG 365); LATN 202 (LAT 212), 300; GRK 202 (GRK 212), 300; PHL 465, 466 (PHIL 461, 463).
5. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division courses presented in fulfillment of requirements for the Classics/Classical Civilization major.
6. The upper-division Writing Expectation must be met by successfully completing HSTR 301, 302, 304 (HIST 302H, 301H, 303H) CLAS 320, 365 or PHL 363 (PHIL 362) with the consent of instructor.

Latin Option:

1. Fifteen credits in Latin beyond Latin 202, Greek 101-102 may account for 4 credits.
2. Latin 402, Advanced Prose Composition.
3. CLAS 155L, 160H and either CLAS 251L or 252L (MCLG 155L, MCLG 160H and either MCLG 251L or 252L).
4. HSTR 304 (HIST 303H) and ARTH 407 (381H).
5. Nine additional credits from recommended or specially approved courses. Recommended courses are HSTR 301, 302 (HIST 302H, 301H), 320, 360H, or 362; PHL 261, or 363 465, 466 (PHIL 251 or 362, 461, 463). Students are encouraged to spread these credits among courses focusing on classical history, philosophy, art and literature.
6. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division courses presented in fulfillment of requirements for the Classics/Latin major.
7. The upper-division Writing Expectation must be met by successfully completing HSTR 301, 302, 304 (HIST 302H, 301H, 303H) CLAS 320, 365 or PHL 363 (PHIL 362) with the consent of instructor.

French

1. French 101 to 202 or equivalent.
2. At least 30 credits of upper-division courses in French, including 301 and 350 (formerly 302), three courses of the 310, 311, 312, 313 series, as well as 421 (formally 408), one 3-credit 400-level literature course and one 3-credit 400-level culture course or a second 3-credit 400-level literature course. Of these specifically required courses, at least 6 credits must be completed in courses with UM French faculty.
3. A second modern or classical language is encouraged as a sequence of complementary electives to a major in French, but is not a requirement.
4. One semester of French history HSTR 352 or 353 (HIST 314 or 315) is encouraged as a complementary elective to a major in French, but is not a requirement.
5. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division French courses presented in fulfillment of requirements for the French major.
6. The upper-division Writing Expectation must be met by successfully completing an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog. See index.

German

1. German 101 to 202 or equivalent.
2. At least 30 credits of upper-division work in German, including 301, 302 or 305, 311, 312 or 318, 400 (GERM 301, 302, 305, 311, 312, 313, 403) and at least two 3-credit courses in literature at the 400 level and at least two of the following culture courses: 332L, 351H, 352H, 350, 322L and/or 362Y (GERM 303, 304, 355, 361, 362).
3. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division GRMN courses presented in fulfillment of requirements for the German major.
4. The upper-division Writing Expectation must be met by successfully completing either 351H or 352H (GERM 303 & 304).
5. German majors are encouraged to participate in the German section's study abroad program to Germany/Austria that is offered every spring semester.

Japanese

1. Japanese 101 to 202 or equivalent.
2. At least 26 credits of upper-division work in Japanese language courses and electives, including 301, 302, 411 (repeatable once), 412 or 415, and at least 12 credits from JPNS 306, 311, 312, 386, 390 (up to 3 credits only), 393 (up to 3 credits only), 412, 431, and 491. Japanese 391 also may be counted as an elective when the course is a Japanese literature, Japanese pedagogy/linguistics, or Japanese cultural course not part of basic Japanese language instruction.
3. Japanese 150H and at least two Asian studies or history courses on Japan or East Asia at any level not in the Modern and Classical Languages and Literatures Department: for example, HSTR 240, 343 (HIST 201H, 381H).
4. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division JPNS courses presented in fulfillment of requirements for the Japanese major.
5. The upper-division Writing Expectation must be met by successfully completing an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog. See index.

Russian

1. Russian 101 through 202 or equivalent.
2. RUSS/MCLG 105H: Intro to Russian Culture
3. At least 27 credits of upper-division work in Russian courses and electives, 15 of which must be in the target language and must include 301 and 302. The remainder of upper-division credits must include RUSS 494, two of the following: 308, 312L and 313L (306L and 307L), and one semester of Russian History.
4. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division courses presented in fulfillment of requirements for the Russian major.
5. The upper-division Writing Expectation must be met by successfully completing RUSS 494: Seminar in Russian Studies.

Spanish

1. Spanish 101 through 202 or equivalent.
2. At least 30 credits of upper-division courses in Spanish, including 301, 326 (311L), 331 (312L) and three 3-credit literature or linguistics courses at the 400 level (not SPNS 408).
3. All Spanish majors must complete MCLG 315L, Major Hispanic Authors, in addition to the 30 hours in upper-division Spanish courses. This class fulfills the upper-division writing requirement for the major.
4. The sequential order of the following required courses must be followed: SPNS 326 (SPAN 311) and SPNS 331 (SPAN 312L) before any 400-level literature course; 301 before 408.
5. Students are required to maintain a minimum overall GPA of 2.5 in all upper-division courses presented in fulfillment of requirements for the Spanish major.
6. Spanish majors interested in Spanish-American literatures and cultures are encouraged to take MCLG 100H, 3 cr., Introduction to Latin American Studies, a requirement for students wishing to obtain the Latin American Studies minor. Students majoring in Spanish are also encouraged to check listings in anthropology, art, history, political science, sociology and other disciplines for additional courses that will fulfill the Latin American Studies minor. Students wishing to improve their facility in Spanish and earn credit toward their Spanish major or minor may wish to consider the Spanish section's study abroad programs offered each spring semester in Latin America or Spain. (Contact the Department of Modern and Classical Languages and Literatures for further information on either the Latin American Studies minor or study abroad programs.)

Minor Degree Requirements

Minors are offered in Chinese, French, German, Japanese, Russian, Spanish, Classical Civilization, Latin, and Greek.

Total credits required for a minor vary by languages. These credits also vary with a student's high school preparation or language credits transferred from another college or university. For example, a student in a modern language with experience equivalent to 101-102 and 201-202 need only complete the upper division requirements and any additional lower division courses. Students with no experience in a modern language, however, must first complete 101-102 and 201-202 before taking upper division courses. Following is a list of requirements for each language.

In French, 101, 102, 201, 202 and 15 upper-division credits. Courses must include 301, 302 (350), and two of the following: 310, 311, 312, 313, 338 (311L, 312L, 313L, 338) and one 400-level course.

In Chinese, 101-102, 201-202, and nine credits in upper-division Chinese literature courses. With prior approval, three of these credits may be in China-focused courses offered by other departments.

In German, 101, 102, 201, 202 and 15 upper-division credits. Courses must include 301, 302 or 305, 311, and 312 or 318, and one of the following culture courses: 332L, 351H, 352H, 350, 322L, or 362Y (303H, 304H, 355, or 361L). Students must maintain a minimum overall GPA of 2.5 in these courses. Native or near-native speakers of German must substitute two 400-level literature courses for 301 and 302.

In Japanese, 101-102, 201-202 and 150H (JPNS 210H), as well as 9 credits in Japanese literature or other courses from among the following: JPNS 306, 311, 312, 386, 390 (up to 3 credits only), 393 (up to 3 credits only), 412, 431, and 491 (495). Students may substitute either Japanese 191 (195) (3 credits) or Japanese 291 (295) (3 credits) for one of the above. Also permitted in substitution would be one course from outside the department, if it has a substantial Japan-related element: Asian studies, Japanese history, etc.

In Russian, 101, 102, 201, 202, and 12 upper-division credits.

In Spanish, 101 through 202 or equivalent and 18 upper-division credits. Courses must include 301, 326 or 331 (311L or 312L), and a 400-level literature or linguistics course.

To earn a minor in Classical Civilization the student must complete either Latin 101, 102 or Greek 101, 102; LS 151L, CLAS 160L (MCLG 160L), and PHL 261Y, 363 (PHIL 251H, 362); three (3) credits from HSTR 301, 302, 304 (HIST 302H, 301H, 303H); and nine additional credits from: CLAS 155L, 251L, 252L, 360H, 365 (MCLG 155L, 251L, 252L, 320, 360H, 365); ARTH 407 (ART 381H); LATN 201, 202, 311 (LAT 211, 212, 300); GRK 201, 202, (211, 212) 300.

To earn a minor in Latin the student must complete LATN 101, 102, 201, 202 (LAT 101, 102, 211, 212) and 9 credits in courses numbered 300 and above.

To earn a minor in Greek the student must complete GRK 101, 102, 201, 202 (211, 212) and 9 credits in courses numbered 300 and above.

Teacher Preparation in Modern and Classical Languages

General Requirements for an Endorsement in the Extended Major, Major, and Minor Teaching Fields: Students must gain admission to Teacher Education Program (see the College of Education section of this catalog). A departmental recommendation on the student's proficiency is required for student teaching. An overall minimum grade point average of 3.0 is required for upper division work. Students must meet the requirements for teaching licensure (see the College of Education section of this catalog.)

Extended Major Teaching Field of French: For an endorsement in the extended major teaching field of French, a student must complete the requirements for the B.A. with a major in French including FRCH 421, LING 270, and MCLG 410. Study in a French language country, provided either through the University's Study Abroad Program or an experience considered to be equivalent, also is required.

French qualifies for a single field endorsement. However, there is a limited demand in the majority of Montana high

schools for teachers with a single endorsement in French. Students should complete the requirements for a second teaching endorsement (major or minor) in another field in more demand in high schools.

Minor Teaching Field of French: For an endorsement in the minor teaching field of French, a student must complete FRCH 101, 102, 201, 202, 301, 350, 421 (FREN 101,102, 201, 202, 301, 302, 401) LING 270, and MCLG 410. Study in a French-language country, provided either through the University's Study Abroad Programs or an experience considered to be equivalent, also is required.

Extended Major Teaching Field of German: For an endorsement in the extended major teaching field of German, a student must complete the requirements for the B.A. with a major in German plus LING 270S and MCLG 410. Study in a German language country, provided either through the University's Study Abroad Program or an experience considered to be equivalent, also is required. German qualifies for a single field endorsement. However, there is a limited demand in the majority of Montana high schools for teachers with a single endorsement in German. Students are encouraged to complete the requirements for a second teaching endorsement (major or minor) in another field in more demand in high schools.

Minor Teaching Field of German: For an endorsement in the minor teaching field of German, a student must complete GRMN 101, 102, 201, 202, 301, 302 or 305 (GERM 101,102, 201, 202, 301, 302 or 305); one of the following German culture courses: 351H, 352H, 350, 322L or 362Y (303, 304H, 355, 361L or 362H); GRMN 400 (GERM 403), LING 270S, and MCLG 410. Study in a German-language country, provided either through the University's Study Abroad Program or an experience considered to be equivalent, also is required.

Major Teaching Field of Latin: For an endorsement in the major teaching field of Latin, a student must complete the requirements for the B.A. with a major in Classics, Latin option, and in addition, MCLG 410.

Minor Teaching Field of Latin: For an endorsement in the minor teaching field of Latin, a student must complete LATN 101, 102, 201, 202 (LAT 101, 102, 211, 212), 6 credits of LATN 311, 402, (LAT 300, 402) and MCLG 410.

Major Teaching Field of Russian: For an endorsement in the major teaching field of Russian, a student must complete the requirements for the B.A. with a major in Russian and MCLG 410.

Minor Teaching Field of Russian: For an endorsement in the minor teaching field of Russian, a student must complete RUSS 101, 102, 201 202, 301, 302, 312 (306L), and MCLG 410.

Extended Major Teaching Field of Spanish: For an endorsement in the extended major teaching field of Spanish, a student must complete the requirements for the B.A. with a major in Spanish including SPNS 301, 305, 400, 408 (SPAN 301, 302, 405, 408) and MCLG 410. Study in a Spanish language country, provided either through the University's Study Abroad Program or an experience considered to be equivalent, also is required. Spanish qualifies for a single field endorsement. However, there is a limited demand in the majority of Montana high schools for teachers with a single endorsement in Spanish. Students are encouraged to complete the requirements for a second teaching endorsement (major or minor) in another field in more demand in high schools.

Minor Teaching Field of Spanish: For an endorsement in the minor teaching field of Spanish, a student must complete SPNS 101 through 202 or equivalent, 301, 305, 326 or 331, 400 (SPAN 101 through 202, 301-302, 311L or 312, 405) and MCLG 410. Study in a Spanish-language country, provided either through the University's Study Abroad Program or an experience considered to be equivalent, also is required.

Suggested Course of Study

The following is a sample first year program to aid students in planning their first year before they arrive on campus and have the opportunity to work out a full four year course plan with their academic advisor. Each student intending to major or minor in a foreign language must consult with an advisor before registering. For any further information contact the Secretary, Department of Modern and Classical Languages and Literatures. For freshmen without previous training in the major language (French, German, Russian, Spanish):

| First Year | A | S |
|--|-----|-----|
| Specific Recommendations: | | |
| Major language 101-102 Elementary | 5 | 5 |
| LSH 151L-152L (LS 151L-152L) Introduction to the Humanities Bible and Medieval | 4 | 4 |
| HSTR 101H-102H (HIST 104H-105H) Western Civilization I, II | 4 | 4 |
| WRIT 101 (ENEX 101) Composition | 3 | - |
| Suggested electives: | | |
| LIT 110L-120L (ENLT 120L-121L) Intro to Lit/Poetry | (3) | (3) |
| CLAS 160L (MCLG 160L) Classical Mythology | (3) | (3) |
| General Education courses in Perspectives 1, 4, or 5 | 0-3 | 3-6 |
| | 16 | 16 |

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

(The Arabic Program offers language instruction and cultural courses through the Central and Southwest Asian Center housed in the Anthropology Department. Course listings can be found under Anthropology.)

General (MCLG & CLAS)

These courses are given in English for the general student body and do not require knowledge of a foreign language. They do not count as language credit toward a B.A. degree in any given foreign language. For clarity, they are arranged below according to the section in which they are offered.

Classical Civilization (CLAS) - Course Descriptions

155L, 160L, 170, 251L, 252L, 309, 319, 320, 360H, 361, 362, 365E,

Courses in Classical Civilization taught by Classics faculty, but through other departments

HSTR 301H, 302, 304H, PHL 363

Modern and Classical Literature (MCLG) - Course Descriptions

Any Language: 195, 198, 295, 296, 381, 395, 396, 398, 410, 440, 494, 495, 496, 501, 522, 594, 596, 598

Chinese Literature/Culture: 313L, 314L, 432

French Culture: 113H, 338, 339

German Literature/Culture: 222L, 231Y, 331H, 332L

Japanese Literature/Culture: 311, 312L, 431

Russian Literature/Culture: 105H, 193, 306L, 307L, 308, 393, 494

Spanish Literature/Culture: 100H, 315, 345, 358

Linguistics (MCLX) - Course Descriptions

395, 495

Arabic (ARAB) - Course Descriptions

101, 102, 191, 201, 202, 291, 292, 301, 302, 305, 307, 317, 391, 392

Chinese (CHIN) - Course Descriptions

101, 102, 191, 199, 201, 202, 211H, 292, 301, 302, 313L, 314L, 380, 388, 391, 392, 395, 399, 432, 492

French (FRCH) - Course Descriptions

101, 102, 191, 199, 201, 202, 292, 294, 300, 301, 310, 311, 312, 313, 338, 339, 350, 355, 391, 392, 399, 420, 421, 430, 440, 491, 492, 494, 500, 594, 595, 596, 599, 699

German (GRMN) - Course Descriptions

101, 102, 191, 199, 201, 202, 292, 301, 302, 305, 311, 312, 318, 321, 322L, 350, 351H, 352H, 391, 398, 399, 400, 431, 441, 451, 453, 491, 492, 540, 594, 595, 596, 599, 699

Greek (GRK) - Course Descriptions

101, 102, 191, 199, 201, 202, 292, 300, 391, 392, 399, 492

Italian (ITAL) - Course Descriptions

101, 102, 201, 202, 391

Japanese (JPNS) - Course Descriptions

101, 102, 150H, 191, 199, 201, 202, 291, 292, 301, 302, 306, 311, 312, 371, 386, 390, 391, 392, 398, 399, 411, 412, 415, 431L, 491, 492, 500

Latin (LATN) - Course Descriptions

101, 102, 191, 199, 201, 202, 292, 311, 391, 392, 399, 402, 492, 596

Russian (RUSS) - Course Descriptions

101, 102, 105H, 191, 192, 199, 201, 202, 292, 301, 302, 312L, 313L, 371, 372, 391, 392, 398, 399, 411, 412, 424, 440, 491, 492, 494

Spanish (SPNS) - Course Descriptions

101, 102, 191, 199, 201, 202, 292, 301, 305, 306, 308, 321, 326, 331, 355, 359, 391, 392, 398, 399, 400, 408, 432, 465, 466, 491, 492, 494, 500, 594, 595, 596, 599, 699

Faculty

Professors

Elizabeth Graff Ametsbichler, Ph.D., University of Maryland at College Park, 1992 (Co-Chair)

Christopher Anderson, Ph.D., University of Iowa, 1990

Hiltrudis Arens, Ph.D., University of Maryland, 1997

Hayden Ausland, Ph.D., University of California, Berkeley, 1987

Timothy Bradstock, Ph.D., Harvard University, 1984

Maria Jose Bustos Fernandez, Ph.D., University of Colorado, 1990

Eduardo Chirinos, Ph.D., Rutgers University, 1997

M. Ione Crummy Ph.D., Stanford University, 1992

Linda W. Gillison, Ph.D., University of Minnesota, 1975

Clary Loisel, Ph.D., University of Florida, 1996

Jannine Montauban, Ph.D., Rutgers University, 2000 (Co-Chair)

Judith N. Rabinovitch, Ph.D., Harvard University, 1981

Stanley L. Rose, Ph.D., University of Wisconsin, 1969

Michel Valentin, Ph.D., University of Minnesota, 1980

Associate Professors

Benedicte Boisseron, Ph.D. University of Michigan, 2006

Mladen Kozul, Ph.D., Universite de Paris X-Nanterre, 1996

Marton Marko, Ph.D., Washington University, 2005

Ona Renner–Fahey, Ph.D., Ohio State University, 2003

Matthew S. Semanoff, Ph.D., University of Wisconsin, 2002

Assistant Professors

Brian Dowdle, Ph.D., University of Michigan, 2012

Khaled Huthaily, Ed.D., University of Montana, 2008

Robert Tuck, Ph.D., Columbia University New York, 2012

Clint Walker, Ph.D., University of Wisconsin, Madison, 2006

Senior Lecturer

Zhen Cao, Ed.D., The University of Montana, 1997

Lecturers

Samir Bitar, M.A., University of Montana, 2009

Kelly Noe, M.A., Miami University, 2004

Alicia Gignoux, Ed.D., The University of Montana, 2009

Linda Bailey, M.A., University of Montana, 2001

Adjunct Instructors

Evelina Badery, M.A., Universita di Torino, 1981

Manolita Connor, M.A., University of Montana, 1992

Melissa MacKenzie, M.S., Eastern Michigan University, 1989

Emeritus Professors

Robert W. Acker, Ph.D., University of Texas at Austin, 1974

Anthony F. Beltramo, Ph.D., Stanford University, 1972

Raymond L. Corro, Ph.D. University of Utah, 1971

Maureen Cheney Curnow, Ph.D., Vanderbilt University, 1975

Gerald A. Fetz, Ph.D., University of Oregon, 1972

James A. Flightner, Ph.D., State University of New York at Buffalo, 1971

John G. Hay, Ph.D., University of Minnesota, 1973

Horst Jarka, Ph.D., University of Vienna, 1955

Gertrud Lackschewitz, Ph.D., Goettingen University, 1954

Dennis R. McCormick, Ph.D., University of Texas at Austin, 1972

Sigyn Minier, Ph.D., University of Connecticut, 1977

O. W. Rolfe, Ph.D., Stanford University, 1967

James M. Scott, Ph.D., University of Washington, 1986

John B. Wang, Ph.D., University of Maryland, 1967

Emeritus Associate Professor

Robert R. Brock, M.A., University of Washington, 1961

Department of Native American Studies

- Special Degree Requirements
- Suggested Course of Study
- Courses
- Faculty

Dave Beck, Chair

The Native American Studies Department at the University of Montana builds its curriculum on the foundation of three interrelated principles: sovereignty, indigeneity and community well-being. In so doing we pay close attention to the continuing role of traditional value systems, the impacts of colonization and the efforts toward decolonization within tribal communities. We define sovereignty broadly as one of the rights of all indigenous peoples, including both the political-legal foundations as provided in U.S. law and policy and self-determination more generally. Indigeneity underlies the unique holistic relationship that Native American communities have to the land and to the environment. In addition, our degree program not only intends to advance the well-being of our individual students, both native and non-native, but also to enhance the well-being of Indigenous communities across Montana, the United States and globally, by providing necessary and relevant education about those communities as well as the skills and knowledge for those working within those communities to do so effectively. Our curriculum and the foundations of faculty research are broadly cross-disciplinary with these principles at their base.

Native American Studies is an academic discipline committed to examining the contemporary and past experiences and life ways of the first Americans from their perspective. The curriculum is designed to provide a study of American Indians from a holistic and humanistic viewpoint by focusing upon their cultures, history, and contemporary life. Courses are designed for both Native American and non Native American students so they can better understand human similarities and differences, thereby leading to more effective work with and within tribal communities, through stronger knowledge bases of tribal America, and the development of better communications and cross-cultural relationships.

The Native American Studies major supports the objectives of a liberal arts education. It is interdisciplinary and provides a perspective that critically analyzes and evaluates the strengths and limitations of each contributing discipline.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

For the Bachelor of Arts degree with a major in Native American Studies, students must complete a minimum of 39 credits, 30 credits in Native American Studies plus nine elective credits which can be met within the department or out-of-

department. The required courses are: NASX 105H, 280, 201X, 235X, 303E, 304E, 306X or 475X, 494 (NAS 100H, 200, 201X, 202X, 301E, 303E, 341S or 400X, 494), and two of the following: NASX 464X, 465X, and 466X (NAS 464X, 465X and 466X).

Beyond these 30 credits in Native American Studies, students have the option to take an additional 17 credits as electives for a maximum of 47 credits in Native American Studies courses. These electives include NASX 141 (NAS 141), 142 (NAS 142), 180, 191 (NAS 195), 198, 210X (NAS 210X), 231X (NAS 231X), 260, 291 (NAS 295), 306X (NAS 341S), 340 (NAS 329), 354X (NAS 324H), 360 (NAS 344), 388 (NAS 388), 391 (NAS 395), 394 (NAS 394), 398, 403 (NAS 403), 405 (NAS 429), 430 (NAS 300), 475x (NAS 400X), 488 (NAS 410I), 491 (NAS 496), 499 (NAS 499), and one of the following: NASX 464X, 465x, and 466X (NAS 464X, 465X, and 466X).

The credits may also be chosen from the following out-of-department courses: ANTY 122S, 323X, 330X (ANTH 102S, 323X, 330X); HSTR 367, 369 and HSTA 455 (formerly HIST 365, 366, and 467).

The Upper-division Writing Expectation must be met by successfully completing an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog. See index.

As part of the major's liberal arts and interdisciplinary focus, all students completing the major must complete a minor in another field. The department recommends cognate areas of study for the minor including anthropology, history, sociology, and political science. Students also are encouraged to pursue a double major. The department recommends a compatible major in one of the following disciplines: anthropology, English, modern or classical languages and literatures, history, linguistics, political science, sociology, or social work. Students who pursue a second major are not required to complete a minor in addition to the second major.

Suggested Course of Study

| | First Year | A | S |
|---|-------------|-----|-----|
| WRIT 101 (ENEX 101) College Writing | | 3 | - |
| M 105 Contemporary Mathematics | | 3 | - |
| NASX 105H (NAS 100H) Introduction to Native American Studies | | 3 | - |
| NASX 201X (NAS 201X) Indian Culture as Expressed Through Language | | 3 | - |
| General Education | | 3 | 9 |
| Electives | | - | 6 |
| Total | | 15 | 15 |
| | Second Year | A | S |
| NASX 280 (NAS 200) Native American Studies Research Theories & Methods | | 3 | - |
| NASX 235X (NAS 202X) Oral & Written Traditions of Native Americans | | 3 | - |
| General Education | | 6 | 9 |
| Electives | | 3 | 6 |
| Total | | 15 | 15 |
| | Third Year | A | S |
| NASX 304E (NAS 301E) Native American Beliefs & Philosophy | | 3 | - |
| NASX 303E (NAS 303E) Ecological Perspectives in Native American Traditions | | - | 3 |
| NASX 306X (NAS 341X) Contemporary Issues of American Indians or NASX 475X (NAS 400X) Tribal Sovereignty | | 3 | - |
| NASX 465X (NAS 465X) History of Indian Affairs in the 19th Century (Spring) or NASX 464 (NAS 464X) History of Indian Affairs to 1776 (Autumn) | | (3) | (3) |
| Electives | | 9 | 9 |
| Total | | 15 | 15 |
| | Fourth Year | A | S |
| NASX 465X (NAS 465X) History of Indian Affairs in the 19th Century (Spring) or NAS 466X (NAS 466X) History of Indian Affairs from 1890 (Autumn) | | (3) | (3) |
| NASX 494 (NAS 494) Seminar/Workshop | | - | 3 |
| Electives | | 12 | 12 |
| Total | | 15 | 15 |

Requirements for a Minor

To earn a minor in Native American studies the student must complete a minimum of 21 credits of the following requirements:

1. Complete NASX 105H, 235X, 304E, 303E (NAS 100H, 202X, 301E and 303E).
2. Complete at least 9 credits of electives from the following approved cognate courses: ANTY 122S, 323X, 330X (ANTH 102S, 323, 330); HSTR 367, 369 (HIST 365, 366), HSTA 455 (HIST 467); NASX 141, 142, 180, 191, 198, 201X, 210X, 231X, 260, 280, 291, 405, 430, 354X, 340, 306X, 360, 388, 394, 391, 475X, 488, 465X, 466X, 491, and

499 (NAS 141, 142, 195, 201X, 210X, 231X, 200, 295, 429, 300, 324X, 329, 341, 342, 344, 388, 394, 395, 400X, 410, 465, 466, 496 and 499).

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Native American Studies (NASX) - Course Descriptions

105H, 141, 142, 180,191, 198, 201X, 210X, 231X, 235X, 260, 280, 291, 303E,304E,306X, 340, 351, 352, 354X, 360, 388, 391, 394, 398, 403, 405H, 430, 464X, 465X, 466X, 475X, 488, 491, 492, 494, 499, 560, 594, 595, 596, 598

Faculty

Professors

David R.M. Beck, Ph.D., University of Illinois at Chicago, 1994, Chair

Richmond L. Clow, Ph.D., University of New Mexico, 1977

S. Neyooxet Greymorning, Ph.D., University of Oklahoma, 1992

Kathryn W. Shanley, Ph.D., University of Michigan, 1987

Associate Professor

Wade M. Davies, Ph.D., Arizona State University, 1998

Lecturer

George Price, Ph.D., The University of Montana, 2006

Non-profit Administration

Andrea Vernon, (Director of the Office for Civic Engagement), Advisor

The interdisciplinary minor in nonprofit administration concentrates on nonprofit board and committee development, fund raising principles and practices, nonprofit financial management, volunteer management, nonprofit management and program planning, grant writing, and nonprofit marketing. It is designed to complement students' major areas of study and prepare them to enter careers in the nonprofit sector. Interested students must meet with the program director at the Office for Civic Engagement prior to declaring the minor.

Students pursuing the nonprofit administration minor will have the option to obtain certification from the national Nonprofit Leadership Alliance organization if they complete additional requirements that include participation in the campus-based student association, extra-curricular training sessions and events, and attendance at a national Alliance Management/Leadership Institute. The director of the Office for Civic Engagement serves as the director for the national certification program. Students should contact that office for information regarding certification.

Requirements for a Minor

Students must complete successfully 21 credits in the following courses:

1. PSCI 466 (PSC 466) Nonprofit Administration and Public Service, 3 cr.
2. PSCI 467 (PSC 467) Advanced Nonprofit Administration, 3 cr.
3. PSCI 498/HC 398 (PSC 498) Nonprofit Internship, 3 cr.
4. Twelve credits from at least four of the following six areas:
 - a. Communication Skills
 - . COMX 115S (COMM 110S), Introduction to Interpersonal Communication

- . COMX 210 (COMM 240) Communication in Small Groups
 - . COMX 421 (COMM 421) Comm in Nonprofit Organizations
 - . COMX 422 (COMM 422) Comm and Technology
 - . COMX 423 (COMM 423) Practical Issues in Organizational Communication
 - . COMX 424 (COMM 424) Risk, Crisis, and Communication
 - . COMX 415 (COMM 451) Intercultural Communication
 - . BMGT 420 (MGMT 420) Leadership & Motivation (for business majors only, MGMT 340 prereq.)
- b. Youth and Adult Development
- . PSYX 230S (PSYC 240S) Developmental Psychology
 - . PSYX 233 (PSYC 245) Fundamentals of Psychology of Aging
 - . SOCI 330 (SOC 330S) Juvenile Delinquency
 - . SOCI 335 (SOC 335) Juvenile Justice System
- c. Human Resources Development and Supervision
- . PSCI 462 (PSC 460) Human Resource Management
 - . PTRM 380 (RECM 380) Recreation Administration and Leadership (PTRM 110S (RECM 110S), PTRM 217S (RECM 217S), and PTRM 230 (RECM 230) prereq..)
 - . COMX 220S (COMM 230S) Intro to organizational Communication
- d. Nonprofit Program Planning
- . PTRM 230 (RECM 230) Programming in Recreation
 - . PTRM 485 (RECM 485) Recreation Planning (for RECM majors only)
 - . BMKT 411 (MKTG 411) Services and Relationship Marketing (for business majors only, MKTG 360 prereq.)
- e. Nonprofit Marketing
- . BMKT 343 (MKTG 363) Integrated Marketing Communications (for business majors only, MKTG 360 prereq.)
 - . BMKT 412 (MKTG 412) Nonprofit Marketing (for business majors only, MKTG 360 prereq.)
- f. Nonprofit Accounting/Financial Management
- . ACTG 201 (ACCT 201) Principles of Financial Accounting (M 115 (MATH 117) prereq.)

Department of Philosophy

- Special Degree Requirements
- Suggested Course of Study
- Courses
- Faculty

Paul Muench, Chair

Philosophy is the search for an understanding of how the world as a whole hangs together and of how we are to assume our place in the world. Philosophy pursues its goal first of all historically. It is the trustee of the heritage of great philosophical texts, and it engages those texts in conversation with contemporary problems. Second, philosophy turns to the contemporary world directly and tries to illuminate and advance its concerns with ethics and art, with science and technology, with ecology and feminism, with law and medicine. Bachelor of Arts and Master of Arts degrees are offered. More information is available online: www.cas.umt.edu/phil/.

Special Degree Requirements

To obtain the Bachelor of Arts degree with a major or minor in philosophy, students must complete the following requirements:

1. Grade Requirements

Students must earn a C- (1.67) or better in all courses that count toward either the philosophy major or philosophy minor.

2. Credit Requirements

A. Philosophy Major: Students must complete a minimum of 33 credits in philosophy; at least 21 credits must be in courses numbered 300 and higher.

B. Philosophy Minor: Students must complete a minimum of 18 credits in philosophy; at least 6 credits must be in courses numbered 300 and higher.

3. Lower-Division Core Courses

Students who major or minor in philosophy must complete the following lower-division core courses:

PHL 210E (PHIL 300E) Moral Philosophy

PHL 233 (PHIL 210) Introduction to Logic: Deduction

PHL 261Y (PHIL 251) History of Ancient Philosophy

PHL 262Y (PHIL 252) History of Modern Philosophy

4. Foreign Language Requirement

Students who major in philosophy must demonstrate third semester proficiency in a foreign language either (i) by completing three semesters of one foreign language, with grades of C- (1.67) or better, or (ii) by receiving an equivalent score on a competence exam. Recommended languages for philosophy are Ancient Greek, Latin, French, and German.

5. Designated Writing Course Requirement

Students who major or minor in philosophy must satisfy the Designated Writing Course Requirement by successfully completing PHL 210E (PHIL 300E) Moral Philosophy. Students will not be eligible to take upper-division core courses until they have met this requirement.

6. Upper-Division Courses

Students are expected to complete lower-division requirements before beginning upper-division coursework.

A. Philosophy Major: Students must complete at least the following upper-division philosophy courses:

(1) four upper-division core courses (12 credits);

(2) two upper-division electives (6 credits);

(3) capstone course (3 credits).

B. Philosophy Minor: Students must complete at least the following upper-division philosophy courses: two upper-division core courses (6 credits).

7. Upper-Division Core Courses

In order to take upper-division core courses students must have satisfied the Designated Writing Course Requirement by successfully completing PHL 210E (PHIL 300E) Moral Philosophy.

A. Philosophy Major: Students must complete at least one course in each of the four core areas (History, Value Theory, Continental Philosophy, Analytic Philosophy).

B. Philosophy Minor: Students must complete at least one course in two of the four core areas (History, Value Theory, Continental Philosophy, Analytic Philosophy).

I. History

PHL 462 (PHIL 452) Early Modern Philosophy

PHL 464 (PHIL 453) Kant

PHL 465 (PHIL 461) Plato

PHL 466 (PHIL 463) Aristotle

II. Value Theory

PHL 412 (PHIL 443) Ethics and Public Affairs

PHL 422 (PHIL 427E) Environmental Philosophy

PHL 427 (PHIL 444) Topics in Philosophy of Art

PHL 429 (PHIL 441) Philosophy in Literature

PHL 449 History of Moral and Political Philosophy

PHL 450 (PHIL 422E) Contemporary Moral and Political Theory

PHL 455 (PHIL 477) Philosophy of Society and Culture

III. Continental Philosophy

PHL 467 (PHIL 465) 19th Century Continental Philosophy

PHL 468 (PHIL 467) 20th Century Continental Philosophy

IV. Analytic Philosophy

PHL 405 (PHIL 469) 20th Century Analytic Philosophy

PHL 406 (PHIL 471) Contemporary Issues in Analytic Philosophy

PHL 445 (PHIL 411) Central Issues in Philosophy of Science

Special Topics courses taught at the 400-level (PHL 491 [PHIL 495]) may count as upper-division core courses provided that they have a suitable content (consult the department advisor).

8. **Upper-Division Electives**

In addition to four upper-division core courses, students who major in philosophy must complete at least two upper-division philosophy electives (6 credits). These courses may be either 300- or 400-level.

9. **Capstone Course**

Students who major in philosophy must complete PHL 499 (PHIL 480) Senior Seminar. This capstone course is normally taken during the spring semester of senior year.

10. **Upper-Division Writing Requirement**

Students who major in philosophy must satisfy the Upper-Division Writing Requirement by successfully completing PHL 499 (PHIL 480) Senior Seminar.

Suggested Course of Study

| First Year | A | S |
|---|----------|----------|
| PHL 101 or 102 (PHIL 100, 105) Introduction to Philosophy or Topical Introduction to Philosophy | 3* | 3* |
| *Students take one semester in semester they do not take PHL 233 | | |
| PHL 233 (PHIL 210) Introduction to Logic: Deduction | 3* | 3* |
| *Students take one semester in semester they do not take PHL 101 or 102 | | |
| WRIT 101 (ENEX 101) College Writing I | 3 | - |
| Foreign language | 5 | 5 |
| HSTR 101H and 102H (HIST 104H, 105H) Western Civilization I and II | 4 | 4 |
| College mathematics course | - | 3 |
| Total | 15 | 15 |
| Second Year | A | S |
| PHL 210E (PHIL 300E) Moral Philosophy (offered autumn and spring) | 3* | 3* |
| * Students take one semester | | |
| PHL 261Y (PHIL 251Y) History of Ancient Philosophy | 3 | - |
| PHL 262Y (PHIL 252Y) History of Modern Philosophy | - | 3 |
| Philosophy elective | 3* | 3* |
| *Students take elective in semester they do not take PHL 210E | | |
| Foreign language | 4 | - |
| LSH 151L and 152L (LS 151L and 152L) Introduction to the Humanities | 4 | 4 |
| Electives and General Education | - | 6 |
| Total | 14 | 16 |

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Philosophy (PHL) - Course Descriptions

101, 102, 110E, 112E, 114E, 191, 198, 210E, 233, 235, 241H, 261Y, 262Y, 291, 292, 298, 301, 311, 316, 321E, 351, 363, 370, 390, 391, 392, 394, 398, 405, 406, 412, 422, 427, 429, 445, 449, 450, 455, 462, 464, 465, 466, 467, 468, 490, 491, 492, 494, 498, 499, 501, 502, 504, 505, 510, 521, 530, 581, 590, 591, 593, 594, 598, 599

Faculty

Professors

Albert Borgmann, Ph.D., University of Munich

Christopher Preston, Ph.D., University of Oregon

David Sherman, Ph.D., University of Texas, Austin

Deborah Slicer, Ph.D., University of Virginia; M.F.A., University of Virginia (Graduate Advisor)

Associate Professors

Bridget Clarke, Ph.D., University of Pittsburgh

Armond Duwell, Ph.D., University of Pittsburgh

Soazig Le Bihan, Ph.D., University of Nancy and University of Bielefeld (joint program)

Paul Muench, Ph.D., University of Pittsburgh (Chair and Undergraduate Advisor)

Assistant Professors

Matthew Strohl, Ph.D., Princeton University

Adjunct Faculty

Patrick Burke, M.A., University of Montana

David Clark, Ph.D., Purdue University

Deni Elliott, Ed.D., Harvard University

Affiliated Faculty

Hayden Ausland, Classics

Ramona Grey, Political Science

Mark Hanson, Liberal Studies

Beth Hubble, Women's and Gender Studies

Sean O'Brien, Film Studies

Emeritus Professors

Thomas Birch, Ph.D., University of Texas

Thomas P. Huff, Ph.D., Rice University

Ray Lanfear, Ph.D., Rice University

Fred McGlynn, M.A., Northwestern University

Burke A. Townsend, Ph.D., University of Hawaii

Richard E. Walton, M.A., Claremont Graduate School

Department of Physics and Astronomy

- Special Degree Requirements
- Suggested Course of Study
- Courses
- Faculty

Andrew S. Ware, Chair

Physics is considered to be the most fundamental of all the disciplines in the natural sciences. In physics we try to describe and understand a myriad of physical phenomena ranging from subatomic to cosmological scales by quantifying the relationships among different physical quantities. Not only does physics have its own merit as a challenging but exciting scientific endeavor, it provides the basis for understanding underlying processes in astronomy, biology, chemistry, geology, computer science, engineering, and even in behavioral sciences. Applications of physics are virtually unlimited: computers, communications, energy production, medical technology, and space flight, to name just a few. The Department of Physics and Astronomy offers a range of physics courses from introductory to advanced undergraduate level in both experimental and theoretical physics with computational methods in mind. In addition, we offer introductory to advanced astronomy and astrophysics courses in which astronomical applications of physics are emphasized. These courses deal with the Universe, from the solar system to clusters of galaxies, both theoretically and observationally. The Department of Physics and Astronomy offers the Bachelor of Arts degree with a major in physics. Graduates with this degree are prepared for further study in physics or related fields at the masters or Ph.D. level, as well as a wide variety of technical positions in industry. In addition, the department offers two other degree paths that combine a solid background in the study of physics with in-depth study in other fields. These options allow for specialization in related fields and provide appropriate background for certain employment opportunities and for continued graduate or professional study:

Astronomy: The astronomy option provides a thorough study of astronomy and astrophysics as well as a solid background in physics and mathematics. Graduates from this program have gone on to graduate programs in astronomy and astrophysics while others have found career opportunities at national astronomical observatories.

Computational Physics: The computational physics option provides a thorough study of computer science and computational physics as well as a solid background in physics and mathematics. Graduates from this program have gone on to graduate programs in physics and computer science while others have found career opportunities in technical fields.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

All majors must meet the Upper-division Writing Expectation by successfully completing PHSX 330 (PHYS 330) or another upper division writing course from the approved list.

Bachelor of Arts with a major in Physics

Forty-three credits in physics must be earned for the Bachelor of Arts degree with a major in physics. Required courses in physics are: PHSX 215-216N-217N-218N (PHYS 211N-212N-213N-214N) or PHSX 205N-206N-207N-208N (PHYS 111N-113N-112N-114N), PHSX 215-216N-217N-218N (PHYS 211N-212N-213N-214N) strongly recommended, PHSX 301, 311, 322, 327, 343, 320, 423 (PHYS 301, 311, 321, 325, 341, 375, 414), PHSX 425 (PHYS 415) strongly recommended), PHSX 444, 461, and 499 (PHYS 444, 461, 480). M 171, 172, 273, 311 (M ATH 152, 153, 251, 311) also must be taken.

Physics majors must satisfy successfully the general education requirements. An additional requirement is in the completion of at least one computer science language course: PSHX 333 (PHYS 331) (strongly recommended), or CSCI 100 or 135 (CS 101, 131). Recommended courses in other departments include M 317, 412, 418 (MATH 317, 412,

418).

Bachelor of Arts with a major in Physics: Astronomy Option

During their first two years, students in the astronomy option should take ASTR 142N (or 132N and 135N), PHSX 215N-216N-217N-218N (PHYS 211N-212N-213N-214N), or 205N-206N-207N-208N (PHYS 111N-113N-112N-114N), PHSX 343 (PHYS 341), and M 171, 172, 273 (MATH 152, 153, and 251), M 151 (MATH 121), if necessary). Forty-seven credits in astronomy and physics courses are required for the B.A. degree in physics with astronomy option. Required courses in physics are: PHSX 215N-216N-217N-218N, 301, 311, 343, 461, 499 (PHYS 211N-212N or 213N-214N, 301, 311, 341, 461, 480) plus at least three courses from the following: PHSX 327, 320, 423, 425, 446 and 462 (PHYS 325, 375, 414, 415, 446, and 462). Required astronomy courses are: 142N (or 132N and 135N), 353, 363, and 365 (351 and 362 recommended). At least one lab course must be taken from ASTR 362, PHSX 322 or 444 (PHYS 321 or 444). M 171, 172, 273, and 311 (MATH 152, 153, 231, 311) also must be taken. Physics with Astronomy option majors must satisfy successfully the general education requirements. An additional requirement is in the completion of at least one computer science language course: PSHX 333 (PHYS 331) (strongly recommended), or CSCI 100 or 135 (CS 101, 131).

Bachelor of Arts with a major in Physics: Computational Physics Option:

The purpose of the computational physics option is to provide a thorough background in both physics and computer science and to inculcate a deeper understanding of their goals and methods. A student earns the computational physics option by completing at least 50 credits in the two disciplines, 30 of these credits in physics courses and 20 of these in computer science courses. The following courses are required: Physics 215N-216N-217N-218N (PHYS 211N-212N-213N-214N), or 205N-206N-207N-208N (PHYS 111N-113N-112N-114N), PHSX 301, 311, 333,343,320,423, and 499 (PHYS 301, 311, 331, 341, 375, 414, and 480) (PHSX 322, 444 and 423 (PHYS 321, 444, and 415) are highly recommended); Computer Science 135-136, 232, 332 (CS 131-132, 241, 332), and seven credits of computer science electives selected from courses numbered 200 and above CSCI 205, 361, 415, and 477 (CS 242, 281, 315E and 477) recommended); M 171, 172, 273, 311 and 325 (MATH 152, 153, 251,311, 325) M 307, STAT 458 and STAT 341 (Math 305, 448 and 341) recommended). Physics with Computational Physics option majors must satisfy successfully the general education requirements.

Teacher Preparation in Physics

Major Teaching Field of Physics: For an endorsement in the major teaching field of Physics, a student must complete the following course requirements: 35 credits in Physics including Physics 205N-206N-207N-208N or 215N-216N-217N-218N (PHYS 111N-113N-112N-114N or 211N-214N) and PHSX 301, 327, 330, 343, 320, 423, 461, and 499 (301, 325, 330, 341, 375, 414, 461, and 480). Also required are Astronomy 131N-132N; M 171, 172, 273, 311, STAT 216 or 341 (MATH 152, 153, 251, 311, 241 or 341); Computer Science 100 or 135 (CS 101 or 131); EDU 497 (C&I 426); CHMY 121N and 485 (CHEM 151N and 485); BIOB 170N or 160N (BIOL 108N or 110N) or BIOO 105N (BIOL120N) or BIOE 172N (BIOL 221N); GEO 101N-102N (GEOS 100N-101N); and ENSC 105 N (EVST 101N) or Science 350 or GEO 105 (GEOS 105) Or GEO 108 (GEOS 108). Students also must gain admission to Teacher Education Program and meet the requirements for teaching licensure (see the College of Education section of this catalog).

Minor Teaching Field of Physics: For an endorsement in the minor teaching field of Physics, a student must complete Physics 205N-206N-207N-208N or 215N-216N-217N-218N (111N-113N-112N-114N or 211N-212N-213N-214N), PHSX 327, 330, 343 and 320 (PHYS 325, 330, 341 and 375). Also required are Astronomy 131N or 132N; BIOB 170N or 160N (BIOL 108N or 110N) or BIOO 105N (BIOL120N) or BIOE 172N (BIOL 121N); CHMY 121N, 485 (CHEM 151N, 485); M 171, 172, 273, 311, STAT 216 or 341 (MATH 152, 153, 251, 311, 241 or 341); CSCI 100 135, (CS 101, 131); and EDU 497 (C&I 426). Students also must gain admission to Teacher Education Program and meet the requirements for teaching licensure (see the College of Education section of this catalog).

Suggested Course of Study

Bachelor of Arts with a Major in Physics

For physics majors with four years of college preparatory mathematics or exemption from M 151 (MATH 121) by

examination:

| First Year | | A S |
|--|--|------------|
| PHSX 101 Freshman Physics Experience | | 1 - |
| *WRIT 101 (ENEX 101) College Writing I | | 3 - |
| M 171-172 (MATH 152-153) Calculus I, II | | 4 4 |
| PHSX 215N-216N, 217N-218N (PHYS 211N-212N, 213N-214N) Fundamentals of Physics | | 5 5 |
| Electives and General Education | | 2 6 |
| Total | | 15 15 |
| *Semester of enrollment depends on beginning letter of student's last name. | | |
| Second Year | | A S |
| M 273 (MATH 251) Multivariable Calculus | | 4 - |
| PHSX 301 (PHYS 301) Introduction to Theoretical Physics | | - 3 |
| PHSX 311 (PHYS 311) Oscillations and Waves | | 2 - |
| PHSX 327 (PHYS 325) Optics | | - 3 |
| PHSX 343 (PHYS 341) Modern Physics | | 3 - |
| Foreign Language* | | 5 5 |
| Electives and General Education | | 1 4 |
| Total | | 15 15 |
| *Can be waived with appropriate testing through MCLL. | | |
| Third Year | | A S |
| M 311, 412 (MATH 311, 412) Ordinary Differential Equations/Systems, Partial Differential Equations | | 3 3 |
| PHSX 322 (PHYS 321) Electronics for Scientists | | 3 - |
| PHSX 330 (PHYS 330) Communicating Physics | | - 3 |
| PHSX 320 (PHYS 375) Classical Mechanics | | - 3 |
| PHSX 423-425 (PHYS 414-415) Electromagnetism | | 3 3 |
| PHSX 446 (PHYS 446) Thermodynamics and Statistical Mechanics * | | 3 - |
| Electives and General Education | | 3 3 |
| * PHSX 446 (PHYS 446) and PHSX 330 (PHYS 330) are offered every other year and may be taken in the third or fourth year. | | |
| Total | | 15 15 |
| Fourth Year | | A S |
| PHSX 333 (PHYS 331) Computational Physics* | | 3 - |
| PHSX 444 (PHYS 444) Advanced Physics Laboratory | | - 3 |
| PHSX 461-462 (PHYS 461-462) Quantum Mechanics I & II | | 3 3 |
| PHSX 491 (PHYS 463) Selected Topics or PHSX 462 (PHYS 462) Quantum Mechanics II | | - 3 |
| PHSX 499 (PHYS 480) Senior Capstone Seminar | | 1 - |
| Electives and General Education | | 8 9 |
| * PHSX 446 (PHYS 446) and PHSX 333 (PHYS 330) are offered every other year and may be taken in the third or fourth year. | | |
| Total | | 15 15 |

Physics majors with fewer than four years of college preparatory mathematics (students who begin M 171 (MATH 152) in the second semester) can use this suggested course of study for physics courses:

| First Year | | A S |
|--|--|------------|
| PHSX 101 Freshman Physics Experience | | 1 - |
| PHSX 141N (PHYS 141N) Relativity: From Galileo to Einstein and Beyond | | - 3 |
| CSCI 100 (CS 101) or CSCI 135 (CS 131) Fundamentals of Computer Science | | - 3 |
| *WRIT 101 (ENEX 101) College Writing I | | 3 - |
| M 151 (MATH 121) Precalculus | | 4 - |
| M 171 (MATH 152) Calculus I | | - 4 |
| Foreign language+ | | 5 5 |
| Electives and General Education | | 2 - |
| Total | | 15 15 |
| * Semester of enrollment depends on beginning letter of students last name. | | |
| +Can be waived with appropriate testing through MCLL. | | |
| Second Year | | A S |
| M 172 (MATH 153) Calculus II | | 4 - |
| M 273 (MATH 251) Calculus III | | - 4 |
| PHSX 215N-216N, 217N-218N (PHYS 211N-212N, 213N-214N) Fundamentals of Physics | | 5 5 |
| Electives and General Education | | 6 6 |
| Total | | 15 15 |
| Third Year | | A S |
| M 311, 412 (MATH 311, 412) Ordinary Differential Equations/Systems, Partial Differential Equations | | 3 3 |
| PHSX 311 (PHYS 311) Oscillations and Waves | | 2 - |
| PHSX 322 (PHYS 321) Electronics for Scientists | | 3 - |
| PHSX 327 (PHYS 325) Optics | | - 3 |
| PHSX 330 (PHYS 330) Communicating Physics | | - 3 |
| PHSX 343 (PHYS 341) Modern Physics | | 3 - |

| | | |
|---|----|----|
| PHSX 301 (PHYS 301) Mathematical Methods for Physical Scientists | - | 3 |
| Electives and General Education | 3 | - |
| * PHSX 330 (PHYS 330) is offered every other year and may be taken in the third or fourth year. | 4 | 3 |
| Total | 15 | 15 |

Fourth Year

| | | |
|--|----------|----------|
| | A | S |
| PHSX 320 (PHYS 375) Classical Mechanics | - | 3 |
| PHSX 423-425 (PHYS 414-415) Electromagnetism | 3 | 3 |
| PHSX 444 (PHYS 444) Advanced Physics Laboratory | - | 3 |
| PHSX 446 (PHYS 446) Thermodynamics and Statistical Mechanics * | 3 | - |
| PHSX 461-462 (PHYS 461-462) Quantum Mechanics I, II | 3 | 3 |
| PHSX 499 (PHYS 480) Senior Capstone Seminar | 1 | - |
| Electives and General Education | 5 | 3 |
| Total | 15 | 16 |

* PHSX 446 (PHYS 446) is offered every other year and may be taken in the third or fourth year.

Bachelor of Arts with a Major in Physics and an Option in Astronomy

For physics with astronomy option majors with four years of college preparatory mathematics or exemption from M 151 (MATH 121) by examination:

| | | | |
|---|-------------------|----------|----------|
| | First Year | A | S |
| ASTR 142N The Evolving Universe | | - | 4 |
| PHSX 101 Freshman Physics Experience | | 1 | - |
| PHSX 215N-216N, 217N-218N (PHYS 211N-212N, 213N-214N) Fundamentals of Physics | | 5 | 5 |
| WRIT 101 (ENEX 101) Composition* | | 3 | - |
| M 171-172 (MATH 152-153) Calculus I, II | | 4 | 4 |
| Electives and General Education | | 2 | 2 |
| Total | | 15 | 15 |

* WRIT 101 (ENEX 101) is required unless exempted by testing. Semester of enrollment depends on beginning letter of student's last name.

| | | | |
|---|--------------------|----------|----------|
| | Second Year | A | S |
| PHSX 311 (PHYS 311) Oscillations and Waves | | 2 | - |
| PHSX 343 (PHYS 341) Modern Physics | | 3 | - |
| PHSX 301 (PHYS 301) Introduction to Theoretical Physics | | - | 3 |
| PHSX 327 (PHSX 325) Optics | | - | 3 |
| M 273 (MATH 251) Multivariable Calculus | | 4 | - |
| Foreign language+ | | 5 | 5 |
| General Education | | 7 | 5 |
| Total | | 15 | 15 |

*+Can be waived with appropriate testing through MCLL.

| | | | |
|--|-------------------|----------|----------|
| | Third Year | A | S |
| ASTR 362 Observational Astronomy* | | 3 | - |
| ASTR 363-365 Stellar Astronomy and Astrophysics* | | 3 | 3 |
| M 311, 412 (MATH 311, 412) Ordinary Differential Equations/Systems, Partial Differential Equations | | 3 | 3 |
| PHSX 330 (PHYS 330) Communicating Physics* | | - | 3 |
| Physics electives, chosen from PHSX 320 (PHYS 375), PHSX 327 (PHYS 320), PHSX 423-425 (PHYS 414-415), or PHSX 446 (PHYS 446) | | 3 | 3 |
| General Education or electives | | 3 | 3 |
| Total | | 15 | 15 |

| | | | |
|---|--------------------|----------|----------|
| | Fourth Year | A | S |
| ASTR 351 Planetary Science* | | 3 | - |
| ASTR 353 Galactic Astrophysics and Cosmology* | | - | 3 |
| PHSX 333 (PHYS 331) Computational Physics+ | | 3 | - |
| PHSX 461 (PHYS 461) Quantum Mechanics I | | 3 | - |
| Physics electives, chosen from PHSX 320 (PHYS 375), PHSX 327 (PHYS 320), PHSX 423-425 (PHYS 414-415), PHSX 446 (PHYS 446) | | - | 3 |
| PHSX 499 (PHYS 480) Senior Capstone Seminar | | 1 | - |
| General Education or electives | | 8 | 9 |
| Total | | 15 | 15 |

*Upper-division astronomy courses can be taken in a different order, as they are offered only in alternate years.

+PHSX 333 (PHYS 330) is offered every other year and may be taken in the third or fourth year.

Physics with astronomy option majors with fewer than four years of college preparatory mathematics (students who begin M 171 (MATH 152) in the second semester) can use this suggested course of study for physics courses:

| | | | |
|---|-------------------|----------|----------|
| | First Year | A | S |
| ASTR 142N The Evolving Universe | | - | 4 |
| PHSX 101 Freshman Physics Experience | | 1 | - |
| CSCI 100 or 135 (CS 101or 131) Intro to Programming or Fundamentals of Computer Science I | | 3 | - |
| WRIT 101 (ENEX 101) Composition* | | 3 | - |
| M 151 (MATH 121) Precalculus | | 4 | - |

| | |
|---------------------------------|-------|
| M 171 (MATH 152) Calculus I | - 4 |
| Electives and General Education | 2 2 |
| Total | 15 15 |

* WRIT 101 (ENEX 101) is required unless exempted by testing. Semester of enrollment depends on beginning letter of student's last name.

Second Year

A S

| | |
|---|-------|
| M 172, 273 (MATH 153, 251) Calculus II, Multivariable Calculus | 4 4 |
| PHSX 215N-216N, 217N-218N (PHYS 211N-212N, 213N-214N) Fundamentals of Physics with Calculus | 5 5 |
| Foreign language+ | 5 5 |
| Electives and General Education | 1 1 |
| Total | 15 15 |

+Can be waived with appropriate testing through MCLL.

Third Year

A S

| | |
|---|-------|
| ASTR 351 Planetary Science or * | 3 - |
| ASTR 353 Galactic Astrophysics and Cosmology* | - 3 |
| ASTR 362 Observational Astronomy* | 3 - |
| M 311 (MATH 311) Ordinary Differential Equations/ Systems | 3 - |
| PHSX 301 (PHYS 301) Introduction to Theoretical Physics | - 3 |
| PHSX 327 (PHYS 325) Optics | - 3 |
| PHSX 311 (PHYS 311) Oscillations and Waves | 2 - |
| PHSX 330 (PHYS 330) Communicating Physics* | - 3 |
| PHSX 343 (PHYS 341) Modern Physics | 3 - |
| Electives and General Education | 1 3 |
| Total | 15 15 |

Fourth Year

A S

| | |
|---|-------|
| ASTR 363-365 Stellar Astronomy and Astrophysics* | 3 3 |
| PHSX 461 (PHYS 461) Quantum Mechanics I | 3 - |
| Physics electives, chosen from PHSX 320 (PHYS 375), PHSX 327 (PHYS 320), PHSX 423-425 (PHYS 414-415), PHSX 446 (PHYS 446) and PHSX 462 (PHYS 461) | 3 3 |
| PHSX 499 (PHYS 480) Senior Capstone Seminar | 1 - |
| General Education or electives | 5 9 |
| Total | 15 15 |

*Upper-division astronomy courses can be taken in a different order, as they are offered only in alternate years.

Bachelor of Arts with a Major in Physics with an Option in Computational Physics

For physics with computational physics option majors with four years of college preparatory mathematics or exemption from M 151 (MATH 121) by examination:

First Year

A S

| | |
|--|-------|
| CSCI 135-136 (CS 131-132) Fundamentals of Computer Science I, II | 3 3 |
| WRIT 101 (ENEX 101) College Writing I* | - 3 |
| M 171, 172 (MATH 152-153) Calculus I, II | 4 4 |
| PHSX 101 Freshman Physics Experience | 1 - |
| PHSX 215N-216N, 217N-218N (PHYS 211N-212N, 213N-214N) Fundamentals of Physics with Calculus* | 5 5 |
| Electives and General Education | 2 - |
| Total | 15 15 |

* Semester of enrollment depends on beginning letter of student's last name.

Second Year

A S

| | |
|---|-------|
| CSCI 232 (CS 241) Data Structure and Algorithms | 4 - |
| M 225 (MATH 225) Introduction to Discrete Math | 3 - |
| M 273 (MATH 251) Multivariable Calculus | - 4 |
| PHSX 301 (PHYS 301) Introduction to Theoretical Physics | - 3 |
| PHSX 343 (PHYS 341) Fundamentals of Modern Physics | 3 - |
| Foreign language+ | 5 5 |
| Electives and General Education | - 3 |
| Total | 15 15 |

+Can be waived with appropriate testing through MCLL.

Third Year

A S

| | |
|--|-------|
| CSCI 205 (CS 242) Programming Languages w/C/C++ | - 4 |
| CSCI 361 (CS 281) Computer Architecture | 3 - |
| M 311 (MATH 311) Ordinary Differential Equations/Systems | 3 - |
| M 325 (MATH 325) Discrete Mathematics | - 3 |
| PHSX 311 (PHYS 311) Oscillations and Waves | 2 - |
| PHSX 322 (PHYS 321) Electronics for Scientists | 3 - |
| PHSX 333 (PHYS 331) Computational Physics # | 3 - |
| PHSX 320 (PHYS 375) Classical Mechanics | - 3 |
| PHSX 330 (PHYS 330) Methods of Communicating Physics# | - 3 |
| Electives and General Education | 3 2 |
| Total | 15 15 |

PHSX 333 (PHYS 331) and PHSX 330 (PHYS 330) are offered every other year and may be taken in the third or fourth year.

| Fourth Year | | A S |
|---|--|------------|
| CSCI 332 (CS 332) Design/Analysis of Algorithms | | 3 - |
| CSCI 415 (CS 415E) Computers, Ethics, and Society* | | - 3 |
| PHSX 423-425 (PHYS 414-415) Electricity & Magnetism I, II * | | 3 3 |
| PHSX 499 (PHYS 480) Senior Capstone Seminar | | 1 - |
| Electives and General Education | | 8 9 |
| Total | | 15 15 |

* CSCI and PHSX courses marked with * are recommended. Other courses in physics and computer science can be substituted for them.

Physics with computational physics option majors with fewer than four years of college preparatory mathematics (students who begin M 171 (MATH 152) in the second semester) can use this suggested course of study for physics courses:

| First Year | | A S |
|--|--|------------|
| CSCI 135-136 (CS 131-132) Fundamentals of Computer Science I, II | | 3 3 |
| WRIT 101 (ENEX 101) College Writing I* | | - 3 |
| M 151 (MATH 121) Precalculus | | 4 - |
| M 171 (MATH 152) Calculus I | | - 4 |
| PHSX 101 Freshman Physics Experience | | 1 - |
| Foreign Language+ | | 5 5 |
| Electives and General Education | | 2 - |
| Total | | 15 15 |

* Semester of enrollment depends on beginning letter of student's last name.

+ Can be waived with appropriate testing through MCLL.

| Second Year | | A S |
|--|--|------------|
| CSCI 232 (CS 241) Data Structure and Algorithms | | 4 - |
| CSCI 205 (CS 242) Programming Languages w/C/C++ | | - 4 |
| M 225 (MATH 225) Introduction to Discrete Math | | 3 - |
| M 172 (MATH 153) Calculus II | | 4 - |
| M 273 (MATH 251) Multivariable Calculus | | - 4 |
| PHSX 215N-216N, 217N-218N (PHYS 211N-212N, 213N-214N) Fundamentals of Physics with Calculus* | | 5 5 |
| Electives and General Education | | - 2 |
| Total | | 16 15 |

| Third Year | | A S |
|--|--|------------|
| CSCI 332 (CS 332) Design/Analysis of Algorithms | | 3 - |
| M 311 (MATH 311) Ordinary Differential Equations/Systems | | 3 - |
| M 325 (MATH 325) Discrete Mathematics | | - 3 |
| PHSX 311 (PHYS 311) Oscillations and Waves | | 2 - |
| PHSX 343 (PHYS 341) Fundamentals of Modern Physics | | 3 - |
| PHSX 333 (PHYS 331) Computational Physics # | | 3 - |
| PHSX 301 (PHYS 301) Introduction to Theoretical Physics | | - 3 |
| PHSX 330 (PHYS 330) Methods of Communicating Physics# | | - 3 |
| Electives and General Education | | 1 6 |
| Total | | 15 15 |

PHSX 333 (PHYS 331) and PHSX 330 (PHYS 330) are offered every other year and may be taken in the third or fourth year.

| Fourth Year | | A S |
|--|--|------------|
| CSCI 415 (CS 415E) Computers, Ethics, and Society* | | - 3 |
| PHSX 322 (PHYS 321) Electronics for Scientists | | 3 - |
| PHSX 320 (PHYS 375) Classical Mechanics | | - 3 |
| PHSX 423-425 (PHYS 414-415) Electricity & Magnetism I, II* | | 3 3 |
| PHSX 499 (PHYS 480) Senior Capstone Seminar | | 1 - |
| Electives and General Education | | 8 6 |
| Total | | 15 15 |

* CSCI and PHSX courses marked with * are recommended. Other courses in physics and computer science can be substituted for them.

Requirements for a Minor in Astronomy

To earn a minor in astronomy the student must complete PHSX 205N-206N-207N-208N or 215N-216N-217N-218N (PHYS 111N-113N-112N-114N or 211N-212N-213N-214N); ASTR 131N- 132N (ASTR 134N-135N strongly recommended); and eight credits from ASTR 351, 353, 362, or 363-364. (Mathematics prerequisites for the astronomy minor are M171, 172, and 273 (MATH 152, 153, and 251)).

Requirements for a Minor in Physics

1) To earn a minor in physics the student must complete PHSX 215N-216N-217N-218N (PHYS 211N-212N-213N-214N) (or PHSX 205N-206N-207N-208N (PHYS 111N-112N-113N-114N)); PHSX 301 (PHYS 301);