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**PUBLICATION NOTES**

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UNIVERSITY CALENDAR

Fall Semester 2002

August 26  Fall semester classes begin
October 4   Fall recess begins after last class
October 9   Fall recess ends at 7:00 a.m.
October 26  Homecoming
November 9  Family Day
November 26 Thanksgiving recess begins after last class
December 2  Thanksgiving recess ends at 7:00 a.m.
December 7  Orientation for new students admitted for Spring 2003
December 10-14 Evaluation period - special class schedule. Classes will meet during this period for regular instruction or for examinations.
December 14  Fall semester classes end
December 15  Commencement begins 2:00 p.m.

Winter Session 2003

January 6  Winter classes begin
January 24  Winter classes end

Spring Semester 2003

January 27  Spring semester classes begin
March 21   Spring recess begins after last class
March 31   Spring recess ends at 7:00 a.m.
May 12-16  Evaluation period - special class schedule. Classes will meet during this period for regular instruction or for examinations.
May 16     Spring semester classes end
May 17     Commencement begins 10:00 a.m.

Summer Preession 2003

May 19  Presession classes begin
May 26  Holiday - no classes
June 13 Presession classes end
June 14 Orientation new students admitted for Summer 2003

First Summer Session 2003

June 16  First session classes begin
July 4   Holiday - no classes
July 18  First session classes end

Second Summer Session 2003

July 21  Second session classes begin
August 15 Second session classes end

Fall Semester 2003

Monday    August 25  Fall semester classes begin
Monday    September 1 Holiday - No classes
Friday    October 10 Fall recess begins after last class
Wednesday October 15 Fall recess ends at 7:00 a.m.
Saturday October 18 Homecoming
Saturday November 1 Family Day
Tuesday   November 25 Thanksgiving recess begins after last class
Monday    December 1 Thanksgiving recess ends at 7:00 a.m.
Orientation for new students admitted for Spring 2004
Evaluation period - special class schedule. Classes will meet during this period for regular instruction or for final examinations.
Fall semester classes end
Commencement begins 2:00 p.m.

**Winter Session 2004**

Class meeting schedules will vary within these dates.

**Spring Semester 2004**

Spring semester classes begin
Holiday - No classes
Spring recess begins after last class
Spring recess ends at 7:00 a.m.
Evaluation period - special class schedule. Classes will meet during this period for regular instruction or for final examinations.
Spring semester classes end
Commencement ceremony begins at 2:00 p.m.

**Summer 1 Term 2004 (formerly Pre-Session)**

Summer 1 classes begin
Holiday - no classes
Summer 1 classes end

**Summer 2 Term 2004**

Orientation for new students admitted for Summer 2004
Summer 2 classes being
Holiday - no classes
Summer 2 classes end

**Summer 3 Term 2004**

Summer 3 classes begin
Summer 3 classes end

**Fall Semester 2004**

Fall semester classes begin
INTRODUCTION

AN INTRODUCTION TO MILLERSVILLE UNIVERSITY

Millersville University of Pennsylvania, located in scenic Lancaster County, is one of the 14 state-owned institutions of higher education that make up Pennsylvania’s State System of Higher Education.

HISTORY

In the early 1850s a group of private citizens in Lancaster County decided to sponsor a three-month summer school program that would provide more education for local pupils than what was then available in public schools. The immediate success of that initial program prompted its sponsors to propose that a permanent academy be established. The decision eventually led to the founding of what is now Millersville University.

The academy began in 1854 with the construction of a three-story building containing a small auditorium, two classrooms and housing for 50 students, located on seven-and-one-half acres at the corner of West Frederick and George Streets in Millersville. In 1855, just as the building was nearing completion, the trustees saw an opportunity to promote the new school by offering its free use to J.P. Wickersham, a superintendent of Lancaster County Schools, who was searching for a place to hold a three-month teachers’ institute.

Wickersham opened his Lancaster County Normal Institute on April 17, 1855, with 147 students each paying $34 for room, board and tuition for the three-month term. Before the term was over, both Wickersham and Academy trustees agreed that the school should become a permanent Normal School.

The Lancaster County Normal School, the first school of its kind in the state, opened at Millersville with approximately 100 students on November 5, 1855. The original academy building, soon to become known as “Old Main,” was expanded and enlarged over the years and served the College in many capacities until it was razed in 1970. The University’s 11-story library now stands on that site.

Two years after the school’s opening, the Normal School Law of Pennsylvania was enacted. It divided the state into 12 normal school districts with Lancaster, York and Lebanon counties forming the second district. The law also established certain minimum requirements for facilities and curricula. The state legislature, however, enacted no funds for the development of the schools. The trustees at Millersville raised $20,000 from gifts and subscriptions of stock at $25 a share to finance the expansion necessary to meet the requirements of the law.

On December 2, 1859, Millersville was approved as the first state normal school. When the school passed completely under the control of the state in 1917, all shares were redeemed at the par value of $25 ending 62 years of private control.

In 1927, Millersville became a State Teacher’s College and was empowered to grant the bachelor of science in education degree. In 1959, the College’s name was changed to Millersville State College and a master’s program in education was added. In 1962, the College was authorized to grant the bachelor of arts degree. In 1982, the Pennsylvania Legislature passed Senate Bill 506, creating the State System of Higher Education, effective July 1, 1983. On that date, Millersville State College became Millersville University of Pennsylvania.

In 1988, Millersville began offering courses at several sites in downtown Lancaster. Both credit courses and continuing education opportunities are provided to serve the educational needs of Lancaster city residents, area businesses and nontraditional students. The Adult and Continuing Education (ACE) Program was established in 1995 to meet the needs of working adults by offering degree programs in the evening and on weekends.

Today Millersville is proud of its beautiful, well-maintained 250-acre campus abounding with reminders of a long history. The bell from Old Main has been carefully preserved and hung in a dramatic tower. The original library, a lovely brick building built around the turn of the century with turrets, stained glass
windows, and extensive oak woodwork, has been carefully restored and is now Biemesderfer Center, “the centerpiece of the campus,” which overlooks a scenic pond with two resident swans.

**MISSION**

The mission of Millersville University today is summarized in a mission statement adopted by the Strategic Planning and Resource Council and approved by the Council of Trustees in 1993:

The primary mission of Millersville University is to promote intellectual development through an exemplary liberal arts-based education. The University is steadfastly committed to the proposition that a thorough, broad-based foundation in the arts and sciences is a necessary condition for the development of the whole person. It resolutely embraces the conviction that all of its degree programs must maintain a strong liberal arts component while preparing students to engage in productive and contributive lives as professionals.

Millersville University resolves to provide a comprehensive range of meritorious baccalaureate programs consistent with student aspirations and faculty wisdom and expertise to all qualified Commonwealth residents at the lowest reasonable cost. Additionally, it will offer graduate programs in those fields where there is both need and corresponding institutional strength.

Millersville University seeks to prepare its students to live in an increasingly diverse, multicultural, and technologically complex society. It will accomplish this by offering a curriculum that is rich and multifaceted, by serving as a model of a pluralistic community and by providing leadership in this regard to the greater community.

While Millersville University recognizes excellence in teaching as its reason for being, it also undertakes to open avenues for personal, social and cultural growth essential to the development of an educated and productive person, including development of the capacity for leadership and decision-making in order to make the fullest possible contribution to society. It will foster the examination, development and understanding of personal values and appreciation of the values of others.

The University also accepts its responsibility to provide opportunities for research, artistic and scholarly effort, and other creative endeavors in a manner consistent with its primary mission as a teaching institution. Additionally, the University accepts its responsibility to serve society by acting as an intellectual and cultural resource to the regional community.

To achieve this mission, the Millersville University community pledges itself to academic freedom and encourages imagination and curiosity, unfettered discourse, the exchange of divergent and controversial opinion, multicultural awareness and understanding, within an environment of civility, mutual respect and cooperation.

**CURRICULUM & PROGRAMS**

Millersville offers 55 bachelor’s and associate degree programs in the arts and sciences, business, and education, most of which offer many options and choices to students. All Millersville undergraduate degree programs include a general education component designed to develop student communication skills and critical thinking abilities as well as provide a broad foundation in the liberal arts, humanities, fine arts, and natural and social sciences.

Millersville also offers master’s degrees in 23 programs in the arts and sciences and education as well as selected certification programs.

A number of special educational opportunities are provided, including honors programs, independent study, field experiences, study at other institutions and abroad, and developmental course work.

Millersville University’s faculty, staff and services reflect the University’s concern for student growth and development. There are approximately 325 full-time faculty members available to advise and counsel students on academic and career-related matters. There are also counseling, career planning and placement, and tutorial services, as well as services for nontraditional students. A wide range of cocurricular and extracurricular activities and cultural events are offered.

**ACCREDITATION**

Millersville University is accredited by the Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104; phone (215) 662-5606; and the Pennsylvania Department of
Education and is approved by the American Association of University Women. Teacher Education programs are accredited by the National Council for Accreditation of Teacher Education, and the University is a member of the American Association of Colleges for Teacher Education. The Respiratory Therapy program is accredited by the American Medical Association Committee on Allied Health Education and Accreditation. The Social Work program is accredited by the Council of Social Work Education. The Music program is accredited by the National Association of Schools of Music. The Nursing program is accredited by the National League for Nursing Accrediting Commission, 350 Hudson Street, New York, NY 10014; phone (212) 989-9393. The Chemistry program is on the approved list of schools of the American Chemical Society. The Computer Science program is accredited by the Computer Science Accreditation Board. The Occupational Safety and Hygiene Management program is accredited by the Accreditation Board for Engineering and Technology. The Industrial Technology program is accredited by the National Association of Industrial Technology. The Technology Education program is in full compliance with the International Technology Education Association/Council on Technology Teacher Education guidelines for technology teacher education. The Business Administration program is accredited by the Association of Collegiate Business Schools and Programs. The School Psychology Certification program is accredited by the National Association of School Psychologists.

THE STUDENT BODY

Millersville University enrolls approximately 7,500 students. More than 70 percent are full-time undergraduates; the rest are part-time undergraduates and graduate students. About 60 percent of undergraduates are women and one in six is at least 25 years old. About 75 percent of Millersville’s undergraduates come from southeastern Pennsylvania; most are from either Pennsylvania or contiguous states.

Millersville University is a selective institution, admitting half of the approximately 6,500 students who apply each year. Millersville students are well above national norms in SAT scores, high school grades and class rank, and years spent studying college preparatory subjects such as English, mathematics, foreign languages, science and social studies. About half the freshman class has combined SAT scores over 1070 and over 75 percent graduated in the top two-fifths of their high school class.

Over 2,500 students live in University residence halls, with the remainder of the student body commuting from homes and nearby apartments.
ADMISSION AND FINANCES

ADMISSION TO MILLERSVILLE UNIVERSITY

Students may be admitted to Millersville University in a variety of ways depending on their goals. Most students wish to work on an undergraduate degree. Others may simply wish to take college-level courses for self-enrichment or career development. Some students already holding bachelor’s degrees wish to pursue a second undergraduate degree. For more information on any of Millersville’s undergraduate admission programs, contact the Director of Admissions in Lyle Hall using 800-MU-ADMIT; 717-872-3371 or visit the MU home page, www.millersville.edu.

GENERAL ADMISSION POLICIES FOR ALL APPLICANTS TO DEGREE PROGRAMS

QUALIFYING FOR ADMISSION

Anyone who wishes to be considered for admission to Millersville must be a graduate of an approved secondary school with evidence of satisfactory performance, or hold a General Educational Development (GED) high school equivalency diploma issued by the Pennsylvania Department of Education. Also required are satisfactory scores on the Scholastic Assessment Test (SAT I) or the American College Test (ACT).

Admission to undergraduate degree programs at Millersville is increasingly selective. Special admission programs are available, however, for some whose high school records, SAT or ACT scores do not demonstrate their true potential.

Admission to Millersville University is granted without regard to race, color, religion, sex, national origin, ancestry, age, handicap, marital status or lifestyle. Applications from qualified out-of-state students are welcomed; requirements for Pennsylvania resident status appear under the Expenses & Financial Aid section of this catalog.

All courses are taught in English and students are expected to have a demonstrated English language proficiency.

HOW TO APPLY

Anyone interested in applying for admission to an undergraduate degree program at Millersville should contact the admissions office, Lyle Hall, for an application. Prospective students may also apply electronically by visiting the MU home page: www.millersville.edu. For an application to be considered complete, the following must also be submitted.

1. An official copy of the secondary school record.
2. An official copy of scores on the Scholastic Assessment Test (SAT I) or the American College Test (ACT). Arrangements for taking either of these tests may be made through the student’s high school guidance office or by writing to the appropriate test organization. Since these scores are used for placement purposes and for determining University Scholarship eligibility, students may wish to retake them if there is reason to expect a significant score increase.
3. An application fee of $30.

Although not required, applicants are encouraged to have two letters of recommendation from their principal, counselor or teachers, which should be sent directly from the school to the admissions office.

DEADLINES FOR APPLICATIONS

Millersville has a rolling admissions policy and usually notifies applicants of a decision within a month after completed forms and supporting credentials are received. High school students are encouraged to submit applications as early in the senior year as possible. Applicants may apply for admission to begin course work in September, January, June or July. Those applying too late for the admission date of their preference will have their application considered for the next available admission date.
ACCEPTING AN OFFER OF ADMISSION

Applicants admitted to the Fall semester at Millersville must pay an advance matriculation deposit no later than April 1 or 15 days after the date of the admission letter, whichever is later. Students admitted to University residence halls must also pay an advance housing deposit. These deposits are explained in the Expenses & Financial Aid section of this catalog.

Students must matriculate in the semester for which they are admitted. Students who do not matriculate must submit a written request for the deposit to be applied to the next semester. This request must be submitted prior to the first day of classes in the term for which admission was offered. Failure to matriculate and/or submit the written request will result in the student being withdrawn from our files and forfeiture of the deposit.

PART-TIME STUDENTS

Full and part-time degree seeking applicants must meet the same admission requirements.

SPECIAL ADMISSION PROGRAMS FOR DEGREE-SEEKING APPLICANTS

PROGRAM FOR THE ADVANCEMENT OF COMPENSATORY EDUCATION (PACE)

PACE is an academic enrichment program provided by the Higher Education Equal Opportunity Act (ACT 101) for students who are educationally and economically disadvantaged.

Students are admitted on the basis of potential for college success as demonstrated by their high school academic profile, two letters of recommendation and evidence of motivation. The program includes developmental instruction, counseling and tutorial services. Students admitted to the program begin their studies in the summer before the freshman year.

TRANSFER APPLICANTS

Anyone who has completed course work at another accredited institution with an overall academic average of 2.0 or better may be considered for admission as a transfer student. Applicants must submit an official college transcript from each institution previously attended. In addition, all transfer applicants must also submit a high school transcript.

A higher GPA and more transferrable credits are required to enter some majors.

Applicants with less than a 2.0 average may be admitted on probation if they have been out of school for at least one semester and meet freshman admissions criteria.

State System of Higher Education (SSHE) Academic Passport. Millersville participates in this program which applies to students who transfer from PA community colleges and other SSHE institutions. Under Passport guidelines students who have earned at least 12 transferable credits with a minimum 2.0 GPA (on a 4.0 scale) from another participating institution will be considered Passport students. A higher GPA will be required to enter some majors. Millersville will make every attempt to transfer previous course work into required General Education or major program course requirements. Some courses may transfer as electives. Courses in which a grade of “D” was received at a participating institution may be transferable.

Harrisburg Area Community College (HACC) / Millersville University Dual Admission Program. This is a dual advisement program designed to assist students who begin their studies at HACC and earn an associate degree prior to transferring to MU. Students apply to the HACC / MU dual admissions program through their HACC transfer center prior to the completion of 30 HACC credits. MU registrar’s office receives the student’s HACC transcript at the completion of each semester and provides a credit evaluation. Early in the transfer student’s last semester at HACC the student should file a Millersville University application for degree status admission.

Transfer Credit. Evaluation of credits from other institutions for possible transfer to Millersville is done by the registrar’s office, Lyle Hall, after a student has been admitted. In general, transfer credit is awarded for courses in fields of study offered at Millersville that were completed with a C- or higher on the campus of a regionally accredited institution. For institutions with other grading scales, courses in which the applicant has earned a grade above the lowest passing grade are accepted.

Transfer students who hold an associate degree from a Pennsylvania community college receive full credit for all work successfully completed except for remedial or developmental courses and Millersville competency requirements in which a grade of C- or higher is not earned. All transfer students are required
to complete a minimum of 30 semester hours at Millersville University.

No credit is given for correspondence work except for college-level courses pursued through a regionally accredited institution while on active duty as a member of the U.S. Armed Forces.

Students who have received transfer credit for an equivalent course at Millersville but who take that course at Millersville forfeit the transfer credit.

Transfer credits are not used in computing Millersville GPAs except when determining graduation honors.

**INTERNATIONAL STUDENTS**

Students from other countries, or for whom English is a second language, may be admitted to a degree program if, in addition to satisfying general admissions requirements, demonstrate proficiency in English. Proficiency is normally shown by earning a minimum of 500 on the written Test of English as Foreign Language (TOEFL) or by earning a score of 183 or higher on the computer based test. The TOEFL is administered internationally.

Students from English speaking countries may choose to take the SAT or ACT as an option to the TOEFL exam. Foreign student athletes who intend to compete in intercollegiate sports must take the SAT or ACT, even if they have taken the TOEFL.

**EARLY ADMISSION**

Exceptional high school students may apply for early admission at the end of their junior year. Admissions criteria include a college preparatory curriculum, superlative high school rank and SAT scores, and a recommendation from the high school principal.

**NURSING MAJORS**

The bachelor of science in nursing (BSN) degree program is designed for the registered nurse (RN) student. Admission requirements to Millersville’s nursing program are:

1. Evidence of scholarship as shown by an official transcript from an NLNAC accredited hospital diploma school of nursing or an NLNAC accredited associate degree in nursing program.

2. License as a registered nurse. RN candidates for licensure will be admitted pending successful completion of state licensure requirements.

Anyone interested in nursing, who is not yet a registered nurse, may choose to contact either Harrisburg Area Community College (HACC) or the Lancaster Institute for Health Education (LIHE).

The Dual Admission in Nursing Program, in conjunction with Harrisburg Area Community College, provides the opportunity for the student to apply for dual admission to the University as well as the Community College. This dual admission enhances student learning by providing access to an array of academic services in support of attaining the bachelor’s degree in nursing. Formal admission to the major in nursing at Millersville University occurs upon graduation from Harrisburg Area Community College. The student should apply for a degree status admission to Millersville University early in their last semester at HACC.

**MUSIC MAJORS**

Applicants for the Music B.A. or Music Education B.S.Ed. programs, including transfer applicants, are required to audition with a solo performance and by taking a musical proficiency test. Information about the audition procedure and dates may be obtained from the music department chairperson, Northumberland House.

**READMISSION OF FORMER STUDENTS**

Former students in good academic standing at the time of their official withdrawal may apply for readmission at any time. Those who were dismissed for academic reasons must interrupt their programs for at least one semester. (Refer to the section entitled *Academic Standards.*) Those who subsequently attended another institution must have an official transcript forwarded by that institution.

Re-entering students are subject to the curriculum and graduation requirements in effect at the time of their readmission, with the exception of those students who re-enter within one year of their official withdrawal or dismissal. These students have the option of continuing under the curriculum and graduation requirements in effect for them at the time of their withdrawal or dismissal.
OTHER RESTRICTED PROGRAMS
Millersville occasionally places more stringent admissions requirements on certain degree programs. Admission to the Elementary Education B.S.Ed. program is presently more selective than general admission to the University’s other undergraduate programs. Some students interested in this program may be admitted to the University but denied admission to this specific program. Once their studies at Millersville are successfully under way, they may formally request to transfer into this program if they meet minimum departmental standards and if space is available.

ACADEMIC AMNESTY
Former Millersville University students applying for readmission following a minimum absence of five years since the end of their last semester are eligible to petition for academic amnesty if their cumulative grade point average (CGPA) was below 2.0 at departure. The petition must be in the form of a letter of appeal to the Academic Standards Committee.

In order to be eligible to petition for academic amnesty, the former student must complete an application for readmission to undergraduate degree status. If academic amnesty is granted, the calculation of the CGPA is restarted with the new matriculation semester.

Under academic amnesty, all previous course work and grades remain on the permanent record but are not included in the calculation of the MU CGPA after amnesty is granted. Students may use courses taken in the preamnesty period to fulfill general education requirements, only if a grade of C- or higher was earned in the course. Graduation with honors will be determined on the basis of a minimum post-amnesty CGPA of 3.35, after which all transfer work and preamnesty MU course work with grades of C- or better will be included to determine honors eligibility.

The student will be notified in writing of the committee’s decision. A denial of academic amnesty may be appealed to the Associate Provost for Academic Administration.

SECOND BACCALAUREATE DEGREE STUDENTS
Anyone with a bachelor’s degree from a regionally-accredited college or university may apply to earn a second bachelor’s degree. All second-degree students must declare a major at the time they apply for admission.

NONDEGREE STUDENTS APPLYING FOR DEGREE-SEEKING STATUS
Individuals who are high school graduates or hold a General Education Development (GED) certificate may choose this alternative entry into a degree program without taking the SAT or ACT tests. These students should first apply to the University as nondegree students. Upon completing 12 credits in at least two subject areas with an average of 2.0 or better, they may then apply for degree-seeking status.

THE ACE PROGRAM
The Adult and Continuing Education (ACE) program at Millersville University serves individuals who wish to pursue academic interests while also fulfilling work and/or family responsibilities. The ACE program enables students to reach educational goals or obtain a degree by attending college on a full-time or part-time basis through evening and weekend classes. Courses are available both on campus and at several off-campus sites.

ACE students may complete the following undergraduate degree programs by attending classes only evenings and weekends:

- Business Administration
  - (Accounting, Management, Marketing)
- English
- History
- Industrial Technology
  - (CADD, Electronics, General, Graphic Communications, Manufacturing, Mechanical)
- Occupational Safety
- and Environmental Health
Degrees can be obtained in other majors through a combination of daytime and evening courses. Minors are available in Psychology and Occupational Safety through evening-only studies.

**Admission to ACE.** ACE is an ideal program for the adult who didn’t have strong academic interests in high school or who tried college but didn’t continue due to motivational or personal reasons. The only required admission credential is a diploma and official transcript from an approved secondary school, a Commonwealth Secondary School Diploma or a General Education Development (GED) certificate.

**ACE Students.** Applicants who meet admissions criteria for regular admission will be admitted to the ACE program with the full privileges of degree students. Applicants who do not meet established admissions criteria may pursue a college degree on a part-time basis with provisional degree status. Provisional status ends when students successfully complete 12 credits with a 2.0 average. Students who recently were asked to leave a college due to poor academic performance may not be admitted to the ACE program. New students may begin the admission process in the spring, fall or summer semesters. ACE application forms are submitted to the Millersville University Office of Admissions with a one-time application fee of $30.00. Students who are granted admission will be assigned an academic advisor in their major field. Those admitted provisionally, or who applied for admission to elementary education, will be listed as undeclared and assigned an undeclared adviser temporarily. ACE students are urged to meet with advisers well before the beginning of the semester to determine course selections. For additional information on the ACE program, contact the Office of Professional Training & Education.

**SPECIAL ADMISSION STUDENTS**

**POST-BACCALAUREATE TEACHING CERTIFICATION STUDENTS**

Anyone with a bachelor’s degree may apply for courses leading to initial or additional teaching certification as a full-time or part-time student. For teaching certification requirements, contact the certification office, Stayer Education Center. To apply for admission, contact the graduate studies office, Lyle Hall.

**TRANSIENT STUDENTS FROM OTHER COLLEGES**

Students in good academic standing who are on leave from a degree program at another college may apply to Millersville as full- or part-time transient students.

**STUDENTS FROM FRANKLIN & MARSHALL COLLEGE AND LANCASTER THEOLOGICAL SEMINARY**

Millersville University has reciprocal agreements with these two institutions. Franklin and Marshall College may, upon appropriate authorization, send students to Millersville for courses not offered at Franklin and Marshall, without a tuition charge by Millersville. Similarly authorized full-time graduate students from Lancaster Theological Seminary may enroll in undergraduate and graduate level courses at Millersville without a tuition charge by Millersville.

Millersville students may also take advantage of these agreements and enroll for courses at these institutions. See the *Special Academic Opportunities* section for more information.

**HIGH SCHOOL STUDENTS**

Qualified high school students may take credit courses at Millersville while pursuing their high school diplomas. Applicants must submit an official transcript and a letter of recommendation from a high school official. They should also complete a special High School Student application form. Both forms can be obtained from the Millersville admissions office. Credits earned are held in abeyance until the high school diploma is awarded. Participation in this program does not guarantee later admission as a degree-seeking student. Home schooled students are encouraged to contact the admissions office for additional details.

**Precollege Program: Upward Bound.** Upward Bound is a college preparatory program for high school students designed to encourage post-secondary study and careers in scientific and technical fields. It is a year round program with a five-week residential summer program designed to develop academic talent in precollege youth. Through students’ participation in academic classes, and leadership and skill development workshops, students are encouraged to maximize their potential in preparation for college. The program experience helps students assess their academic capabilities, potential and interests. Subsequently, students who participate in the program enhance their academic preparation through development of study habits and their targeted goals. For more information, contact the Upward Bound Office, Somerset House.
VETERANS
Millersville University meets all criteria for approval for Veterans Education under the provisions of Title 38, United States Code, Section 1775 (a)(1). DANTES and USAFI courses are considered for transfer credit in accordance with the recommendations of the Commission of Accreditation for Service Experiences of the American Council on Education.

Veterans, reservists, VA vocational rehabilitation participants and eligible dependents should contact the Office of Veteran’s Affairs, Student Memorial Center, for information on educational benefits.

AUDITING COURSES
An individual who is not concerned with earning credit may audit a course upon approval of the course’s instructor. An auditing student attends classes and participates in class discussions but does not take examinations, write papers, or fulfill other requirements generally associated with earning credit. The student’s transcript does not record a grade but notes that the course was audited. Standard tuition and fees are charged. Ordinarily no more than one course may be audited per semester.

Students enrolled in a degree program may also request audit privileges. See the Special Academic Opportunities section of this catalog.

Attendance Fee Program. This is a special audit program for nondegree students to permit them to try a college course, improve career skills and otherwise enrich themselves at relatively low cost. Approval of the course’s instructor is required. Unlike other auditing students, attendance fee students have no transcript record noting the course. Matriculated students have first priority for class space. Specified courses which require minimum skills or physical considerations for instructional purposes may not be open to attendance fee students. Typically these include art studios, science and industrial arts labs, physical education classes, instrumental or vocal music, and similar classes.

The cost to attend a class on an attendance fee basis is the current rate for one credit plus the general fee. For more information, contact the Office of Professional Training & Education, Lyle Hall.

ADVANCED STANDING
ADVANCED PLACEMENT EXAMINATIONS (AP)
Credit is granted to students earning scores of 3 or higher on the AP examinations. The number of credits awarded depends on the academic major, AP subject area, and departmental recommendation. Contact your high school guidance office for information on taking an AP examination. Students must be admitted to degree status and be currently enrolled to be eligible for AP credit award. A score report from the College Board must be sent to MU. Contact the registrar, Lyle Hall (registrar@millersville.edu) or see www.millersville.edu/~registrar/ for more information regarding score reports or credit awards.

COLLEGE LEVEL EXAMINATION PROGRAM (CLEP)
CLEP is a program of the College Board which includes more than 30 Subject Examinations. Six (6) credits are awarded for scores of 50 or above on each of these CLEP Subject Examinations: English Composition (with or without essay), Humanities; College Mathematics; Natural Sciences; and Social Sciences and History. Credit is not granted for these 6 CLEP Subject Examinations taken after 15 college credits have been earned, or in discipline areas where college-level coursework has been taken, whether the course was passed or not.

Three (3) to six (6) credits are awarded to students who earn a score of 50 or above on the other CLEP Subject Examinations. Currently enrolled MU students must obtain written departmental approval prior to taking a subject examination.

Contact the University Test Center, Lyle Hall, for information on taking a CLEP examination. Contact the Registrar, Lyle Hall, regarding score reports or credit awards.

CHALLENGING COURSES BY EXAMINATION
Students who feel they have already mastered the material in a Millersville course may “challenge the course by examination,” taking a test of the course content instead of enrolling for the course itself. Students may challenge any course in which they have not received a grade and which has not been waived because of demonstrated competency or advanced placement. Because of content and structure, some courses may not be challenged by examination.

Contact the registrar’s office, Lyle Hall, for instructions, fee information and approval forms. The
examination is given at the convenience of the instructor. The grade earned is entered on the student’s record and calculated into GPA whether or not a passing grade is earned.

In some instances department chairpersons may approve the use of a CLEP subject examination to challenge a course by examination. Under these circumstances, see the preceding section on CLEP for more information.

**EXPENSES & FINANCIAL AID**

As a state-owned university, Millersville University provides educational opportunities that surpass those available at many more costly institutions. Public funds appropriated by the Pennsylvania legislature pay for building construction costs and approximately half of Millersville’s operating budget. The state appropriation is in essence a scholarship that permits a quality education at an affordable price for every student.

The table below and other information in this section presents costs for the 2001-02 academic year (September to May) for students living in University residence halls, effective July 2001. Tuition and fees are subject to change at any time.

<table>
<thead>
<tr>
<th></th>
<th>Residents of Pennsylvania</th>
<th>Non Residents of Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition</td>
<td>$4,016</td>
<td>$10,040</td>
</tr>
<tr>
<td>General Fee</td>
<td>1,037</td>
<td>1,037</td>
</tr>
<tr>
<td>Room and Meals</td>
<td>5,100</td>
<td>5,100</td>
</tr>
<tr>
<td><strong>Total fixed costs</strong></td>
<td><strong>$10,153</strong></td>
<td><strong>$16,177</strong></td>
</tr>
<tr>
<td>Estimated books and supplies costs</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Estimated personal costs</td>
<td>1,054</td>
<td>1,143</td>
</tr>
<tr>
<td>Estimated travel costs</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total estimated annual costs</strong></td>
<td><strong>$11,279</strong></td>
<td><strong>$16,796</strong></td>
</tr>
</tbody>
</table>

*Rates are subject to change

**PAYMENT OF TUITION & FEES**

Students enrolling for classes during the early registration period are not required to pay immediately. Semester bills are mailed four to six weeks before the beginning of each semester. Full payment is due two to three weeks prior to the beginning of the semester.

Student account balances by term are available on the web at MAX. Students enrolling after billing are requested to make payment immediately upon registration. Students are considered officially enrolled, able to earn credits, receive grades and graduate when all fees are paid in full or their account is “clear.”

Information about fees, payments and receipts are found at [www.millersville.edu/~bursar](http://www.millersville.edu/~bursar) or at the Office of the Bursar, Dilworth Building. Credit card payments can be made using MAX, 717-872-3999.

**Installment Payment Plan.** Millersville University offers an installment payment plan to all students and parents to help meet educational costs. The Millersville University Installment Payment Plan (MIPP) enables participants to make 12 regularly scheduled monthly installments beginning May 1 or six monthly payments for a single semester contract. Spring contracts begin November 1. In addition, MIPP allows participants to determine how much of tuition, room and board, and fees they may want to pay in installments. This feature affords our participants the ability to budget costs as best fits their personal situation. Questions should be directed to the MIPP coordinator, bursar’s office, Dilworth Building. Application forms can be printed from the web site, [www.millersville.edu/campus/current.student.html](http://www.millersville.edu/campus/current.student.html) under forms or go to the bursar’s homepage.

**NOTE: Enrollment closes August 1 for annual or fall-only contracts and closes December 1 for spring-only contracts.**
**TUITION**

Tuition charges are set in July by the Board of Governors of the State System of Higher Education and are uniform throughout the 14 state-owned universities.

**Tuition for Residents of Pennsylvania.** Full-time undergraduates pay $2,008 per semester for 12 to 18 credit hours plus $167 for each credit hour over 18. Part-time undergraduates enrolled for fewer than 12 credit hours pay $167 per credit hour. All undergraduates pay $167 per credit hour during winter and summer sessions.

**Tuition for Nonresidents of Pennsylvania.** Full-time undergraduates pay $5,020 per semester for 12 to 18 credit hours plus $418 per credit hour over 18. Part-time undergraduates enrolled for fewer than 12 credit hours pay $418 per credit hour. All undergraduates pay $418 per credit hour during winter and summer sessions.

**Tuition for International Students.** International students are charged out-of-state tuition and fees.

**Residency Status.** In order to qualify for Pennsylvania resident tuition, students must meet State System of Higher Education criteria as summarized below:

1. Continuous residence in Pennsylvania for 12 months prior to registration.
2. U.S. citizenship, formal declaration of intent to become a citizen, or admission to the United States on an immigrant visa. A nonimmigrant visa (tourist or student visa) is not proof of intent of residency.
3. Pennsylvania residency by parent(s) or guardian(s) of students who are minors. The age of majority in Pennsylvania for establishing an independent residence for tuition purposes is 22. A minor may, however, prove financial emancipation and independence through clear and convincing evidence.
4. A United States government employee or a member of the armed forces who was residing in Pennsylvania immediately prior to entering the government service and who has continuously maintained Pennsylvania as his or her legal residence is considered a Pennsylvania resident. Others in military service stationed in Pennsylvania are considered Pennsylvania residents.
5. A student receiving scholarship or grant dependent on residence in a state other than Pennsylvania is not considered a Pennsylvania resident.

A student who changes his or her residence from Pennsylvania to another state must give prompt written notice to the University. The University may reclassify a student if it believes he or she is no longer a Pennsylvania resident. Students may challenge residency classifications by making written petitions to the bursar’s office, Dilworth Building. To obtain the request form go to the bursar’s homepage and click on residency.

**Refunds.** Requests for refunds should be submitted in writing or email to the Bursar’s Office, Dilworth Building. Refunds will be made according to current University and State System of Higher Education policies. The refund schedule for tuition is as follows for fall and spring semesters.

Before the end of the first full day of scheduled classes ..............100%
First week ........................................................................90%
Second week .....................................................................80%
Third week .........................................................................70%
Fourth week .......................................................................60%
Fifth week ...........................................................................50%
After fifth week ....................................................................No refund

This refund schedule applies to part-time students who reduce their credit load and to full-time undergraduates who reduce their credit load to fewer than 12 credits.

**NOTE:*** Refunds for first-time students receiving financial aid under Title IV are made according to Public Law 102-135, Section 484B of the Higher Education Amendments.

Presession, first summer session, second summer session and winter session are each considered to be separate terms and are treated as such for refund purposes. See the appropriate session course listing for the applicable refund schedule on MU Homepage; [www.millersville.edu/~bursar](http://www.millersville.edu/~bursar). Rates and refund amounts are subject to change.
GENERAL FEE
The General Fee is a mandatory fee used to support a variety of ongoing student services and activities such as student government, student organizations, health services and wellness programs, Student Center debt service, expansion, capital replacement and maintenance.

The fee is charged to all students (full-time and part-time, residential and commuting/off-campus) during all University sessions (including presession, first summer session, second summer session and winter session) and at all course locations (including University Center in Harrisburg and other off-campus sites).

The 2001-2002 fee is $518.50 per semester for full-time students and $43.50 per credit hour for part-time students.

Refunds. The policies and schedule for tuition refunds also apply to the General Fee.

HOUSING & MEAL PLAN FEES
The 2001-02 housing and meals rate is $2,550 per semester and $850 for a five-week summer session.

Adjustments in Meal Plan Fees. Student teachers and cooperative education students residing in University-operated residence halls may request a meal plan adjustment until the Wednesday prior to the beginning of the semester. No reduction in rate will be made for students who go home for a few days at a time.

Meal Plan for Students Living Off Campus. Students living off campus are welcome to dine in University dining halls.

Meal plan per semester:
$1,100........19 meals per week, plus $100 Flex
$1,060........14 meals per week, plus $100 Flex
$825.........9 meals per week, plus $100 Flex
$530.........5 meals per week, plus $100 Flex

The 2002 summer meal plan charge for a five-week summer session:
$367.50.........................19 meals per week
$353.75.........................14 meals per week
$275.00............................9 meals per week
$177.50.............................5 meals per week

All students who leave the University, regardless of reason, receive a prorated refund of meal plan fees, provided they complete the official withdrawal process.

Millersville Advantage Plan (MAP). Money deposited into your MAP account may be used to make purchases at campus locations that display the MAP logo, including the bookstore. You can open a MAP plan with a minimum deposit of $50 and additions of $25. Please notate MAP and the amount being sent on your statement.

MAP must be paid by check, money order or credit card. Financial Aid and MIPP balance may not be used.

 Visitors and students who live off campus are also welcome to dine in University dining halls on an occasional basis. Breakfast costs $4.00; lunch, $5.70; dinner, $7.65; and brunch, $7.65. Rates for special events are available from the University Food Service, Gordinier Dining Hall.

Refunds. A prorated refund schedule for housing and meal plan fees for students who withdraw from the University is as follows:

Before student move-in day ..........100%
First week ...........................................90%
Second week ......................................80%
Third week ...........................................70%
Fourth week ......................................60%
Fifth week ...........................................50%
After fifth week ......................... No refund
OTHER FEES

Application Fee Undergraduate Admissions. Students who apply and are admitted to the University through the Undergraduate Admissions Office and are seeking an undergraduate degree, will pay the undergraduate application fee of $30 only once. After the application fee is paid the first time, any subsequent re-application will not require payment of a second application fee.

No application fee will be required for transient and non-degree admission using the Part-time Non-Degree Application (blue form).

Application Fee Graduate Admissions. People who apply for admission through the Graduate Office, regardless of the type of admission they seek (e.g., master’s degree, certification, non-degree), will pay a graduate application fee of $30 only once, provided that they have not been previously denied admission from academic reasons or dismissed from the University. Those in the latter categories who wish to reapply shall pay the graduate application fee with the submission of each new application.

Late Payment Fee. Students who do not return the billing statement or make full settlement of their account by the due date are charged $20.

Late Registration Fee. Students who register after the start of the semester/session are charged $20, except when permission for late registration has been granted by the Registrar.

MIPP Delayed Payment Fee. Installment Payment Plan participants are charged $10 when payments are not received by the first day of the month.

Orientation Fee. Students admitted for the fall semester are required to pay an Orientation Fee and are expected to attend one of the ten orientation programs offered during June and July. The orientation fee amount varies annually and is required regardless of attendance.

Special Handling Fee. Anyone who gives the University a check or credit card that is not honored by the bank on which it is drawn is charged $20.

Replacement Fees. The fee for replacement of a Millersville Student Identification Card is $15.

Damage Fees. Students are responsible for damages, breakages, and loss or delayed return of University property.

Degree/Transcript Fee. Each candidate for a degree must pay $30 to cover the cost of the diploma and future transcripts.

Certification Fee. The Commonwealth of Pennsylvania requires a nonrefundable fee for credentials evaluations and processing teaching certification applications.

Infirmary Supplies Fee. The cost of any expensive supplies used to treat a patient at the infirmary will be charged to the patient.

Library Overdue and Items Fees. Please contact the Library for information at 717-872-3612 or visit the MU website, www.millersville.edu.

DEPOSITS

Advance Matriculation Deposit. A $75 deposit is required upon acceptance of the offer of admission. It may be used toward payment of tuition. It is transferable on a one-time basis to a revised admission date upon the approval of the Director of Admissions. It is fully refundable only for medical reasons certified in writing by the attending physician or for compulsory military service certified in writing by military authorities. A partial refund ($25) of the fall semester deposit is made if written notification is received by the Admissions Office no later than May 15.

Advance Housing Deposit. Students admitted to University residence halls must pay a deposit of $125 each year. It may be applied only toward payment of residence hall fees for spring. It is transferable on a one-time basis to a revised admission date upon the approval of the Director of Admissions. It is fully refundable only for medical reasons certified in writing by the attending physician or for compulsory military service certified in writing by military authorities. A partial refund ($50) of the deposit is made if written notification is received by the admissions office no later than May 15. A partial refund ($25) of the deposit is made if written notification is received by the admissions office or the resident life office no later than July 1.
OTHER EXPENSES
Most students incur additional expenses for books and supplies, personal needs and travel to home. While these expenses vary widely, the University provides estimates for the purposes of determining financial need for grants and loans.

The total annual expenses for Pennsylvania residents living in University residence halls is estimated at $12,300 ($18,244 for nonresidents).

The total annual expense for commuting students who live with their parents or guardians while attending school is estimated at $9,354.

The total annual expense for off-campus students who are renting temporary housing in the Millersville/Lancaster area is estimated at $12,300. This amount assumes the student is sharing facilities and rental costs with at least two other persons.

For more information about estimated expenses and their impact upon financial aid, contact the financial aid office, Lyle Hall.

Student Insurance. An accident and sickness insurance plan is available to Millersville University students through the University insurance carrier, Engle-Hambright & Davies. All questions regarding eligibility, insurance coverage, costs or premium refunds should be directed to the insurance carrier.

FINANCIAL AID
Financial assistance is available to Millersville students through grants, scholarships, employment, and loans. Contact the Office of Financial Aid for information and application for most programs or visit the website, www.millersville.edu/~finaid.

UNIVERSITY SCHOLARSHIPS
A number of scholarships are offered at Millersville including scholarships based on academic performance, athletic potential and need. Some of the larger programs are the SICO, Search for Excellence, and MEDAL Fund scholarship programs, and the Board of Governors tuition waiver program. Information on these and other University scholarships follows the Financial Aid section.

FEDERAL GRANT PROGRAMS
Federal Pell Grants. Federal Pell Grants are federally-funded awards based on the financial need of the family.

To apply for a Federal Pell Grant, complete a Free Application for Federal Student Aid, available from high school guidance offices or the Office of Financial Aid. You may also apply online at www.fafsa.ed.gov. Procedures and deadlines are in the form’s instructions. Within six weeks the student will receive notification of eligibility from the U.S. Department of Education.

Federal Supplemental Educational Opportunity Grant (FSEOG). This program is for undergraduate students of exceptional financial need. To be eligible, students must be eligible for a Federal Pell Grant and be enrolled at least half time (6 credits). FSEOG Grants at Millersville normally range from $400 to $800 per academic year.

STATE GRANT PROGRAMS
The Pennsylvania Higher Education Assistance Agency (PHEAA) provides state grants (PHEAA Grants) to help Pennsylvania residents in need of financial assistance attend approved institutions of higher education. Millersville University is approved by PHEAA.

Grant sizes vary depending on educational expenses, family size, and resources.

PHEAA Grants are subject to annual review and may change from year to year. Renewal depends on satisfactory academic standing, continued need for financial assistance, and the availability of funds appropriated by the Pennsylvania General Assembly.

STUDENT EMPLOYMENT PROGRAMS
Federal Work Study Program (FWS). This program provides jobs for students who have financial need and must earn a part of their educational expenses. Students are eligible if they are enrolled at least half time (6 credits).

Millersville University Student Employment Program. This program differs from the Federal Work Study Program in that students do not have to demonstrate financial need in order to qualify.
LOAN PROGRAMS

Federal Perkins Loans. This program is for students who are enrolled at least half time (6 credits) and demonstrate significant financial need. Maximum loans are $3,000 per year.

Repayment begins nine months after leaving school with up to ten years to repay. During the repayment period, five percent interest is charged on the unpaid balance of the principal.

Federal Stafford Loan Program. This program enables students to borrow directly from a bank, credit union, savings and loan association or other participating lender. Millersville University will determine a student’s borrowing eligibility and pre-certify a loan with PHEAA. PHEAA will mail a promissory note to the student for completion. After the completed promissory note is returned to PHEAA, the loan can be guaranteed.

To be eligible, a student must be enrolled at least half time (6 credits) and meet financial need requirements. The maximum loan for an undergraduate ranges from $2,625 to $5,500 a year. Total loans may not exceed $23,000 for undergraduate study.

Federal Stafford loans can be subsidized or unsubsidized. The government pays the interest on the subsidized loan while the student is enrolled. On the unsubsidized loan, the student must pay the interest on a monthly or quarterly basis while enrolled.

Repayment normally begins six months after leaving school with up to ten years to repay. The size of repayments depends upon the size of the debt and ability to pay.

Federal PLUS Loans are available to parents of dependent undergraduate students. Additional information can be obtained from the Office of Financial Aid.

Emergency Loans. Enrolled students may apply for emergency loans, which are limited to $100 and must be repaid within 30 days. These loans assist with unexpected expenses that may arise. They cannot be used for books or to pay University charges. Applications and additional information are available from the Office of Financial Aid.

ACADEMIC PROGRESS POLICY

In order to receive federal and state student financial aid, a student must pass a prescribed number of new credits each academic year s/he receives financial aid. A new credit is defined as a credit for which the student did not receive a previous grade of A, B, C, D or pass.

<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>Total # of credits that must be earned per academic year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G = Graduate</td>
<td></td>
</tr>
<tr>
<td>UG = Under Graduate</td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>(12 cr/sem) 24 new credits</td>
</tr>
<tr>
<td>3/4 time</td>
<td>9 to 11 cr/sem 18 new credits</td>
</tr>
<tr>
<td>Half Time</td>
<td>6 to 8 cr/sem 12 new credits</td>
</tr>
</tbody>
</table>

Failure to pass the prescribed number of new credits during an academic year in which the student receives financial aid will result in the student losing his/her eligibility. Students may make up the credits without financial aid during the winter and summer sessions (without financial aid).
UNIVERSITY SCHOLARSHIPS AND AWARDS

A scholarship is a financial grant for a student’s University expenses. These grants are usually given based on financial need and/or particular academic or athletic excellence.

The University Scholarships marked with an asterisk (*) are awarded to incoming students. For more information regarding freshman scholarships contact the admissions office, and for general information regarding scholarships, contact the financial aid office.

SCHOLARSHIPS – ACADEMIC

*AFSCME Local 2421 Scholarship. Awarded annually by the American Federation of State, County and Municipal Employees to a student graduating from each Lancaster County high school.

APSCUF-MU Scholarship. Awarded to two undergraduates enrolled part- or full-time in a degree program at Millersville. Applicants must have completed 45-75 credits, including at least nine at Millersville, and have a GPA of at least 3.7. Financial need is also considered.

African American/Latino Alumni Scholarship. Awarded to African American and Latino students who are full-time undergraduates. Recipients must have a minimum CGPA of 2.5 with 36 or more credits. A written essay and interview are required.

All Greek Council/Stephanie Wocjik Scholarship. Awarded to a student affiliated with an organization which is a member of All-Greek Council.

American Association of University Women Scholarship. Awarded to a “nontraditional” woman student from the Lancaster area who has completed 90 credits and is one year from completing her degree requirements.

American Industrial Hygiene Association Scholarship. Awarded to a student majoring in Occupational Safety and Hygiene Management or a related discipline and who has demonstrated a proclivity toward industrial hygiene. Applicants must have completed 60 credits, including 12 in industrial hygiene, and have a GPA of at least 2.5.

Eugene and Dora Androlonis Endowed Scholarship. Awarded to orphans students, or students who have financial need, who are also residents of the community of Shenandoah, Pa. or its vicinity.

Leo Ascher Music Scholarship. Established by Mrs. Franzi Ascher Nash and awarded to the undergraduate music major who has best developed a musical composition based on one of Leo Ascher’s original themes.

James C. Atty Memorial Scholarship. Awarded to a student of the Counselor Education Program on the bases of financial need and potential as a counselor.

Laurene Cassady Auker Scholarship. Awarded to students demonstrating financial need.

Thomas R. Baker Memorial Scholarship. Awarded “to a worthy student of ability” upon completion of the junior year. The Wickersham Scholarship winner is not eligible for this award.

*D. Luke and Elva W. Biemesderfer Scholarship for Merit in Foreign Languages. Awarded annually to an entering full-time freshman majoring in a foreign language. The recipient shall be chosen on the basis of excellence in scholarship and leadership potential. Financial need may be taken into consideration but shall not be the major criterion.

Elva W. Biemesderfer Scholarship. Presented to a student in the Communication and Theatre curriculum with a concentration in Theatre.

*Board of Governors Scholarships. Awarded primarily to minority students for yearly tuition and renewable each year that the recipients maintain acceptable academic standards. Twenty percent of the scholar ships are used to support academically talented students regardless of minority status.

A.G. Breidenstine Scholarship. Established by friends of Dr. A.G. Breidenstine in recognition of his service as dean from 1955 to 1965. Awarded to the student whose honors work is judged to be most outstanding.

Campus Club Scholarships. Awarded to members of the junior class who have maintained a GPA of 2.0 or higher and who are dependent wholly or in large part upon their own efforts for financing an education.
**Harry E. Canter Statistics Scholarship.** Awarded to the junior or senior mathematics or computer science major who has shown the most outstanding performance in statistics.

*Joseph Anthony Caputo and Linda Ryan Caputo Scholarship in Chemistry.* Awarded to an incoming chemistry major based on merit as demonstrated by class rank performance, scholastic aptitude examinations and other criteria as recommended by the admissions office.

**Lt. Col. Jo Ann Cashman Scholarship Endowment.** Awarded annually to a student enrolled in the nursing curriculum who is in good academic standing. Preference may be given, but is not limited to, students who are in financial need.

**Ernest & Mary Chamberlain Scholarships.** Awarded to students in the Adult Continued Education program who have earned the highest number of credits up to 90 and who have a GPA of at least 3.8 in their current program of study.

**Christina A. Ciallella Memorial Scholarship.** Awarded to a female student who has completed at least 60 credits at MU within restriction upon major and based upon financial need.

**Class of 1917 Sanders P. McComsey Scholarship.** Awarded to a student who excels in English, payable at the end of the junior year.

**Class of 1916 / R. Bruce Walter Scholarship.** Awarded for an academic scholarship as determined by the University President or his designee.

**Class of 1927 Memorial Scholarship.** Awarded to a sophomore majoring in education who has passed 45 credits or more, has an aptitude and ability for the profession of teaching, and who participates in University activities, especially intercollegiate sports.

**Class of 1935 Scholarships.** Awarded to junior students who are in good academic standing and demonstrate financial need.

**Class of 1937 Scholarship** Awarded to a first semester senior who intends to teach. The student must have a GPA of at least 2.5 and two letters of recommendation from teaching faculty.

**Class of 1940 Scholarship.** Awarded to a student who demonstrates financial need and who is majoring in education.

**Class of 1942 Scholarship.** Awarded annually to an outstanding education major who has achieved academic excellence and has demonstrated financial need.

**Class of 1943 Scholarship.** Awarded to a senior in the School of Education based on exceptional potential as a classroom teacher, who has earned a total of 96 credits with a GPA of 3.0 or better.

**Class of 1944 Scholarship.** Awarded to a student majoring in education, who has completed at least 60 credits of course work and has demonstrated financial need.

**Class of 1947 Scholarship/Scholarship for Research Students in University Honors Program.** Awarded to a student who is enrolled in the honors program, engaged in independent research related to his or her course of study at the University, and demonstrates a need for financial assistance.

**Class of 1948 Scholarship.** Awarded to an upperclassman who demonstrates scholastic ability and financial need.

**Class of 1951 Endowment.** Awarded for an academic scholarship (as determined by the director of financial aid), based upon merit, financial need or both.

*Elisabeth Ruth Cramer Endowed Scholarship.* Awarded to a student majoring in art education who demonstrates financial need. The scholarship shall be presented to a first year student and may be renewed as long as that student is in good academic standing and has financial need.

**Gladys Cooper Cunningham Scholarship.** Awarded to a junior or senior who is most outstanding in early childhood education.

**Beatrice U. Datesman Scholarship.** Awarded to a junior/senior on the basis of scholarship, requiring at least a 3.0 GPA in the major. Students’ financial need shall be a determining factor.

**Aimee Decker Scholarship.** Awarded to a deserving MU student who is in good academic standing and has financial need as determined by the Director of Financial Aid.
William H. and Alma P. Duncan Scholarship in Elementary Education. Awarded to an elementary education major on the basis of financial need, excellence in scholarship, leadership qualities and service to others.

*Dean Dutcher Memorial Music Scholarship. Awarded to an incoming freshman who maintains enrollment as a full-time music major at Millersville University, based on musical talent in art performance medium.

*Elementary Education Scholarship. Awarded to a freshman majoring in Elementary Education and based on financial need. Recipient must demonstrate high academic performance in high school record and strong community service during the final two years of high school. May be renewed for three additional years; application required.

Daniel G. Engle Scholarship. Awarded on completion of the junior year to a science major for superior scholarship and exceptional University and community service and maintain a 3.0 CGPA.

Paul W. Eshelman Memorial Scholarship. Awarded annually to a junior industry and technology major for excellence in wood technology, payable upon the student’s enrollment for the second semester of the senior year.

Ermaleen B. Etter Endowment in Special Education. Awarded to senior student teachers enrolled in the School of Education who have demonstrated professional excellence during their student teaching experience with learning disabled children.

Exide/Fittipaldi Memorial Scholarship. Awarded to children or spouses of employees of Exide Corporation, Lampeter Plastics Division, who are admitted as full-time undergraduate students.

*John Charles Falck Scholarship For Academic Excellence. Awarded to an undergraduate student on the basis of academic excellence and good character, as determined by the director of financial aid, and renewable each year that the student maintains a passing academic average.

*Dr. Dominick J. and Frances McAndrew Fanani Memorial Scholarship. Awarded to an incoming freshman in Humanities who has achieved a minimum cumulative high school academic performance of 3.30 and strong record of high moral character demonstrated by community service and volunteer experience.

Valborg Fletty Memorial Scholarship. Awarded to a student entering the senior year on the basis of scholarly ability and financial need.

Robert & Darlene Ford Merit Scholarship in Geography. Awarded to a geography major who has completed a minimum of 75 credits at Millersville University by the semester prior to award of the scholarship and maintain a GPA of 3.2 overall.

Forty et Eight (Voiture 42) Endowment for Nursing Education. Awarded to one or more students enrolled in the nursing program in pursuit of the Bachelor of Science in Nursing, the Master of Science in Nursing or the Nurse Practitioner Certification program. The student should also demonstrate intent to be active in the practice of nursing upon completion of the program. The award will be made on the basis of academic potential and financial need as determined by the nursing faculty. The scholarship may be renewed on recommendation of nursing faculty.

Arthur and Claribel Gerhart Scholarship in Biology. Awarded to a student who is majoring in biology, is in good academic standing, and has completed 60 credits by the end of the semester in which the award is made. Preference is given to sophomores and juniors.

*Greek Council Scholarships. Awarded to encourage academically strong high school students with extensive extracurricular involvement to attend Millersville University.

*Nancy Zakrewski Groff Memorial Scholarship. Awarded to a first year student who has demonstrated academic achievement in high school; there is no restriction upon major or field of study.

Willard O. & Dr. Catherine Gibson Havemeier Endowment in Computer Science. Awarded to a student engaged in computer science and robotics research. Recipient must have a GPA of 3.0 or higher. Award is restricted to related travel, materials and supplies.

Dr. Alex Henderson Scholarship in Biology. Awarded to a student who is majoring in biology, is in good academic standing, and has completed 60 credits by the end of the semester in which the award is made. Preference is given to sophomores and juniors.
**Hoffman Family Endowment for Honors Program Students.** Awarded to two students in the Honors College; one majoring in humanities or social science and one majoring in science or math.

**Alan S. & Adeline Holliday Endowment.** Awarded to a student who demonstrates scholastic ability and financial need.

**James Hughes Memorial Scholarship.** Awarded to an incoming freshman from the city of Philadelphia who has financial need.

**The Russell C. Hughes English Scholarships.** Awarded to two incoming freshman students majoring in English, for the period of time each is in good academic standing and majoring in English at Millersville University. Student must have a minimum academic average of 3.0 and have a history of participation in high school publications.

**Hazel Jackson Scholarship.** Awarded annually to an African-American student majoring in secondary education language arts or the humanities who is in good academic standing and demonstrates financial need. Preference given to students from Lancaster County.

**Jackson Memorial Scholarship.** Established by Dr. George F. and Lelia M. Stauffer and awarded annually to a graduate of Hempfield High School who has completed the junior year and has attained distinguished achievement in elementary education. In the event no Hempfield High School graduate is eligible, the award is made to the highest ranking elementary education major from Lancaster County high schools.

**Keever Biology Research Scholarship.** Awarded to an undergraduate biology major to train the recipient in the methods and values of scientific research. Preference is given to those concentrating in botany.

**Beatrice M. Killough Endowment for Spanish Studies.** Awarded to an entering freshman, enrolled in the Spanish or Spanish-Education curriculum. The award may be renewed for up to seven additional semesters, providing the student maintains a 3.5 GPA in Spanish and a 3.0 overall GPA.

**Esther S. Knaub Scholarship.** Awarded to a York County student, as determined by the appropriate college officials.

**James E. Koken Science Scholarship.** Awarded to a student enrolled in a science curriculum or in science education, who has completed 55 credits at Millersville University by the end of the semester prior to the semester in which the scholarship is awarded.

**David B., Ph.D. and Kathryn Millar Kraybill Scholarship.** Awarded to an entering freshman from the Lampeter-Strasburg school district. Selection is based upon financial need for academic studies only, and use of the scholarship is limited to payment of tuition. Scholarship may be renewed for eight semesters or until graduation, whichever is first.

**Lancaster County Chapter - PA Association of School Retirees Scholarship.** Awarded to a junior education major who is a Lancaster County resident who graduated from a local high school with a passing cumulative grade point average and has financial need.

**Violet F. Markey Academic Scholarship.** Awarded for an academic scholarship as determined by the University President or his designee.

**Dr. William B. McIIwaine Scholarship in Earth Sciences.** Awarded to a student majoring in earth sciences who has completed 60 semester hours of academic credit at MU with a GPA of 3.2 or higher and demonstrates financial need.

**MEDAL Fund Academic Scholarship.** Established by Millersville University employees and awarded to incoming freshmen on the basis of academic merit and renewable annually for those who maintain established academic standards.

**Dana Messman Scholarship.** Presented annually to a senior female elementary education major with a GPA of 3.5 or higher, demonstrating financial need and participating in University and professional activities.

**Helen R. Metzler Undergraduate Reading Scholarship.** Awarded to an elementary education major who has completed course work in reading and has shown excellence in classroom performance and knowledge of reading techniques.

**Robert S. & Helen R. Metzler Scholarship in Elementary Education.** Awarded to a student enrolled in the elementary education curriculum who has completed 45 credits at Millersville University. Chosen by the department on the basis of financial need and exceptional potential as an elementary teacher.
Millersville University Alumni Scholarship. Established by the Millersville University Alumni Association. Awarded to the student with the highest GPA who has earned more than 57 but fewer than 72 credits upon completion of the spring semester.

*Millersville University Alumni Association Legacy Scholarship. Awarded to an incoming freshman who has ranked in the top 10% of his/her high school class and has an outstanding record of extracurricular activities and leadership.

Millersville University Business Associates Scholarship. Awarded to female(s) nontraditional student(s) from Lancaster County enrolled in the Professional Training & Education program. Students must be financially independent and have demonstrated financial need.

Kurtz J. & Mary A.C. Mock Memorial Scholarship. Awarded to a female enrolled in the elementary supervisor certificate program who possesses either a bachelor’s or master’s degree from Millersville University. Recipient must have a minimum 3.0 GPA and demonstrate superior leadership qualities.

The Charles E. Muench Endowed Scholarship in Communications and Theatre Arts. Awarded to an entering senior majoring in communication and theatre arts who has demonstrated financial need, has a minimum overall academic average of 3.0, and exemplifies commitment to and excellence in the discipline of communications.

*Edna H. Myers Mathematics Scholarship. Awarded to an incoming freshman majoring in mathematics.

John David Neider Memorial Scholarship. Awarded to a junior who has made a significant contribution to the success of musical or dramatic performing arts at Millersville and has a GPA of at least 2.0.

Neimeyer-Hodgson Student Research Grant. Awarded to a student attending Millersville University in pursuit of the baccalaureate degree.

Paul H. Nichols Earth Sciences Scholarship. Awarded to a junior earth sciences major who is chosen on the basis of outstanding motivation and academic excellence.

Nontraditional Student Scholarship. Awarded to an independent full- or part-time undergraduate student who is returning to school, has earned at least 15 credits at Millersville University and has demonstrated financial need.

Philip Ressler–Comcast Cable Memorial Scholarship. Awarded to a sophomore student from Lancaster County entering the junior year. Recipient must have core curriculum in political science, demonstrate service to community, and be in financial need.

Helen C. Riso/Commuting Students Association Endowed Scholarship. Awarded to a commuting student who best demonstrates financial need, satisfactory academic performance and noteworthy service to the Commuting Student Association.

Dr. Eugene K. Robb Scholarship. Awarded to a graduate student in education on the basis of academic achievement and for contributions to the field of education.

The Lina Ruiz y Ruiz Endowed Memorial Scholarship. Awarded to a junior student majoring in Spanish who, in the judgment of the professors of the Spanish section, has completed work in the field of Spanish studies.

Richard Sasin Endowed Scholarship in Chemistry. Awarded to a student majoring in chemistry and who is in good academic standing. Selection is based upon financial need and/or participation in intercollegiate sports.

Dr. Nathan C. Schaeffer Memorial Scholarship. Awarded to a resident of Lancaster County who demonstrates financial need and who is enrolled in the final year of an undergraduate program or in a postgraduate program in education and maintain a 2.5 GPA.

Hazel Rork Schmuck Alumni Scholarship. Awarded to a full-time secondary education major with an overall 3.0 GPA who has completed at least 30 and no more than 60 credits prior to the fall semester in which the award is made.

*Search for Excellence Scholarships. Awarded to entering freshmen whose class rank places them in the top 10% of their high school graduating class or who possess a math/verbal minimum combined Scholastic Aptitude Test (SAT) score of 1100. Renewable annually to those who maintain satisfactory academic standards.
*Ellen Currier Sellers Endowment for Organ Performance.* Awarded to high school seniors who will be majoring in organ or university students who are currently majoring in music with organ as an instrument of study.

*N.E. Shoemaker Biology Teaching Scholarship.* Awarded to the sophomore secondary education biology major who has earned the highest GPA.

*Amos L. Shopf Endowment for Lancaster County Students.* Awarded to a freshman who is a graduate of a secondary/high school in Lancaster County, Pa. Based on merit performance and financial need. May be renewed for three additional years providing student maintains good academic standing.

*SICO Foundation Scholarship.* Four-year scholarships awarded annually to Millersville freshman on the basis of high school records, competitive examination, personality and financial need. Only high school graduates from counties served by SICO are eligible.

*Elizabeth Smithgall Scholarship.* Awarded to students who are ranked in the top 10% of their class, demonstrate financial need and have a native language other than English.

Blanche Henninger Snyder (1918) Endowment. Used to support a scholarship in a curriculum as determined by the president of the University. Recipient will be selected by the president or his designate.

*George F. Stauffer Scholarship.* Established by Dr. George F. Stauffer and Lelia M. Stauffer. Awarded to a student who has completed the sophomore or junior year and has demonstrated academic excellence in a physical science major.

Steinman Communications Scholarships. Awarded to full-time undergraduates in good academic standing who have completed at least 15 but not more than 100 credits, for outstanding contributions to campus communications and who indicate an intention to continue to serve in a capacity that will advance campus communications.

*The Steinman Foundations / Intelligencer Printing Freshman Scholarship.* Awarded to a full-time freshman admitted into either the associate or baccalaureate degree programs in industrial technology or technology education with demonstrated interest in graphic communication.

*The Steinman Foundations / Intelligencer Printing Upperclassman Scholarship.* Awarded to a full-time junior or senior industrial technology-graphic communication or technology education major with demonstrated performance in graphic communication and a 3.0 GPA in the major.

*Nicholas W. Stephens Memorial Endowment.* Awarded to an incoming freshman from the School District of Lancaster, Pa. The scholarship may be renewed for seven additional semesters provided student maintains acceptable academic standing.

The Clyde S. and Pauline F. Stine Endowed Scholarship. Awarded annually to a resident assistant who is a member of the junior class and who has demonstrated outstanding service to resident life.

*Nadine Thomas Journalism Scholarship.* Awarded to a third or fourth year female journalism student. The recipient will be selected by a faculty committee from the English department.

Phi Sigma Pi Joseph Torchia Scholarship. Established by the Sigma Chapter of Phi Sigma Pi Honor Fraternity and awarded to a chapter member who has demonstrated high scholarship, outstanding leadership and all-around service to the fraternity.

*Ethel Ulrich Cassel and Francis Cassel Memorial Scholarship.* Awarded to an incoming freshman organ or piano music major at MU. The scholarship may be renewed annually providing the recipient remains in good academic standing, retains a concentration in organ or piano, and fulfills the performance requirements set by the Salem United Methodist Church.

United States Steel Scholarship in Business Administration. Awarded to a junior business administration major who has the highest GPA in courses taken within the department and who has demonstrated outstanding ability and dedication to the study of business.

*Thomas G. Versprille Memorial Scholarship Fund.* Awarded to a student in good academic standing who is an active, outstanding sophomore or junior member of the Millersville University cheerleading squad who has participated in MU cheering at least one year; is a full-time student with a 2.3 GPA at the time of the award. A member anticipating continued service to the squad is preferred. The scholarship recipient is to be chosen by the cheerleading coach and the director of women’s athletics.
Joseph E. Walker American History Scholarship. Awarded to a worthy junior who intends to teach American history on a elementary, secondary, or college level. Secondary consideration is given to a junior history major who excels in American history.

Theodore Weeks APICS — The Educational Society for Resource Management Scholarship. Given by the Lancaster-York Chapter of the American Production and Inventory Control Society to a senior for outstanding achievement in production and operations management.

Gerald S. Weiss Chemistry Scholarship. Awarded to a chemistry major who has demonstrated financial need and superior academic achievement in CHEM 251: Inorganic Chemistry I, a required course in inorganic chemistry for majors in the ACS certified program leading to the bachelor of science degree in chemistry.

Wickersham Memorial Scholarship. Awarded to a senior for excellence of scholarship and exemplary character.

Joan Williams Scholarship. Awarded to a junior education student concentrating in history. Awarded on the basis of prior academic performance. The recipient should best exemplify love of learning, courage, determination, honesty and a sense of humor.

*Roy Lutz Winters Foreign Language Scholarship. Awarded to an incoming freshman foreign language major who has an outstanding high school record in foreign languages. The award is applicable to tuition, room, and board.

Janet Wood Memorial Fund. Awarded to a student enrolled as an education major and/or seeking teacher certification who has a GPA of at least 3.5. Undergraduate applicants must have obtained advanced professional standing and graduate students must have obtained admission to degree candidacy status prior to applying for scholarship.

SCHOLARSHIPS – ATHLETIC

For additional information about the following athletic scholarships, contact the head coach of the respective sport or the directors of athletics.

*Gene A. Carpenter Football Scholarship. Awarded to entering or enrolled athletes who have established themselves as outstanding intercollegiate football players. Recipients must meet all requirements for admissions or be full-time students in satisfactory academic standing.

*J. Freeland Chryst Scholarship. Awarded to an entering freshman who exhibits the qualities of a student athlete and participates in intercollegiate football. First consideration is given to a student residing in Lancaster County.

*George Doherty Memorial Scholarship for Wrestling. Awarded to athletes who have established themselves as outstanding wrestlers. Entering freshmen are selected based on their potential for outstanding achievement in intercollegiate wrestling; upperclassmen are selected based on their previous achievements as members of the wrestling team.

Elwood J. Finley Award. Presented to an outstanding male and female senior athlete. The award encompasses the career athletic accomplishments of the student.

*Glenn M. Flegal ’54 Wrestling Scholarship. Awarded to an incoming freshman with a proven wrestling record and who will participate in the MU wrestling program. If no freshman is available then the student must be in good academic standing with a GPA of 2.0 or better and be an MU wrestler.

*Dr. Frank Kafka Basketball Scholarship. Awarded to an athlete who has potential for outstanding achievement in men’s intercollegiate basketball. Recipients must meet all requirements for admission or be full-time students in satisfactory academic standing.

*Willard O. & Dr. Catherine Gibson Havemeier Endowment for Football. Awarded to one or more first-year students who matriculate at MU with a GPA of 3.0 or higher, and who have demonstrated leadership qualities during high school.

*J. Henry Keneagy Scholarship in Athletics. Awarded to an entering full-time freshman who intends to participate in intercollegiate athletics on the basis of potential for outstanding achievement in intercollegiate athletics and financial need.
*F. W. McLaughlin Football Scholarship.* Awarded to athletes who have established themselves as outstanding football players. Entering freshmen are selected based on their potential for achievement in intercollegiate football; upperclassmen are selected based on their previous achievements as members of the football team.

*MEDAL Fund Athletic Scholarships.* Established by Millersville University employees and awarded to athletes who have potential for outstanding achievement in intercollegiate football, wrestling, men’s basketball or women’s basketball. Recipients must meet all requirements for admission to be full-time students in satisfactory academic standing.

*Men’s Basketball Memorial Scholarship.* Established in memory of Eugene Rutherford, Class of 1940, and other former Millersville basketball team members now deceased. Awarded to athletes who have potential for outstanding achievement in men’s intercollegiate basketball. Recipients must meet all requirements for admission or be full-time students in satisfactory academic standing.

**Millersville University Alumni Association Athletic Scholarship.** Awarded to one male and one female athlete who participates in NCAA recognized sports at MU. Students must be full-time, maintain an overall GPA of 3.0 and have passed 24 credits but no more than 60 credits.

**Aurora Wickey Pucillo Award.** Awarded to an outstanding female athlete who has participated in more than one varsity sport and lettered in at least one sport. Recipients must exhibit outstanding traits of loyalty, leadership and sportsmanship, and have a GPA of at least 2.5.

**John A. Pucillo Memorial Scholarship.** Awarded in alternating years on the basis of financial need to a female or male who has participated in intercollegiate athletics for at least two years, has completed at least 60 credits, and has a GPA of at least 2.0.

*Maryann Kitson Raspen Scholarship in Women’s Athletics.* Awarded to an entering freshman who intends to participate in women’s intercollegiate athletics, on the basis of potential for outstanding achievement in intercollegiate athletics.

**Theodore Rupp Wrestling Scholarship.** Awarded to a student who participates in intercollegiate wrestling and demonstrates financial need.

*Mike Stone Wrestling Scholarship.* Awarded to a student who has established himself as an outstanding wrestler.

*Richard C. Todd Scholarship.* Established by Dr. Todd and Claudia Pennock Todd and awarded to athletes who have established themselves as outstanding basketball players. Entering freshmen are selected based on their potential for achievement in intercollegiate basketball; upperclassmen are selected based on their achievements as members of the basketball team.

*James E. Treasure Football Scholarship.* Awarded to an incoming freshman who has good academic high school preparation and will participate in intercollegiate football. The student will receive the scholarship each year he is in good academic standing and eligible to participate in intercollegiate football.

*University Athletic Scholarships.* Awarded to student athletes on the basis of potential for outstanding achievement in intercollegiate athletics. Recipients must meet all requirements for admission and maintain satisfactory academic progress.

**Women’s Athletic Scholarships.** Awarded to two junior female athletes.

**UNIVERSITY AWARDS**

An award is a cash grant or gift made directly to a student, a student’s account, or a mention on a University plaque in recognition of the student’s achievements. For more information on any of these awards, contact the honors and awards committee through the Advancement Office of Development.

**Duncan Alumni House.**

**Alpha Beta Alpha Awards.** Presented by the Kappa Chapter to one of its graduating members for service to the University and the faculty, scholarship, and outstanding professional attitude.

**American Chemical Society, Millersville University Student Affiliate Award.** Recognition on a plaque in Science & Technology Complex to a graduating senior of high academic standing who has contributed outstanding service to the chemistry department and the chapter.
American Chemical Society, Southeastern Pennsylvania Section Award. The Merck Index is awarded to the outstanding senior chemistry major. Recognition on a plaque in Science & Technology Complex a choice from several reference works, and journal subscriptions are awarded.

American Chemical Society Undergraduate Award in Analytical Chemistry. A subscription to *Analytical Chemistry* and honorary membership in the Division of Analytical Chemistry to the outstanding student in analytical chemistry.

American Institute of Biological Scientists Outstanding Biologist Award. Recognition on a plaque in Science & Technology Complex to a graduating biology major who has excelled in scholarship, research and service to the biology department.

American Institute of Chemists Award. A one-year associate membership in AIC and recognition on a plaque in Science & Technology Complex to the outstanding graduating chemistry major based on character, academic standing and potential to become a successful chemist.

American Society of Safety Engineers/Raymond C. Mullin Award. Presented by the Central Pennsylvania Chapter of ASSE each semester to a junior or senior occupational safety and hygiene management major who has completed at least 15 credits of occupational safety and hygiene management courses and 12 credits of related courses with a GPA of at least 2.5 overall and 3.0 in health safety management courses.

Art Department Art History Award. Given to a junior or senior art major who has taken at least two art history courses and who, in the opinion of the art history faculty, has shown high academic promise.

Athletic Coaching Minor Faculty Award. Presented to the outstanding graduating male and female athletic coaching minor students, based on academic excellence, campus leadership, sportsmanship and community service.

Guy Kurtz Bard Award. Awarded to a senior political science major in even-numbered years and to a senior history major in odd-numbered years for outstanding ability in political science and history.

Esther Herr Bear Award. Awarded to worthy and deserving students who excel in music.

Anne E. Beyer Award. Awarded for outstanding performance in student teaching to senior elementary education majors who have spent two full academic years at Millersville preparing to teach in elementary schools.

Cora Catharine Bitner Music Award. Awarded to students who are proficient in musical performance and have rendered loyal service to the musical activities of the University.

Henry Franklin Bitner Science Prizes. Awarded to two seniors annually, one in physical science and one in biological science.

The Black Student Union/Allen-Coleman Award. Awarded to a member of the Black Student Union who has a CGPA of 2.75 and who has demonstrated service to the Millersville campus community through active membership and involvement in campus organizations.

Lee E. and Laura H. Boyer Award. Awarded to two seniors: one who is a computer science major excelling in mathematics and one who is a mathematics major excelling in computer science.

Chemical Rubber Company Chemistry Achievement Award. A book to the outstanding student in the general chemistry sequence.

Class of 1866 Award. Awarded to two seniors for excellence in mathematics.

Class of 1895 Award, also known as the Frank Albert Fund of the Class of 1895. Awarded to a graduating senior on the basis of scholarship and all-around service to the University.

Class of 1898 Award. Awarded to the second-ranking member of the junior class, payable after graduation.

Class of 1910 Award. Awarded to a student for excellence in English at the end of the student’s senior year.

Class of 1911 H. Justin Roddy Memorial Award. Awarded to a graduating senior who, in student teaching, shows greatest promise of becoming a successful teacher of the sciences.

Class of 1922 Esther E. Lenhardt Award. Awarded to a senior who has demonstrated outstanding proficiency in the use of English.
Class of 1928 Isaac F. Seiverling Award. Awarded to a junior for proficiency in mathematics.

Commission on Cultural Diversity Award. Awarded annually to one female and one male student of diverse backgrounds. Selection of the student is based on academic performance and service to the University community.

Commonwealth of Pennsylvania Universities Biologists Award. Awarded on the basis of academic standing, excellence in biology and research potential.

Computer Science Award. Awarded to a senior computer science major for outstanding achievement in computer science courses.

Cooperative Education Program Certificate of Achievement. Awarded to seniors for outstanding achievement in the cooperative education program.

Dilworth-McCullough English Award. Awarded to a student who has achieved excellence in English literature.

Laura B. Doering Library Service Award. Presented to senior student library workers who have demonstrated exceptional commitment on the job.

Dramatics Service Award. Presented by Citamard Players to a graduating senior for outstanding service in the area of dramatics.

Earth Sciences Awards for Academic Excellence. Recognition on a plaque in Roddy Science Center to seniors for excellence in earth sciences.

EAPSU Award. A merit award for overall excellence in English given by the English Association of Pennsylvania State Universities.

Michael W. Eisenberger Choir Award. Awarded to the graduating senior University Choir member who has been recognized by fellow choir members as emulating those qualities of leadership, musical ability and friendliness displayed by the late Michael W. Eisenberger during his association with the Choir and the University.

Excellence in Marketing Award. Presented by Sales & Marketing Executives, Inc. to the outstanding graduating senior in the Department of Business Administration.

Excellence in Printing Technology Award. Presented annually to a senior industry and technology student who possesses a GPA of at least 3.0, consistently produces high quality work, displays innovative ideas and demonstrates outstanding commitment to the printing profession.

Faculty-Student Athletic Committee Awards. Plaques to the male and female varsity letter winners who have attained the highest GPA over seven semesters of academic work.

Dominick J. and Frances M. Fanani Junior Senior Award. Awarded to a full-time junior or senior student in the arts and humanities for outstanding scholarship and character.

Betty J. Finney Community Service Award. Awarded to a senior psychology major who has demonstrated outstanding community service relevant to the field of psychology. Recipient must have attained a CGPA of at least 3.0. Selection is by vote of the psychology faculty.

Antone K. Fontes Health Professions Award. Reference books presented to three graduating seniors, one each from premedical/pre-dental, nursing, and allied health programs, who have demonstrated outstanding ability. Selections are on the basis of GPA and recommendations.

Marion G. Foster Award. Awarded to a junior social work major who best exemplifies those qualities of Marion G. Foster: dedication to the social work profession; a genuine respect for people; and demonstrated academic excellence under extraordinary circumstances.

Alice R. Fox Memorial Award. Awarded to a student who has achieved excellence in English.

Sandra Fruitman Art Award. Awarded to an art or art education major who is in good academic standing and who has best demonstrated excellence in the 2-D (two-dimensional) mixed media category.

Leah Fudem Photographic Service Award. Awarded to two students for outstanding photographic service to The Snapper or The Touchstone.

Verda M. Fulmer Award. Established by the Philadelphia Alumni Branch/MU Alumni Association, and awarded to an outstanding senior elementary education major.
**Fulton Bank Award in Economics.** Awarded to a student who, in the judgment of the economics department, has written the best essay on an aspect of banking.

**Geography Award.** Awarded to a junior or senior majoring in Geography who demonstrates a strong commitment to the discipline of geography, is in good academic standing, and demonstrates financial need. Renewable in the subsequent year.

**Geography Faculty Award.** A certificate and an appropriate gift, usually a book, presented annually by the geography department. Selection is made by the geography faculty.

**D. Joan Godfrey Nursing Award.** Awarded to one to three senior nursing majors on the basis of participation in the nursing program, club and other campus activities, involvement in the nursing profession and academic standing.

**John K. Harley Award.** Awarded to a student who has maintained the highest standing in scholarship and deportment during both his/her junior and senior year, and who is of high moral character and exemplary habits.

**James Hamilton and Lucretia Boyd Hartzell Piano Award.** Awarded to a junior or senior piano student who possesses extraordinary talent, has shown considerable progress, and has contributed to the musical enrichment of the University community.

**Frank R. Heavner Memorial Award.** Awarded to the English major who has the highest average in at least nine credits of linguistics courses.

**Earle M. Hite Award.** A plaque awarded to a senior or junior for outstanding service to the University yearbook, *The Touchstone*.

**Elsie Hostetter Award.** Presented by the early childhood faculty to the outstanding senior early childhood education major.

**Ralph J. Hyson Memorial Award.** Awarded to the senior French major judged outstanding in French studies.

**Institute of Management Accountants Managerial Accounting Award.** Awarded by the Lancaster Chapter of the National Association of Accountants to a graduating senior who has completed at least 18 semester hours in accounting. Also based on senior thesis and academic achievement.

**Instrument Society of America Central Keystone Section Outstanding Student Award.** Awarded to a junior or senior industry and technology student who possesses a GPA of at least 3.0 and is committed to specializing in and demonstrating outstanding performance in transportation/energy/power.

**Henry J. Kauffman Award in Metal Technology.** Awarded to a senior industry and technology major who has attained distinguished achievement in metals technology.

**Richard C. Keller Award in American History.** Awarded to a senior history major who has shown strong interest and capability in American history.

**Martin and Anna Zimmerman Kondor Award.** Awarded to a graduating elementary education major on the basis of a 3.35 GPA, excellence in student teaching, outstanding personal and professional characteristics and dedication to teaching.

**Helen Koontz Award.** Awarded to two junior elementary education majors who have spent at least two full academic years at Millersville and have devoted two full academic years to preparation for elementary teaching.

**Louis and Margarete Koppel Awards in European History and German Literature.** The awards are given to two graduating seniors, one excelling in the study of European history, and the other excelling in German language and literature.

**Lancaster-Lebanon Reading Council Award.** Awarded to an elementary education major with an area of interest in reading, for outstanding work in reading education.

**Edward J. Laucks Memorial Sertoma Award.** Awarded to a student who has achieved excellence in the communication major.

**Harold A. Laynor Art Education Award.** Awarded to art education majors demonstrating financial need and maintaining a GPA of 3.0 or higher.

**John Mentzer Award in Special Education.** Awarded to a junior who is enrolled in the certification program in special education and has demonstrated potential to become an outstanding teacher.
Music Faculty Award. A bond and recognition on a plaque in Lyte Auditorium to the outstanding music education graduate.

C. Maxwell and Edna H. Myers History Award. Awarded to a history major who has earned a minimum of 85 credits; based on academic accomplishment and service to the department and the University.

National Association of Accountants Managerial Accounting Award. Presented by the Lancaster Chapter of the National Association of Accountants to a graduating senior who has completed at least 18 credits in accounting. Selection is based on academic excellence and excellence of the senior thesis.

National Association of Music Merchants Award. Awarded to a student planning to pursue a career in the music products industry.

Jay B. Niesley '73 Memorial Student Leadership Award. Awarded for outstanding leadership to a student or students with at least 45 completed credits and a GPA of 2.5, and shall be based upon the student's/students' contributions to MU and the potential for future development as a leader. Financial need is not a consideration.

Burl N. Osburn Award. Awarded annually to a student who excels in technology education.

Outstanding Student in Instrumentation — Power Technology Award. Presented annually to a junior or senior industry and technology student who possesses a GPA of at least 3.0, is committed to specialize in and demonstrates outstanding performance in the power technology cluster.

*Pennsylvania Bandmaster's Association Award. Awarded to an incoming freshman who excels in band instrument performance.

Pennsylvania Institute of Certified Public Accountants Award. A plaque to a graduating senior who has demonstrated outstanding commitment to the profession of accounting. Selection is based on high performance in accounting, in particular, and on excellent general performance plus participation in the co-curricular activities in business administration.

Phi Kappa Phi Award. Awarded for the best essay written by an undergraduate member of Phi Kappa Phi Chapter 211.

Phi Sigma Pi Award. Awarded to a graduating Phi Sigma Pi member for scholarship, leadership, character and outstanding service to the University. Service keys are awarded to graduating members of the fraternity using the same criteria.

Philadelphia Alumni Award. Awarded to a technology education major who demonstrates the best qualities of a technology teacher.

Polymer Education Undergraduate Award. Awarded to a sophomore/junior level chemistry major who has a minimum GPA of 3.5 and who has earned an A in each semester of the two semester organic chemistry course sequence.

Psychology Club Award. Awarded to a senior psychology major for outstanding interest and enthusiasm in psychology, service to the department, and scholarship as evidenced by a GPA of at least 3.0.

Psychology Faculty Awards. Established by the psychology faculty and awarded to outstanding junior and senior psychology majors.

Margie L. Ranck Award. Awarded to a student who has completed the junior year on the basis of outstanding intellectual attainment and good character.

Gary W. & Jacqueline Reighard Award for Outstanding Leadership. Awarded to a student for outstanding leadership who has completed at least 60 credits and who possesses at least a 2.75 GPA. Selection based upon past contributions to Millersville University and potential for future development as a leader.

Henry J. Rutherford Memorial Award. Awarded to a junior or senior who has been constructively involved in environmental action and environmental enrichment activities.

Irene P. Seadle German Section Award. Awarded to a senior German major who has done excellent work in German studies and contributed significant service to the German section.

Harold W. and Miriam W. Shaar String Award. Awarded to a sophomore or junior music education major who has demonstrated considerable progress in playing a string instrument, shown an interest in teaching string instruments, and contributed to the musical enrichment of University musical organizations.

Social Work Faculty Award. Awarded to a senior social work major for academic excellence.
Social Work Organization Award. Awarded to a senior social work major for academic excellence and contributions to the Social Work Organization.

Society for the Advancement of Management Award. Presented by the Millersville student chapter of S.A.M. to a junior or senior who has maintained at least a 3.0 GPA and exhibited outstanding management potential through participation in co-curricular activities in Business Administration.

Charles D. Spotts Naturalist-Humanist Award. Awarded to the junior or senior who has contributed most to the naturalist humanist ethic.

Mary R. Slokum Sproul Prize. Awarded to a student for excellence in public speaking.

J. Richard Steinmetz Technology Teaching Award. Awarded to a technology education senior who in the judgment of the industry and technology faculty has high potential to become a successful teacher as evidenced by outstanding performance in student teaching and excellence in professional technical areas.

Mark Stine Scholastic Attainment Award. Awarded to a junior and a senior who have pursued higher education primarily on a part-time basis and who have had special family responsibilities or who have overcome cultural challenges. Students admitted on nondegree status are eligible.

Gertrude Bettle Stoll Memorial Award in Elementary Education. Awarded to a junior early childhood education major on the basis of an empathic concern for the personal, emotional, and educational needs of young children, a GPA of at least 3.0, and financial need.

Anna Tunis Summy Print Award. Awarded for outstanding achievement by a student who has produced the best print in the art department’s printmaking classes, as judged by a jury of art department faculty.

Anna Tunis Summy Water Color Award. Awarded to a student demonstrating special talents and contributions related to visual arts and specifically the water color medium.

Ronald E. Sykes Artist-Teacher Award. Awarded to the art education student teacher who has achieved the highest GPA based on 30 or more Millersville art credits.

Cecil M. Upton Organic Chemistry Award. Awarded to the outstanding student in the organic chemistry course sequence.

John C. Ursprung Award. An engraved silver bowl and award for contributions of high journalistic quality to the University yearbook, the Touchstone.

John A. Van Horn Memorial Award for Applied Physics. A book to a senior physics major who demonstrates outstanding ability in applied physics.

Louis Vyner Performance Award. Awarded to a full-time music major selected by an audition committee of the music department on the basis of outstanding performance in the field of music and demonstrated academic excellence.

Steven A. Walker Memorial Award. Awarded to one or more junior or senior Spanish majors who have done excellent work in Spanish studies and contributed significantly to the Spanish Club.

The Wall Street Journal Award. A subscription to the economics student submitting the winning essay on an aspect of government and its relation to business.

Wentzel-Wright Memorial Award. Awarded to a student at the end of the junior year, payable upon enrollment for the second semester of the senior year, on the basis of financial need, industry, service to the University community, participation in campus activities, scholarship, good character, integrity, honesty and professionalism.

Who’s Who Among Students in American Universities and Colleges. Awarded to outstanding seniors for scholarships, service, constructive participation in activities, and contribution to student government and campus life.

Ruth Fox Wilkinson Award. Awarded by the Philadelphia Alumni Branch/MU Alumni Association to a graduating senior who has attained the highest average in elementary and early childhood education courses.

WIXQ Service Award. Awarded to a senior for outstanding service to the University radio station.

Edna Rochow Workman Memorial Award. Awarded to a junior or senior art or art education major who has produced during the academic year the best painting in oil or related media.

Xenophile-Theodore H. Rupp Foreign Language Award. Awarded to a graduating senior for excellence in foreign languages.
ACADEMIC REQUIREMENTS, OPPORTUNITIES, AND POLICIES

ACADEMIC REQUIREMENTS

THE BACCALAUREATE CURRICULUM

Millersville University’s baccalaureate degree programs have four common curricular elements:

1. Proficiency requirements in English composition and mathematics.

2. The general education program, which constitutes about half of the curriculum (54 of the 120 minimum credits required for graduation).

3. The major program, which usually constitutes most of the other half of the curriculum.

4. Electives courses if needed to meet the minimum of 120 credits required for graduation. (A number of programs require more than 120 credits for graduation). Students may combine elective and general education courses to complete a minor.

Within each of these components students have many choices in developing programs of study. They have a challenging and responsible role in planning the substance of their program.

Students are reminded that a full semester course load consists of 15 credit hours. It is necessary to average at least 15 credit hours each semester in order to graduate in 4 years (8 semesters).

Final responsibility for each student’s program rests with the student. The role of the adviser is just that—to advise. Students are expected to familiarize themselves thoroughly with program requirements for their major described in this catalog, the Curriculum Record Form and the computerized degree audit (DARS). This computerized audit report is available to help students monitor progress toward completion of their major, minor, and general education requirements.

PROFICIENCY REQUIREMENTS

MATHEMATICS

1. All undergraduate students must demonstrate minimum levels of proficiency in mathematics.

   a. All entering undergraduate students are required to take part in the mathematics placement process.

   b. The mathematics department determines the test(s) and the criteria for course placement.

2. Students placed in a developmental mathematics course are required to enroll in that course. Such students must demonstrate proficiency by satisfactorily completing the course with a grade of C- or above prior to taking any mathematics course at the 100 level or higher.

3. Students who must take developmental mathematics earn course credits and the grade is counted in the cumulative grade point average, but developmental course credit cannot be counted in fulfillment of the baccalaureate or associate degree.

ENGLISH

1. All undergraduate students must demonstrate minimum levels of proficiency in English composition.

   a. All entering undergraduate students who have not completed ENGL 110: English Composition or the equivalent, earning a C grade or higher, are required to take an English composition placement diagnostic test.

   b. The English department determines the test(s) and the criteria for course placement.

2. Students placed in a developmental English course are required to enroll in that course. Such students must demonstrate proficiency by satisfactorily completing the course with a grade of C- or above prior to taking any English course at the 100 level or higher.

3. Students who must take developmental English earn course credits and the grade is counted in the cumulative grade point average, but developmental course credit cannot be counted as fulfillment of the baccalaureate or associate degree.
THE GENERAL EDUCATION PROGRAM

General education is that part of the curriculum that everyone takes to acquire a broad foundation in the liberal arts and sciences: the humanities, fine arts, and natural and social sciences.

Through its emphasis on the liberal arts and sciences, Millersville’s general education program gives students the background in writing, speaking and critical thinking across a broad range of subjects that they will need to advance through their careers and address the wide variety of problems they will face as citizens and leaders of a complex world.

Millersville’s general education program also prepares students for productive and meaningful lives outside their careers, continuing their personal development through a lifetime of learning. It helps them better enjoy a concert or a painting, appreciate people from different backgrounds and cultures, read a novel or a scientific article with greater understanding, and enjoy a stimulating conversation with friends.

The specific goals of the general education program are for students to develop:

• Written and oral communication skills.
• Critical and analytical reasoning.
• Mathematical reasoning and problem solving.
• Skills and knowledge in the humanities, social sciences and natural sciences.
• Communication technology literacy.
• Inquiry and information literacy.
• Connections among various disciplines.
• Diversity knowledge, skills and attitudes.
• Historical consciousness.
• Personal, ethical and civic values.

To meet these goals, the general education program is organized into a structure with three components: the communications (writing and speech) component, the liberal arts core and the perspectives component.

THE COMMUNICATIONS COMPONENT

These requirements focus on skills basic to success in all fields of study.

English Composition (0-3 credits). This college-level competency requirement is in addition to the pre-college proficiency requirement described earlier. Competence in English composition must be demonstrated in one of the following ways before the junior year.

1. Achieving a combined score of 1230 in the Verbal portion of the Scholastic Assessment Test (SAT) and the CEEB English Composition Achievement Test.
2. Achieving a score of 3 or higher in the Advanced Placement (AP) test in English Composition.
3. Achieving a satisfactory score in the CLEP subject examination in English Composition.
4. Passing the English Composition Competency Examination administered by the English department at the beginning of each fall and spring semester.
5. Earning a grade of C- or higher in English Composition (ENGL 110).

Fundamentals of Speech (0-3 credits). College-level competency in speech must be demonstrated in one of the following ways, preferably before the junior year:

1. Earning a grade of C- or higher in a competency examination administered by the Communication and Theatre department. To take this examination, register with the Communication and Theatre Department by the end of the drop-add period.
2. Earning a grade of C- or higher in Fundamentals of Speech (COMM 100).

Advanced Writing Course (3 credits). A course to further enhance writing skills. The courses currently approved to meet this requirement are ENGL 311, ENGL 312, ENGL 313 and ENGL 316.
THE LIBERAL ARTS CORE
These courses focus on concepts basic to the liberal arts. Students must take 4 courses (12 credits minimum) in each of three areas: Humanities, Science and Mathematics, and Social Sciences. The following stipulations apply to these courses:

1. To develop depth as well as breadth of understanding, at least 3 courses must be at the 200 level or above.

2. To achieve greater understanding in some disciplines, within each Liberal Arts Core area two courses must be from a single department. No more than two courses from a single department may be credited toward the Liberal Arts Core.

3. To develop scientific reasoning abilities, at least one of the courses in Science and Mathematics must be a laboratory science course. In addition, at least two of the courses in science and mathematics must be from the physical or life sciences.

4. Up to 4 courses required for the major from departments outside the major may be credited toward the Liberal Arts Core or used as the general education elective. Courses taught by the student’s major department may not be credited toward the core or the general education elective.

5. To develop mathematical reasoning ability, at least one math course approved for the Liberal Arts Core must be taken. Non-math majors may satisfy this requirement by including an approved math course in the Liberal Arts Core or as the general education elective.

6. To develop competence and confidence in writing skills, at least four courses must have a significant writing component. These courses may be counted in the Liberal Arts Core, in the major if required there, or as electives.

THE PERSPECTIVES COMPONENT
These courses are interdisciplinary and/or multicultural in content and require a high level of educational maturity, knowledge and thinking. They encourage students to:

• Integrate knowledge acquired in previous course work.
• Demonstrate how different areas of knowledge relate and can be used in complementary ways.
• Make independent and responsible value judgments and decisions.
• Apply analytical and critical thinking abilities in resolving social, cultural, scientific and aesthetic problems. The following stipulations apply to Perspectives courses:

1. Students must take one Perspectives course, which may be either in the major department or outside the major department. A Perspectives course taken in the student’s major department cannot also count toward the major or required related courses.

2. Before taking a Perspectives course, English Composition and at least 24 credits of the Liberal Arts Core must be completed.

3. Perspectives courses may not be credited toward the Liberal Arts Core.

4. Students completing a semester abroad or international students are considered to have fulfilled the perspectives requirement. In such cases, only 51 credits of other General Education courses are required.

GENERAL EDUCATION ELECTIVE
Students must take one additional general education course (minimum of 3 s.h.) from among the courses identified as Liberal Arts Core or Perspectives courses. This elective may not be a Liberal Arts Core course from the student’s major department.

WELLNESS & SPORT SCIENCES
Students must complete 3 credits in wellness courses approved to satisfy this requirement. Special courses or accommodations are available for disabled and nontraditional (mature) students.

COURSES APPROVED TO SATISFY GENERAL EDUCATION REQUIREMENTS
Lists of courses that may be credited toward each of the general education requirements are available from the academic advisement office, the academic advisement web page and the web class locator.
THE MAJOR PROGRAM

After general education, the second component of a high-quality university education is an in-depth understanding of an academic discipline. Millersville currently offers 50 major fields of study within its bachelor’s degree programs. Many majors offer options for fulfilling requirements that provide even greater choice in selecting a field of study. Students enrolled in programs that require more than 128 credits may need more than the traditional four years to complete their studies.

A list of Millersville’s major programs and options and the specific course requirements for each are given in the Academic Programs section. Curriculum Record Forms have also been developed for each major and option to summarize the requirements and provide an informal record of student progress. They are available from department offices and the Office of Academic Advisement. In addition, degree audit reports summarizing the status of a student’s degree requirements are available on request in the Office of Academic Advisement, Lyle Hall and on the MU website.

DECLARING OR CHANGING A MAJOR

To declare or change a major or an option within a major, contact the Office of Academic Advisement, Lyle Hall, for an appropriate form. Some departments have minimum special requirements for admission to their major programs.

Students must meet the major program requirements in effect at the time they declare or change their major.

DEPARTMENT EVALUATION OF MAJORS

Students are subject to the approval of their major department for continuation in their major program. Departments may establish additional requirements for continuation in the major, review student credentials at the end of any semester, and deny continuation in the major to any student they feel is not making satisfactory progress. Students who have been denied continuation in the major may appeal to the School Dean and then to the Academic Standards Committee for reconsideration.

SECOND MAJORS

In some programs, through careful selection of elective courses, it is possible to complete the requirements for a second major. Upon certification by each major department that requirements have been satisfied, both majors are recorded on the student’s records.

MINORS

Students who wish to become proficient in a second discipline may complete the requirements for a minor. Each minor requires a minimum of 18 credits. Half of the minor must be completed at Millersville, and only one course may count toward both a major and a minor. A list of minor programs and specific course requirements for each are given in the Academic Programs section. Since a number of new minors are under development, students should contact the Academic Advisement Office, Lyle Hall, for a complete list of approved minors.

To declare or change a minor, obtain an appropriate form from the academic advisement office.

THE ASSOCIATE DEGREE CURRICULUM

Millersville’s associate degree programs are career-oriented for students with specific occupational objectives. They consist of 60 to 64 credits of study. The programs normally have three components: communication skills; general knowledge of the natural sciences, social sciences, and humanities; and an area of concentration. Approximately half the course work is in communication skills and general education; the other half is in the area of concentration. For more information see the Academic Programs section.

OTHER CURRICULAR POLICIES

ADDITIONAL DEGREE REQUIREMENTS

To earn an undergraduate degree at Millersville University, a student must meet the following requirements:

1. All curricular and proficiency requirements as described above must be met.
2. A minimum of 120 credits must be completed for a bachelor’s degree.
3. A GPA of at least 2.0 must be earned in Millersville courses.

4. A GPA of at least 2.0 must be earned in Millersville courses required for the major (area of concentration for associate degrees).

5. A GPA of at least 2.0 must be earned in Millersville courses required for the minor.

6. At least 30 credits must be completed at Millersville (in addition to student teaching).

7. At least half the major requirements must be completed at Millersville.

8. At least half of the minor requirements must be completed at Millersville.

9. Students who graduate with a B.S.Ed. degree or complete an approved program of post-baccalaureate studies for teaching certification must be admitted to Advanced Professional Studies. They must also meet the Pennsylvania State requirements and other Pennsylvania certification requirements such as passing the required Praxis exams to qualify for Pennsylvania teacher certification.

10. An Application for Degree form should be submitted before the end of the add period of the term in which the student expects to graduate. The University confers degrees six times annually— at the conclusion of the fall semester, winter session, spring semester, pre-summer session, first summer session and second summer session. Application forms are available from the registrar’s office, Lyle Hall.

**ADMISSION TO ADVANCED PROFESSIONAL STUDIES AND CERTIFICATION (EDUCATION MAJORS)**

All students enrolled in teacher preparation programs must be admitted to Advanced Professional Studies and meet Pennsylvania State requirements and university requirements prior to being enrolled in their initial Advanced Professional Studies course. Students must meet additional Pennsylvania State requirements in order to be certified. A listing of Advanced Profession Studies courses and requirements is available in each department office, the early field experiences office, and on the early field experiences website.

**EARNING A SECOND DEGREE**

While it is possible for a student to satisfy the course requirements for two different degrees (e.g., B.A. and B.S.Ed.) simultaneously, only one degree will be awarded. The student chooses the degree to be awarded. A student who is progressing toward or holds a bachelor’s degree will not be awarded an associate degree in the same discipline.

A student may earn a second associate or bachelor’s degree at a later time by meeting the following requirements:

1. A minimum of 30 additional credits must be completed at Millersville at the undergraduate level following the award of the first degree. These credits must be in the major and required related fields.

2. All requirements for the major of the second degree must be satisfied.

3. Course work completed as part of the first degree program may be used to satisfy the related course work requirement in the second degree.

4. Course work completed as part of the first degree program may be used to satisfy up to half of the second degree’s major. If a course required in the second degree’s major was completed as part of the first degree, it may not be repeated.

5. Teacher certification credits may not be counted toward a second degree.

6. When there is overlap in the majors of the first and second degrees, the 50 percent limitation in Requirement 4 and the limited course offerings in some departments may preclude the pursuit of a second degree.

**SPECIAL ACADEMIC OPPORTUNITIES**

**HONORS COLLEGE AND DEPARTMENTAL HONORS**

Millersville University offers a number of programs to help exceptionally talented students develop their potential. Students who complete the programs earn special recognition.

**UNIVERSITY HONORS COLLEGE**

The University Honors College challenges talented students while encouraging them to develop their
intellectual potential. The program introduces students to the main currents of Western thought and culture and develops writing, research and analytical skills. Enrollments in honors classes are limited to facilitate student-faculty interaction. Students who successfully complete the program are awarded the University Honors baccalaureate at graduation.

Invitations to the program are extended to entering freshmen who have combined SAT scores of 1200 or above and are in the top 10 percent of their high school class. Other interested freshmen and currently enrolled students with cumulative grade point averages (CGPAs) of at least 3.35 are encouraged to apply for admission to the director of the University Honors College.

To remain in good standing in the Honors College, students must maintain a GPA of at least 3.0 in the freshman and sophomore years, 3.25 in the junior year, and must have a 3.35 GPA at graduation.

To receive the University Honors baccalaureate, students must:
1. Earn a cumulative GPA of at least 3.35.
2. Earn a minimum of 30 honors credits and fulfill the curricular requirements. Honors credit is awarded only for those honors courses in which an A or B is earned.
3. Complete an Honors Independent Study (HNRS 489) and an Honors Senior Thesis (HNRS 499). Criteria are the same as for departmental honors (see that section) with the additional requirement that the thesis must be examined by and defended before a committee that includes a member of the University Honors College Committee and includes an authority from outside the major department.

For more information, contact the director of the Honors College.

DEPARTMENTAL HONORS
This program provides an opportunity for superior and highly motivated students to pursue a specialized area of interest intensively and independently. Upon successful completion of the program, students are recognized for their achievements at graduation with the designation of Departmental Honors on their diploma and University record.

To be eligible for the program, students must have a cumulative GPA of at least 3.0 and the endorsement of a faculty member.

The program generally consists of two to four semesters of supervised tutorial work, reading, self-instruction, creative inquiry and research, which culminates in the production of a thesis or project. One to four credits may be earned for each of the departmental honors courses (HNRS 489 and HNRS 499). Grades in these courses are determined by the faculty supervisor and departmental committee.

Final theses or projects are examined by and orally defended before the departmental committee. Grades of A and B must be earned on them. They are then presented to the honors and awards committee for review. Titles of completed works are published in the commencement program.

Contact the department office for an application and more information.

HONORS COURSES
Honors courses, designated by the prefix HNRS, offer special academic challenges and opportunities for intellectual inquiry. These courses require a measure of independent reading, thinking and questioning. Students are expected to assume a greater portion of the responsibility for learning. Course requirements include activities to develop writing, research and analytical skills.

Honors courses are open to students in the University honors college, students with a cumulative GPA of at least 3.35, and other students with permission from the instructor. Enrollment in departmental honors courses requires permission from the department chairperson. A grade of A or B must be earned to qualify for the honors designation on the student’s record.

ON-CAMPUS ACADEMIC OPPORTUNITIES
WINTER SESSION
Winter Session allows students to complete an additional three-credit course during the January break between the fall and spring semesters. Courses are open to students from other institutions of higher education as well as Millersville students. Residence halls and dining facilities are closed during the winter session. Students may register for winter session and spring semester classes simultaneously, at their regularly scheduled registration time. For more information about winter session, call the registrar’s office at 717-872-3035, or check the University website.
INDEPENDENT STUDY
Independent study allows students to pursue an academic area of interest not available through an established course with faculty supervision and guidance. To apply, complete an application form, available in department offices, and obtain approval for the proposed topic and faculty supervisor from the department chairperson and school dean prior to the start of the term.

INDIVIDUALIZED INSTRUCTION
Individualized instruction allows students to complete an established course during a semester in which it is not offered. Approval to pursue a course through individualized instruction is granted only under special circumstances. To apply, complete an application form, available in department offices, and obtain approval for the proposed topic and faculty supervisor from the department chairperson and school dean prior to the start of the term.

TAKING GRADUATE COURSES AS AN UNDERGRADUATE
Undergraduates may enroll in 500-level graduate courses for undergraduate credit with permission of the instructor and adviser. The credits earned count toward baccalaureate degree requirements and cannot be converted to graduate credits.

An undergraduate with a 3.0 GPA or higher may enroll in 500- and 600-level graduate courses for graduate credit. The student must have a maximum of 15 semester hours to be completed in the baccalaureate degree program. Written permission must be acquired from the adviser, the course instructor, the graduate program coordinator and/or chair of the department offering the course, and the Dean of Graduate Studies. The undergraduate will also need to be admitted as a nondegree graduate student.

A maximum of 9 graduate credits may be earned by an undergraduate. These credits may not count toward the completion of the student’s baccalaureate degree.

PASS-FAIL OPTION & AUDITING COURSES
The pass-fail option provides students the opportunity to pursue a course without the usual pressure of earning a grade.

Auditing a course allows a student to attend classes and participate in discussions without the pressures of taking examinations, writing papers, or fulfilling other requirements generally associated with earning credit.

Students must submit requests to take a course on an audit or pass-fail basis by the end of the add period. See Grades & Policies for more information.

DEVELOPMENTAL COURSES
Course numbers beginning with a zero are pre-college developmental courses that provide opportunities for students to remediate academic skill weaknesses and develop basic proficiency. They are available in communications, English, reading and mathematics. Placement in them is recommended and under some circumstances required, following an assessment of student’s basic skills. For more information, see the section on Proficiency Requirements.

A grade of C- or higher is required to demonstrate proficiency in a developmental course. Credits earned in developmental courses may not be used to fulfill general education or graduation requirements.

UNDECIDED MAJOR STATUS
Students may seek admission to Millersville without selecting a major. Special academic advisers are assigned to guide undecided students through the general education requirements and assist them in exploring potential majors.

Students who qualify for admission to Millersville but do not meet admission criteria for a selected major are classified as undecided until they qualify for study in the major of their choice.

Students with at least 45 credits passed and in undecided status or changing to undecided status must either:

1. declare and be accepted into a major
or

2. complete a review of academic goals as follows: The student, in consultation with an assigned adviser, must propose and have approved by the adviser each semester, an academic plan of action which includes a realistic timeline for the completion of degree requirements. The approval form will indicate whether the
student is waiting to get into a major and, if so, the reason for nonacceptance into that major; a copy will be filed in the Office of the Registrar.

3. A student may sign a statement which indicates awareness of the ramifications of remaining in an undecided status but may choose to continue to remain in that status.

Permission to register will be granted only if one of the above requirements is completed.

**OFF-CAMPUS ACADEMIC OPPORTUNITIES**

**COOPERATIVE EDUCATION/INTERNSHIP**

Cooperative Education is an optional learning experience which takes place in a work setting rather than in a classroom. Co-op and internships are the result of partnerships between the University and employers in business, industry, government, and human services. The program is flexible, allowing students to work full-time or part-time. They may work locally, nationally or internationally. This work experience becomes part of the total learning experience, giving the student’s academic program a sense of reality and relevance. As a result of the Cooperative Education program, students in any major can receive work experience, earn income and apply learned theories. Co-op also provides the opportunity for students to gain greater insight into their chosen career, either strengthening or redirecting their career choice.

The Millersville University student may begin to show his/her interest in the Cooperative Education program as early as the first semester, freshman year. Sophomores and juniors (in some instances, seniors, too) are highly encouraged to take the first steps to find out more about Cooperative Education by attending a Co-op orientation.

At the discretion of the department, a maximum of 12 s.h. may be counted in the major or as electives toward normal graduation requirements. Additional credits will be counted over and above the normal graduation requirements. A Cooperative Education student may participate in a maximum of four cooperative experiences.

The Cooperative Education program is optional for most Millersville majors. Students must, however, meet the following criteria for participation:

1. Be enrolled in a degree program at Millersville University.
2. Have successfully completed at least 24 college credits.
3. Have a GPA of at least 2.0 (individual departments may stipulate higher GPA requirements).
4. Have approval from the appropriate academic department to participate.
5. Attend pre-employment skills workshops on resume preparation and job interview procedures.
6. Transfer students become eligible to enroll in the program upon successful completion of twelve (12) academic credits at Millersville if all other eligibility requirements are met.

For more information, contact the cooperative education office in Lyle Hall. Information sessions on the cooperative education program are conducted on a weekly basis.

**GRADUATE AND UNDERGRADUATE COURSES**

Credit-bearing courses are scheduled at off-campus sites as a convenience to Lancaster area residents. Graduate courses for teachers are available most semesters at schools in local school districts and/or at the University Center in Harrisburg.

Undergraduate courses are offered each semester at several sites in the city of Lancaster. Students enrolled in off-campus sites are welcome and encouraged to use campus facilities and services. Courses are scheduled off campus to assist part-time students and adult students enrolled in the Adult and Continuing Education (ACE) Program. For more information, see the catalog entry on that program. For schedules of off-campus courses, contact the Office of Professional Training & Education, 717-872-3030.

**NONCREDIT COURSES**

Classes may be scheduled at off-campus sites to provide tailored employee training programs to businesses or community organizations. For information, contact the Office of Professional Training & Education, 717-872-3030.
STUDY ABROAD

Study abroad can be a valuable and important part of a student’s undergraduate education. Regardless of a student’s major, learning firsthand about another way of life and seeing the world from another culture’s perspective are invaluable assets for success in our global society.

Millersville University students may study abroad in nearly every country worldwide for a summer, a semester or an academic year. Although most students study abroad during their junior year, students may study and/or do an internship abroad for University credit any time after completing 24 academic credits. Student teaching abroad also is available.

Whether fluent in foreign languages or only English, students may participate in study abroad through Millersville’s own international partners, through other accredited U.S. institutions’ programs or directly through many international universities. Millersville offers its own student exchange programs with the University of Strathclyde in Glasgow, Scotland; Philipps University in Marburg, Germany; University of Lincoln in Lincoln, England; Kansai Gaidai University in Osaka, Japan; University of North London, London, England; Catholic University of Valparaiso in Valparaiso, Chile and Foro Europeo School of Business in Pamplona, Spain. International internship placements as part of a formal study abroad program are possible through the North London, Valparaiso, Foro and Marburg programs.

For Kansai Gaidai, Millersville students pay MU tuition, room, board and general fees. For the Catholic University of Valparaiso, Foro Europeo and Lincoln programs, Millersville students pay MU tuition and general fees but make separate room and board arrangements. For Marburg and North London, Millersville students pay Millersville tuition as well as an additional program and room fee.

To be eligible for any study abroad experience, students must have: completed at least 24 college credits; maintained a minimum 2.0 GPA prior to departure (individual programs may have higher requirements); and received advanced approval from the Office of International Affairs.

For more information about study abroad, contact Dr. Kirsten Bookmiller, Director of International Affairs, Cumberland House. Phone 717-872-3884 or send email to internationalaffairs@millersville.edu.

STUDY AT OTHER INSTITUTIONS

Millersville students may take courses at other colleges and universities for transfer to Millersville. Many students, for example, take summer courses at a college near their homes. To ensure that the credits will be accepted at Millersville, students must obtain approval in advance from their adviser, the department chairperson and the registrar. Approval forms are available in the registrar’s office or on the MU website under the MAX Student Forms Center.

For more information, see the Transfer Credit section.

Exchange Agreement with Franklin & Marshall College. Through this exchange agreement full-time Millersville students may, with approval, pursue courses not available at Millersville at Franklin and Marshall College. No tuition is charged by Franklin and Marshall College. This agreement does not include courses offered during the summer at Franklin and Marshall.

Exchange Agreement with Lancaster Theological Seminary. Through this exchange agreement full-time Millersville students who qualify for admission to graduate level courses may, with approval, pursue courses not available at Millersville at Lancaster Theological Seminary. No tuition is charged by the seminary.

3-2 Cooperative Programs in Engineering. Physics-Engineering and Chemistry-Engineering majors are offered in cooperation with Pennsylvania State University and the University of Pennsylvania. These programs require three years of study at Millersville with a major in physics or chemistry and two years in residence in the engineering program of one of the cooperating institutions. Interested students should contact the physics or chemistry department chairpersons for further information.

INTERNSHIPS

The Harrisburg Government Internship Semester (HGIS). During each semester of the academic year, Millersville University selects an academically outstanding undergraduate student to participate in the Harrisburg Government Internship Semester Program, sponsored by the State System of Higher Education. Students selected are placed with policy-makers in the state legislature, executive branch, and other governmental agencies. Each intern earns 15 semester hours: 9 semester hours for the internship program, 3 semester hours for a research project, and 3 semester hours for participating in an academic seminar. Allocation of credits to degree requirements are the responsibility of the faculty in the student’s major.
To be eligible to apply a student must have maintained a 3.0 GPA in at least 45 semester hours. Interns are selected from all majors. Contact Richard Fulmer, Department of Social Work, for application information. Specialized internships are also available through some academic departments. Some degree programs require internship experiences. For more information, contact department offices.

**STUDENT TEACHING, EARLY FIELD EXPERIENCES & CERTIFICATION**

Undergraduate and graduate teaching experiences including pre-student teaching (early field experiences), student teaching, internships, and student teaching in international and Native American settings are coordinated through the Field Services Office.

**EARLY FIELD EXPERIENCES**

The University maintains a strong commitment to connecting theory and practice through early field experiences, prior to student teaching, in local school districts. Most early field experiences are integral parts of specific education courses and students must successfully complete these experiences to be admitted to student teaching. Admission to Advanced Professional Studies is required for many of the courses that contain early field experiences. (Please consult the section on Admission to Advanced Professional Studies.) For the early field experiences available in your major, contact your department chairperson.

**STUDENT TEACHING**

The University, working with school district administrators, will assign student teaching placements. Student teachers may not request a specific school or cooperation teacher, nor may a cooperating teacher request a specific student teacher. Student teachers are not assigned to the school district from which they were graduated or in which family members are attending or employed.

For admission to the Millersville student teaching program, the following policies apply:

1. Student must have earned at least 85 credits with a cumulative GPA and major GPA that meet university and state requirements prior to the student teaching semester.
2. Students must have successfully completed all required professional education courses and early field experiences and been admitted to Advanced Professional Studies.
3. Students must apply to the student teaching office one full year prior to the semester in which they plan to student teach.
4. No student may student teach while on academic probation.
5. A student with an unsatisfactory Act 34 or Act 151 clearance may be denied a certificate to teach by the Pennsylvania Department of Education or may be denied placement in student teaching or an early field experience.

**CERTIFICATION**

Millersville University prepares students to be able to apply for the following certification areas in the state of Pennsylvania:

- Art
- Biology
- Chemistry
- Citizenship Education
- Early Childhood
- Earth Science
- Elementary
- English
- French
- German
- Industrial Arts/Technology Education
- Mathematics
- Special Education
- Music
- Physics
- Reading Specialist
- Social Sciences
- Social Studies
- Spanish
MARINE SCIENCE CONSORTIUM
Millersville is the founder of the Marine Science Consortium, 14 colleges and universities that operate a marine station at Wallops Island, Virginia. The consortium has several seagoing vessels and laboratories with biological and oceanographic equipment. It provides living facilities for students and staff at the station.

Four three-week sessions are offered at Wallops Island each summer. See the biology and earth sciences department listings for information on many of the courses offered. Applications for these courses must be received by February 15. For more information, contact the School of Science and Mathematics.

SPECIAL EVENTS
For more information on special events at MU, visit the MU home page: www.millersville.edu.

CULTURAL AFFAIRS SERIES
A variety of cultural programs, films and international art exhibits are presented by the Cultural Affairs Committee throughout the academic year to develop in students an appreciation of music, art, literature, dramatics, and a thoughtful and well-informed attitude toward contemporary issues.

ARTISTS/SCHOLARS IN RESIDENCE
Outstanding artists and scholars are brought to the Millersville campus for several days to interact with students.

CENTER FOR POLITICS & PUBLIC AFFAIRS ACTIVITIES
The Center promotes the exchange of ideas between the academic community and those who have a central role in making and implementing public policy. State and national public figures meet with faculty, students and members of the Lancaster community.

ROBERT A. CHRISTIE LECTURE
A respected leader from the American business community speaks on an aspect of economics or business in honor of Robert A. Christie, president of Millersville University from 1965 to 1968.

HOLOCAUST CONFERENCE
Academics and other scholars are invited to campus to discuss an aspect of the Holocaust.

HAZEL JACKSON LECTURE
The Hazel I. Jackson Lecture honors the first African-American professor at Millersville and the first African-American female teacher in the School District of Lancaster. A member of Millersville’s English department, she retired from MU in 1994 after 23 years of service to the institution.

RAY W. KAUFFMAN FUND FOR ORCHESTRAL GUEST ARTISTS
Distinguished artists perform with the Millersville University Community Orchestra. Established in honor of Ray W. Kauffman, assistant professor of music at Millersville, in recognition of his distinguished service to the University and the community as founder and first conductor of the Millersville University-Community Orchestra.

ANNA FUNK LOCKEY LECTURE IN EDUCATION
A noted educator is invited to campus to discuss the state of education with students, faculty and members of the Lancaster community. Established by Anna Funk Lockey, Class of 1926.

PAUL J. MCIENERNEY MEMORIAL LECTURE
A noted scientist presents a lecture in the physical sciences. Established in honor of Paul J. McInerney, a member of the earth sciences faculty from 1961 to 1978.

MILLERSVILLE UNIVERSITY LECTURE IN SCIENCE
A noted person in the field of science presents a lecture as part of the University’s Science Day program. Sponsored by the Mr. and Mrs. William F. Brossman Foundation.

JOSEPH F. NOONAN MEMORIAL ACADEMIC STUDENT ACTIVITY FUND
Programs and events are provided to enrich Millersville students, to supplement classroom instruction, and to broaden the cultural awareness of the University community.
HAROLD R. WEIRICH MEMORIAL LECTURE
A noted scientist-humanist presents a lecture. Established in honor of Harold R. Weirich, a member of the biology faculty from 1959 to 1976.

CARTER G. WOODSON LECTURE IN AFRO-AMERICAN HISTORY & CULTURE
A lecture, presented as part of Millersville’s Celebration of Black Culture, and established in honor of the founder of Black History Month.

SPECIAL FUNDS
Class of 1938 Endowed Fund. Used in support of University projects as determined by the President of the University.
Class of 1939 Endowed Fund. Used in support of University projects as determined by the President of the University.
Class of 1949. Funds to be used for library acquisitions.
Class of 1950. Funds to be used for purchasing computers for classrooms and the library as determined by the University President or his designee.
Albert W. Bender Memorial Endowment. Used for acquisition of materials for the University library.
Brenner Fund. Used for acquisition of materials for the University library.
Helen A. Ganser Endowment Fund. Used to purchase library materials.
Glenna M. Hazeltine Endowment. Used in support of a University conference, to be known as the Glenna M. Hazeltine Women in Mathematics and Science Conference.
Elsie Breckbill Hollinger Endowment for Library Acquisition. Used for acquisition of materials for University library.
Esther Kilheffer Endowment in Earth Sciences. Used for the purchase of instructional equipment for the earth sciences department.
Harry D. Kilheffer Endowment. Used for acquisition of materials for the University library.
Elsie McAuslan Library Endowment Fund. Used to purchase materials for the library.
William M. and Winifred Cooke McCain Endowment. Used for acquisition and restoration of material of historical value to the Millersville University Archives and Special Collections.
Mary McGrann Endowed Fund. Used to assist deaf or hearing impaired students who, in the opinion of the selection committee, have demonstrated academic ability and financial need. Preference given to Lancaster County students.
Meteorological Endowment. Established in memory of Dr. Russel De Souza for equipment acquisition for the earth sciences department.
C. Maxwell Myers Endowed History Memorial Fund. Used to purchase library books for the history department.
Conrad Nelson Endowment in the Fine Art. Funds used to fund Artist in Residence Program.
Melzer Porter Memorial Library Fund. Used to purchase music literature for the music collection of the library.
Carl R. Rees Mathematics and Computer Science Fund. Used to advance faculty development in the mathematics and computer science departments.
Donald E. Weiman Instructional Equipment Endowment. Award used to support the repair or purchase of equipment for the chemistry department.
Women’s Issues Endowment. Awarded annually to members of the University community for conducting or disseminating research or organizing programs that focus on issues of central concern to women.
David Zubatsky Endowment for International Studies. Used for acquisition of materials of value to the library to establish a collection for international studies.
David S. Zubatsky Endowment for Judaic Studies. Used for acquisition of materials for the University library to establish a collection for Judaic studies.
ACADEMIC POLICIES

GRADING POLICIES
Each instructor establishes his or her own grading policy based on classroom participation, homework, unannounced quizzes, etc., and states it clearly and in writing at the beginning of the course. Sufficient measures are built into each course structure to evaluate student achievement.

Final examinations normally do not count as more than one third of any student’s final grade. Instructors may excuse any student with superior achievement (a grade higher than A-) from taking a final exam.

GRADES AND GRADE POINT SYSTEM
The grade point average (GPA) is a comprehensive evaluation of a student’s academic standing. The grades and terms used to describe achievement are reported at the end of each semester as:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Grade Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td></td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td></td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>3.0</td>
</tr>
<tr>
<td>B-</td>
<td></td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>Acceptable</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>C-</td>
<td></td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td>Poor</td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>D-</td>
<td></td>
<td>0.7</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>0.0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>*</td>
</tr>
<tr>
<td>P</td>
<td>Pass</td>
<td>*</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory</td>
<td>*</td>
</tr>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
<td>*</td>
</tr>
<tr>
<td>W</td>
<td>Withdrew</td>
<td>*</td>
</tr>
<tr>
<td>AU</td>
<td>Audit</td>
<td>*</td>
</tr>
<tr>
<td>X</td>
<td>Proficiency in Progress</td>
<td>*</td>
</tr>
<tr>
<td>Z</td>
<td>No Adequate Evaluation</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*Not considered in computing GPA

University policy accepts D- as minimum earned credit. There are certain general education and department major competency requirements that are satisfied only by a higher minimum grade. If a student earns less than this higher minimum grade in such a course, the credits will count toward completion of University credits but might not count toward completion of general education and department major requirements.

The semester GPA is the number of grade points earned in Millersville courses in a semester divided by the number of credits in that semester for which grades calculated in the GPA were earned. Grade points for each course are calculated by multiplying the grade point value by the number of credits for the course.

The cumulative GPA (CGPA) is the total number of grade points earned in Millersville courses divided by the number of Millersville GPA credits. Credits from audited courses, subsequently repeated courses, advanced standing programs such as AP and CLEP, and transfer credits are not included in the CGPA.

GRADES AND POLICIES
Incomplete Grades (I). An instructor may issue an incomplete grade (I) if:
1. the student is passing the course;
2. the incomplete work can be completed without further class attendance; and
3. the work is unfinished because of death in the family, personal illness, accident, or other unavoidable circumstances directly related to the completion of an assigned class project. The instructor must be
notified by the student as soon as the unanticipated circumstance develops.

An incomplete grade must be removed by the instructor assigning a final grade within 8 weeks of the start of the next semester (summer session excluded).

Pass/Fail Courses (P, F). In order to stimulate and/or satisfy intellectual curiosity, students are encouraged to engage in challenging study on an elective basis. The pass-or-fail option provides the opportunity for a student to enter a course that he/she might ordinarily avoid. Accordingly:

1. A student may enroll in no more than a total of two courses pass/fail.
2. The student needs to have passed 60 or more credits before electing a course pass/fail.
3. The student must have a minimum GPA of 2.80 or obtain permission of the instructor.
4. The pass/fail option is ordinarily restricted to courses numbered 300 or above. However, a 200-level course may be taken pass/fail with the prior approval of the instructor.
5. Courses taken to satisfy degree requirements for the major, whether offered by the department of the major or offered by other departments as required-related courses, may not be taken pass/fail.
6. Departments may designate which of their course offerings beyond degree requirements their majors may not take pass/fail.
7. Professional Education requirements may not be taken pass/fail.
8. No course used to satisfy general education requirements may be taken pass/fail, but if students take the same courses for other than general education purposes, they may take them pass/fail.
9. Courses taken on a pass/fail basis will be counted toward the total hour requirement for graduation, but those courses that are passed will not be included in the GPA computation on which academic honors and academic standing are based. Courses failed under the pass/fail option will be included when computing the GPA.
10. The minimum grade a student must earn in order to be awarded a ‘pass’ grade is D-.
11. The option to take a course on a pass/fail basis may be exercised until the end of the add period. Contact the Registrar’s Office, Lyle Hall, for the appropriate form. Having properly registered for a course on a pass/fail basis, a student still has the option to take a letter grade instead of a pass/fail grade provided that the decision to change is filed with the Registrar the week prior to finals week.
12. The pass/fail option is limited to students not on probation at the time of registration.

Satisfactory and Unsatisfactory (S, U). These terms describe achievement in student teaching and other field experiences.

Withdrew (W). The notation made on a student’s record about a withdrawn course depends on when the student withdraws. Students who “drop” or withdraw by the end of the first week of classes have all references to that course deleted from their records.

Students who withdraw between the beginning of the second week of classes and the end of the ninth week receive a grade of Withdrew (W).

Students who withdraw after the end of the ninth week of classes receive an instructor-assigned grade as earned.

The official date of withdrawal is the date the withdrawal form is submitted with proper signatures to the registrar’s office. Deadlines for returning the form are strictly enforced. It is the student’s responsibility to obtain all required signatures in time to meet the deadline.

Failure to withdraw from a course properly may result in additional tuition fees as well as a failing grade. For example, a student who does not attend a class but only submits a withdrawal form during the second week of classes may be subject to additional tuition for that two-week period. See the sections on Overloads and Tuition for more information.

During summer sessions, the registrar sets equivalent deadlines for withdrawing from a course without a grade or with a W grade.

To withdraw from a course, contact the registrar’s office, Lyle Hall, for an appropriate form.

Audit (AU). Auditing a course allows a student to attend classes and participate in discussions without the pressures of taking examinations, writing papers, or fulfilling other requirements generally associated with earning credit. An audited course is reported on the student’s record with the designation AU. It cannot be used to satisfy graduation requirements, nor is it considered in computing GPAs. Standard tuition and fees apply.
To register to audit a course, contact the registrar’s office, Lyle Hall, for information and a permission form and submit it by the end of the add period. Audit privilege may not be changed to credit status. Audit privileges are ordinarily limited to one course per semester.

**Proficiency in Progress (X).** This grade reflects progress toward, but not achievement of, proficiency in pre-college developmental courses.

**Z-Grade (Z).** A grade of Z is treated the same as a grade of F in calculating the student’s GPA. The Z grade may not be removed or changed except by the student registering for and satisfactorily completing the course. The receipt of a Z grade shall not entitle a student to a refund of fees. This grading procedure is intended to apply only to those students for whom there is no adequate evaluation for the determination of a grade. In those cases where the faculty member does not assign any grade the registrar will assign the Z grade if the student has officially registered for the course.

**GRADE CHANGES**

Students are responsible for reviewing grade reports as soon as they are available and contacting their instructor about any grade in question. Grade changes may be made only by the instructor issuing the grade with the approval of the department chairperson and the school dean. Changes must be made in writing and submitted to the Registrar within two months from the date the grade report was issued.

**REPEATING A COURSE**

Students may repeat courses for which they have received a grade of D+, D, D-, F, W, I, Z or U. With adviser approval, they may also repeat courses in which grades of B+, B-, C+, C, C have been earned. Students may repeat courses for which they have received transfer credit, but they will forfeit the transfer credit.

An undergraduate student may not take an undergraduate course of record more than three times. A course of record is defined as a course in which a student receives a grade of A, B, C, D, F, P, S, U, Z (including + and -).

Failed courses do not have to be repeated unless they are specifically required, but they must be repeated if the student wishes to earn credit for those courses toward graduation. Courses failed at Millersville must be repeated at Millersville in order to earn course credit and credit toward graduation. Once the course is repeated, the new grade, credits, and grade points replace those earned before in both the term and cumulative GPA. The earlier grade remains on the student’s record even though it is no longer included in the computation of credits or cumulative GPA.

**TAKING A LESS ADVANCED COURSE**

Students do not receive credit for a less advanced course if they have already demonstrated competency by passing a more advanced course. For example, MATH 100 and 101 may not be taken for credit after MATH 161, and FREN 201 may not be taken for credit after FREN 202. Students who wish to review less advanced material may do so on an audit basis.

**ACADEMIC STANDARDS**

The registrar determines the academic standing of all students at the end of each semester. Academic standing is based on:

1. The student’s cumulative grade point average (CGPA).
2. The total number of credits for which the student has enrolled prior to the review. The review credits also include transfer credits, CLEP credits and credits for repeated courses. It does not include credits for audited courses.

Students with a CGPA of 2.00 or higher are in satisfactory academic standing. Students with less than satisfactory academic standing are subject to warning, probation or dismissal.

The following procedure applies to all students who do not meet the required minimum CGPA as specified:

<table>
<thead>
<tr>
<th>Review Credits</th>
<th>CGPA</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5–16.0</td>
<td>Below 2.00</td>
<td>Warning letter</td>
</tr>
<tr>
<td>16.5–32.0</td>
<td>1.75–1.99</td>
<td>Warning letter</td>
</tr>
<tr>
<td>16.5–32.0</td>
<td>Below 1.75</td>
<td>Probation</td>
</tr>
<tr>
<td>32.5 or more</td>
<td>Below 2.00</td>
<td>Probation</td>
</tr>
<tr>
<td>32.5 or more</td>
<td>Below 2.00</td>
<td>Dismissal while on probation</td>
</tr>
</tbody>
</table>
ACADEMIC PROBATION

When subject to academic probation, the full-time student will be placed on probation for one semester; the part-time student will be on probation for a maximum of 12 credit hours. Such students are not allowed to pre-register for more than 4 courses or 13 credits, whichever is less, in any term, session, or semester unless they have the written permission of the adviser, chair, head of academic advisement or appropriate designee.

A student on probation will return to satisfactory academic standing at the end of the semester in which he/she earns a 2.00 cumulative grade point average (CGPA).

ACADEMIC DISMISSAL

The student on academic dismissal for the first time will not be able to register for or attend classes at the University for one semester. The student on academic dismissal for the second time will not be able to register for or attend classes for two semesters. The third time a student is dismissed from the University, the student will be dismissed for at least 3 years and after that time only special cases for re-admission will be considered by the Academic Standards Committee.

Students who have been dismissed may not register for courses offered during Winter Session, Summer Session, or for courses offered by the University on the web, or at off-campus locations.

Dismissed students who wish to re-enter the University must apply for readmission through the admissions office.

A student will not be dismissed for academic reasons in any semester that he/she has:

1. been in good academic standing, i.e., not on probation or,
2. earned a 2.00 or higher semester GPA.

Students subject to dismissal who have earned a 2.00 or higher semester average will be continued on academic probation until their CGPA is at least 2.00.

APPEALS

Students who have been dismissed and believe specific, unusual circumstances affected their academic performance may request a review by writing a letter of appeal to the Academic Standards Committee in care of the registrar’s office and may request a personal interview before the committee.

For the appeal to be considered before the next semester, it must be received by the committee by the date specified in the notice of dismissal.

SEMESTER CREDIT LOAD POLICIES

FULL-TIME/PART-TIME STATUS

To be considered full-time, undergraduates must be registered for at least 12 credits by the end of the drop/add period. Audited courses are included in the computation of semester credit load.

RECOMMENDED CREDIT LOADS

The normal semester load for undergraduates is 15 credits during the freshman year and 15 to 18 credits in subsequent years. Students with GPAs below 2.00 are strongly advised to take fewer than 15 credits; students on academic probation are limited to 13 credits per semester.

Students should recognize that many programs require more than 120 credits. Completing these programs or a second major or minor usually requires carrying semester loads above 15 credits, attending summer school, and/or taking more than four years to complete a degree.

OVERLOADS

Normally students may not carry more than 21 credits in any one semester. Students enrolled in student teaching courses may enroll for one additional course if it does not conflict with the student teaching assignment.

Students enrolled for more than 18 credits are charged additional tuition.

Summer Session Overloads. The recommended maximum credit load during any summer session is 7. Students must have a CGPA of 3.00 or higher and adviser approval to register for more than 7 credits. Normally students may not carry more than 9 credits in any one summer session nor more than 15 credits in two sessions.
LEAVING MILLERSVILLE UNIVERSITY

Students who wish to leave Millersville before graduating may take a temporary leave of absence or withdraw completely.

LEAVE OF ABSENCE

Students who wish to interrupt their studies at Millersville for up to two consecutive semesters may request a leave of absence. This allows them to register for courses upon their return without applying for readmission. To be eligible for a leave of absence, a student must be enrolled in degree status and have a minimum CGPA of 2.00.

To request a leave of absence, complete an official Leave of Absence Form, available from the registrar’s office, Lyle Hall or on the MU website in the MAX Student Forms Center. Contact the registrar’s office for information on the effects of a leave of absence on refunds, financial aid, housing, insurance and veterans’ benefits status.

Students who take a leave of absence to study at another institution during the fall or spring semester should also complete an Authorization for Transfer of Credit form, available from the registrar’s office.

A leave of absence is cancelled and the student considered withdrawn if the student fails to return by the established ending time or is dismissed by the University.

WITHDRAWING FROM THE UNIVERSITY

Students who wish to withdraw from the University must complete an Official Withdrawal Form, available from the registrar’s office or on the MU website in the MAX Student Forms Center. This applies to all students, whether withdrawing during or between semesters, regardless of reason for withdrawal. Failure to complete this form will jeopardize a student’s chances of future readmission.

Students who have officially withdrawn from the University and wish to return should contact the admissions office, Lyle Hall, for an application for readmission. See the Admissions section for more information.

OTHER ACADEMIC POLICIES

ACADEMIC APPEALS

Students who believe that an academic injustice has occurred should try to resolve the problem at the lowest appropriate level of authority. If the problem is not resolved at this level, the case should be presented to progressively higher levels of authority for further consideration. The levels of authority, from lowest to highest, are individual faculty member, department chairperson and/or department grievance committee, school dean and lastly, the provost and vice president for academic affairs.

If the student believes an academic injustice has been committed by an administrator (e.g., the registrar or director of academic advisement), the levels of authority are the administrator, the associate provost, and lastly, the provost and vice president for academic affairs.

CLASS STANDING

Class standing is based on total credits earned, including those transferred from other colleges and earned through advanced standing programs such as CLEP, as follows:

<table>
<thead>
<tr>
<th>Credits Earned</th>
<th>Class Standing</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–29.5</td>
<td>Freshman</td>
</tr>
<tr>
<td>30–59.5</td>
<td>Sophomore</td>
</tr>
<tr>
<td>60–89.5</td>
<td>Junior</td>
</tr>
<tr>
<td>90 or more</td>
<td>Senior</td>
</tr>
</tbody>
</table>

CLASS ATTENDANCE POLICY

Students are expected to attend all their classes and to accept full responsibility for a decision to miss a class without official authorization.

Authorized absences are granted for reasons of (1) student’s illness, (2) death in the family, (3) religious holidays, (4) participation in outside-of-the-classroom educational activities, and (5) participation in University-sponsored activities or programs including intercollegiate athletic contests. Official authorization may be obtained from the registrar’s office, Lyle Hall. For participation in educational activities or athletic contests, students must apply for authorized absence and arrange to make up work before the missed class.
Each instructor will establish his/her own grading policy based on classroom participation, homework, unannounced quizzes, etc. This policy shall be clearly stated in writing at the beginning of the course.

Students who miss class for an officially authorized reason are entitled to make up work at the convenience of the instructor. Students who miss a class without official authorization may make up work at the discretion of the instructor. Students are solely responsible for materials presented, assignments made, and tests given in regularly scheduled classes.

**COURSE NUMBER SYSTEM**

Millersville University uses the following course numbering system:

- **000-099** Pre-college developmental courses
- **100-199** Courses primarily designed for freshmen
- **200-299** Courses primarily designed for sophomores
- **300-399** Courses primarily designed for juniors and seniors
- **400-499** Courses primarily designed for seniors
- **501-599** First level graduate courses (these courses may be taken by advanced undergraduates but may not be required of an undergraduate student)
- **600** Graduate level courses

The following course numbers are reserved:

- **200, 300, 400, 500** Cooperative Education experiences
- **179, 279, 379, 479** Experimental courses
- **489** Honors courses
- **498** Independent study
- **499** Departmental honors

**DEAN’S LIST**

A student is eligible for the Dean’s List after a given semester if he or she has:

1. earned a semester GPA of 3.50 or higher, and
2. attempted at least 12 credits of course work, excluding those courses not used to compute the GPA.

**GRADUATION HONORS**

Students who have earned consistently superior grades in their course work are recognized for their achievements at graduation with the designation of graduation honors. The student’s diploma and University record carry the appropriate honors designation:

- **Cum laude** for a cumulative GPA between 3.35 and 3.64
- **Magna cum laude** for a cumulative GPA between 3.65 and 3.94
- **Summa cum laude** for a cumulative GPA between 3.95 and 4.00

**Graduation Honors for Students with Transfer Credits.** To qualify for graduation honors, students must:

1. Earn an honors average in work done at Millersville, and
2. Complete at least 30 credits with grades A through D at Millersville, and
3. Earn a combined honors average in all work done at Millersville and in accepted transfer credit courses.

**Graduation Honors for Candidates for a Second Baccalaureate Degree.** To qualify for graduation honors, second degree students must earn an honors average in work in the second degree program. The entire previous academic record is combined with second degree credits and grade points when determining graduation honors.

**Graduation Honors for Associate Degree Candidates.** To qualify for the designation “with honors” on their diploma and University record, associate degree candidates must:

1. Earn a GPA of 3.50 or higher in work done at Millersville, and
2. Complete at least 30 credits with grades A through D at Millersville.

Millersville credits and grade points are combined with accepted transfer credits and grade points when determining graduation honors.
SERVICES FOR STUDENTS

Millersville University offers a number of programs and services designed to identify students’ academic and personal needs, to develop their skills and abilities to meet their needs, and to support their academic efforts.

ACADEMIC ADVISEMENT

The student-adviser relationship is the keystone of the advisement process. Students who have declared a major are assigned an adviser from that department. Undeclared students are assigned specially trained advisers from the faculty and staff. Students admitted under special programs such as PACE are assigned advisers from those programs.

Academic advisement begins during orientation and continues through a final review before graduation. Advisers are available to:

• Discuss academic and career interests, requirements.
• Refer students to other University services.
• Share academic and professional insights.

Students have the right to expect meaningful academic advisement. They share responsibility with their adviser to plan and be available for advisement sessions. Contact the director of academic advisement, Lyle Hall, for more information.

CAREER SERVICES

Career Services, located in Lyle Hall, offers programs and services to help students/alumni clarify and attain educational and career goals. Choice of academic major, exploration and selection of an appropriate occupation, awareness of employment trends, and skill development for finding and landing prime jobs need to be an integral part of a college education. Career Services assists students/alumni with these important activities.

Career counseling, computer-assisted career guidance, current information on hundreds of occupations, and videos describing MU majors are available to students starting with their freshman year.

A two week interactive seminar helps students:

• identify their interest, values, and personality traits as they relate to careers,
• analyze employment trends and their influence on career choice,
• learn how to research and evaluate career information,
• discover how to make a realistic and satisfying choice of majors.

All undecided majors or students who are not certain about their present major are encouraged to participate in this program.

Instructional workshops and videos on resume writing, interviewing, and job search strategies are available to students and alumni.

Students who are participating in cooperative education experiences and seniors/alumni who wish to maximize their post graduation employment and/or graduate school opportunities will want to use Career Services for assistance. On-campus interviews with employers, job vacancy announcements, graduate school information, resume referrals, job fairs, and library resources to research potential employers are available. During fall and spring semesters, Career Services office hours are 8 a.m.-7 p.m., Monday through Thursday, and 8 a.m.-5:30 p.m. on Fridays. A counselor is available to answer general questions and critique resumes daily from 11 a.m.-1 p.m.

CENTER FOR COUNSELING & HUMAN DEVELOPMENT

The Center for Counseling & Human Development is located on the third floor of Lyle Hall. The Center offers students the opportunity to discuss any matter that may be of concern to them freely, and in a confidential, professional setting. There is no cost to students for this service. Staff psychologists, all licensed by the Commonwealth of Pennsylvania, help students reach greater self-understanding and enhance their abilities to manage immediate and future concerns. Individual counseling, workshops, group experiences,
psychological testing and career information are available. Counseling services are strictly confidential.

HEALTH SERVICES

University Health Services in Witmer Infirmary seeks to promote good health among students through education, diagnostic and treatment programs. A wide range of patient services are available including medical exams, screening tests, treatment of acute and chronic illnesses, and referral to other medical personnel and services. Twenty-four-hour care is offered during the fall and spring semesters.

The staff includes two physicians, one nurse practitioner and seven nurses. The facility is well equipped for routine outpatient care and limited inpatient care for students who require more medical attention but not hospitalization.

A physical examination form must be completed by your medical provider before matriculation. This will include a TB test (Mantoux), a detailed review of your immunization record, and information regarding your insurance coverage. This information must be on file in order to use Health Services. Brochures are available with specific information about the services offered.

ORIENTATION

Orientation begins the transition to the University’s environment and expectations; it is the first step in the collegiate experience. Millersville’s orientation programs are opportunities for new students to become familiar with campus facilities, services and people before beginning classes.

Orientation programs are offered to all full-time students admitted to Millersville and are tailored to student needs. Their scope and format depends on the semester in which the student plans to enroll and usually includes diversity workshops, meetings with University officials, advisement, registration for first semester classes, and opportunities to meet other students and experience the college environment. A program that is designed especially for family members is presented at the same time. Therefore, family participation in orientation programs is encouraged.

PRE-PROFESSIONAL ADVISEMENT

Pre-professional advisement is available to students contemplating a professional post-baccalaureate program such as law or medicine. It is a secondary system that helps students prepare for admission to and success in these programs.

Health Professions Advisory Committee. This multi-disciplinary faculty panel advises students interested in attending schools of allopathic medicine (M.D.), osteopathic medicine, podiatry, optometry or veterinary medicine. Students in any major may participate in this program. Contact the Department of Biology, Roddy Hall, for details.

Pre-Law Advisement. Students interested in preparing for law school are assigned a special prelaw adviser in the department of their major, if possible. These advisers help students identify areas of study and extracurricular activities that law school admissions offices consider important. They also help students identify appropriate law schools and complete the application process. Contact the Dean, School of Humanities and Social Sciences, McComsey Hall, for more information.

SERVICES FOR COMMUTERS

Commuting students are an integral part of the University community. Philadelphia House is a special facility for commuters with rooms for studying and relaxing and a kitchen for preparing meals. The Commuting Students’ Association (CSA) has an office in the Student Memorial Center and holds meetings and activities in both the Student Memorial Center and the Philadelphia House.

Parking permits are available to commuting students for a nominal fee. Public buses run regularly between downtown Lancaster and the Millersville campus. Bus schedules are available in the Student Memorial Center.

SERVICES FOR NONTRADITIONAL STUDENTS

While the majority of the Millersville undergraduates are full-time residential students of traditional college age, an increasing number of students are commuters, aged 23 or older, attending part-time, and/or parents of young children. Millersville attempts to meet the special needs of these students through a variety of services.

For information on admission to Millersville as a nontraditional student, see the section on Admission to Millersville University. For more information on services for nontraditional students, contact the Office of Professional Training and Education, Lyle Hall.
SERVICES FOR STUDENTS WITH PHYSICAL DISABILITIES

Millersville University admits students without regard to disability. Where physical barriers exist, accessibility is accomplished by reasonable accommodations and equipment. Students with disabilities are encouraged to contact the assistant vice president for student affairs/student support services, Lyle Hall, immediately after admission to Millersville as the scheduling of classes and procurement of auxiliary aids require time to arrange.

SHUTTLE BUS SERVICE

Millersville University has a shuttle bus that runs throughout the campus and to surrounding apartment complexes, shopping centers and the Amtrak train station in Lancaster. Schedules are available in the Student Memorial Center and at the information desk, Dilworth Building.

SOCIAL EQUITY & DIVERSITY

The Office of Social Equity and Diversity plays a vital role as advocate for equality and diversity on campus, identifying people with needs and providing resources by:

• Encouraging a campus free of harassment and discrimination by giving serious attention to complaints of this nature and fact-finding the specific situation or incident.
• Serve as certified mediators to faculty, staff and students by providing opportunities for discussion and conflict resolution.
• Undertaking the initial fact-finding and case preparation for Millersville University legal counsel in legal challenges that allege discriminatory practices.

Millersville University expects all its members—students, faculty and staff—to respect the rights, dignity and worth of others. The University’s policy of nondiscrimination extends to all phases of campus life.

Members of the University community who feel their individual rights have been violated or the policy of nondiscrimination has been abridged should address their concern to Patricia Hopson-Shelton, Assistant to the President for Social Equity, Delaware House. Questions or complaints regarding discrimination and sexual harassment should also be addressed to the Office of Social Equity and Diversity.

TUTORIAL SERVICES

Tutoring is available at no cost to all University students who request it through the academic department that offers the course in which the student is seeking tutoring. Priority for services is given to students in developmental (000-level) and 100-level courses.

Applications for tutoring or for employment as a tutor are available through department offices.

UNIVERSITY DINING SERVICES

Millersville operates comprehensive dining services for students and guests of the University. Services are provided in Gordinier and Lyle Dining Halls and the William H. Bolger Conference Center. In addition to standard board plan programs, retail cash operations are located throughout campus and offer dining alternatives. The University is proud of the excellent facilities and the quality of the food and service it offers to students and guests.

Students who reside in the residence halls are required to purchase a board plan. Guests may purchase individual meal tickets at the entrance of either of the University dining facilities. For more information, see the section on Expenses.

UNIVERSITY TEST CENTER

The University Test Center offers a variety of standardized tests to candidates seeking teacher certification, graduate or professional program admissions, and course credit by examination.

Services also include proctoring examinations for courses taken at other institutions and for individuals seeking to meet professional licensing or certification requirements.

For a full description of services and test schedules, contact the University Test Center, Lyle Hall, or www.millersville.edu/~testctr for the latest information.

WELLNESS AND COMMUNITY SERVICE PROGRAMS

Millersville University approaches wellness activities as a framework that supports and encourages students to reach their greatest potential for well-being.

Wellness activities include an annual wellness fair and Wellness Week. The office also hires a number of
students each year to serve as peer health educators, who do lifestyle workshops for other students, as well as local elementary and high schools, and various community groups. These workshops cover a wide variety of wellness-related topics: nutrition, stress management, sexuality, HIV and AIDS, and other issues that promote various aspects of the wellness lifestyle. The Wellness Center is supplied with brochures, videos, student resource files and consultation services.

The office encourages community service on campus and in the community through events like Into the Streets, the Empty Bowls Project, the annual Dance Marathon and Play Fair. The Wellness Center also serves as a liaison between community agencies with volunteer needs and students looking for placement.

**STUDENT HOUSING**

**ON-CAMPUS HOUSING**

Millersville has ten residence halls offering a variety of housing lifestyles: single sex, coeducational and special interest theme areas. Each residence hall is staffed by a full-time professional director, a graduate assistant, and specially selected and trained undergraduate resident assistants. The staff strives to maintain an environment conducive to study and social interaction. Special residence hall programs, including lectures, intramurals, and excursions to off-campus cultural, athletic, and recreational sites are offered throughout the year.

Millersville University firmly believes that residence hall living is beneficial for the academic adjustment and personal development of its students. Therefore, all full-time undergraduate students (those enrolled in 12 or more credit hours as of the end of the period held each fall and spring semester during which students may drop and add courses) are required to live in University residence halls until they have attempted 60 credit hours or they have completed four regular (fall or spring) semesters, whichever comes first.

In addition, the University normally makes exceptions to the residence hall requirement for full-time students who are:

- commuting from the home where they live with their parent(s) or a member of their immediate family who is at least 21 years old, provided the one-way commuting distance does not exceed 40 miles. The University requires written verification of a student’s commuting status from the parent(s)/immediate family member(s). *NOTE: A Request to Change to Commuter Status* form is available in the Office of Housing and Residential Programs.
- married
- custodial parents
- twenty-one years of age or older by the beginning of the term for which an exception to the residence hall requirement is requested.

Questions regarding this policy and requests for exceptions to it should be directed to the director of housing and residential programs.

Details of residence hall policies and procedures are in the *Living On Campus Handbook*, available from the Office of Housing and Residential Programs, Harbold Hall.

**OFF-CAMPUS LIFE**

Millersville University maintains a listing of local landlords and property owners from the surrounding community who historically rent rooms, houses or apartments to our students. All off-campus residences fall within the category of “independent” student housing. This designation means that the University does not endorse residences off campus. The University Off-Campus Life office serves as a reference agency collecting information on off-campus housing opportunities and preparing a periodic listing for the convenience of the campus community. The Off-Campus Life office also provides educational workshops for eligible students interested in moving off campus.

Students not admitted as commuters must live on campus until junior status is achieved. Eligible interested students may contact the Off-Campus Life office in Hull Hall at (717) 872-3707 for information on off-campus housing opportunities and educational workshops.

**STUDENT ACTIVITIES**

Millersville University believes that the lifelong benefits of a college education are not derived solely from the classroom. One of the University’s priorities is, therefore, to develop the full potential of its students
and in so doing to enhance the quality of their lives. To achieve this goal, Millersville offers a wide variety of extracurricular activities to supplement academic experiences and develop confidence, self-sufficiency, and social and leadership skills. Student activities enrich student lives and play a critical role in developing personality and character.

Virtually any student interest or need may be met through one of the 140 organizations on campus. Students whose particular interests are not represented by an existing organization may establish a new club by following procedures in the Student Senate Constitution.

Many student activities are funded by student activity fees. Allocations to over 50 organizations and programs are decided by the allocations committee of the Student Senate, with approval of the full senate and the University president.

For a complete listing of all student organizations, see the Student Handbook.

ATHLETICS AND RECREATION

Intercollegiate Athletics. Intercollegiate athletics have a long and proud tradition at Millersville University. They are designed to meet the needs of both participants and spectators. All intercollegiate teams play in NCAA Division II with the exception of wrestling (Division I). Two full-time professional athletic trainers and student trainers serve all intercollegiate teams.

Men’s programs are available in baseball, basketball, cross-country, football, golf, soccer, tennis, track and wrestling. Women’s programs are available in basketball, cross-country, field hockey, lacrosse, soccer, softball, swimming, tennis, track and field, and volleyball.

Intramural Athletics. All students are encouraged to participate in intramural sports, which are planned and administered with considerable student input. Activities include badminton, basketball, flag football, inner tube water polo, racquetball, soccer, softball, ultimate frisbee and volleyball.

Club Sports. Club sports offer organized, non-varsity competition and recreational activities. Club sports currently active on campus include archery, bowling, fencing, ice hockey, international folk dance, martial arts, men’s lacrosse, men’s volleyball, rugby, synchronized swimming and water polo.

Recreational Activities. Millersville’s gymnasium and swimming pools are open for recreation at scheduled hours. A number of other recreational activities, such as tournaments and runs, are offered throughout the year. For more information contact the Director of Intramurals and Recreation in Pucillo Gymnasium.

Athletic and Recreational Facilities. Millersville’s facilities include two gymnasiums, two swimming pools, a paracourse, an archery range, several weight training facilities, outdoor tennis and basketball courts, a lighted football stadium and practice field, and fields for field hockey, baseball and softball.

STUDENT MEMORIAL CENTER (SMC)

Much of the social life on campus centers within the Student Memorial Center (SMC). The building’s facilities offer many outlets to relieve the stress of academic life.

The main entrance lobby area contains an information desk that provides building information and campus activities. Various newspapers and a wide selection of magazines are available to borrow for reading anywhere in the building.

The SMC has nine furnished conference rooms. These rooms are widely used for weekly meetings, guest speakers and a variety of other events. The Reighard Multipurpose Room provide seating for approximately 500. The Reighard Multipurpose Room is used for film series, lectures, parties, fashion shows and dances. Reservations for conference rooms and the multipurpose room may be made at the information desk.

The student banking area is located on the main level. This area houses the banking services for recognized student organizations, auditing services for student organizations, and acts as the campus ticket outlet. Monthly local bus passes may be purchased and personal checks up to $50.00 may be cashed with a valid Millersville University I.D. card.

The Cafe de `Ville is located in the main level. The Cafe de `Ville menu features a wide selection of foods including a variety of breakfast choices, a Pizza Hut, sandwiches, subs, cheese steaks, hamburgers, soups, a salad bar, ice cream and other various snack items.

On the balcony overlooking the Cafe area are student organization offices. Currently the Student Senate, Allies, University Activities Board, Black Student Union, and the International Students have offices there.
The lower level of the SMC contains offices for The Snapper (student newspaper), Touchstone (student yearbook), and WIXQ (campus radio station).

The Club de ‘Ville is located on the lower level. This game room is equipped with 4 billiard tables, a disc player jukebox, video games and pinball machines. On evenings and weekends, Club de ‘Ville, provides alternative entertainment for the campus community. Frequent events include movie nights, coffee houses, comedians and Monday Night Football gatherings.

A fitness wing is located at the south end of the SMC. It consists of a fitness center with two circuits of selectorized weight training equipment, plate-loading free weight equipment and a wide range of cardiovascular equipment. Four racquetball courts can be reserved for wallyball and racquetball play. The fitness wing is also home to an open recreation area where members can participate in various types of athletic activities.

The University Store is located in the north end of the Student Memorial Center. The upper level contains an extensive selection of general interest books in a very attractive setting. A large selection of imprinted campus wear, as well as classroom supplies and art supplies are kept in stock. Computers and related computer software may also be purchased. In addition, various types of cards, posters and electronic items are available. The lower level of the University Store includes the textbook department and a full service copy shop.

EDUCATIONAL & POPULAR PROGRAMMING

A wide range of cultural and popular programming is provided for the students by the Millersville University Activities Board (UAB). Funded by Student Senate, it is a student-run organization divided into committees, with each committee responsible for programming in their specific area (i.e., multicultural films, noontime programs, social events, concerts, coffee house entertainment, public relations and travel).

The performing arts series is scheduled by the Cultural Affairs Committee described under Special Academic Opportunities.

STUDENT GOVERNMENT

To foster an atmosphere of open communication within the University, Millersville offers a number of avenues for student participation in University governance. Consultation with students is an integral step in any major decision. The aim of student government is to encourage students to participate in sound governmental procedures and develop innovative and creative University programs.

Students participate in University governance through the Student Senate and Faculty Senate committees such as the Undergraduate Course and Program Review Committee, the Academic Policies Committee, the Cultural Affairs Committee, the Faculty-Student Athletic Committee, and the Board of Directors of Student Services, Inc. Five student consultants serve the Faculty Senate and one student is appointed a member of the Council of Trustees.

As the governmental body of the students, the Student Senate is an integral component in the governance of the University and works with the faculty and administration on major University policies. The Senate approves the constitution of every campus organization, delegates responsibility to its constituent groups, recommends the allocation of activity fee funds, and makes emergency allocations to recognized University organizations when necessary. These decisions are subject to approval by the University president.

STUDENT COMMUNICATIONS MEDIA

The Snapper, Touchstone, George Street Carnival and WIXQ-FM are the four official student communications media of Millersville University.

The Snapper is the University’s student-run newspaper, published weekly during the academic year. For many years the paper has won the highest awards given by major press associations.

Touchstone, the University yearbook, serves as a record of University activities and personalities.

George Street Carnival is a literary magazine featuring student poetry, essays, short stories, art work and photography.

WIXQ-FM, the campus radio station, provides the University and local community with educational programming, news, sports, talk shows and music. The station adheres to all Federal Communications Commission regulations and is student operated.
MUSICAL GROUPS
A number of musical groups are open by audition to all University students. These groups include the Marauder Marching Band, the University Choir, the University Orchestra, the Symphonic Band, the Mixed Chorus, the Gospel Choir, the Jazz Ensemble and numerous small ensembles.

SPECIAL INTEREST CLUBS
Special interest clubs provide students with pre-professional activities. Accounting, Art, English, Dramatics, Graphics, History and Human-Powered Submarine are some of the interests represented by clubs. Clubs that focus on social, political or environmental issues are also available.

FRATERNITIES & SORORITIES
Millersville’s 10 social fraternities and 11 sororities promote social and service projects for their members and the University community. These groups are governed by the All-Greek Council, which reports to the Student Senate. The main goal of the Council is to foster unity in spirit and action among fraternities and sororities. Greek organizations respond to campus and community needs in a variety of ways. Leadership skills are developed through positions within individual chapters and on the governing council. Philanthropy in the community is promoted by supporting organizations such as the Cancer Society, Lancaster Area Retarded Citizens Organization, Boys’ and Girls’ Clubs.

RELIGIOUS LIFE
Millersville University encourages students to maintain an interest in and devotion to their religious faith. Several religious organizations offer religious, social and cultural programming including: United Campus Ministry (formerly A.D., Interfaith Protestant), ONE (formerly Brothers and Sisters in Christ), Black Campus Ministry, Hillel, Intervarsity Christian Fellowship, John Newman Association (Roman Catholic), Lutheran Student Group, and University Christian Fellowship. Although not members of the University staff, Roman Catholic and Protestant ministers are employed by Catholic Campus Ministry, United Campus Ministry and University Christian Fellowship to serve the University. Both Roman Catholic and Protestant services are conducted on campus.

Millersville’s churches welcome students to their services; several sponsor programming specifically for students. Students who do not find the church of their preference in Millersville will find many places of worship available in nearby Lancaster. Three synagogues in Lancaster represent the Reform, Conservative and Orthodox branches of Judaism. A Muslim mosque is located in Steelton; a Buddhist association is in Columbia and a Hindu temple is in New Cumberland.

SPECIAL EDUCATIONAL FACILITIES
FOREIGN LANGUAGE MEDIA CENTER
The foreign language media center in Byerly Hall includes student listening/speaking booths and a variety of materials for the study of French, German, Russian, Spanish, Latin and Greek. Self-instructional programs in Japanese, Chinese, Italian, Arabic and modern Greek are available. The media center also houses computers and several satellite receivers. Live and delayed newscasts are available in foreign languages.

GANSER LIBRARY
The present library building opened in 1967 and was named for Helen A. Ganser, head librarian from 1911 to 1952. The library faculty and staff have organized a varied collection of materials and encourage all members of the University community as well as interested community residents to use its facilities and services. The library houses approximately a half million books and provides access to nearly 4,000 periodical titles. Circulation policy information as well as information about other library policies and services is accessible from the library’s website, through links via the University home page.

The University Library is a selective Federal Depository, one of nearly 1400 depository libraries in the United States that comprise a national resource network providing access to government information. Designated a selective depository in 1966, Millersville’s Government Documents Collection consists of current materials with some older major publications and sets. The library catalog provides access to most government publications in the collection, including books, periodicals, maps, microfiche, CD-ROMs and electronic records. The library is also a depository for the Commonwealth of Pennsylvania.

The Curriculum Materials Center provides access to current K-12 materials for teacher education students and others. These include textbook series, activity guides, kits and games, manipulatives, educational
software, and audio/visual materials such as videocassettes. The Center adjoins a large collection of current and classic children’s literature.

The University archives and special collections are regional repositories for historic documents and records located on the Millersville University campus. Those unique documents and records which have enduring research value are identified, selected, organized and preserved. The collections serve as a resource center for local and state history. Some of the more significant collections include the University archives, the manuscript collection, the local history and culture collection, the Wickersham pedagogical collection, the Carl Van Vechten collection of African American arts and letters, and the rare book collection.

Library faculty provide workshops and instruction in information literacy skills for faculty, staff, and students, and through the world wide web for asynchronous learning. Scholarly research is further supported by a comprehensive and well-developed library collection that is continuously being augmented by the most current and up-to-date resources available, both in print and electronic format.

The Library belongs to several state-wide and regional library consortia. These consortia allow for resource sharing, reciprocal borrowing, and collaborative purchasing of resources. Most notably, the Keystone Library Network provides the Millersville University community with access to dozens of electronic information resources as well as direct access to the library catalogs of the libraries within the State System of Higher Education. Many of these electronic resources, as well as the Millersville University library catalog, are accessible from the University home page.

INDUSTRY & TECHNOLOGY FACILITIES

The Department of Industry and Technology, Osburn Hall, houses classrooms and laboratories to support the Industrial Technology, Technology Education and Occupational Safety and Environmental Health programs. The technology laboratories represent communication, transportation, manufacturing, construction and biochemical-related technologies. These laboratories are equipped to enable direct experiences with communications, desktop publishing, photography, drafting, design, power and energy, transportation, aviation, electronics, automated manufacturing, production, metallic and nonmetallic materials, material testing, ergonomics, safety engineering, industrial hygiene and fire protection.

Osburn Hall has direct access to the global community and its information resources via the Internet. Two of the most sophisticated IBM-compatible and Macintosh computer laboratories on campus are in the department and available to all University students. Specialized technical equipment includes computer-aided drafting/design (CADD), computer-aided instruction in electronics, computer-controlled machining (CNC), an automated manufacturing center, robots, programmable logic controllers, digital electronics, desktop publishing, multimedia development and instruction, multi-color printing, laser technology, fluid power, aircraft flight simulation, noise dosimeters and safety engineering training modules.

INFORMATION TECHNOLOGY

The Department of Information Technology provides a wide variety of services for faculty and students that enhance the processes of research, instruction and learning. These services include computer workshops relating to pertinent software products, classroom visitations to demonstrate the benefits of technology relative to class work, various documentation and how-to instructional materials, assistance in the design of surveys including the statistical analysis of data, file conversions and transfers between different computing platforms, equipment maintenance and repair, and advice on purchasing decisions.

Over a dozen general purpose and specialized computer laboratories located throughout the campus, housing more than 150 Macintoshes, 150 PCs and 30 Unix workstations, provide students with convenient access to the University network, email and the Internet. Most of these labs are multimedia capable and may be used by faculty as technology classrooms to enhance the student’s learning experience. The labs are available during daytime and evening hours. General purpose labs in Ganser Library are often open 24 hours a day during the week and provide extensive hours of availability over the weekends.

Every room in every dormitory has an Internet connection for every occupant providing residents with continuous access. Information Technology, through ResNet, provides technical assistance and advice for all connections.

Assistance for any type of technology question is provided by information technology’s Help Desk. The Help Desk, located on the first floor of the Boyer Building, with its entrance on the Frederick Street side, provides weekday and extensive weekend telephone support for hardware or software questions. Walk-in support is available weekdays from 8 a.m. until 10 p.m. and enables faculty and students to receive
personalized attention and provides access to the Help Desk’s technical resource center of manuals, training documents and videos.

For complete details about information technology staff, services provided, equipment in labs, lab schedules and many more facts, visit the Millersville University home page, www.millersville.edu and click on information technology from the faculty & staff page, or phone 717-872-3341.

INTERNET ACCESS

Millersville University has a comprehensive and robust campus-wide network that connects all major buildings and all residence halls with high-speed fiber optic access to the Internet. Modem access is also available for remote access to University computers. All students at Millersville are provided with an email account and Internet access that remains valid as long as they are actively enrolled at the university.

All students at Millersville are entitled to an Internet account, which remains valid as long as they are enrolled at Millersville. In order to get an Internet account, students are required to complete a self-paced computer-based tutorial on effective use of the Internet and electronic mail. At the completion of this tutorial, they are required to sign a fair use policy document to make them aware of their rights and responsibilities.

An Internet training group consisting of computer specialists, librarians and faculty offers a variety of free seminars and workshops each semester on how to use particular Internet resources as well as how to find and access information.

JENKINS EARLY CHILDHOOD CENTER

The on-campus early childhood center is located in Stayer Education Center. It provides pre-service field experiences for undergraduates as well as in-service experiences for graduate students and professional school personnel. The licensed day care center, early childhood programs for three and four year-olds and private academic kindergarten follow a constructivist learning model.

The Jenkins Early Childhood Center is available to provide child care for a fee. Other educational programs such as pre-school, pre-kindergarten, and kindergarten are also available. The Center is open from 7 a.m. to 5:30 p.m. Monday through Friday. For further information call the Jenkins Center office in the Stayer Center, 717-872-3465.

SCIENCE AND MATHEMATICS FACILITIES

The Millersville University Science and Technology Complex includes the 88,000 sq. ft. Science and Technology Building (1999), the 55,000 sq. ft. Roddy Hall (renovated 2001), Brossman Hall (1994), and Nichols House. The complex includes 44 teaching laboratories, 49 individual student research laboratories, specialized support laboratories, 11 classrooms, 4 lecture halls, a student study lounge, a student café and lounge, seminar and conference rooms, and faculty offices. Classrooms are all outfitted with multimedia technology. The Department of Computer Science moved into the complex in 2001 with two computer teaching laboratories, the human-computer interaction laboratory, and the graphics virtual reality and haptics laboratory. There are over 300 computers located throughout the science facilities for student use. This is one of the finest science facilities in the region; it houses programs in biology, chemistry, computer science, earth sciences, physics and nursing.

Wickersham Hall, home of the Department of Mathematics, houses developmental and faculty offices, as well as a mathematics computer laboratory with 36 networked PCs, each loaded with an array of mathematical software including the Mathematica computer algebra system and the Minitab statistical software package. Wickersham also has student study areas, a conference room, dedicated space for mathematics tutoring and eight classrooms.

Millersville University has an extensive inventory of modern instrumentation that students use in classroom work and independent study and research. Included are four large environmental chambers, autoclaves, pH meters, optical microscopes, several types of spectrophotometers (CW and FT infrared, visible-ultraviolet and FT nuclear magnetic resonance), differential scanning calorimeter/thermogravimetric analyzer, gas chromatograph/mass spectrometers, a scintillation counter, phase contrast microscopes, optical bench components, a vibration-isolating table for holography and optical interferometry, a cryogenics unit, eximer laser, x-ray spectrometer, cosmic ray muon detector, electrophoresis equipment, thermocyclers, ultramicrotomes, high speed and table-top centrifuges and microfuges, laminar flow hoods, CO\textsubscript{2} incubators for tissue culture, ultra-low freezers, an ultracentrifuge, several gas chromatographs, an electrochemical oxygen analyzer, an auto-analyzer, a high vacuum system, equipment for microwave behavior study, and
hardware/software for data capture. Field equipment includes dissolved oxygen probes, flow meters, backpack electroshocker, PIT tagging equipment, active infrared monitors, fluorometer, digital camera, video cameras, turbidity meters and microbalance. Additional science facilities include botanical glasshouses, a limnological research pond, the Keever ecological study area, a microcomputer based laboratory, photographic darkrooms, and cold rooms. There are museum reference collections of mammals, birds, fishes, insects, and other invertebrates and modern animal care facilities, including special aquatic “wet” rooms for maintenance of animals and research.

The meteorology program is supported by a large number of networked Unix and Windows workstations, in three teaching laboratories, two research labs, and a state-of-the-art weather station. Equipment for acquisition and display of satellite imagery and other meteorological data is available, as are standard instruments for making weather observations. A tethered atmospheric sounding system and instrument trailer is used for fieldwork in meteorology. Four teaching labs, including a fully equipped soil mechanics laboratory, support the geology program. Geological field equipment includes a surveyor’s total station, a proton magnetometer, and a 12-channel engineering seismograph. Roddy Hall houses an earthquake seismograph station. The oceanography program is supported by one on-campus lab, which includes a wave tank, and field station of the Marine Science Consortium, including access to a modern research vessel.

**STUDENT POLICIES**

Students are expected to familiarize themselves with and abide by all student conduct regulations found in this catalog and other University publications, including the Student Code of Conduct, the Living on Campus Handbook, and the Student Handbook. Please refer to the Student Handbook for information on the student discrimination grievance procedures, sexual harassment policy, and policy on sales and vendors.

**IDENTIFICATION CARD**

Enrolled students are required to have a Millersville University Identification Card. The card is needed for facility access and for the use of many campus services and activities.

Identification cards may be obtained at the Campus I.D. Office in the Lobby of Gordinier Hall. There is no charge for the first card, and the current fee for replacement is posted in the Campus I.D. Office.

Office hours are Monday through Friday, 8 a.m. to 5 p.m. Hours are extended at the beginning of fall and spring semesters and are posted at the I.D. office.

**MOTOR VEHICLES**

Freshman and sophomore resident students are not regularly permitted to have motor vehicles on campus. This restriction is in effect throughout the academic year. Exceptions are made by the Chief of University Police only in extreme hardship cases.

Any eligible student wanting to park a vehicle on the University grounds must purchase a University parking sticker at the University Police Office in Lebanon House.

Violations of University parking regulations result in parking violation tickets and possible disciplinary action, including cancellations of parking privileges.

**PRIVACY OF STUDENT RECORDS**

The Family Educational Rights and Privacy Act of 1974, known as the Buckley Amendment, gives students the right to review their academic records, to challenge their contents and to protect their confidentiality. Basic directory information may be disclosed without prior consent of the student.

Millersville’s policy on the confidentiality of student records is available from the Vice President for Student Affairs, Biemesderfer Center. Directory information is used to report student achievements in academic, athletic and extracurricular activities through appropriate media. Students may request that such information not be released by filing a written request during the first two weeks of each semester with the Office of the Registrar, Lyle Hall.

Students may file complaints about the contents of their records or alleged wrongful disclosures of information with the Vice President for Student Affairs.

**SMOKING**

Smoking is prohibited in all academic buildings on campus, except designated areas.
STANDARDS OF CONDUCT

Academic Dishonesty:

Academic Dishonesty includes:

Plagiarism: the inclusion of someone else’s words, ideas, or data as one’s own work. When an individual submits work that includes the words, ideas or data of others, the source of that information must be acknowledged through complete, accurate, and specific references, and through quotation marks or other accepted citation if verbatim statements are included.

By placing his/her name on a scholarly product, the individual certifies the originality of all work not otherwise identified by appropriate acknowledgments. Thus, plagiarism would include representing as one’s own any academic exercise (e.g., written work, computer program, sculpture, etc.) prepared totally or in part by another.

Fabrication: the falsification of research or other findings.

Cheating: the act or attempted act of deception by which an individual seeks to misrepresent that he or she has mastered subject matter in an academic project or the attempt to gain an advantage, usually academic, by use of illegal or illegitimate means.

Academic Misconduct: the violation of University policies by tampering with grades or taking part in obtaining or distributing any part of a test prior to its administration.

When a faculty member suspects that a student has committed an act of academic dishonesty, the faculty member should follow the procedures outlined in the brochure, Academic Honesty and Dishonesty at Millersville University. In brief, the academic sanctions which may be imposed by the faculty member can be categorized as minor or major sanctions. Minor sanctions include oral or written reprimands, requiring the student to redo/resubmit an exam/assignment/project, or lowering the grade for an exam/assignment/project. If the faculty member believes that stronger (major) sanctions are warranted, then a formal charge must be filed with the Associate Provost for Academic Programs & Services (APAPS). The APAPS will conduct an administrative hearing as outlined in the Student Code of Conduct.

For all charges of academic dishonesty, a one-page report summarizing the academic sanction imposed or recommended by the faculty should be completed and filed with the APAPS. More than one (1) occurrence of academic dishonesty in the student’s file will trigger a review of the student’s record by the APAPS who will recommend appropriate corrective action. This file will be destroyed at the time of the student’s graduation.

The student has the right to appeal any faculty decision on academic dishonesty to the department chair or dean of the school. Any student who believes that he/she has been treated unfairly may also request a new (de novo) hearing before the University Judicial Board.

Further explanations and/or examples of academic dishonesty can be found in the brochure titled Academic Honesty and Dishonesty at Millersville University.

Student Records and Other University Documents. Students are responsible for providing accurate information for their University records. Changes in name, address, or other status should be reported immediately to the registrar’s office, Lyle Hall.

Students found guilty of forgery, alteration, misuse, unauthorized possession of, or deliberately omitting or falsifying requested information on registration forms or other University documents, records, stationery or identification cards are subject to disciplinary action as provided in the Student Code of Conduct.

Possession or Use of Alcoholic Beverages and Illegal Drugs. The possession, use or sale of alcoholic beverages and illegal drugs is prohibited on the University campus. Students found guilty are subject to disciplinary action as provided in the Student Code of Conduct.
Millersville offers 60 undergraduate degree programs leading to an associate or baccalaureate degree as well as minor programs. Many majors offer options for fulfilling requirements. These programs and options, subject to change, are as follows. Teaching certification grades are given in parentheses. The specific requirements for each program are given on the following pages under the department offering the program.

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### Baccalaureate Degrees & Options

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<td>Music</td>
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<td>Oceanography</td>
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<td>Occupational Safety &amp; Environmental Health</td>
<td>Industry &amp; Technology</td>
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<td>Sociology</td>
<td>Sociology-Anthro.</td>
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<td>Spanish</td>
<td>Foreign Languages</td>
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<td>Statistics</td>
<td>Mathematics</td>
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<td>Theatre</td>
<td>Communication &amp; Theatre</td>
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<tr>
<td>Women’s Studies</td>
<td>(Interdepartmental)</td>
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</table>
GRADUATE PROGRAMS

Millersville offers master’s degree programs as well as post-baccalaureate and post-master’s certification programs. These programs, subject to change, are as follows:

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<tr>
<th>MASTER'S DEGREES</th>
<th>DEPARTMENT</th>
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<tr>
<td>Athletic Coaching M.Ed.</td>
<td>Wellness &amp; Sport Sciences</td>
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<tr>
<td>Art Education M.Ed.</td>
<td>Art</td>
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<td>Biology M.S.</td>
<td>Biology</td>
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<td>Business Administration M.B.A.</td>
<td>Business Administration</td>
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<tr>
<td>Clinical Psychology M.S.</td>
<td>Psychology</td>
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<tr>
<td>Earth Sciences M.S.</td>
<td>Earth Sciences</td>
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<tr>
<td>Elementary Education M.Ed.</td>
<td>Elementary &amp; Early Childhood Edu.</td>
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<tr>
<td>English M.A. and M.Ed.</td>
<td>English</td>
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<td>French M.A. and M.Ed.</td>
<td>Foreign Languages</td>
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<td>German M.A. and M.Ed.</td>
<td>Foreign Languages</td>
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<tr>
<td>History M.A.</td>
<td>History</td>
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<td>Leadership for Teaching and Learning M.Ed.</td>
<td>Educational Foundations</td>
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<tr>
<td>Mathematics M.Ed.</td>
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<td>Nursing M.S.N.</td>
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<td>Family Nurse Practitioner</td>
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<td>Nursing Case Management</td>
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<td>Psychological Services M.S.</td>
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<tr>
<td>Reading/Language Arts Education M.Ed.</td>
<td>Elementary Edu.</td>
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<tr>
<td>School Counseling M.Ed.</td>
<td>Psychology</td>
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<td>School Psychology M.S.</td>
<td>Psychology</td>
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<td>Spanish M.A. and M.Ed.</td>
<td>Foreign Languages</td>
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<tr>
<td>Special Education M.Ed.</td>
<td>Special Education</td>
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<tr>
<td>Sport Management M.Ed.</td>
<td>Wellness and Sport Sciences</td>
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<tr>
<td>Technology Education M.Ed.</td>
<td>Industry &amp; Technology</td>
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<tr>
<th>POST-BACCALAUREATE AND POST-MASTER'S CERTIFICATION PROGRAMS</th>
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<tr>
<td>Instructional:</td>
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<td>Biology</td>
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<td>Chemistry</td>
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<td>Early Childhood Education</td>
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<td>Earth Sciences</td>
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<td>Elementary Education</td>
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<td>Elementary Education M.Ed.</td>
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<td>English</td>
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<td>German</td>
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<td>Mathematics</td>
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<td>Mentally and/or Physically Handicapped</td>
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<td>Music Education</td>
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<td>Permanent Teaching Certification</td>
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<td>Physics</td>
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<td>Reading Specialist</td>
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<td>Russian</td>
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<td>Social Studies Education</td>
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<td>Spanish</td>
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<td>Technology Education</td>
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<td>Educational Specialist:</td>
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<td>School Nurse</td>
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<td>School Psychology</td>
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<td>Elementary School Counselor</td>
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<td>Administrative:</td>
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<td>Elementary Principal</td>
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<td>Secondary Principal</td>
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<td>Supervisory Certificate Programs:</td>
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<td>Respiratory Therapy Certification</td>
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<td>Technology Education</td>
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UNDERGRADUATE PROGRAMS OF STUDY

In the following course listings, G1, G2 and G3 refer to general education courses which count in the liberal arts core. G4 courses refer to additional general education requirements.

- **G1** Course counts in Humanities and Fine Arts block.
- **G2** Course counts in Science and Mathematics block.
- **G3** Course counts in Social Sciences block.
- **G4** Fundamentals, Advanced Writing, Perspectives, Wellness and an elective.

The symbols L, P, W, and AW indicate additional educational components contained in the course. The symbols are defined as follows:

- **L** A lab course.
- **P** A perspectives course.
- **W** A significant writing component.
- **AW** An advanced writing course.

For more information on these components of the general education program, refer to the section in the catalog entitled The General Education Program.

<table>
<thead>
<tr>
<th>FREQUENCY OF COURSE OFFERINGS</th>
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<tbody>
<tr>
<td>When a course is always offered in fall, spring and summer: No notation is shown.</td>
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<td>When a course is listed as “Offered in...”: it is offered only in the semesters noted.</td>
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<tr>
<td>When a course is listed as “Offered periodically”: it is offered on an irregular or as-needed basis.</td>
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<tr>
<td>When a course is listed as “Offered infrequently”: the course has not been offered for 2 years and will not be offered for 2 more years.</td>
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<tr>
<td>When a course is listed as “Offered annually”: the course is taught in either spring or fall.</td>
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**ACCOUNTING**

SEE BUSINESS ADMINISTRATION

**ACTUARIAL SCIENCE**

SEE MATHEMATICS

**AFRICAN-AMERICAN STUDIES**

Professor Smith-Wade-EI, director

African-American Studies is an 18 credit interdisciplinary minor focusing on the history and socio-culture of African Americans. The minor offers an introduction to issues, theories, and research concerning African Americans in various disciplines. Courses in the minor emphasize African-American perspectives, as well as the development of critical thinking and written and oral communication skills. The minor will present opportunities to examine, compare and contrast African-American perspectives with those of other American cultures. It offers students in a variety of disciplines important perspectives on African-American history and culture that will help them to understand the possibilities and values of cultural differences.

Students will be encouraged to connect issues about African-American culture raised in the classroom to current society. Fifteen of the 18 credits satisfy General Education requirements and knowledge of African-American culture will complement many majors, especially elementary and secondary education, business, communications and theatre, English, history, sociology, art, music, and industry and technology. It appears to be both essential and beneficial that all students have a multi-cultural perspective of themselves and the world around them.
**African-American Studies Minor: 18 s.h.**

Required courses: AFAM 201, AFAM 401, HIST 272 or HIST 273, and ENGL 333 or ENGL 334, plus two electives from an approved list, at least one must be at the 300 level or above.

**COURSE DESCRIPTIONS**

**AFAM 201: 3 s.h.**
*Introduction to African-American Studies (G3)*

Provides an overview of African-American culture and history. African-American perspectives and contributions in the areas of literature, art, theater, music, politics, economics, science and technology, medicine, male-female relationships, family, the church and the media will be presented. Offered annually.

**AFAM 401: 3 s.h.**
*Senior Seminar in African-American Studies*

An examination and discussion of current research issues in African-American studies. May be taken in conjunction with a 2 to 3 credit independent study. Prereq: AFAM 201.

**AFAM 496: 3 s.h.**
*Topics in African-American Studies*

Presents a detailed investigation on a topic of current interest in African-American studies. Topics will be announced. Prereq: AFAM 201.

**APPROVED AFRICAN-AMERICAN STUDIES COURSES**

Descriptions of these courses may be found under the appropriate departmental listing. No more than one course may be taken from the same discipline grouping (the four groupings are humanities, social sciences, science and mathematics, and education).

**HIST 272: 3 s.h.**
*African-American History I (G3,W)*

**HIST 273: 3 s.h.**
*African-American History II (G3,W)*

**ENGL 333: 3 s.h.**
*African-American Literature I (G1,W)*

**ENGL 334: 3 s.h.**
*Afro-American Literature II (G1,W)*

**ANTH 344: 3 s.h.**
*Gender, Race, & Class (P)*

**EDUC 403: 3 s.h.**
*Cultural Diversity (W)*

**EDUC 433: 3 s.h.**
*Gender & Race Issues in Children's Literature (P)*

**ENGL 429/629: 3 s.h.**
*Black Women Writers*

**HIST 401: 3 s.h.**
*Cultural Interactions in The Atlantic World: 1450-1820 (P)*

**MATH 102: 3 s.h.**
*Survey of Mathematical Ideas in Non-Western Cultures (G2)*

**MUSI 263 (designated sections): 3 s.h.**
*Popular Music (G1)*

**MUSI 369: 3 s.h.**
*Introduction to West African Music and Dance*

**PSYC 318: 3 s.h.**
*Psychology of Racism (P)*

**PSYC 319: 3 s.h.**
*Psychology of African-Americans (G3,W)*

**SOWK 350: 3 s.h.**
*Encounter in Human Diversity (P)*

**SSCI 212: 3 s.h.**
*The Black Women (G3)*
ANTHROPOLOGY
SEE SOCIOLOGY-ANTHROPOLOGY

ARMY: MILITARY SCIENCE (ROTC)

Reserve Officers Training Corps
Assistant Professor Keith B. Shaw, director

Participation in military science courses during the freshman and sophomore years results in no military
obligation. Individuals who elect to continue in and successfully complete the program during their junior
and senior years can receive a commission as a second lieutenant in the U.S. Army, National Guard or
Army Reserves upon graduation. They will be required to serve from four months to four years in the
active Army, depending upon type of commission.

COURSE DESCRIPTIONS

MILS 101, 102: 1 s.h.
Introduction to Military Science
An introduction to the fundamental components of service as an officer in the United States Army. Initial
lessons form the building blocks of progressive lessons in values, fitness, leadership and officership. By
means of both written and oral presentations regarding the history of military art, battle history, technical
studies and the relationship of the armed forces with society, students will be encouraged to develop a habit
of critical reflection. To complement their investigation of military history, students will receive practical
instruction in the application of military art and basic soldier skills. Meets one hour per week.

MILS 210, 211: 2 s.h.
Self and Team Development & Military Leadership
A continuation of the fundamentals introduced the previous year by focusing on leadership theory and
decision making. “Life skills” lessons during this year include: problem solving, critical thinking,
leadership theory, followership, group interaction, goal setting and feedback mechanisms. The use of
practical exercise is significantly increased over previous semesters, as cadets are increasingly required to
apply communications and leadership concepts. Meets two hours per week.

MILS 301, 302: 3 s.h.
Leadership and Management & Military Tactics
Advanced instruction in topics introduced during the basic course. Emphasis on leadership. Situations
require direct interaction with other cadets and test the student’s ability to achieve set goals and to get
others to do the same. Students master basic tactical skills of the small unit leader. Principles and
techniques of effective leadership, methods of developing and improving managerial abilities and
leadership qualities, and a basic understanding of interpersonal interactions. Use is made of recent
developments in the administrative and the behavioral sciences to analyze the individual, group, and
situational aspects of leadership, and the management of resources. Participation in operations and basic
tactics to demonstrate leadership problem solving and to develop leadership skills. Meets two hours per
week. Prereq: Open only to advanced course cadets.

MILS 401, 402: 3 s.h.
Contemporary Military Issues
Emphasis is placed on developing planning and decision-making capabilities in the areas of military
operations, logistics and administration. Concepts of organization theory and the principles of
management. Management and leadership relationships are investigated as they apply to the general theory
and practice of the management functions of planning, organizing, staffing, direction, coordination, control,
innovation and representation. Meets two hours per week each semester. Prereq: Open only to advanced
course cadets.
ART
School of Humanities and Social Sciences
Associate Professor Kerlavage, chairperson
Professors Hay, O’Hanrahan, Ragouzeos
Associate Professors Andriulli, Robinson
Assistant Professors Bensur, Burns, Frischkorn, Schuller, Sigel, Wolf

All courses are available to students enrolled in any curriculum.

The Department of Art offers three baccalaureate degree programs: the bachelor of arts in art (B.A.), the bachelor of science in art education (B.S.Ed.), and the bachelor of fine arts in art (B.F.A.). The recommended course sequence during the first two years for all three programs is similar, so that any change in degree program within the Art Department need not result in loss of time or credits.

Liberal arts, art education and fine arts degree programs are designed to offer the flexibility needed to meet the unique needs of each student. To lend authenticity to this idea, each student, with the help of an adviser, assumes much of the responsibility for determining a self-directed program of studies.

All art students must maintain a minimum grade average of 2.50 in their major.

The B.A. program in art provides a sound, broad-based educational foundation which, to considerable extent, can be individually tailored to meet the specific educational goals of each student. While most B.A. students pursue a commercial art (Graphic Design/Visual Communications) option, opportunities for study that lead to entry into a variety of other art and art related fields are commonly chosen by students in this program. The B.A. degree program also provides a sound preparation for graduate study.

The B.S. Ed. in art education program is designed for students who aspire to become art teachers. Upon completing this program, students are certified to teach art at both the elementary and secondary levels in the public and private schools of Pennsylvania.

The B.F.A. program offers greater depth in art studio and is the professional studies program designed for persons who either intend to become self-employed artists or who wish to further their education in graduate school programs in studio art. Additionally, students may combine the B.F.A. degree with Teaching Certification.

The art department encourages highly motivated students from each of the three programs to participate in internship and cooperative education opportunities that exist in both the public and private sectors. These opportunities are described in the Special Academic Opportunities section.

COURSE REQUIREMENTS

Art Major (B.A.): 120 s.h.
Core Studies: Students must complete the design-drawing foundation program (ART 142, ART 242, ART 133 and ART 233) and select* any two courses in art history. Students must select* any one course from each following core area: painting, space arts and graphics.

Areas of Extension: Students must select* any additional seven courses offered by the Art Department to complete their program.

Art Education Major (B.S.Ed.): 132 s.h.
Certification in Art Education
Core Studies: Students must complete the design-drawing foundation program (ART 142, ART 242, ART 133, ART 233); ART 310; ART 312; plus any other two 300 level art history courses; ART 201 or PHIL 383. Students must select* any one course from each following core area: painting, graphics and space arts.

Areas of Extension: Students must select* any additional three to four courses offered by the Art Department, which includes at least two courses in one studio area beyond what is taken to complete the core requirements.

In addition, students must complete the art education foundation program (ART 221, ART 322, ART 325 and ART 426); 57 total credits must be completed from the Art Department.

The following courses are also required: EDFN 211, 241, and 330; and EDAR 462, PSYC 100 and PSYC 227.

Fine Arts Major (B.F.A.): 132 s.h.
Foundation Courses: Students must complete the B.F.A. design-drawing foundation program: ART 142, ART 242, plus 3 s.h. of a design elective, in addition to ART 133, ART 233 and ART 333 (Drawing), plus
any four art history courses, one painting or watercolor course, and one course from each of the following areas: photography, printmaking, sculpture, jewelry/metals and clay.

Concentration: Students must complete a minimum of 15 s.h. in at least one of the following eight studio areas: drawing, design, photography, sculpture, clay, visual communications/graphic design, painting/watercolor, or jewelry/metals. The concentration may include work taken to satisfy the foundation sequence. Students must select* art electives to bring their total art major credits to 78 s.h. A portfolio review is mandatory prior to the junior year; a senior exhibition and a senior professional portfolio plus slides of art work are graduation requirements.

**B.F.A. with Certification: 153 s.h.** Includes all requirements for the B.F.A. for intro, foundations and studio concentration. Plus art education core studies and student teaching. This degree option is designed for students who are serious about their artistic preparation but also want to be certified to teach in PA schools. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

**Graphic Design Art Option: 120-132 s.h.**

Students may pursue a program of studies in the Graphic Design area by completing a sequence of courses and applying them toward the requirements of either the B.A. (120 s.h.) or the B.F.A. (132 s.h.) degree. Beyond, or as part of the minimum basic core or foundation requirements for each degree, students must complete ART 344 and select at least 15 s.h. (5 courses) from the following in consultation with their advisers: ART 240, ART 244, ART 266, ART 375, ART 443, ART 444 and ART 544. Students may use a total of three (9 s.h.) of the graphics courses from the Industry and Technology Department to satisfy art elective requirements. One of these courses may be applied to satisfy the 15 s.h. program of studies as described above. ITEC graphics courses include: ITEC 110, ITEC 251, ITEC 355, ITEC 356, ITEC 455, and ITEC 456.

**Art Minor Program**

Studio Option: The Art Minor with an option in studio is an organized program of studies designed for the student who wishes to pursue a sequence of courses in studio art in addition to those of his major field. Students must complete ART 133, ART 142; select one course from the graphics, painting or space arts areas; select one art history course; and select two additional art electives to complete the 18 s.h. program.**

* With the approval of the student’s adviser.

**A minimum of two 300 level courses must be completed to satisfy program requirements.

**Art History Option**

The art minor with an option in art history is an organized program of studies designed for the student who wishes to pursue a sequence of courses in art history in addition to those of his major field. Students must complete ART 301, 302, 303 and 304, as well as two additional elective art courses in art history.

**COURSE DESCRIPTIONS**

**Art History and Criticism**

**ART 100: 3 s.h.**

Art in Culture (G1)

A course designed for the non-art major which involves a general study of the role of historic and contemporary architecture in art and in society. Criticism, analysis and evaluation of works of art are central to the course. Offered in fall, spring, summer.

**ART 201: 3 s.h.**

History and Aesthetics of Photography (G1)

A survey of the history, principles and theory of photography in the 19th and 20th centuries as it is used as an aesthetic medium and for visual communication. Differentiation between photographs made as art vs. snapshots, photojournalism, scientific record and commercial art is emphasized. A research project is required. Offered in spring.

**ART 301: 3 s.h.**

The Ancient World (G1, W)

A survey of Western painting and sculpture from the Paleolithic through the Hellenistic periods. Offered periodically.
ART 302: 3 s.h.
The Italian Renaissance (G1, W)
A comprehensive analysis of painting and sculpture produced in Florence and Siena from the 13th through the 15th centuries. Offered periodically.

ART 303: 3 s.h.
The 19th Century (G1, W)
A survey of European art of the 19th century. Offered periodically.

ART 304: 3 s.h.
The 20th Century (G1, W)
The varied schools and styles of painting and sculpture in the 20th century. Offered periodically.

Art 310: 3 s.h.
Art Criticism
The growth and development of aesthetic form and compositional analysis of the major art forms with emphasis upon the relationship to socioeconomic, political, philosophical and religious issues. Student participation through research, analytical writing and discussion are required. (May not be used to satisfy art history requirements.) Offered spring, summer.

ART 312: 3 s.h.
Survey of Art History (G1)
A general survey of the art of the Western World with emphasis on the nature of style, medium, aesthetic changes and continuity. Criticism, analysis and evaluation of works of art related to their aesthetic worth and cultural significance are central of the course.

ART 313: 3 s.h.
Art in America (G1)
A comprehensive survey of 18th and 19th century American painting concentrating on those influences and traditions that were significant in the development of the art of the new world. Offered periodically.

ART 403: 3 s.h.
Art History: The Northern Renaissance
An in-depth study of Flemish, Dutch, Bohemian and German painting from the 14th through 16th centuries.

ART 404: 3 s.h.
Contemporary Movements in Art (G1, W)
An in-depth study of the contemporary art scene including an exploration of its cultural and historical roots. Offered periodically.

ART 588, 589: 3-6 s.h.
Topics in Art History
Offered periodically.

Art Education
ART 221: 3 s.h.
Introduction to Art Education
The history of art education, current issues and theories, and practical problems involving visual resources in selected two and three dimensional art processes used in art education. Field experiences include observing art classrooms in county and city schools. For Art Education majors only. Offered in spring.

ART 322: 3 s.h.
Child Development in the Visual Arts (W)
Survey of the holistic development of children and adolescents; investigate theories of cognitive, social, physical, emotional and language development as it effects the artistic growth of the typical and atypical child. Influences of society, school culture, peers, economic status, race and gender. Analysis of artwork, media and material toward development of appropriate visual arts curricula. Field experience includes observing in city/county schools. Offered in fall. Prereq: ART 221; EDFN 211, 241 or permission of instructor. Admission to APS (Advanced Professional Studies).

ART 325: 3 s.h.
Methodology and Pedagogy of Art
A survey of the pedagogy and methodology for students of all ages and developmental levels. Includes teaching and learning styles sensitive to the physiological, cognitive, emotional, social, perceptual and
aesthetic make up of students. Introduction to art experiences relevant to students’ needs, strategies for implementation and classroom management. Field experience in city/county schools. Offered in fall. Prereq: ART 221; EDFN 211, 241. Admission to APS (Advanced Professional Studies).

**ART 327:** 3 s.h.
**Art for the Exceptional Child**  
A survey of methods, materials and philosophy involved in teaching art to exceptional children. Open to all education majors. Offered periodically.

**ART 426:** 3 s.h.  
**Art Curriculum Design and Application**  
An in-depth investigation of curriculum planning and implementation sensitive to the needs of a diverse student population. Offered each semester and is designed to be taken along with student teaching. Offered in fall, spring. Prereq: ART 221, 322, 325; EDFN 211, 241, 330.

**EDAR 461 and EDAR 462:** 12 s.h.  
**Student Teaching and Seminar**  
Student teachers in art education spend one-half semester in elementary schools and one-half semester in secondary. Seventh or eighth semester. (Eligibility requires students to have completed the art core program and 12 semester hours in art education. See catalog information regarding student teaching application and eligibility.) Offered in fall, spring.

**ART 521:** 3 s.h.  
**Visual Resources in Art Education**

**ART 522:** 3 s.h.  
**Art Media Studio/Seminar**

**ART 523:** 3 s.h.  
**Art Curriculum Seminar/Workshop**

**ART 524:** 3 s.h.  
**Administration and Supervision of Art Programs**

**ART 586, 587:** 3-6 s.h.  
**Topics in Art Education**

**Drawing**

**ART 133:** 3 s.h.  
**Drawing I (G1)**  
Introduces drawing as artistic expression as well as a form of nonverbal communication. Traditional and contemporary perspectives. Emphasis on original creative solutions to visual problems. Students explore artistic composition employing various drawing media and techniques. Includes criticism, analysis and evaluation. For both the non-art major and the art major.

**ART 233:** 3 s.h.  
**Drawing II**  
Fundamental drawing skills are stressed and personal expression is emphasized. A variety of techniques and observational exercises will be used. Working from the figure, short and extended studies will be developed. Offered in fall, spring. Prereq: ART 133.

**ART 333:** 3 s.h.  
**Drawing III**  
Continued drawing skill development using a variety of subjects including the figure. Traditional and nontraditional approaches to methods and materials are encouraged. Individual development of a personal idiom of expression will be required. Prereq: ART 233. Offered in fall, spring.

**ART 433:** 3 s.h.  
**Drawing IV**  
Advanced drawing in which individual style and technique are emphasized. An intensive course of independent research including creation of a portfolio. Prereq: ART 333. Offered in fall, spring.

**ART 533, 534:** 3-6 s.h.  
**Drawing**
Design

ART 141: 3 s.h.
Fundamentals of Studio Art (Non-Art Majors) (G1)
Introduces visual arts through studio experiences. Criticism, analysis and evaluation are central to the course as the student seeks creative, original solutions to artistic problems while working with various media and techniques. Emphasis on aesthetic expression and effective visual communication rather than on skills development.

ART 142: 3 s.h.
Design I (G1)
Introduces two-dimensional design and composition, applicable to all art forms, in which students seek original, creative solutions to problems. Design principles and methods are employed as students learn language and visual communications techniques. Artistic production, criticism, analysis and evaluation are central to this course. (For both non-art and art majors.) Offered in fall, spring.

ART 240: 3 s.h.
Calligraphy and Lettering (G1)
History and development of communications systems especially as related to writing and the evolution of the Roman alphabet. Traces history of calligraphy and lettering in Western culture through study and studio practice. Includes creative design projects in layout and composition. Includes criticism, analysis and evaluation. (For both non-art and art majors.) Offered in fall.

ART 242: 3 s.h.
Design II
Introduces visual composition as related to organizing and working with three-dimensional space. The student seeks original, creative solutions to visual problems by exploring methods and techniques. Covers fundamental visual grammar and principles. Offered in fall, spring. Prereq: ART 142.

ART 244: 3 s.h.
Typography
Studio course explores the origins of alphabets and writing, and the development, classification and creative use of typefaces in graphic design. Includes hand lettering, basic typography specification and copyfitting, type indication, type personification, computers in typography, and use of type as image and design. Emphasis on creative problem-solving through typography. Offered in spring. Prereq: ART 133 and ART 142 (ART 240 is suggested, but not required).

ART 344: 3 s.h.
Visual Communications and Graphic Design I
Studio course explores typography and design processes in solving design and communication problems similar to those found in commercial art studios and advertising agencies. Emphasis on logo and layout design from rougths through comprehensives. Offered in fall, spring. Prereq: ART 133, 142 or permission of instructor.

ART 375: 3 s.h.
Illustration
Studio exploration of various illustration techniques and media appropriate for book, magazine and newspaper illustration. Offered periodically. Prereq: ART 133, 142 or permission of instructor.

ART 442: 3 sh.
Introduction to Computer Art
Explores and develops the capabilities for aesthetic expression native to computer-generated art forms. Includes system knowledge and preparation, artistic input, manipulation, display and output of chosen images in response to given assignments. Offered in fall, spring. Prereq: ART 133 and ART 142.

ART 443: 3 s.h.
Introduction to Computers in Design
Explores and develops capabilities for graphic expression through the use of computers in design. Various computer programs will be employed to developing formats, imagery and type applicable to graphic design problems. Includes system knowledge and preparation, artistic input, manipulation, display and output of designs. Offered in fall, spring. Prereq: ART 133 and ART 242.

ART 444: 3 s.h.
Visual Communications and Graphic Design II
Continued study in this area with an emphasis on concept development and marker layout design. Previous coursework in typography suggested. Offered in spring. Prereq: ART 344 or permission of instructor.
ART 541, 542: 3-6 s.h.  
Design  
ART 543: 3 s.h.  
Advanced Computer Art  
Offered in fall, spring.  
ART 544: 3 s.h.  
Advanced Computers in Design  
Offered in fall, spring.

Painting  
All classes listed in the “Painting” section are offered in fall, spring.  
ART 352: 3 s.h.  
Painting I  
An introduction to painting in oil, acrylic and related media in which the student explores basic techniques and approaches to painting through the use of drawing, design and color. Prereq: ART 133, 142, or permission of instructor.  
ART 354: 3 s.h.  
Painting II  
Continued development of painting skill with the emphasis on sustained individual development and technical expression. Prereq: ART 352 or permission of instructor.  
ART 452: 3 s.h.  
Painting III  
Further study in painting as the individual student works toward developing a personal idiom of expression. Prereq: ART 354 or permission of instructor.  
ART 454: 3 s.h.  
Painting IV  
An advanced course in which students continue to develop style and technique as they seek their own direction in painting. Prereq: ART 452 or permission of instructor.  
ART 552, 554: 3-6 s.h.  
Painting  
ART 353: 3 s.h.  
Watercolor I  
Introduces watercolor techniques through a series of problems related to the development of skill in handling the medium. Prereq: ART 133 and ART 142.  
ART 355: 3 s.h.  
Watercolor II  
Continued development of painting in watercolor with the emphasis on sustained individual development and technical expression. Prereq: ART 353 or permission of instructor.  
ART 453: 3 s.h.  
Watercolor III  
Further study in watercolor as the individual student works toward developing a personal idiom of expression. Prereq: ART 355 or permission of instructor.  
ART 455: 3 s.h.  
Watercolor IV  
An advanced course in which students continue to develop style and techniques as they seek their own direction in watercolor painting. Prereq: ART 453 or permission of instructor.  
ART 553, 555: 3-6 s.h.  
Watercolor and Related Media  

Graphics  
ART 167: 3 s.h.  
Non-Traditional Photography  
A studio course in alternative photographic processes for the artist, photographer and craftsmanship. Camera not required. Offered annually.
ART 266: 3 s.h.
Fine Art Photography I (G1)
An introduction to the value, function and perception of fine art photography through study and practice. Student work is analyzed, criticized and evaluated in terms of the photograph as fine art, advertising photographs and photojournalism. (For both non-art and art majors.) Offered in fall, spring.

ART 314: 3 s.h.
The Family Album (P)
A perspectives course in which students will assemble a collection of family photographs and albums for research and interpretation. This activity will be based upon readings in feminist scholarship, visual anthropology and feminist analysis of mass communication. An approved Women’s Studies course. Offered in fall. Prereq: Junior class standing.

ART 366: 3 s.h.
Color Photography
Introduces basic techniques and materials of color photography with an emphasis on aesthetic approaches. The course includes a survey of color reversal films, color negative films and color print materials and techniques. Prereq: ART 266 or permission of instructor. Offered in spring.

ART 466: 3 s.h.
Fine Art Photography II
Photography as a working method for the creative photographer. View-camera techniques and various printing processes may be chosen to suit the individual photographer’s objectives. Prereq: ART 266 or permission of instructor.

ART 566, 567: 3-6 s.h.
Fine Art Photography

ART 362: 3 s.h.
Printmaking I
Introduction to the four areas of printmaking: intaglio, lithography and relief. Projects in each of these areas will develop technical skills and understanding of the physical nature of creating original prints. Issues of subject matter, content and intent will be discussed and explored. Creative and original solutions to visual problems will be emphasized. Offered in fall, spring. Prereq: ART 133 and ART 142.

ART 363: 3 s.h.
Printmaking II
Continued development of technique and personal expression in intaglio, lithography, relief and screenprinting. Innovative and experimental approaches will be introduced along with color printing. Individual conceptual issues of style and content will be emphasized. Offered in fall, spring. Prereq: ART 362.

ART 462: 3 s.h.
Printmaking III
An advanced course which places emphasis on personal creative research in one or more printmaking areas. An intensive course based on individual choice of content and intent. Work and related aesthetic issues will be discussed in group critiques. Offered in fall, spring. Prereq: ART 363 or permission of instructor.

ART 463: 3 s.h.
Printmaking IV
An intensive self-motivated research oriented course. The development of experimental techniques and approaches will be emphasized. Advanced multiple color images and the creation of a print portfolio of quality and creative integrity will be required. Offered in fall, spring. Prereq: ART 462 or permission of instructor.

ART 563, 564: 3-6 s.h.
Printmaking
Space Arts
All "Space Arts" courses except ART 181 are offered in fall, spring.

**ART 181: 3 s.h.**

Art Crafts
A studio course focusing on various art crafts as forms of artistic expression. Contemporary design and creative, original artistic solutions are stressed. Students may work in one or more craft areas. (For both non-art and art majors, but cannot satisfy the space art requirement for majors.) Offered infrequently.

**ART 282: 3 s.h.**

Sculpture I (G1)
An introduction to sculpture as a three-dimensional form of artistic expression with an emphasis on lost wax casting. The critical, the productive and the evaluative aspects of sculpture as art are central to the course. (For both non-art and art majors.)

**ART 382: 3 s.h.**

Sculpture II
Continued development of individual artistic expression with the emphasis on contemporary sculptural form. Prereq: ART 282.

**ART 482: 3 s.h.**

Sculpture III
Further study in sculpture as the student works toward developing a personal idiom of expression. Prereq: ART 382.

**ART 483: 3 s.h.**

Sculpture IV
Advanced study in sculpture in which the student continues to develop style and technique while discovering personal artistic direction. Prereq: ART 482.

**ART 582, 583: 3-6 s.h.**

Sculpture

**ART 291: 3 s.h.**

Fine Art Metals I (G1)
Introduces jewelry and metals as a form of artistic expression. The student seeks creative solutions to visual problems while employing various metalworking techniques and media. Critical analysis and evaluation of jewelry and metal art are central to the course. (For both art majors and non-art majors.)

**ART 391: 3 s.h.**

Fine Art Metals II
Continued development of individual artistic expression in jewelry and metals with the emphasis on artistic inventiveness and personal style. Prereq: ART 291.

**ART 491: 3 s.h.**

Fine Art Metals III
Further study of jewelry and metals as an art form in which the student is encouraged to develop an original aesthetic style while exploring and employing advanced technical processes. Prereq: ART 391.

**ART 492: 3 s.h.**

Fine Art Metals IV
Advanced study in jewelry and metals in which the student continues to develop style and techniques while discovering personal artistic direction. Prereq: ART 491.

**ART 591, 592: 3-6 s.h.**

Fine Art Metals

**ART 295: 3-6 s.h.**

Ceramics I: Handbuilding
Introduces clay and the ceramics process utilizing handbuilding methods. Emphasis on the productive, critical, cultural and historical aspects of ceramics as a form of artistic expression. Basic handbuilding and glazing techniques are employed as students seek creative solutions to visual problems (for both non-art and art majors).
ART 296: 3-6 s.h.
Ceramics I: Wheel Throwing
Emphasis on the productive, critical, cultural and historical aspects of ceramics as a form of artistic expression. Basic wheel throwing & glazing techniques are employed as students seek original creative solutions to visual problems (for both non-art and art majors).

ART 297: 3 s.h.
Ceramics II
Development of clay as a means for self-expression. Introduces glaze preparation, experimentation and simplified glaze chemistry. Prereq: ART 295 or 296.

ART 396: 3 s.h.
Ceramics III
Continued development of the student’s own style and means of self-expression. An in-depth study in one technical aspect related to the work being produced. Prereq: ART 297.

ART 497: 3 s.h.
Ceramics IV
Advanced study in clay in which students continue to develop style and techniques as they pursue their own artistic direction. Prereq: ART 396.

ART 596, 597: 3-6 s.h.
Ceramics

Studio Topics
Art 686, 687: 3-6 s.h.
Topics in Art Studio

Independent Study
ART 498: 1-3 s.h.
Independent Study in Art
For further information on independent study, see the Special Academic Opportunities section.

ART 490: 3 s.h.
Professional Seminar and Exhibition
An independent problem culminating in the development of a portfolio and exhibition of the student’s art work. The student is required to attend and participate in seminar activities for this course. Offered in fall. Prereq: Senior standing.

BIOCHEMISTRY
SEE CHEMISTRY

BIOLOGY
School of Science and Mathematics
Professor Yacom, chairperson
Associate Professor Ladd, allied health coordinator
Professors Cosentino, Dobbins, Hepfer, Ostrofsky, Parks, Piperberg, Reinking, Steucek, Whisenton-Davidson, Yurkiewicz, Zegers
Associate Professors Ambler, DiBartolomeis, Hoover, Moné
Assistant Professors Boal, Wallace
Respiratory Therapy Clinical Faculty: Chrissos, Hughes, Patel

The Department of Biology offers three degrees and nine options leading to the baccalaureate degree. The requirements are very similar for all programs during the first two years so that any change in career emphasis need not involve any major loss of time or credits. The department also offers a minor in biology.

The program leading to the bachelor of arts degree is broad, embracing interdisciplinary study of cell and molecular biology, plant and animal science and population biology. Programs can be tailored to prepare the student for employment or graduate study in a variety of subdisciplines of biology.

The program leading to the bachelor of science provides the student an opportunity to elect a substantial number of courses in a specific area of biology. This program provides a strong background for admission to graduate or professional school and prepares the student for employment in the field of biology upon graduation.
Options available within the B.S. program include: botany, environmental biology, marine, molecular biology/biotechnology, respiratory therapy, medical technology, nuclear medicine technology, optometry and pre-podiatry.

Students in the botany option concentrate on the study of plants while obtaining a broad background in biology. This option effectively prepares those interested in professions in horticulture or plant sciences and in advanced graduate study in botany.

The environmental biology option (ecology) permits students to concentrate in ecology and enables them to gain expertise to be competitive in industry, governmental agencies and graduate school.

The marine option encourages students to choose electives in the marine biology area. Many marine science courses are offered at our field station at Wallops Island, Virginia, since they usually involve significant field work. For more information on the field station, see “Marine Science Consortium” in the Special Academic Opportunities section.

The molecular biology/biotechnology option allows students to concentrate in genetics, cell and molecular biology. The courses required for this option complement each other, training students in a variety of laboratory methods and enabling students to gain the theoretical understanding and technical expertise currently needed to be competitive in industry and graduate school.

After completing three years of undergraduate study, students in the medical technology program are eligible to apply to an accredited hospital-based medical technology program for one year of clinical laboratory experience after which they will be awarded the bachelor of science degree and will be eligible to sit for the national certification examination. Currently, MU is affiliated with ten hospital-based medical technology programs.

After completing three years of undergraduate study, students in the nuclear medicine technology program are eligible to apply for admission to one of the member hospitals of the Lancaster Institute for Health Education School of Nuclear Medicine Technology for one year of hospital training after which they will be awarded the bachelor of science degree and will be eligible to sit for the national certification examination.

An agreement between Millersville University and the Pennsylvania College of Optometry in Philadelphia allows students in the optometry option to complete three years of undergraduate study at Millersville and then transfer to Philadelphia for the first year of study in the doctoral program. Students who complete the year with good grades receive a B.S. in biology from Millersville University and after three additional years earn the doctor of optometry degree.

A cooperative option exists between Millersville University and the Temple University School of Podiatric Medicine. This 3/4 pre-podiatry program allows students to transfer to the professional school after satisfactorily completing 99 semester hours at the University. After successful completion of the basic science courses at the Temple University School of Podiatric Medicine, students are awarded a B.S. in biology from Millersville University. Three recommended Millersville students a year have reserved spaces for admission to the podiatric college, where graduation after four years earns a D.P.M. degree.

Millersville University is the sponsoring institution for the respiratory therapy program. After successfully completing three years of study at the University, students enter the 16 month clinical phase. At the end of the clinical phase, they are awarded the bachelor of science degree, and a certificate in respiratory therapy, and will be eligible to sit for the national credentialing examination.

The education curriculum leads to the bachelor of science in education with secondary education certification in biology.

Individualized programs in pre-medicine, pre-dental, pre-optometry, pre-podiatry and pre-veterinary medicine are organized with the program adviser.

**Retention-in-the-Major Policy**

University requirements for retention must be met. In addition, all biology majors except those in allied health options (medical technology, nuclear medicine technology, and respiratory therapy) must earn grades of C (2.00) or better in BIOL 211, BIOL 221 and BIOL 263. Allied Health students must earn grades of C (2.00) or better in BIOL 211 and BIOL 263. These requirements must be satisfied before completion of 60 Millersville University credit hours. University students who change their major, or their option within the Biology major, must satisfy the above requirements prior to completion of 30 additional credit hours. Transfer students with 60 credit hours or more must satisfy the requirements prior to completion of 30 Millersville University credit hours. Transfer students with fewer than 60 credits must
follow the policy for all other majors. Any students failing to meet these requirements will be dropped from the biology major. Those who wish to re-enter the major must meet Admission-to-the-Major requirements.

**COURSE REQUIREMENTS**

**Biology Major (B.A.): 120 s.h.**
Biology Major (B.A.): 120 s.h.
BIOL 211, 221, 263, 365, and 472 and 3 s.h. from each area: Cellular & Molecular, Plants, and Animals. 6 s.h. from Population Biology area and electives to bring total biology credits to 33. See the curriculum record form for appropriate courses for each area. 16 s.h. chemistry; 8 s.h. physics; 7 s.h. mathematics/computer science including calculus; 3 s.h. earth sciences. Foreign language through intermediate level or equivalent.

**Biology Major (B.S.): 120 s.h.**
Biology Major (B.S.): 120 s.h.
BIOL 211, 221, 263, 365, and 472 and 3 s.h. from each area: Cellular & Molecular, Plants, and Animals. 6 s.h. from Population Biology area. Electives to bring total biology credits to 43. See the curriculum record form for appropriate courses for each area. 20 s.h. chemistry; 8 s.h. physics; 7 s.h. mathematics/computer science including calculus.

**Biology Major (B.S.): 122 s.h.**
Biology Major (B.S.): 122 s.h.
Botany Option
BIOL 211, 221, 263, 365, 427, and 436. 3 s.h. from each area: Cellular and Molecular, Plants, Animals. 6 s.h. from Population Biology area. See the curriculum record form for appropriate courses for each area. Electives to bring total biology credits to 45. 20 s.h. chemistry; 8 s.h. physics; 7 s.h. mathematics/computer science including calculus.

**Biology Major (B.S.): 125 s.h.**
Biology Major (B.S.): 125 s.h.
Environmental Biology Option
BIOL 211, 221, 241, 242, 263, 365, 375 and 448. 6 s.h. from each area: Advanced Ecology, Taxa Based Electives, Function Process Block. Electives to bring total biology credits to 50. See the curriculum record form for appropriate courses for each area. 16 s.h. chemistry; 8 s.h. physics; 4 s.h. calculus; 4 s.h. earth sciences.

**Biology Major (B.S.): 121 s.h.**
Biology Major (B.S.): 121 s.h.
Marine Biology Option
BIOL 211, 221, 241, 263, 291 (or MS 241 offered at Marine Science Consortium) , and 472. 24 s.h. additional Biology courses. See the curriculum record form for appropriate courses for this area. Marine biology courses which must be approved by the adviser to bring total biology credits to 46. 15-16 s.h. chemistry; 8 s.h. physics; 4 s.h. calculus; 4 s.h. oceanography.

**Biology Major (B.S.): 120 s.h.**
Biology Major (B.S.): 120 s.h.
Molecular Biology/Biotechnology Option
BIOL 211, 221, 263, 365, 462, 466, 472 and 461 or 463 or 465. 3 s.h. from each area: Plants & Animals and Population Biology. Electives to bring total biology credits to 39. See the curriculum record form for appropriate courses for each area. 24 s.h. chemistry; 8 s.h. physics; 7 s.h. mathematics/computer science including calculus.

**Biology Major (B.S.): 122 s.h.**
Biology Major (B.S.): 122 s.h.
Medical Technology Option
BIOL 211, 257, 263, 356 and 375. Electives to bring total biology credits to 22. 16 s.h. chemistry; MATH 161; 8 s.h. physics. 30 s.h. of clinical laboratory study from a hospital program in medical technology approved by the National Accrediting Agency for Clinical Laboratory Sciences.

**Biology Major (B.S.): 122 s.h.**
Biology Major (B.S.): 122 s.h.
Nuclear Medicine Technology Option
BIOL 211, 257, 263, 356, 375. Electives to bring total biology credits to 22. 16 s.h. chemistry; MATH 161; 8 s.h. physics. 30 s.h. of clinical laboratory study in nuclear medicine technology at the Lancaster Institute for Health Education School of Nuclear Medicine Technology.

**Biology Major (B.S.): 124 s.h.**
Biology Major (B.S.): 124 s.h.
Optometry Option
BIOL 211, 263, 375, 461, 472. Electives to bring total biology credits to 20. 20 s.h. chemistry, 7 s.h. mathematics/computer science including calculus; 8 s.h. physics, 3 s.h. psychology. 24 s.h. transfer credits upon completion of one year at the Pennsylvania College of Optometry.
Biology Major (B.S.): 123 s.h.  
Pre-Podiatry Option  
BIOL 211, 263, 356, 365, and 435. 16 s.h. chemistry; 8 s.h. physics; MATH 161 and 162; 6 s.h. psychology. 24 s.h. transfer credits from Pennsylvania College of Podiatric Medicine.

Biology Major (B.S.): 148 s.h.  
Respiratory Therapy Option  
BIOL 211, 257, 263, 455 and 461. 61 s.h. of respiratory therapy courses. 16 s.h. chemistry; 8 s.h. physics; MATH 161.

Biology Major (B.S.Ed.): 129 s.h.  
Certification in Secondary Education  
BIOL 211, 221, 241, 242, 263, 365 and 473. Electives to bring total biology credits to 32. 16 s.h. chemistry; 8 s.h. physics; 3 s.h. earth sciences; MATH 160 or 161. Professional education courses (27 s.h.): EDFN 211, 241 and 330. EDSE 321, 435, and 461. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

Biology Minor  
BIOL 211, 221, 263, 365. Electives to bring total biology credits to 20. CHEM 112 must be taken prior to BIOL 263.

COURSE DESCRIPTIONS

BIOL 100: 3 s.h.  
General Biology (G2, L)  
An introduction to biology with emphasis on cell structure, metabolism, genetics, behavior, ecology, adaptations, organ systems and evolution. 2 hours lecture, 2 hours lab. No credit toward BIOL major.

Competency in Biology  
Competency must be demonstrated before taking most 200-level courses. Competency may be demonstrated by: a) a course grade of “A” or “B” in AP Biology; b) a score of 3 or better in the national AP examination; c) a successful score on the CLEP examination; d) a successful score on a General Biology challenge or placement examination; e) a passing grade for General Biology (BIOL 100).

BIOL/HNRS 108: 1 s.h.  
Honors Freshman Biology Seminar  
Emphasis on the intellectual and historical context of the core ideas of BIOL 100 and in-depth exploration of ideas raised in lecture and laboratory. Satisfies the honors lab when taken with Biology 100. Offered in fall, spring. Prereq or coreq BIOL 100.

BIOL 154: 4 s.h.  
Human Anatomy and Physiology I  
Study of the structure and function of the human body. This first semester of a two-semester sequence deals with the development, histology, gross anatomy, function and pathophysiology of the cutaneous, skeletal, muscular and nervous systems. 3 hours lecture, 3 hours lab. Offered in fall, spring. Co- or prereq: CHEM 103 or 111 or equivalent. No credit toward BIOL major.

BIOL 155: 4 s.h.  
Human Anatomy and Physiology II  
Study of structures and function of the human body. The second semester of a two-semester sequence deals with the development, histology, gross anatomy, function and pathophysiology of the circulatory, respiratory, digestive, urinary, reproductive and endocrine systems. 3 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: BIOL 154 and CHEM 103 or 111 or equivalent. No credit toward BIOL major.

BIOL 161: 3 s.h.  
Clinical Microbiology  
An introduction to basic microbiology emphasizing medical bacteriology, virology, mycology and immunology. Principles of epidemiology and control of infectious disease will also be covered. 2 hours lecture, 3 hours lab. Offered in summer. No credit toward BIOL major.

BIOL 204: 3 s.h.  
Human Biology (G2, W)  
A non-laboratory course in human biology designed specifically for those students planning to specialize in social work, psychology or related fields. An overview of the changes that take place in the course of a human lifetime; basics of human evolution, ecology, behavior, anatomy and physiology of the human
organism are discussed. 3 hrs. lecture. Offered periodically. Prereq: BIOL 100, demonstrated competency or permission of instructor and ENGL 110. No credit toward BIOL major.

**BIOL 205: 3 s.h.**
**Heredity and Human Affairs (G2)**
Genetics for non-majors with reference to human heredity and development. The social implications of recent advances in genetics are considered. 3 hours lecture. Offered periodically. Prereq: BIOL 100, demonstrated competency, permission of instructor or RN. No credit toward BIOL major.

**BIOL 207: 3 s.h.**
**Human Sexuality (G2, W)**
Study of the nature of human sexuality, particularly as it relates to biological phenomena. Discussions and films will cover the biology of human reproduction, biology of human sexual behavior and its implications. 3 hrs. lecture. Offered periodically. Prereq: BIOL 100, demonstrated competency, permission of instructor or RN, and ENGL 110. No credit toward BIOL major.

**BIOL 208: 3 s.h.**
**Plants and People (G2)**
Explores uses of plants and plant products by man and their impact on the development of civilization. Characteristics of plants that make them suitable for food, shelter, clothing, energy, medicines, entertainment, objects of worship, microclimate modification and aesthetic objects are discussed. 3 hours lecture. Offered periodically. Prereq: BIOL 100, demonstrated competency or permission of instructor. No credit toward BIOL major.

**BIOL 211: 4 s.h.**
**Concepts of Zoology (G2, L)**
Study of invertebrate and vertebrate animals. Classification, reproduction, development, ecology, physiology, behavior, genetics, scientific methodology (including simple statistical approaches), and evolution. Laboratory studies include microscopy, dissections, live observations, computer exercises and experimentation. 3 hours lecture, 3 hours lab. Prereq: BIOL 100, demonstrated competency or permission of instructor.

**BIOL/HNRS 212: 1 s.h.**
**Honors Zoology Seminar**
Continuation of BIOL 211. Original investigations and/or readings and discussions of the zoological literature about the diverse adaptations of animals to their environments. Completion of both BIOL/HNRS 212 and BIOL 211 earns 5 credits to be counted as one course in the G2 block. BIOL/HNRS 212 may not be used independently to fulfill a G2 requirement. Offered periodically. Prereq: completion of BIOL 211 with a grade of B or higher and member of University Honors College or 3.35 GPA or instructor’s permission.

**BIOL 221: 4 s.h.**
**Concepts of Botany (G2, L)**
Consideration of features unique to plants such as localized meristems and open growth, water relations, photosynthesis, cell structure. An integrated study of a plant structure and function using angiosperms as principal examples. Includes brief discussions of plant and fungal diversity, plant ecology and evolution and economic botany. 3 hours lecture, 3 hours lab. Prereq: BIOL 100 or demonstrated competency.

**BIOL/HNRS 222: 1 s.h.**
**Problem Solving in Botany**
A botanical science investigation of a problem or series of problems. Define a problem with a botanical basis, search appropriate literature, formulate hypotheses and collect appropriate information to test hypotheses through experimentation and data gathering. Completion of both BIOL/HNRS 222 and BIOL 221 earns 5 credits to be counted as one course in the G2 block. BIOL/HNRS 222 may not be used independently to fulfill a G2 requirement. Offered periodically. Prereq: completion of BIOL 221 with a grade of B or higher and University Honors College or 3.35 GPA, or instructor’s permission.

**BIOL 241: 3 s.h.**
**Principles of Ecology**
Ecological principles underlying physiological adaptations of organisms to their environment, population dynamics, community analysis and ecosystem studies. Ecological and evolutionary theory emphasized with examples from aquatic and terrestrial habitats. 3 hours lecture. Offered in fall, spring. Prereq: BIOL 100 or demonstrated competency, MATH 235, 151, 160 or 161.
BIOL 242: 2 s.h.
Ecology Laboratory
Introduction to techniques used in terrestrial and aquatic environments to gather ecological data, laboratory experiments, and quantitative data analysis using computers. 4 hours lab. Offered in fall, spring. Coreq: or prereq: BIOL 241.

BIOL 247:3 s.h.
Biodiversity: Origins and Extinctions (G2)
Existing patterns of biological diversity (biodiversity), the processes and events that produce biodiversity, and the natural and unnatural factors that limit and/or reduce biodiversity. The ethics of biodiversity are also discussed. 3 hours lecture. Offered periodically. Prereq: BIOL 100 or demonstrated competency and COMM 100. No credit toward BIOL major.

BIOL 256: 3 s.h.
Nutrition (G2, W)
Principles of adequate nutrition including digestion and metabolism of foods; energy, protein, mineral and vitamin needs; environmental and industrial contaminants, additives and carcinogens; dietary treatment for nutritional disorders. 3 hours lecture. Prereq: ENGL 110.

BIOL 257: 1 s.h.
Introduction to Allied Health Professions
A survey of the various disciplines in the allied health field. The course describes the type of training offered by hospitals for students who are planning to major in a health profession and for students who are undecided on a career. 1 hour lecture. Offered in fall.

BIOL 263: 4 s.h.
Cell Biology (G2, L, W)
Cell structure and function including cellular ultrastructure, methods used in cell biology, cell motility, cell division, cellular macromolecules, organelles, metabolism, cell surface and the cytomembrane system. Laboratory includes isolation of cell components, enzyme kinetics, microscopy and other techniques of cell biology. 3 hours lecture, 3 hours lab. Prereq: BIOL 100 or demonstrated competency, CHEM 112 and ENGL 110.

BIOL 264: 2 s.h.
Frontiers in Biomolecular Science I (G2)
Introduction to current trends in research in molecular, cell and developmental biology. Background information is presented to enable critical analysis of current research publications through faculty-student interactions and discussions. 2 hours per week of interactive presentations and discussions. Offered periodically. Prereq: BIOL 263 or permission of instructor.

BIOL 265: 2 s.h.
Frontiers in Biomolecular Science II (G2)
Continuation of BIOL 264. Focus on more in-depth consideration of research topics, enabling students to formulate conceptual linkages. Interactive discussions and presentations of recent research topics in molecular, cell and developmental biology are stressed. 2 hours per week of interactive presentations and discussions. Offered periodically. Prereq: BIOL 264 or permission of instructor.

BIOL/HNRS 266: 1 s.h.
Advanced Principles of Cell Biology
Cellular operations and processes; (hormonal control of cell physiology, secretory activities and vesicular trafficking, control of cell division, neurotransmission, control of muscle contraction, signal transduction, interrupted genes, cell recognition, etc.). Students explore and lead discussions on one of these topics. Completion of both BIOL/HNRS 266 and BIOL 263 earns 5 credits to be counted as one course in the G2 block. BIOL/HNRS 266 may not be used independently to fulfill a G2 requirement. Offered periodically. Prereq: completion of BIOL 263 with a grade of B- or higher and member of University Honors College or 3.35 GPA or instructor’s permission.

BIOL 281: 3 s.h.
Behavioral Biology (G2, W)
Provides an evolutionary and ethological frame of reference for further studies in psychology and animal behavior. Lectures supplemented by demonstrations and A-V media cover animal diversity, nervous systems, sensory reception, communication and behavior. 3 hours lecture. Offered in spring. Prereq: BIOL 100 or demonstrated competency, and ENGL 110. No credit toward BIOL major.
BIOL 291: 3 s.h.
Marine Biology
Phylogeny, morphology and ecology of marine organisms. Stressed are similarities and differences in solutions to problems of life in the marine environment. 2 hours lecture, 3 hours lab. Weekend field trips. Offered in fall, summer at the Marine Science Consortium. Prereq: BIOL 211; Coreq: BIOL 221.

BIOL 316: 3 s.h.
Invertebrate Zoology
Study of the morphology, physiology, behavior, adaptations, ecology, taxonomy, evolution and life history of members of the major invertebrate phyla. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: BIOL 211.

BIOL 318: 4 s.h.
Comparative Vertebrate Anatomy
Functional and comparative anatomy of selected vertebrates with developmental and evolutionary perspectives. Lab will primarily consist of dissection and histological analyses of animals representing various vertebrate classes. Comparisons between animals at the same level, and to see diverse features superimposed upon a common pattern. 3 hours lecture, 3 hours lab. Offered in spring, 2 of 3 years. Prereq: BIOL 211 and BIOL 263 or permission of instructor.

BIOL 325: 3 s.h.
Plant Systematics
A survey of local vascular flora, use of dichotomous keys in identifying plants, distinguishing features of common plant families, principles of plant systematics. Phylogenetic, biosystematic and nomenclatural concepts are considered. 2 hours lecture, 3 hours lab. Offered in spring. Prereq: BIOL 221.

BIOL 326: 3 s.h.
Lower Plants
The structure, life histories and evolution of algae, bryophytes and the vascular cryptogams. Notes are made of their distribution, physiological peculiarities and pathogenicity or usefulness to people. 2 hours lecture, 3 hours lab. Offered in fall, periodically in summer. Prereq: BIOL 221.

BIOL 327: 3 s.h.
Horticultural Science
Principles of horticultural science including regulation of plant growth, propagation and breeding, plant nutrition, pruning, plant diseases and special topics related to individual types of plants. Laboratory includes propagation and handling of plants in the greenhouse and field trips. 2 hours lecture, 3 hours lab. Offered in spring of even years. Prereq: BIOL 221, or permission of instructor.

BIOL 340: 3 s.h.
Perspectives in Environmental Awareness (P)
Interdisciplinary study of current environmental problems and their implications on future habitability of the planet. Physical, biological and social aspects of alterations to ecosystems presented and solutions considered. Course includes lectures, open forums and student participation. Offered periodically. Prereq: ENGL 110, completion of at least 36 credit hours which MUST include a minimum of 24 credit hours of Liberal Arts Core Courses and at least one science (G2 block) AND one social science course (G3 block). May be used as biology elective if not applied to Gen Ed Perspective requirement.

BIOL 342: 1-4 s.h.
Biology Field Camp
Students to spend significant time studying and working in the field; includes specimen collecting and identification, description of habitat, communities and biomes. Offered infrequently in summer. Prereq: BIOL 100 or demonstrated competency, and permission of instructor.

BIOL 345: 3 s.h.
Applied Ecology (W)
The application of ecological principles and methods to the solution of environmental problems in the fields of agriculture, forestry, fisheries and preservation of biological diversity are examined. Impacts of pollutants on ecosystems are discussed. A major focus is the use of biological processes to limit and/or reverse pollution and human-induced environmental degradation. 2 hours lecture, 3 hours lab. Offered in fall or spring. Prereq: BIOL 211, 221, 241 and 375 and ENGL 110.
BIOL 346: 3 s.h.
Ornithology
Ecology, behavior, taxonomy and evolution of birds with emphasis on field studies. 2 hours lecture, 3 hours lab. Weekend field trips. Offered in spring of odd years. Prereq: BIOL 211.

BIOL 356: 5 s.h.
Functional Human Anatomy
A systemic approach to the study of the structure of the human body with discussion of general function. Course designed primarily for those planning to enter medical or allied health professions. Clinical laboratory experiences related to human anatomy. 3 hours lecture, 4 hours lab. Offered in fall. Prereq: BIOL 211.

BIOL 365: 3 s.h.
Genetics
The gene is defined at biochemical, molecular, organismal and population levels. Labs studies with Drosophila, microorganisms, cell culture, modern molecular genetic techniques. 2 hours lecture, 3 hours lab. Prereq: BIOL 263; CHEM 231 or 235 recommended.

BIOL 375: 3 s.h.
Biometry
Use of statistical techniques in descriptive and experimental biology and the use of mathematical models in describing biological phenomena. 3 hours lecture. Offered in fall, spring. Prereq: BIOL 100 or demonstrated competency, and MATH 151.

BIOL 415: 3 s.h.
Mammalogy
Phylogeny, taxonomy, adaptations, behavior and ecological relationships of mammals. Acquisition of laboratory and field techniques are stressed. 2 hours lecture, 3 hours lab. Weekend field trips. Offered in fall of odd years. Prereq: BIOL 211.

BIOL 416: 3 s.h.
Entomology
Introduction to insects with emphasis on structure and function, behavior, adaptations, ecology, systematics, and economic and medical significance. Collecting, pinning and mounting techniques are covered. 2 hours lecture, 3 hours lab. Offered periodically Prereq: BIOL 211.

BIOL 417: 3 s.h.
Parasitology
Biology of parasites and their host/parasite relationships are considered. Parasites infesting humans and domestic animals stressed. Includes practical aspects of diagnosis. 2 hours lecture, 3 hours lab. Offered in spring. Prereq: BIOL 211. BIOL 263 recommended.

BIOL 424: 3 s.h.
Mycology
The taxonomy, morphology, physiology and ecology of fungi. Laboratory activities include surveys of local populations of fleshy fungi, fungal pathogens of plants and soil fungi; physiological studies on growth and reproduction; experimental studies of fungal ecology; and studies of comparative morphology of diverse fungal groups. 2 hours lecture, 3 hours lab. Offered in fall of odd years. Prereq: BIOL 221 and 263.

BIOL 427: 3 s.h.
Developmental Plant Anatomy
Structure and function of cells, tissues and organs constituting the plant body. Developmental aspects such as cellular differentiation and organogenesis are used to enhance the understanding of plant structure and its variability. Investigations of plants in the laboratory and greenhouses including microtechniques, theory and application of light microscopy and basic photomicrography. 2 hours lecture, 3 hours lab. Offered in fall. Prereq: 221. BIOL 263 recommended.

BIOL 428: 3 s.h.
Plant Morphogenesis
Concepts of plant growth and development utilizing vascular and non-vascular plants. Includes developmental topics such as regeneration, cell production, polarity, correlative growth, developmental genetics, totipotency and integration. Laboratories stress experimental design and include microscopy, cell and tissue culture, cyto-histological techniques. 2 hours lecture, 3 hours lab. Offered in spring of odd years. Prereq: BIOL 221, 263, 365 and CHEM 235 or 231.
BIOL 435: 3 s.h.
Animal Physiology
Structure and functions of animals. Independent investigation and recent physiological theories emphasized. 2 hours lecture, 3 hours lab. Offered in fall. Prereq: BIOL 211 and 263; CHEM 112 and 235 or 231.

BIOL 436: 3 s.h.
Plant Physiology
Life processes of plants. Water relations, nutrition, translocation, photosynthesis, metabolism, growth, development and reproduction will be considered with particular reference to higher plants. 2 hours lecture, 3 hours lab. Offered in spring. Prereq: BIOL 221 and 263. CHEM 231 or 235 recommended.

BIOL 437: 3 s.h.
Endocrinology
The role of hormones in the integration and control of physiological and developmental process is stressed as well as the molecular mechanism of hormone action. 3 hours lecture. Offered in fall. Prereq: BIOL 263.

BIOL 438: 3 s.h.
Neurobiology (W)
The structure and function of the nervous system. Lecture and laboratories will cover a broad range of topics, from the molecular to the cognitive. One of the major themes is the relationship between the brain and behavior. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: BIOL 263 and ENGL 110.

BIOL 443: 3 s.h.
Conservation Biology
Population ecology and genetics applied to the conservation of rare, threatened and endangered species. Emphasis on the regulation of abundance, theoretical models of population dynamics, experimental design, sampling approaches and case studies. 2 hours lecture, 3 hours lab. Offered annually. Prereq: BIOL 211, 221, 241, 241 and 375.

BIOL 445: 3 s.h.
Aquatic Biology
Study of the physical and biotic aspects of temporary pools, streams, ponds and rivers. Field trips. 2 hours lecture, 3 hours lab. Offered in spring. Prereq: BIOL 211, 221; PHYS 132 or 232 desirable.

BIOL 446: 3 s.h.
Ecosystems (W)
Ecosystem processes including nutrient cycles, energy budgets and trophodynamics are discussed for terrestrial, coastal and marine ecosystems. Processes are discussed for ecosystem types such as those controlled by fire, volcanism, chemosynthetic bacteria, detrital food resources, herbivory and predation. Ecosystems viewed in a global perspective to understand global carbon and nutrient cycles. 3 hours lecture/discussion. Offered in spring. Prereq: BIOL 211, 221, 241, and 375 and ENGL 110. Prereq or coreq: BIOL 242.

BIOL 447: 4 s.h.
Chesapeake Bay System (W)
Study of the effects of human activity on the ecosystems of the Chesapeake Bay System and the role of ecological principles in current restoration efforts. Investigation of how agricultural practices, riparian forests, tidal and non-tidal wetlands and urban development affect the input of nutrients and toxins, and the estuarine processes in Chesapeake Bay that cause eutrophication and population declines in fisheries. 2 hours lecture, 4 hours lab/field. Offered in fall. Prereq: BIOL 211, 221, 241, and 375 and ENGL 110. Prereq or coreq: BIOL 242.

BIOL 448: 2 s.h.
Biological Problems of Environmental Management
Development of environmental management plans. Individual and/or group projects. Impact assessment and environmental planning will also be discussed. 2 hours lecture. Offered in fall, spring. Prereq: Senior standing in Environmental Biology (Ecology) option (biology major).

BIOL 454: 2 s.h.
Immunology
The development of humoral and cellular immunity to an antigenic stimulus is discussed. Role of these mechanisms in immunogenetics, immunologically mediated disease, immunological protection against infectious agents and cancer also considered. 2 hours lecture. Offered in spring. Prereq: BIOL 263.
BIOL 455: 3 s.h.
Cardiopulmonary Physiology
Cardiovascular and pulmonary function. Covers heart muscle, electro-mechanical properties of the heart, hemodynamics, mechanics of ventilation, gas transport and cardiopulmonary insufficiencies. Laboratory exercises include use of human subjects, animal experimentation and computer simulations. 2 hours lecture, 3 hours lab. Offered in spring. Prereq: BIOL 211, 263, 356. CHEM 231 or 235.

BIOL 461: 3 s.h.
General Microbiology
The structure, physiology and ecology of microorganisms. Principles of microbial virulence and immunology are also discussed. Laboratory investigations include the isolation and identification of unknown microorganisms. 2 hours lecture, 3 hours lab. Offered in fall. Prereq: BIOL 263.

BIOL 462: 4 s.h.
Molecular Biology (W)
The molecular and macromolecular basis of life. The structure and function of cellular macromolecules, molecular techniques of genetic analysis and the control of cellular processes will be examined in depth. 3 hours lecture, 3 hours lab. Offered in fall. Prereq: BIOL 365 and ENGL 110. BIOL 461 or CHEM 326 recommended.

BIOL 463: 4 s.h.
Virology
Comprehensive investigation of animal viruses. In depth analysis of virus particles, modes of replication, epidemiology of virus infection, virus host interactions and vaccines. Focus is on medically-important viruses such as herpes, influenza, hepatitis and human immunodeficiency viruses. Laboratory exercises include the culture and analysis of viruses in bacterial and mammalian systems. 3 hours lecture, 3 hours lab. Offered in fall. Prereq: 263; BIOL 365 recommended.

BIOL 465: 3 s.h.
Developmental Biology
Principles of development and differentiation in animals and plants at the molecular and supramolecular levels of organization. The laboratory includes both experimental and descriptive embryology. 2 hours lecture, 3 hours lab. Offered in spring. Prereq: BIOL 211, 221 and 263 or permission of instructor.

BIOL 466: 3 s.h.
Molecular and Cellular Techniques
Application and theory of techniques commonly used in biotechnology, cell and molecular biological research. Cell culture, plant tissue culture, immunological techniques, cell fusion, radioisotope labeling and detection, centrifugation, microscopic techniques and electrophoretic protocols will be covered in depth. Intended for Biology B.S. majors in the Molecular Biology/Biotechnology option. 5 hours integrated lecture/lab. Offered in spring. Prereq: BIOL 462. BIOL 461 recommended.

BIOL 471: 1-4 s.h.
Topics in Biology
Detailed investigations of a topic of current interest. Topic to be announced each time course is offered. Offered periodically. Prereq: Upper class standing or permission of instructor.

BIOL 472: 1-2 s.h.
Seminar in Biology
Group discussions. General theme to be determined by professor. Prereq: 16 s.h. of biology and courses indicated by the instructor.

BIOL 473: 1 s.h.
Seminar-Methods of Teaching Biological Issues in the Secondary School
A seminar for prospective life science teachers to consider methods a teacher might employ to present controversial aspects of biology in intellectually honest, balanced ways which also demonstrate sensitivity to the various moral, ethical and political dilemmas secondary school students may encounter. 1 hour lecture. Offered annually. Co- or prereq: EDSE 435; required of all B.S. Ed./BIOL students prior to or with EDSE 461.

BIOL 485: 3 s.h.
Animal Behavior
Animal groups from protozoa to mammals, studied from an ethologist’s point of view. Inheritance, learning, development and motivations will be covered. 2 hours lecture, 3 hour labs. Offered in spring. Prereq: BIOL 211.
BIOL 487: 3 s.h.
Evolution
Broad survey of evolution, including development of evolution theory, history of life and mechanism of evolution. 3 hours lecture. Offered annually. Prereq: 12 s.h. biology including BIO 365 and MATH 161.

BIOL 489: 1-4 s.h.
Honors Independent Study
For the definition of honors course and student eligibility, refer to the Special Academic Opportunities section of this catalog.

BIOL 498: 1-3 s.h.
Independent Study in Biology
Student research on a topic agreed on with faculty supervisor. Applicant for independent study is required to register.

BIOL 499: 1-4 s.h.
Honors Senior Thesis
For the definition of honors thesis and eligibility, refer to the Special Academic Opportunities section of this catalog.

Honors Courses
See course descriptions as listed within this department. Also see Honors section of this catalog. BIOL/HNRS 108, BIOL/HNRS 212, BIOL/HNRS 222, BIOL/HNRS 266.

Marine Biological Science
The following courses in marine biological science are usually offered during summers at the Marine Science Consortium.

BIOL 295: 3 s.h.
Marine Invertebrates
The invertebrate phyla with emphasis on development, reproduction, structure, function and classification of selected marine organisms. Laboratory and field experience in collection, preservation and classification of the phyla.

BIOL 296: 3 s.h.
Marine Ecology
Interrelationships among animals, plants and physical and chemical aspects of the environment will be studied, with stress on adaptations for survival that are unique to the marine environment.

BIOL 297: 3 s.h.
Management of Wetland Wildlife
The ecology and management of wetland wildlife, particularly of freshwater marshes and saltwater marshes. Special emphasis on ecosystem approach.

BIOL 391: 3 s.h.
Anatomy of Marine Chordates
The speciation process in the marine environment to understand the structure of primitive chordates and to trace importance trends in the evolution of various marine vertebrate lines.

BIOL 396: 3 s.h.
Marine Ichthyology
Marine fishes-morphology, anatomy, physiology, systematics and behavior covered using specimens collected from nearby estuaries and the ocean. Zoogeography, life histories and speciation also discussed. Prereq: BIOL 100.

BIOL 397: 3 s.h.
Marine Botany
The taxonomy, ecology, distribution, life histories, physiology and economic status of marine and marine-fringe plants of the Middle Atlantic coast. Covers techniques of collecting, preserving, identifying and cataloging.
BIOL 495 or ESCI 465: 3 s.h.
Biological Oceanography
Physical, chemical and biological factors controlling marine populations; methods of sampling, identification and analysis. 2 hours lecture, 3 hours lab. Prereq: BIOL 211 and 221; ESCI 261.

BIOL 588: 4 s.h.
Aquatic Plants

Respiratory Therapy
The following courses are offered as needed for students in the clinical phase of the respiratory therapy program.

RESP 410: 2 s.h.
Acute Cardiopulmonary Care
The student becomes certified in Basic Cardiac Life Support (CPR), interprets electrocardiograms, and learns to use artificial airways and manual ventilation. Integrated lecture/lab. Prereq: BIOL 356.

RESP 411: 2 s.h.
Respiratory Care Techniques I
Study of the basic techniques of respiratory care. AARC, JRCRTE, and JCAHO structures, medical terminology, health care system overview, aerosol medications, intermittent positive pressure breathing, incentive spirometry and basic diagnostic appliances are discussed. Prereq: BIOL 356.

RESP 412: 3 s.h.
Principles of Aerosol and Gas Therapy
Medical gas therapy, therapeutic aerosols, and related theory about making sound judgments in their application. Includes devices used in this therapy, their operation and maintenance. Integrated lecture/lab. Prereq: BIOL 356, CHEM 112, and PHYS 131.

RESP 413: 4 s.h.
Respiratory Assessment and Therapeutics
Lungs and chest wall are studied to give an understanding of breathing mechanics. Therapeutic measures are considered in regard to reducing the work of breathing. Includes examination of the chest of a pulmonary patient and evaluation of findings; also postural drainage and various hand techniques; overview of current thinking on pulmonary rehabilitation. Integrated lecture/lab. Prereq: RESP 411 and 412.

RESP 414: 3 s.h.
Respiratory Care Techniques II
Covers basic chest x-ray interpretation. Includes examination of roentgenologic assessment of the chest, the equipment/techniques utilized for both general and specialized examinations, and clinicians’ protocols to utilize chest roentgenology in patient care. Includes basic testing procedures for performing pulmonary function studies. Integrated lecture/lab. Prereq: RESP 411.

RESP 415: 3 s.h.
Technical Aspects of Mechanical Ventilation
Includes the mechanics of basic ventilator models, classification, control interrelation, electropneumatic systems and audiovisual alarm systems: ventilator models MA-1, BEAR 2, and 5, PB 7200, Servo900C and 300. Newer, technically sophisticated modes (PSV, AMV, and pressure controlled ventilation) will be introduced. Unconventional High Frequency Jet Ventilation is covered. Workshop format provides hands-on knowledge of control, function, and alarm systems, as well as troubleshooting experience. Integrated lecture/lab. Prereq: RESP 421.

RESP 416: 2 s.h.
Current Perspectives in Cardiopulmonary Care
Presentations of topics by experts and guest lecturers. Students become proficient in hemodynamic monitoring and earn ACLS certification. Integrated lecture/lab. Prereq: RESP 410 and permission of Program Director.

RESP 417: 3 s.h.
Respiratory Care Techniques III (W)
RESP 419: 2 s.h.
Respiratory Care in Alternate Sites
Alternate sites for respiratory care are studied as career opportunities. Covers roles for respiratory therapists in home care, subacute care and pulmonary rehabilitation settings. Covers current reimbursement policies for third-party payer plans. Lecture, one-day site visit, and in-class presentation. Prereq: RESP 411, 412, and 413.

RESP 420: 3 s.h.
Arterial Blood Gas Analysis
Includes physiologic causes of various gas pressures (alveolar, blood, inspired, tissue, etc.) and pulmonary abnormalities causing hypoxemia; control of ventilation, oxygen transport, and carbon dioxide transport. The student will interpret acid base imbalances, blood gas abnormalities, and understand the principle of operation of blood gas electrodes (pH, PCO2 and PO2). Prereq: CHEM 112 and PHYS 131.

RESP 421: 2 s.h.
Physiology of Mechanical Ventilation
Continuous positive and negative pressure breathing are discussed. Emphasis on complications of mechanical ventilation, various pressure patterns produced by different ventilator modes, and ventilator classification; includes theory and measurement of airway resistance and lung thorax compliance; and guidelines and calculations for correct ventilator set up. Prereq: RESP 411 and 420.

RESP 422: 2 s.h.
Pharmacology
A concise source of pharmacologic knowledge used by the respiratory therapist to acquire an understanding of how chemical agents affect living processes. Emphasis on chemical and molecular structures, toxic aspects, actions, and hazards of drugs. Prereq: CHEM 112.

RESP 423: 2 s.h.
Infectious Diseases
An overview of agents used to disinfect and sterilize respiratory therapy equipment. Infectious diseases resulting in respiratory infections, host defense mechanisms, immunology of the respiratory system, and temporary or permanent failure of many protective mechanisms of the body to ward off infectious agents are discussed. Prereq: BIOL 461.

RESP 424: 2 s.h.
Non-Infectious Diseases
Diseases of the airway parenchyma and pleura are covered in detail to understand the etiology, diagnosis and treatment of non-infectious pulmonary diseases. Prereq: BIOL 461.

RESP 425: 2 s.h.
Neonatology for the Respiratory Therapist
Uterine development of the embryo is discussed with emphasis on the fetal pulmonary system. The respiratory and circulatory changeover of the neonate at birth is studied. Temperature regulation, signs of respiratory distress, oxygen administration, arterial blood analysis, congenital abnormalities and disease states are studied with respect to the newborn. Prereq: BIOL 356 (or BIOL 154 and BIOL 155).

RESP 430: 2 s.h.
Clinical Practice I
A laboratory course covering patient care: aerosol therapy set up, oxygen analysis, bedside parameter measurement, pulmonary function screening, chest physical therapy, pulse oximetry, bedside pulmonary function screening, peak flow determinations, incentive spirometry, calibration of the blood gas analysis of an arterial sample, radial artery puncture, brachial artery puncture, oxygen therapy set up, metered dose inhalation and aerosol therapy. Prereq: permission of program director.

RESP 431: 4 s.h.
Clinical Practice II
Laboratory/patient care practice including supervised clinical practice and mastery of RESP 430 skills. New skills are endotracheal intubation, cuff pressure measurements, calibration of the Bird respirator, IPPB therapy ambulation with oxygen, tracheal aspiration, ventilator set up, ventilator check, ventilator circuit change and complete pulmonary function testing. Prereq: RESP 413, 421, and 430.

RESP 432: 13 s.h.
Clinical Practice III
A 725-hour clinical practicum focusing on supervised advanced practice in a variety of regional medical centers. Prereq: RESP 430 and 431.
RESP 495: 2 s.h.
Respiratory Care Research
Senior student selects a research problem relevant to current respiratory care practice then designs and conducts an investigation of the problem with faculty guidance. Findings are reported in a manuscript suitable for submission to a professional journal and in a verbal presentation. Prereq: Enrollment in RESPT Clinical Program.

GRADUATE LEVEL COURSES
All 500 level courses are open to qualified undergraduates. For course descriptions, please refer to the Graduate Catalog.

BIOL 505: 4 s.h.
Biological Techniques
BIOL 510: 4 s.h.
Biological Photography
BIOL 516: 4 s.h.
Aquatic Entomology
BIOL 546: 4 s.h.
Plant Ecology
BIOL 547: 3 s.h.
Population Dynamics
BIOL 567: 4 s.h.
Vertebrate Morphology
BIOL 568: 4 s.h.
Experimental Embryology
BIOL 588: 4 s.h.
Aquatic Plants
BIOL 589: 1-4 s.h.
Topics in Biology

BIOTECHNOLOGY
SEE BIOLOGY

BROADCASTING
SEE COMMUNICATIONS & THEATRE

BUSINESS ADMINISTRATION
School of Humanities and Social Sciences
Professor Frazer, chairperson
Professors Bhatia, Brady, Cox, Ellis, Ghoreishi, Molz, Nakhai
Associate Professors Guo, Krumsk, Leinberger, McCaskey
Assistant Professors Blazer, Galante, Heckert

The Department of Business Administration is nationally accredited by the Association of Collegiate Business Schools and Programs to offer the bachelor of science (B.S.) in business administration with options in accounting, finance, international business, management and marketing. The curriculum is designed to provide study in the subjects required for employment in any business or organization. The programs in business administration are supported by a diverse faculty with extensive academic training and business experience.

The curriculum also provides excellent preparation for graduate and professional studies leading to such degrees as the M.B.A., M.S., Ph.D. and the J.D. Accounting students have available all the necessary coursework to sit for either the CPA or CMA, CIA, or the CFE examination.

The curriculum is flexible enough to permit internships, cooperative education with local industry and
minor study can be incorporated if desired. Studies in disciplines outside business are required and encouraged to help develop the well-rounded and liberally educated person employers seek.

Admission into the department’s bachelor of science program from other departments of the University is limited to those who have earned at least 30 credits, and is offered on a space-available basis. Those interested should apply to the chairperson of business administration. Transfers from other institutions should check with the Office of Admissions for current grade point average requirements. The department offers minors in general business, accounting, finance, management and marketing. Admission into the minor in business administration program is also on a space-available basis. Please see the chairperson of business administration for an application. A certificate program in international business is available to qualified individuals of all majors.

The Department of Business Administration offers a Master of Business Administration. Please refer to the Millersville University Graduate Catalog for more information on the program.

COURSE REQUIREMENTS

Business Administration Major (B.S.): 120 s.h.
Curriculum requirements include 33 credits of courses in the business core; 15-16 credits in required related nonbusiness support courses; 15 credits in a professional option; and 9 credits in business or approved nonbusiness electives or in an approved minor.

Business Core
Accounting: BUAD 161, 162
Finance: BUAD 341
Management: BUAD 251, 352, 455
Marketing: BUAD 231

Required Related Nonbusiness Support Courses
Economics: ECON 101, 102
Math: MATH 151 or 161 or 163; and MATH 235
English: ENGL 316

Professional Option Areas
(One of the following 5 options is required.)
Accounting: BUAD 361(261), 362(262), 364, 488 and 3 credits in accounting
Finance: BUAD 342, 447 and 9 credits in finance
International Business: BUAD 201; 9 credits from BUAD 357, BUAD 435, BUAD 348, ECON 325; 3 credits from ANTH 121, PSCI 251, PSCI 351, GEOG 222, ECON 202 or any BUAD course.
Management: BUAD 452, 488 and 9 credits in management
Marketing: BUAD 431, 488 and 9 credits in marketing

Business Administration Minor: 18 s.h.
(Not available to Business Administration Majors.)
BUAD 101 and five courses from one of the following option areas:
General Business: BUAD 161, 162, 251, 231, 341
Accounting: BUAD 161, 162, 361(261), 366(266), 364
Finance: BUAD 161, 162, 341, 342, and either 345 or 445
Management: BUAD 251, and 12 credits in management
Marketing: BUAD 231, 431, 436 and 6 credits in marketing
COURSE DESCRIPTIONS

General Business

BUAD 101: 3 s.h.
Introduction to Business (G3)
Introduction of basic business concepts such as the institutional setting, organizational structures, decision making, accounting, finance, labor relations, management, marketing and government-business relations. No credit for Business Administration majors.

BUAD 200: variable credit
Cooperative Education in Business Administration

BUAD 201: 3 s.h.
Introduction to International Business
A survey of international business (IB). Introduces major issues, institutions, opportunities, problems and managerial processes unique to international business. Includes micro and macro context, theory, impact of environmental factors on international business operations, and identification and analysis of managerial issues. Course content relates to current events. Offered in fall, spring. Prereq: ECON 101, 102.

BUAD 202: 3 s.h.
The Legal Environment of Business (G3)
The American legal system and its impact on business. Emphasis on decision-making in a legalistic and widely-regulated environment. Includes the court system, litigation and alternative dispute resolution, contract law, torts in the business environment, product and service liability. Offered in fall, spring.

BUAD 207: 3 s.h.
Introduction to Quantitative Concepts
The application of widely used mathematical methods helpful to business majors. Topics include classical optimization methods, matrix algebra, counting methods, applications of basic probability concepts and the mathematics of finance. Offered infrequently. Prereq: MATH 101 or completion of a more advanced math course.

BUAD 300: variable credit
Cooperative Education in Business Administration

BUAD 302: 3 s.h.
Law of Business Organizations and Transactions
Continuation of BUAD 202. Includes consumer law, debtor-creditor law, secured transactions, bankruptcy, forms of business organization, securities regulation, antitrust, labor-management relations, employment discrimination, environmental law, international business, wills and trusts. Counts as a business administration elective, or as an accounting elective in the accounting option. Recommended for students studying for the CPA exam, or for business students who wish to broaden their knowledge of the legal environment of business. Offered annually. Prereq: BUAD 202.

BUAD 306: 3 s.h.
Research Methods in Business
The theory and practice of a number of widely-used research techniques as an aid to decision-making. Business application will be emphasized with cases and problems from the areas of management, marketing, finance and accounting. Uses computer programs for data analysis, interpretation and presentation of research results. Offered in fall, spring. Prereq: MATH 235.

BUAD 307: 3 s.h.
Introduction to Information Science
Technology, application and management of computer-based management information systems. Covers identification of the need for management information, the assignment of resources and establishment of an information system. Includes case studies. Offered in fall, spring. Prereq: BUAD 162, 251.

BUAD 308: 3 s.h.
Quantitative Methods For Business
An introduction to management science techniques in order to facilitate quantitative reasoning as an aid for managerial decision-making. Emphasis on developing analytical skills. Decision-making cases and problems presented with the aid of computers. Topics include linear programming (including modeling, computer solution, and sensitivity analysis), assignment/transportation/transshipment problems, project management techniques (PERT/CPM), queuing models, simulation, inventory control models, decision theory, analytic hierarchy process (AHP), and markov processes. Offered in fall, spring. Prereq: MATH 235.
BUAD 310: 3 s.h.  
**The Economics of Justice (P)**  
Economic concepts and models used to explain legal principles. The effects of legal decision-making on economic efficiency. The law is analyzed from an economic perspective, including property, contracts, torts and criminal law. Offered periodically. Prereq: BUAD 202, and ECON 102.

BUAD 400: variable credit  
**Cooperative Education in Business Administration**

BUAD 405: 3 s.h.  
**Special Topics in Business Administration**  
Advanced, innovative, or exploratory topics and disciplines within business administration. Specific content items developed by instructor. Most topics will be for business majors only. Offered periodically.

BUAD 488: 3 s.h.  
**Seminar in Business Administration (W)**  
Research on a topic within a student’s option area, including preparation and critical analysis of a paper. Offered in fall, spring. Prereq: Senior status prerequisites will vary.

BUAD 498: variable credit  
**Independent Study in Business Administration**  
For the definition of independent study and eligibility, refer to the *Academic Policies* section of this catalog.

**Accounting**

BUAD 161: 3 s.h.  
**Introduction to Financial Accounting**  
Examination of the account cycle and systems and procedures for developing financial information; introduction to the conceptual and theoretical foundation of financial information systems; and interpretation of financial statements. Offered in fall, spring. Prereq: MATH 101 or equivalent (MATH 160, 161, 151, 163H, 165H).

BUAD 162: 3 s.h.  
**Introduction to Managerial Accounting**  
Problem-oriented introduction to the interpretation and application of accounting information from the viewpoint of management with emphasis on planning and control and long-range strategies. Offered in fall, spring. Prereq: BUAD 161.

BUAD 361(261): 3 s.h.  
**Intermediate Accounting I**  
Financial statement preparation with special attention to revenue recognition and asset valuation. Emphasis on generally accepted accounting principles and accounting theory. Students will develop a familiarity with the official pronouncements. Offered in fall, spring. Prereq: BUAD 162.

BUAD 362(262): 3 s.h.  
**Intermediate Accounting II**  
Examination of generally accepted accounting principles as they apply to long term liabilities and equity. This course is a continuation of Intermediate Accounting I. Includes issues of current interest. Selected readings from pronouncements. Offered in fall, spring. Prereq: BUAD 361(261).

BUAD 366(266): 3 s.h.  
**Federal Income Tax I**  
Study of federal income laws as they relate to individuals and businesses. Topics include gross income, deductions, basis, gains and losses and tax computations. Students are introduced to tax research techniques and applications. Offered annually. Prereq: BUAD 162.

BUAD 367(267): 3 s.h.  
**Federal Income Tax II**  
Study of corporate, Subchapter S and partnership taxation. Topics include corporate organization, distribution, reorganization and accumulations; Subchapter S corporate election; and partnership formation, operation and transfers. Offered annually. Prereq: BUAD 366(266).
BUAD 363: 3 s.h.
Accounting Information Systems
Special emphasis on current problems and issues within the accounting profession. Offered infrequently. Prereq: BUAD 361(261).

BUAD 364: 3 s.h.
Cost Accounting
Investigates cost accounting techniques such as budgeting, accounting controls, standard cost, operation evaluation techniques, variance analysis and performance analysis. The role of cost accounting in profit planning and decision making is examined. Offered in fall, spring. Prereq: BUAD 162, 306.

BUAD 365: 3 s.h.
Not-for-Profit Accounting
A review of fund accounting, application of fund accounting to nonprofit organizations such as state and local governments, health care institutions. Offered infrequently. Prereq: BUAD 161.

BUAD 461: 3 s.h.
Auditing
Study of the attest function of the independent auditor and review of theory and procedures for evaluating internal control and financial information. Includes generally accepted auditing standards as developed and applied to different audit areas in order to establish the fairness of financial information. Offered annually. Prereq: BUAD 361(261).

BUAD 465: 3 s.h.
Advanced Accounting
Accounting formation, operation and liquidation of the partnership and corporate forms of business. Emphasis on preparing consolidated financial statements. Review of topics such as nonprofit accounting and multinational business. Offered annually. Prereq: BUAD 362(262).

BUAD 561: 3 s.h.
Auditing

Finance
BUAD 143: 3 s.h.
Personal Financial Planning
Theoretical tools of economics and business management are applied to personal financial planning and management. Topics include financial planning, consumer credit, budgeting, insurance, retirement and estate planning. Offered infrequently. Does not count in any business administration option.

BUAD 341: 3 s.h.
Managerial Finance I (W)
Introduces cash flow analysis of the firm’s financial decisions. Critical analysis of the accounting model for decision making, capital budgeting techniques and cash management techniques. Offered in fall, spring. Prereq: ECON 102, BUAD 161.

BUAD 342: 3 s.h.
Managerial Finance II
Advanced topics in finance, including risk analysis of operating and financial decisions. Implications of capital budgeting and cost of capital are analyzed using the Capital Asset Pricing Model. Offered annually. Prereq: MATH 235 & BAUD 306 or ECON 332 or ECON 333.

BUAD 343: 3 s.h.
Real Estate Fundamentals
Introduces special characteristics of real estate and how real estate decisions are made. Includes real estate terms, laws, commercial and residential markets, and property valuation. Prereq: BUAD 341. Offered periodically.

BUAD 344: 3 s.h.
International Finance
The international financial environment and a comprehensive analysis of foreign exchange rates and instruments. Topics include the international monetary system, balance of payments, contemporary currency trading and quotation, forward contracts, international parity conditions and foreign currency options. Offered annually. Prereq: BUAD 341.
BUAD 345: 3 s.h.
Investment Analysis
Analysis of investment objectives and functioning of capital markets including maximizing of rate of return, corporate stocks and bonds, municipal bonds, securities market; analysis of financial reports and other investments. Offered annually. Prereq: BUAD 341.

BUAD 346: 3 s.h.
Principles of Bank Administration
Bank investment practices, liquidity management, deposits acquisition and administration, branch location decisions, optimal bank capital, mathematical model in banking, management science in banking, computers and checkless banking. Offered periodically. Prereq: BUAD 341.

BUAD 347: 3 s.h.
Risk and Insurance
Introduces principles and mechanics of insurance. Includes the conceptual and historical framework of insurance and the actual mechanics of insurance risk management as they pertain to personal and business needs. Offered periodically. Prereq: BUAD 341.

BUAD 445: 3 s.h.
Financial Markets (W)
Classical and modern thought on markets. Numerous modern markets are investigated in terms of functionality, strategy and development. Offered annually. Prereq: ECON 101; BUAD 342.

BUAD 447: 3 s.h.
Cases in Finance (W)
Continuation of the study of financial theory and its application using the case method. Real-world financial problems, for which elementary or traditional analysis may be deficient. Emphasizes the interrelationship of finance to other areas of study (such as marketing, personnel). Offered annually. Prereq: BUAD 342.

Management
BUAD 251: 3 s.h.
Organization and Management (G3, W)
Examines elements of the management process: planning, organizing, leading and controlling. Introduces principles and concepts of management applicable to a wide variety of profit and nonprofit organizations. Includes management as a discipline, evolution of management theory, organizational environment, social responsibility and ethics, elements of management process, alternative organizational models, effective decision making and emphasis on emerging quality and international issues. Offered in fall, spring. Prereq: ECON 101, 102.

BUAD 351: 3 s.h.
Organization Theory
Introduction of the perspective of business as a system dedicated to the reduction of uncertainties. Topics include leadership, styles of management, the management of conflict, group behavior, politics, power and the understanding of the importance of knowledge related to the external environment. Offered annually. Prereq: BUAD 251.

BUAD 352: 3 s.h.
Human Resource Management
Survey course familiarizes students with the personnel function. Topics include recruitment, orientation, training, compensation, safety, performance evaluation and labor relations. Offered in fall, spring. Prereq: BUAD 251.

BUAD 353: 3 s.h.
Labor-Management Relations
Course covers roles of management and labor unions using an analytical framework for labor relations problems, and contract negotiations and administration. Offered periodically. Prereq: BUAD 251.

BUAD 354: 3 s.h.
Compensation Management
Specific focus on methods for determining wages. Salaries, incentive payments, point classification and factor comparison systems are discussed in detail. Management of benefits, including hospitalization, major medical, life insurance, long-term disability and pension administration is emphasized. Offered periodically. Prereq: BUAD 352.
BUAD 355: 3 s.h.
Business and Society (G3, W)
Relationships between economic decision-makers (business) and the various interests affected by their decisions (society). Emphasis on the ethical dimensions of decision-making in business. Specific issues include cultural relativism, social and economic justice, private property and the choice of an economic system, corporate social responsibility, acceptable risks for consumers, acceptable risks to the environment, affirmative action and reverse discrimination, sexual harassment and comparable worth, disclosing and concealing information in sales, insider trading and whistleblowing. Offered annually.

BUAD 356: 3 s.h.
Small Business Management (W)
The small business environment with emphasis on entrepreneurism. Students learn how to start and manage a small business. Solving problems in small firms through adequate planning, implementing, and controlling strategies in accounting, finance, management and marketing. Offered in fall, spring. Prereq: BUAD 251.

BUAD 357: 3 s.h.
International Management (G3, W)
Examination of management challenges associated with developing strategies and managing operations of firms whose activities extend across national boundaries. Theoretical, institutional, and case analysis of major issues including the impact of international codes and organizations on corporate policies, the effect of government policies, techniques for assessing foreign environments, and strategies for managing international business operations are covered. Offered annually. Prereq: BUAD 251.

BUAD 452: 3 s.h.
Production and Operations Management
Survey of basic principles, concepts, and techniques of operations management applicable to manufacturing as well as service organizations. Examines positioning, design, and operating decisions and their interrelationships in the context of the overall competitive strategy of the firm. Explores current trends and innovations in operations management theory and practice. Topics include operations strategy, quality control/TQM, product/service design, capacity planning, process design, facility layout, design of work systems, location planning, supply chain management, inventory control, MRP/ERP, just-in-time systems, scheduling and project management. Offered in fall, spring. Prereq: MATH 235, BUAD 251.

BUAD 455: 3 s.h.
Strategic Management

BUAD 457: 3 s.h.
Japanese Management
Japanese organizational climate, the styles of management, theories and principles of management; contrasts and similarities of theories and principles used in Japan and the United States. Includes management, systems, culture, environment. Offered annually. Prereq: BUAD 251.

Marketing
BUAD 231: 3 s.h.
Principles of Marketing

BUAD 332: 3 s.h.
Consumer Behavior
Analysis of individual and collective consumer behavior patterns both within and without the marketplace through theoretical model building and empirical research findings. Emphasis on the role of consumer research in identifying, planning, implementing and evaluating both short-term and long-term marketing strategies. Offered annually. Prereq: BUAD 231.
BUAD 333: 3 s.h.  
Personal Selling  
Covers skills and knowledge required of sales representatives to understand customers’ needs and make effective presentations. Includes prospecting and contacting customers, making presentations, handling objections, closing the sale and developing long-term relationships. Emphasis on individual role-play and group presentations. Offered annually. Prereq: BUAD 231 and 60 credits.

BUAD 335: 3 s.h.  
Advertising  
Economic and social roles of advertising in a contemporary business setting. Emphasis on the creation, development, implementation and evaluation of advertising campaigns through the analysis of creative processes, managerial techniques, media resources, budgeting methods and the concept of social responsibility. Offered annually. Prereq: BUAD 231.

BUAD 336: 3 s.h.  
Retail Marketing  
The role of retail institutions in the marketing system. Emphasis on strategy development in the retailing context. Offered annually. Prereq: BUAD 231.

BUAD 337: 3 s.h.  
Sales Force Administration  
Planning, direction and control of the sales force. Includes recruiting, selecting, training, supervising, compensating, motivating and evaluating sales representatives. Emphasis on acquisition of basic sales and managerial skills. Offered annually. Prereq: BUAD 231.

BUAD 431: 3 s.h.  
Marketing Research  
Research theory and techniques used in marketing activities. Stresses formulation of research objectives, instrument design, sample selection, data collection, statistical analysis, computer applications and report writing for managerial use. Offered fall, spring. Prereq: BUAD 231 and MATH 235.

BUAD 435: 3 s.h.  
International Marketing  
The development of marketing strategy for entering and competing with businesses in foreign countries. Uniqueness of foreign markets and their impact on the marketing manager’s decision-making processes are examined. Offered annually. Prereq: BUAD 231.

BUAD 436: 3 s.h.  
Marketing Strategy  
Analysis of opportunities and problems confronting the marketing manager in decision making. Includes market segmentation, target marketing, positioning, market research, product life cycle strategies, marketing mix implementation and social responsibility. Emphasis on case analysis to bridge gap between marketing theory and application. Offered annually. Prereq: BUAD 231, 431, and 90 credits.

CHEMISTRY  
School of Science and Mathematics  
Professor Turchi, chairperson  
Professors T. Greco, Hill, Rickard, Rajaseelan, Wismer  
Associate Professors Iannone, Shepherd  
Assistant Professors Anna, Yoder  
Instructor C. Greco  
The Department of Chemistry, accredited by the American Chemical Society, offers three degree programs leading to the baccalaureate degree with a major in chemistry. The recommended course sequence during the first year is identical for the three programs and thereafter differs only slightly through the junior year; thus a change in career emphasis in chemistry need not delay graduation.

The bachelor of science degree (B.S.) offers intensive training in chemistry and mathematics and is designed specifically for students who wish to pursue graduate studies or employment as a chemist. There are three options available within the B.S. degree program. The first option, in biochemistry, provides study in the chemistry of life processes. This program offers the best preparation for acceptance to medical schools. Completion of the requirements for either of these degree programs leads to certification of the graduate by the department to the American Chemical Society, which offers immediate membership...
eligibility in ACS as well as more desirable employment opportunities. The second option, in environmental chemistry, provides study in areas that involve the traditional chemistry of the atmosphere, hydrosphere, geosphere and biosphere. The third option is in polymer chemistry. Polymer chemistry forms the basis for the production of plastics, synthetic fibers, paints, coatings, adhesives and many other chemical products.

The bachelor of arts degree (B.A.) is a more versatile program, combining a solid foundation in chemistry with an ample opportunity for breadth of study. Students electing this degree have found it to be sound preparation for further study or a career in chemistry. It invites interdisciplinary studies in areas such as environmental science, geochemistry, oceanography and chemical physics and provides the breadth and depth of pre-professional training necessary for subsequent study in, for example, law or medicine.

For those students desirous of pursuing a career in high school teaching, the bachelor of science in education degree (B.S.Ed.) provides a sound background in chemistry as well as the necessary methods courses.

An important program option in chemistry is cooperative education. Applicable to any of the above degree options, cooperative education offers students invaluable experience in a job related to their career goal as well as financial remuneration, which helps significantly to defray the expenses of college study. Beginning after the freshman year, students choosing this option may alternate periods of on-campus study with off-campus employment until graduation. In addition, up to three credits may be approved to count toward major sequence requirements for each co-op experience and up to nine credits may be counted toward degree requirements. For more information, see Cooperative Education in the Special Academic Opportunities section.

The chemistry-3/2 cooperative engineering option within the B.A. program requires three years of study as a chemistry major in the Millersville University liberal arts curriculum with two years of residence in the chemical engineering program at either Pennsylvania State University or the University of Pennsylvania. At the end of five years, the student receives two baccalaureate degrees: a B.A. in chemistry from Millersville and a B.S. in chemical engineering from the cooperating engineering school.

The associate of science degree (A.S.) is a two-year program designed to train students for technical positions in the chemical industry. It is available primarily as an evening program.

**COURSE REQUIREMENTS**

**Chemistry Majors (B.S.): 125 s.h.**

55-57 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 251, 265, 326, 341, 342, 391, 392, 452, 465, 488, 495 (1) plus 8-10 s.h. minimum from CHEM 327, 328, 375, 381, 435, 476, 482, 486, 498, 499, COOP 200, 300. Required related courses: MATH 161, 162, 261 and PHYS 231, 232 plus two courses elected in computer science, mathematics and/or physics.

**Chemistry Major (B.S.): 128 s.h.**

**Biochemistry Option**

51 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 251, 265, 326, 327, 328, 341, 342, 465, 488, 495 (1), plus 4 s.h. minimum selected from CHEM 381, 375, 391, 392*, 435, 452, 482, 486, 498, 499, COOP 200, 300. Required related courses: BIOL 100, 263 and two of 365, 461, 462; MATH 161, 162, 261 and PHYS 231, 232.

*This elective must be completed to gain ACS certification in biochemistry.

It is strongly recommended that students pursuing the bachelor of science degree achieve competency equivalent to the first two courses in a foreign language. A course in economics is also recommended.

**Chemistry Major (B.S.): 125 s.h.**

**Environmental Option**

49 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 251, 265, 375, 341, 342, 465, 476, 488, 495 (1) plus 3 s.h. minimum selected from CHEM 326, 381, 391, 392, 486, 498, 499; COOP 200, 300. Required related courses: BIOL 100, 211 OR 221 and MATH 161, 162, 261 and PHYS 231, 232. Additional electives (9-11 s.h.) selected from BIOL 211 OR 221, 241, ESCI 245, 426, GEOG 202, OSEH 321.
Chemistry Major (B.S.): 122 s.h.
Polymer Chemistry
55 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 251, 265, 341, 342, 381, 452, 465, 482, 488, 495 (1)
plus 7 s.h. minimum selected from CHEM 326, 375, 391, 392, 435, 498, 499; COOP 200, 300; ITEC 375.
Required related courses: ITEC 271; MATH 161, 162, 261 and PHYS 231, 232.

Chemistry Major (B.A.): 120 s.h.
37 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 251, 265, 341, 342, 391, 488, plus 3 s.h. minimum
selected from CHEM 326, 327, 375, 381, 392, 435, 452, 465, 486, 495, 499; COOP 200, 300. Required
related courses: PHYS 231, 232; MATH 161, 162, 261; competency equivalent to the first two courses in a
foreign language.

Chemistry Major (B.A.): 101 s.h.
3/2 Cooperative Engineering Option
21 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 265. Required related courses: PHYS 231, 232, 233,
311; MATH 161, 162, 261, 365; ITEC 241; ECON 100, 101, or 102; CSCI 161. Specific engineering
curricula have additional requirements; students should consult adviser or chemistry department
chairperson.

Chemistry Major (B.S.Ed.): 138 s.h.
Certification in Secondary Education
40 s.h. in chemistry: CHEM 111, 112, 188, 231, 232, 251, 265, 326, 341, 342, 375, 488. Required related
courses: BIOL 100, ESCI 221 or 261, MATH 161, 162, 261, and PHYS 231, 232. Professional Education
courses (27 s.h.): EDFN 211, 241 and 330. EDSE 321, 435, and 461. Refer to Admission to Advanced
Professional Studies and Certification (Education Majors) in this catalog for more information.

Chemistry Major (A.S.): 60 s.h.
23-24 s.h. in chemistry: CHEM 111, 112, 231, 232, 265 plus one elective. Required related courses: PHYS
131 (or 231), 132 (or 232); MATH 161 (or 160).
It is strongly recommended that students pursuing any of the degrees in chemistry elect an appropriate
course in computer science.

Chemistry majors are required to have a grade of C (2.00 quality points) or better in chemistry courses
required for the major at the 100 and 200 level before proceeding to a course for which it is a prerequisite.
Currently, these courses include: CHEM 111, 112, 231, 232, 251, and 265.

Chemistry Minor: 20 s.h.
20 s.h. in chemistry: CHEM 111, 112, 265; and CHEM 231 and 232, or CHEM 341 and 342, or CHEM
235 plus one elective from CHEM 326, 375.

Biochemistry Minor: 25 s.h.
25 s.h. in chemistry: CHEM 111, 112, 231, 232, 326, 327, 328.

COURSE DESCRIPTIONS

CHEM 101: 3 s.h.
The Science of Chemistry (G2)
A course offering a brief introduction to chemical principles and to their relevance to modern society at
both regional and global levels. Topics are presented in a mostly descriptive fashion. No credit toward
chemistry major. 3 hours lecture. Offered in fall.

CHEM 102: 4 s.h.
The Science of Chemistry (G2, L)
A course in general, inorganic, organic and biochemistry for those students requiring the breadth of
knowledge of chemistry in these fields. Chemical principles as they apply to real world societal issues and
to the life process will be emphasized throughout. A knowledge of high school chemistry or equivalent is
assumed. No credit toward chemistry major. 3 hours lecture and 2 hours lab. Offered infrequently.

CHEM 103: 3 s.h.
General, Organic and Biochemistry I (G2, L)
An introduction to the basic theories of general and organic chemistry including nomenclature, reactions,
problem solving. Proficiency in algebra is essential. High school chemistry or CHEM 110 is required. 2
hours lecture, 2 hours lab. Offered fall, summer.
CHEM 104: 3 s.h.  
General, Organic and Biochemistry II (G2, L)  
Solutions, acids and bases, oxidation-reduction, and organic chemistry; including nomenclature and basic reactions with relevancy to biochemistry. Offered in spring. 2 hours lecture, 2 hours lab. Prereq: CHEM 103.

CHEM 110: 3 s.h.  
Fundamentals of Chemistry  
An intensive review of the fundamentals of chemistry, with particular emphasis placed on solving chemistry problems. Topics include: measurements, formulas and nomenclature, equations, stoichiometry, atomic and molecular structure, solution concentrations, acids and bases. This course is designed to prepare students majoring in the sciences for their general chemistry sequence, CHEM 111 and CHEM 112. This course may be counted only as an elective beyond normal graduation requirements. Placement in CHEM 110 on the basis of placement examination and adviser recommendations. 3 hours of lecture and problem solving sections. Offered in fall.

CHEM 111: 4 s.h.  
Introductory Chemistry I (G2, L)  
The properties and theories of the solid, liquid and gaseous states of matter, the stoichiometry and thermochemistry of chemical reactions, and theories and applications of molecular structure and bonding. Proficiency in algebra is essential. High school chemistry is strongly recommended. 3 hours lecture, 1 hour discussion, 2 hours lab.

CHEM 112: 4 s.h.  
Introductory Chemistry II (G2, L)  
Continuation of CHEM 111. The interactions of matter and energy-thermodynamics, kinetics, electrochemistry. Equilibria in aqueous systems-theory and practice. Coordination chemistry and descriptive chemistry of the elements. 3 hours lecture, 1 hour discussion, 2 hours lab. Prereq: CHEM 111.

CHEM 113: 1 s.h.  
Honors Seminar for Introductory Chemistry  
The ideas of introductory chemistry are studied in extended depth, using problems, laboratory exercises, readings and discussion. Grades of B or better in both CHEM 112 and CHEM 113 will result in honors designation for the pair. The pair of courses counts as one entry in the science component of general education and results in 5 hours of general education credit. Corequisite: concurrent registration in CHEM 112 is required. Prereq: CHEM 111 grade B or better and consent of Honors College Committee.

CHEM 188: 1 s.h.  
Freshman Seminar in Chemistry  
An orientation to the opportunities and services available to chemistry students in the university and professional environments. Students will develop a better understanding of the major and career options and will be introduced to the chemistry department faculty and programs. 1 hour of discussion. Required of all freshman chemistry majors. Recommended for transfer students. Offered in fall.

CHEM 205: 3 s.h.  
The Molecular Basis of Color and Form—Chemistry in Art (G2)  
Artists and chemists are both interested in the topics of color and form. In this course, color and form will provide the focus for students to investigate, through a variety of lecture and studio activities, the scientific basis of such topics as paints, clays and glazes, metalworking, photography, dyes and fabrics, polymeric materials, art preservation and restoration and chemical hazards in art. A knowledge of high school chemistry or equivalent is assumed. 3 hours lecture. Offered in spring.

CHEM 206: 1 s.h.  
The Molecular Basis of Color and Form-Chemistry in Art Lab (G2, L)  
Laboratory to accompany CHEM 205. Coreq: Chem 205.

CHEM 231: 4 s.h.  
Organic Chemistry I (G2, L)  
Organic structural theory including conformations and configurations of molecules and functional group classification of organic compounds-alkanes, alkenes, alcohols, ethers, alkyl halides, aldehydes and ketones, aromatic and organometallic compounds. Major emphasis on relationships among molecular structure, chemical reactivity and physical properties. Thorough integration of reaction mechanisms as elucidated using principles of kinetics, thermodynamics, stereochemistry and spectroscopy. Introduction to
the instrumentation of organic chemistry: proton and carbon-13 nmr, infrared and mass spectrometry. 3 hours lecture and 3 hours lab. Prereq: CHEM 112.

CHEM 232: 4 s.h.  
Organic Chemistry II (G2, L)  
The structure-property-reactivity-mechanism-synthesis approach from CHEM 231 continues with application to and emphasis on unsaturated compounds-alkynes, dienes, aromatic compounds. Also carbonyl compounds including carboxylic acids and derivatives; along with amines, phenols, and complex compounds with multiple functionality. Introduction to natural and synthetic polymers; biomolecules including fats, oils, amino acids, and carbohydrates, along with the basic reactions of metabolism. Thorough integration of structural relationships to spectral properties using uv, ir, C-13 and H-1 nmr, and mass spectral instrumentation and derived data. 3 hours lecture and 3 hours lab. Prereq: CHEM 231.

CHEM 235: 4 s.h.  
Organic Chemistry  
The elementary theory, reactions, and properties of organic compounds in an integrated fashion. No credit toward chemistry major. 3 hours lecture and 3 hours lab. Offered in fall, spring. Prereq: CHEM 112.

CHEM 251: 3 s.h.  
Inorganic Chemistry I  
Emphasis on the unification of descriptive chemistry with the basic principles that may be used to explain natural phenomena in inorganic chemistry. The physical and chemical properties of the elements and classes of compounds such as oxides, halides, hydrides, etc. will be described and explained. Acid-base and oxidation-reduction behavior will be emphasized along with coordination chemistry. Periodic trends are an integral part of the course. Offered in spring. Pre- or coreq: CHEM 112.

CHEM 265: 4 s.h.  
Quantitative Analysis (G2, L)  
An integrated study of advanced chemical equilibrium, activity, experimental uncertainty and accepted practice in the analytical laboratory. Titrimetry, potentiometry, extraction theory, introductory spectroscopy and chromatography are discussed. 3 hours lecture and 3 hours lab. Offered in spring. Prereq: CHEM 112.

CHEM 326: 4 s.h.  
Biochemistry I (G2, L)  
The structure and physical and chemical properties of carbohydrates, lipids, nucleic acids, and other biological compounds and their importance in life processes. Introduction to metabolic processes. Laboratory studies include the properties of chemicals of biological origin, techniques in isolation, identification, qualitative and quantitative analysis. 3 hours lecture and 3 hours lab. Offered in fall, spring. Prereq: CHEM 232 or 235.

CHEM 327: 4 s.h.  
Biochemistry II  
Dynamic aspects of biochemistry; enzyme reactions including energetics, kinetics and mechanisms. Major emphasis on intermediary metabolism of fats, carbohydrates, lipids, proteins, nucleic acids and other macromolecules. Photosynthesis, electron transport phosphorylation and replication mechanisms also presented in detail. 3 hours lecture and 3 hours lab. Offered in spring. Prereq: CHEM 232 and 326.

CHEM 328: 1 s.h.  
Analytical Biochemistry Laboratory  
Introduction to biochemistry literature research, methodology of enzyme assays and peptide synthesis, and techniques used for separation, analysis and characterization of all major classes of biologically important compounds. 3 hours lab. Offered in spring. Prereq or Coreq: CHEM 327.

CHEM 341: 4 s.h.  
Physical Chemistry I (W)  
A thermodynamic study of chemical systems including ideal and non-ideal solutions, chemical and phase equilibria, and electro-chemistry. Investigation of the macroscopic behavior of gases and its theoretical explanations. Summary of the determination and application of additive properties. 3 hours lecture and 3 hours lab. Offered in fall. Prereq: CHEM 265, PHYS 232, MATH 261.

CHEM 342: 4 s.h.  
Physical Chemistry II (W)  
Chemical kinetics, statistical mechanics, the development and present state of quantum theory including chemical bonding theories, atomic and molecular spectroscopy, and methods of structure determination. 3 hours lecture and 3 hours lab. Offered in spring. Prereq: CHEM 341.
CHEM 367: 3 s.h.
Introduction to Chemical Instrumentation
An introduction to chemical instrumentation dealing with the methods usually encountered in clinical laboratories including the theory of common clinical determinations, a discussion of typical equipment employed, and consideration of simple faults in equipment that can be remedied by the technician. Not open to chemistry majors. 2 hours lecture and 3 hours lab. Offered infrequently. Prereq: CHEM 232 or 235. Pre- or coreq: PHYS 132 or 232.

CHEM 372: 3 s.h.
The History of Chemistry and Society (P)
The history of the development of the science of chemistry from its roots in Egyptian and Greek societies through its specialization in the early twentieth century. The relationships between chemical developments and society are explored, as well as the influences of chemistry on Western thought. 3 hours of discussion. Offered in spring. Prereq: CHEM 102, 104, or 111; 2 social science courses, including one history course: HIST 100, 101, or 310 preferred.

CHEM 375: 3 s.h. (4 s.h. with Laboratory)
Environmental Chemistry (G2, L)
The application of modern chemical principles to the chemical and physical interactions among the hydrosphere, lithosphere, atmosphere and biosphere. Also discussed are the more recent topics in the areas of pollution, energy and waste control. (The laboratory covers the current, fundamental instrumental methods and techniques encountered in environmental analysis.) 3 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: CHEM 112.

CHEM 381: 4 s.h.
Polymer Chemistry
An introduction to polymer chemistry. Covered are nomenclature, solutions and solubility, molecular weight determination, morphology, structure determination, polymerization reactions and synthetic methods, physical properties and fabrication methods. The laboratory provides an introduction to the methods of polymer synthesis and characterization. 3 hours lecture and 3 hours lab. Offered in fall. Prereq: CHEM 232 or permission of instructor.

CHEM 391: 1 s.h.
Advanced Laboratory I
Application of advanced techniques in organic synthesis including chemical and physical methods of separation with major emphasis on advanced spectroscopic methods of characterizing organic compounds. 3 hours lecture/lab. Offered in fall. Prereq: CHEM 265, 232.

CHEM 392: 1 s.h.
Advanced Laboratory II
A continuation of CHEM 391 including advanced techniques in inorganic synthesis and analysis. Offered in spring. Prereq or Coreq: CHEM 251.

CHEM 435: 3 s.h.
Advanced Organic Chemistry
Current theories of organic chemistry with major emphasis on physical aspects as applied to structure, reactions, spectroscopy and reaction mechanisms. 3 hrs. lecture and reading in current literature. Offered in spring. Prereq: CHEM 232.

CHEM 452: 3 s.h.
Inorganic Chemistry
Theories of bonding and structure of inorganic elements and compounds, acid-base theories, coordination chemistry, organometallic chemistry, bioinorganic chemistry. 3 hours lecture. Offered in fall. Prereq: CHEM 251 and 342 or permission.

CHEM 465: 4 s.h.
Analytical Chemistry
Theory and practice of modern analytical techniques in chemical separations and instrumental analysis. 3 hours lecture and 3 hours lab. Offered in spring. Pre- or coreq: CHEM 342.

CHEM 476: 4 s.h.
Environmental Chemistry II
Extension of the principle topics covered in CHEM 375 with emphasis on quantitative aspects of topics such as the ozone layer, potential greenhouse effects, tropospheric chemistry, chemical fate and transport in aquatic systems, phase interactions and chemical equilibrium. Includes computer modeling, government
regulations, pesticides and pollutants, hazardous waste and disposal methods. All topics will be studied from chemical, political and socio-economic perspectives. 3 hrs. lecture, 3 hrs. lab. Offered alternate spring semesters. Prereq: CHEM 341 and 375.

CHEM 482: 3 s.h.
Polymer Physical Chemistry
Topics in polymer physical chemistry, including conformation of polymer molecules, polymer solutions, theory of molecular weight determination methods, rheology, orientation, time-temperature dependence of physical properties, thermodynamics and kinetics of polymerization, rubber elasticity and spectroscopic methods of polymer characterization. 3 hrs. lecture. Offered alternate spring semesters. Prereq: CHEM 342 and 381 or permission of instructor.

CHEM 486: 1-4 s.h.
Topics in Chemistry
Detailed investigation of a topic in chemistry of current interest. Topic to be announced each time course is offered. Offered infrequently. Prereq: permission of instructor.

CHEM 488: 1 s.h.
Seminar in Chemistry
Topics of current chemical interest. 1 hour. Offered every year, half credit per semester. Prereq: Senior standing or permission of instructor.

CHEM 495: 1 s.h.
Introduction to Research
A course for qualified students to investigate problems in chemistry. Guidance in the methods of chemical research. Prereq: permission of instructor.

CHEM 498: 1-3 s.h.
Independent Study in Chemistry
For further information on independent study, see the Special Academic Opportunities section. Guided research for qualified students who are interested in investigating problems in chemistry. Prereq: CHEM 495 or permission of the instructor.

COMMERCIAL ART
SEE ART

COMMUNICATION & THEATRE
School of Humanities and Social Sciences
Professor Umble, chairperson
Professors Catt, J.S. Henke
Associate Professors Dorman, J.A. Henke, Seigworth
Assistant Professors Boyle, Chang, Igyor, Russell-Loretz, Williams
Instructors Donovan, Ellis

The Department of Communication and Theatre offers a bachelor of science degree in speech communication. The liberal arts program prescribes a common core of required courses and allows the choice of one of four options including broadcasting, communication studies, public relations and theatre. Each option contains a specific group of required courses and an additional group of electives chosen in consultation with a departmental adviser.

COURSE REQUIREMENTS

Persons considering the speech communication program should consult with the department about options and requirements. These programs undergo periodic revision. A complete description of the current program and GPA requirements are available from the departmental office. Options or minor programs of study must be chosen by students with their adviser’s consent.

Upon acceptance into the speech communication program, the following academic requirements must be maintained in order to graduate: a C or better is required in each core course before taking the next higher
core course; students’ progress in the major is reviewed no later than the semester following completion of 60 hours. Students in the major must attain a 2.5 GPA in the major in order to be retained in the major.

**Required Core:**
COMM 101, 201, 301 and 401.

**Communication Options**

**Speech Communication Major (B.S.)**

**Broadcasting Option**
Required courses: Core courses above plus the following: COMM 121, 220, 320, 321, 326. Additional Requirements: select 24 s.h. of electives from approved list in consultation with adviser.

**Speech Communication Major (B.S.)**

**Communication Studies Option**
Required courses: Core courses above plus the following: COMM 217, 224, 303, 305, 324, 342 or 403, 429 or 441. Additional Requirements: Students in the Communication Studies Option must complete a University-approved minor outside the department.

**Speech Communication Major (B.S.)**

**Public Relations Option**
Required Public Relations Courses: Core courses above plus the following: COMM 121, 206, 220, 224 or 305, 251, 351, 403 or 342, 451, 452. Additional Requirements: BUAD 101; ENGL 313, ENGL 317 or ITEC 356. Students are encouraged to complete either a minor or an internship.

**Speech Communication Major (B.S.)**

**Theatre Option**
Required Theatre Courses: Core courses above plus the following: THEA 120, 130, 217, 340, 341, 412. Additional Requirements: BUAD 101; ENGL 313, ENGL 317 or ITEC 356. Students are encouraged to complete either a minor or an internship.

**COURSE DESCRIPTIONS**

**Communication Studies**

**COMM 100: 3 s.h.**
Fundamentals of Speech
Required fundamentals course in general education. An introductory study of the principles of public speaking with particular emphasis upon the selection and organization of information for persuasive purposes. Satisfies competency requirement.

**COMM 101: 3 s.h.**
Introduction to Communicology (G1)
Introduction to the study of human communication, discourse study and the means by which theatre and communication act as mutual influences on one another. Offered in fall, spring. Prereq: COMM 100.

**COMM 201: 3 s.h.**
Theories of Communication (G1)
Introduction to the study of human efforts to exchange meanings. Offered fall, spring. Prereq: COMM 100 and for communication majors, COMM 101 also.

**COMM 217: 3 s.h.**
Interpersonal Communication (G1)
Students study the nature of human interpersonal relationships from a communicologist’s standpoint. Combines both theory and experiential application to afford students a means to analyze relationships and to integrate more effective communication strategies in their lives. Offered in fall, spring.

**COMM 224: 3 s.h.**
Introduction to Organizational Communication
A survey of the major theoretical approaches to the field and applications to specific organizational issues. Explores the scope and history of organizational communication. Offered in fall. Prereq: COMM 201.
COMM 301: 3 s.h.
Communication Research (W)
A survey of research methods for the study of problems in communication. Students define a research
problem, survey and critique relevant literature and design a research strategy using various research
paradigms. Majors should take this course in the junior year. Offered fall, spring. Prereq: COMM 201.

COMM 303: 3 s.h.
Principles and Practices of Small Group Communication
Study and application of small group communication processes. Offered fall or spring. Prereq: COMM 201,
224.

COMM 305 (302): 3 s.h.
Business and Professional Communication
Principles of public speaking, organization and adaptation of speech materials, effective presentation styles,
forms of proof. Offered periodically. Prereq: COMM 100, ENGL 110 and junior status.

COMM 324: 3 s.h.
Advanced Topics in Organizational Communication
Content varies. Selected theoretical perspectives and topics in-depth. Potential topics include:
organizational cultural and critical studies; organizational conflict and conflict resolution processes;
organizational semiotics; organizational group issues; decision-making and leadership. Offered in spring.
Prereq: COMM 100, 101, 201, 224; Junior status or permission of instructor.

COMM 342: 3 s.h.
Theories of Rhetoric
Principal figures, theories, and movements in rhetoric from the classical period to the present. The
relationships between rhetoric and political, social and personal decisions are explored. Offered
infrequently. Prereq: COMM 100.

COMM 401: 3 s.h.
Critical-Cultural Studies in Communication
Reciprocal influences of communication on culture and culture on communication. Messages, meanings
and culture are approached from several critical standpoints. Offered in spring. Prereq: COMM 301.

COMM 403: 3 s.h.
Persuasion
Persuasive speaking from both the modern and classical points of view. Offered in fall or spring. Prereq:
COMM 301.

COMM 429: 3 s.h.
Special Topics in Communication Studies
Content varies. Selected theoretical perspectives and communication issues in-depth. Potential topics
include: power, ideology and discourse in communication studies; Semiotics and communication studies;
and qualitative research methods and communication studies. Offered periodically. Prereq: COMM 301.

COMM 430: 3 s.h. (P)
Culture and the Semiotics of Communication
Verbal and nonverbal signs and the realities they seem to represent. Various cultures reproduced as systems
of signs and how these are coded as ideologies and myths. Taken-for-granted experiences of language and
discourse are decoded through the experiential encounter of signs from other cultures. Offered periodically.
Prereq: COMM 100, ENGL 110; junior/senior status.

COMM 441: 3 s.h.
Political Communication
Contemporary American political rhetoric focusing on national politics. Content varies. During election
years, content includes campaign rhetoric, advertising and debates. In other years, the focus is
administrative rhetoric and the interaction of Congress with the President on domestic and foreign affairs.
Offered periodically. Prereq: COMM 100, ENGL 110; junior/senior status or permission of instructor.

COMM 498: 1-3 s.h.
Independent Study in Communication
For the definition of independent study and student eligibility, refer to the Academic Policies section of this
catalog.
**Public Relations**  
COMM 206: 3 s.h.  
**Communication and Media Law**  
The legal parameters of freedom of expression under the U.S. legal system. Students explore legal and ethical issues related to media systems, organizational communication, public relations and theatre. Offered in fall, spring.

COMM 251: 3 s.h.  
**Public Relations I: Introduction to Principles and Theory (G1)**  
The first of a 4-course sequence covers the history, principles and current practices of public relations. Series must be taken sequentially. Offered in fall, spring.

COMM 351: 3 s.h.  
**Public Relations II: Public Relations Writing (W)**  
Hands-on practice in writing news releases for print and broadcast, brochure and newsletter copy, and pitching story ideas to trade editors. Offered in fall, spring. Prereq: COMM 251, ENG 110.

COMM 451: 3 s.h.  
**Public Relations Issues and Cases**  
Analysis of various organizations’ public relations problems and communicative responses. Third in a 4-course sequence. Offered in fall. Prereq: COMM 301, COMM 351 or permission of instructor.

COMM 452: 3 s.h.  
**Public Relations Campaigns**  
Hands-on practice in public relations problem solving. Involves work in student-run “agencies” to develop and implement a public relations campaign for a nonprofit organization. Capstone course in public relations. Offered in spring. Prereq: COMM 451.

**Broadcasting**  
COMM 121: 3 s.h.  
**Introduction to Audio and Video**  
Audio and video production fundamentals, techniques and uses. Includes study of the production process and hands-on production assignments in both audio and video. Laboratory work required. Offered in fall, winter, spring.

COMM 220: 3 s.h.  
**Survey of the History, Structure and Social Impact of American Mass Media (G1)**  
A review of mass media in America and discussion of the social, cultural and technological forces that shape them. Evaluations of media criticism. Offered in fall, spring.

COMM 230: 3 s.h.  
**Comparative Broadcasting Systems**  
Devoted to the cross-cultural study of the World Broadcasting Systems as an introduction to international electronic media. The course compares the ways in which the media are organized in other countries with that of the United States of America. Offered in spring. Prereq: COMM 220.

COMM 320: 3 s.h.  
**Radio Production**  
Theory and production of various types of audio production using basic studio equipment. Laboratory work required. Offered in fall. Prereq: COMM 121.

COMM 321: 3 s.h.  
**Television Production I**  
Theory and application of various phases of studio operation and editing in television production. Laboratory work required. Offered in fall, spring. Prereq: COMM 121.

COMM 322: 3 s.h.  
**Media Criticism**  
An examination of the processes and products of various media industries with a focus on understanding and learning to critique the ways in which the media, their texts and audiences exist within a set of increasingly complex relationships. Offered periodically. Prereq: COMM 201.
COMM 325: 3 s.h.
Broadcast News Reporting (W)
Style and other basics of radio and television news. Includes collecting data, writing stories, editing and producing video for campus cable TV station. Laboratory work required. Offered periodically. Prereq: ENGL 110, COMM 121 and basic typing skills.

COMM 326: 3 s.h.
Broadcast Workshop I (W)
Basic news writing and reporting, stressing electronic media. Offered in fall. Prereq: ENGL 110 or permission.

COMM 330: 3 s.h.
Media and Women’s Culture (P)
The course focuses on the role of the media in the creation and reproduction of culture. It examines how gender, race and class are constructed in media texts, and how women in various social and cultural positions negotiate their own meanings in relation to media portrayals. Offered periodically. Prereq: Jr/Sr standing, ENGL 110.

COMM 421: 3 s.h.
Television Production II
An advanced lecture-demonstration-laboratory application of the various phases of electronic field production, with special attention to directing and advanced editing techniques. Offered in spring. Prereq: COMM 321.

COMM 422: 3 s.h.
Advanced Audio Production
Intensive analysis of field and studio techniques with emphasis on multi-track audio production and engineering. Lecture/lab course designed for students with a strong commitment to audio production. Emphasizes techniques of sound engineering, live/field recording, music studio and television control room. Offered periodically. Prereq: COMM 320.

COMM 426: 3 s.h.
Broadcast Workshop II (W)
Emphasis on the writing of dramatic scripts with selective production. Offered in spring. Prereq: COMM 320, 326, ENGL 110.

Theatre
THEA 120: 3 s.h.
Stagecraft
Construction and handling of stage scenery; training in technical theatre. Offered in fall.

THEA 130: 3 s.h.
Acting I (G1, W)
Training in the art and craft of acting. Emphasis on improvisation, theatre games and the creative process. Elementary scene and monologue work. Offered in fall, spring.

THEA 217: 3 s.h.
Theatre Appreciation (G1)
Historical and analytical approaches to the theatrical experience. Emphasis on the combination of communicative media involved in the experience. Offered in fall.

THEA 220: 3 s.h.
Lighting and Sound
An advanced study of the equipment and techniques involved in theatrical lighting and sound. Offered in fall.

THEA 230: 3 s.h.
Acting II (G1)
Purpose of acting and underlying principles, as well as training voice and body to project characterization. Offered in spring. Prereq: THEA 130 or permission of instructor.

THEA 312: 3 s.h.
History and Principles of Stage Design
The history of scene, lighting and costume design for the stage, and the study of common aesthetic principles shared by all areas of stage design. Offered infrequently.
THEA 315: 3 s.h.
Directing
Practical experience in both directing and coaching actors. An overview of directing process and directing style. Offered in spring. Prereq: THEA 110 (130) or permission of instructor.

THEA 340: 3 s.h.
History of Theatre I (G1, W)
Detailed study of development of all phases of theatre art and dramatic literature from its origin to 1700. Offered in fall. Prereq: ENGL 110, COMM 100.

THEA 341: 3 s.h.
History of Theatre II (G1, W)
Survey of European and American drama from the time of Ibsen to the present, tracing development of dramatic literature from rise of realism to contemporary experimentalism; emphasis on plays illustrating significant trends and movements. Offered in fall. Prereq: ENGL 110, COMM 100.

THEA 350: 3 s.h.
Theatre Management
Introductory survey of theatre management which addresses concerns related to theatre. An overview of the theatre manager’s role, focus on strategic planning, organizational design, economics and the theatre, unions and financial concerns which affect the success of theatre organizations. Offered infrequently. Prereq: COMM 100 and ENGL 110.

THEA 412: 3 s.h.
Topics in Theatre
Advanced work in the area of theatre production. May be taken more than one semester for credit as topic varies. Topics include design, production, direction, performance and criticism. Offered periodically. Prereq: permission of instructor.

THEA 498: 1-3 s.h.
Independent Study in Theatre
For further information on independent study, see the Special Academic Opportunities section.

COMPUTER AIDED DRAFTING AND DESIGN TECHNOLOGY
SEE INDUSTRY & TECHNOLOGY

COMPUTER SCIENCE
School of Science and Mathematics
Professor Davis, chairperson
Professor Webster
Associate Professors Chaudhary, Hutchens, Lifick
Assistant Professors Mertz, Ravenscroft

The Department of Computer Science offers a baccalaureate degree and an associate degree in computer science. It also offers a minor in computer science.

The Bachelor of Science degree program in computer science is accredited by the national Computing Sciences Accreditation Board (CSAB). To be accredited, a university degree program has been certified as meeting requirements of academic excellence including faculty, curriculum, computing resources, student preparation, and institutional support. The Bachelor of Science degree program in computer science has been recognized as a high-quality degree program that meets national standards for computer science education. Millersville University is one of the few universities in Pennsylvania and the only school among the 14 universities in the Pennsylvania State System of Higher Education that is accredited by CSAB.

The B.S. degree program in computer science is designed to provide students with a fundamental background in computer science as well as to allow students to study advanced topics such as programming languages, compiler design, software engineering, artificial intelligence, robotics and computer vision, human computer interaction, algorithms, networking, computer graphics, virtual reality, internet programming, parallel programming, and database management. Graduates are well prepared to pursue graduate study or a career in the computer field. Opportunities for student research are available.

For admission as a major in computer science, a student is expected to have a sound preparation in high school academic mathematics: algebra I and II, plane geometry, trigonometry and analytic geometry.
Students who have completed a C++ language course in high school are encouraged to take the College Board Advanced Placement Exam in Computer Science and have their scores sent to MU for evaluation. University credit for freshman-level computer science major course(s) will be offered to students with grades of 3 or higher. For further information, see “Advanced Placement Examinations” elsewhere in this catalog.

The cooperative education program allows students to gain valuable experience in a full-time professional position related to their career goals, adding practical relevance to their program of study as well as financial remuneration. This often leads to full-time employment after graduation. Students may elect one or more cooperative education experiences.

Information about the computer science degree program can be found on the web at www.millersville.edu or send email to: info@cs.millersville.edu.

COURSE REQUIREMENTS

Computer Science Major (B.S.): 120 s.h.
Students must complete requirements A - E, below. A grade of C- or better is required in all prerequisite computer science courses before taking the next course.

A. Required CSCI Courses: 28 s.h.

*NOTE: CSCI 161 is a prerequisite.

B. Required CSCI electives: 16 s.h.
Four of the following: CSCI 375, 385, 395, 420, 425, 435, 440, 450, 456, 466, 467, 476.

C. Required Related MATH Courses: 14-15 s.h.
MATH 161, 162, 235 and (PHIL 312, or MATH 220 or above but not 301, 314, 315).

D. Required Related Natural/Physical Sciences: 12 s.h.
At least 12 s.h. of Natural/Physical science courses: Biology, Chemistry, Earth Sciences and/or Physics that are intended for science majors. These courses must include a two semester laboratory sequence. BIOL 100, General Biology, and one of the following Biology courses: BIOL 211, 221, 263, or CHEM 111, 112, or PHYS 231, 232, or ESCI 221, 222, or ESCI 241, 261, or ESCI 241, 245.

E. Technical Writing Requirement
ENGL 312, Technical Writing, is the required course for the upper-level writing course under the General Education Curriculum Requirements.

Computer Science Major (A.S.): 60 s.h.
A. Required Courses: 11-14 s.h.
CSCI 161, 162; one MATH or PHYS course.

B. CSCI Electives: 16-19 s.h.
CSCI electives will be selected based upon the student’s background and objectives.

C. Technical Writing Requirement: 3 s.h.
ENGL 312.

Computer Science Minor: 20 s.h.
A. Required CSCI Courses: 16 s.h.
One of the following: CSCI 101, 111, 121 and all of the following: CSCI 161, 162, 362.

B. CSCI Electives: 4 s.h.
Choose any 300 or 400 level Computer Science major course not in required CSCI courses above.
COURSE DESCRIPTIONS

CSCI 101: 4 s.h.
Introduction to Problem Solving with Computers (G2)
Designed to introduce concepts, techniques and history of computing to students who are not computer science majors. Emphasis on problem solving using the computer including making calculations and presenting reports, tables and graphs based on those calculations. Collecting, storing, updating and retrieving data. Display and interpretation of information using the Internet. No credit toward computer science major.

CSCI 111: 4 s.h.
Introduction to Problem Solving with Visual Basic (G2)
Designed to introduce problem solving and computer programming to students who are not computer science majors. Topics include Windows operating system, Visual Basic development environment, data types, objects and methods, graphical user interfaces, programming structures such as decisions, repetition, arrays, sequential files, and graphical display of data. No credit toward computer science major. Offered periodically. Prereq: CSCI 101 or permission of instructor.

CSCI 121: 4 s.h.
Introduction to Internet Programming (G2)
Designed to introduce Internet programming to students who are not computer science majors. Topics include Web page design, JavaScript programming, graphics animation, image handling, keyboard and mouse handling, check boxes and radio buttons. Some coverage of VBScript and conversion from Microsoft Office applications to Web pages. No credit toward computer science major. Offered periodically. Prereq: CSCI 101 or permission of instructor.

CSCI 140: 4 s.h.
Discrete Structures
Discrete mathematical structures and their application to computer science including formal mathematical notation and proofs, algorithms, computer related arithmetic, propositional logic, predicate logic, set theory, graphics, relations and databases, functions, matrices and combinatorics. Prereq: Placement in MATH 160 or higher.

CSCI 161: 4 s.h.
Introduction to Computer Programming I (G2)
Introduction to computer programming for the student intending to major in computer science or related fields. Emphasis on developing ability to apply problem-solving strategies to design and implement algorithms in a modern programming language. Prereq: Placement in MATH 160 or higher.

CSCI 162: 4 s.h.
Introduction to Computer Programming II (G2)
Continuation of CSCI 161 covering advanced computer programming techniques. Emphasis on object-oriented programming, specification, design, elementary data structures, and proper use of programming language and development tools. Abstract data types, classes and objects, recursion, linked lists, queues, stacks and binary trees.

CSCI 240: 4 s.h.
Computational Models
Introduction to theory of computation. Topics include finite state automata, regular languages and grammars, pushdown automata, context-free languages and grammars, Turing machines, limits on algorithmic computation. Offered in fall, spring. Prereq: CSCI 140, 162.

CSCI 270: 4 s.h.
Computer Architecture
Structure of digital computers including register transfer notation, instruction set architecture, computer arithmetic, pipelining and parallel processors. Offered in fall, spring. Prereq: CSCI 140, 162.

CSCI 330: 4 s.h.
Programming Languages and Software Engineering
Relationship between programming languages and software engineering. Structure and vocabulary of modern programming languages. Objectives and methods of software engineering. Programming language topics include binding, data control and sharing, type checking, object-oriented programming, parallel programming and implementation of language constructs. Software engineering topics include requirements definition, specification, design, implementation, verification, validation and relationship of paradigms to languages. Offered in fall, spring. Prereq: CSCI 140 and CSCI 162.
CSCI 350: 3 s.h.
Cognitive Science (P)
Basic introduction to cognitive science. Reviews attempts to understand cognition in psychology, artificial intelligence, philosophy, linguistics and the neurosciences and examines the synthesis of these attempts in the emerging field of cognitive science. No credit toward computer science major. Offered infrequently. Prereq: completion of general education curriculum fundamentals component; 24 s.h. in liberal arts core.

CSCI 362: 4 s.h.
Data Structures
Abstract data types, objects, algorithm design and analysis, trees, graphs, sorting and searching. Emphasis on ADT-based and object-oriented design, incremental development and testing, and comparison of data structure implementations. Offered in fall, spring. Prereq: CSCI 140 and CSCI 162.

CSCI 375: 4 s.h.
Computer Graphics and Virtual Reality
Theory and implementation of computer graphics and virtual reality including mathematical basis for computer representation of two and three dimensional objects. Graphical programming assignments use latest graphics standards and hardware and software. Topics include primitives and attributes, line drawing algorithms, fill algorithms, curve fitting, clipping algorithms, three dimensional transformations, graphical I/O devices, 3-D modeling, animation, sensory tracking, virtual world modeling, virtual reality software tools, 3-D applications and graphics workstations. Offered periodically. Prereq: CSCI 362.

CSCI 380: 4 s.h.
Operating Systems
Design and implementation of operating systems including types of operating systems, file systems, resource management, concurrent processes, deadlocks, memory management techniques, processor scheduling, disk scheduling, operating system security and system administration. Students expected to develop significant operating systems programming projects. Offered in fall, spring. Prereq: CSCI 362.

CSCI 385: 4 s.h.
Real-Time Systems Engineering
Systems that must interface with the physical world in real-time such as programs that run telephone switches, control robot arms, pilot airplanes, monitor radiation leaks, move mobile robots or autonomous land vehicles and avoid railroad collisions. Prereq: CSCI 362.

CSCI 395: 4 s.h.
Computer Networks
Introduction to computer networks. Topics include network media, architecture and topology, protocols and layering, client-server models, Ethernet media and hardware, TCP/IP and other protocols, setup and system administration, application protocols and communication, network servers and services, security, data integrity, encryption, and firewalls. Offered periodically. Prereq: CSCI 362.

CSCI 406: 1-4 s.h.
Topics in Computer Science
This course allows students and faculty to explore various topics in computer science that are not included in other course offerings. CSCI 406 may be taken more than once for credit with departmental approval. Offered periodically. Prereq: Depends on topic to be studied.

CSCI 420: 4 s.h.
Software Engineering
Overview of software engineering concentrating on phases of the software development life cycle including waterfall model, iterative enhancement, prototyping, axiomatic and algebraic specifications, user interface design, and object-oriented design, testing, quality assurance and reliability. Team project provides students with practical experience applying techniques. Offered periodically. Prereq: CSCI 330 and CSCI 362.

CSCI 425: 4 s.h.
Human-Computer Interaction
Design, evaluation and implementation of interactive computing systems for human use including study of the major phenomena surrounding them. Presents a broad overview of the field with an emphasis on interface development and evaluation. Offered periodically. Prereq: CSCI 362 required; CSCI 380 recommended.
CSCI 435: 4 s.h.
Compiler Construction
Students implement a compiler for a simplified modern programming language. Theory of compiler construction including finite state automata, LL(1) grammars and top-down parsing. Project includes lexical and syntax analysis, name storage, scope and type analysis, error recovery and code generation. Advanced topics covered as time permits including LR(k) grammars, bottom-up parsing, compiler generators (e.g., LEX and YACC) and code optimization. Offered infrequently. Prereq: CSCI 240, CSCI 330 and CSCI 362.

CSCI 440: 4 s.h.
Theory of Computation
Advanced topics in theoretical computer science including automata, formal languages, computability and computational complexity. Offered infrequently. Prereq: CSCI 240.

CSCI 450: 4 s.h.
Artificial Intelligence
Introduction to artificial intelligence including problem solving, search, heuristic methods, machine learning, knowledge representation, natural language processing, computer vision, expert systems, theorem proving and current applications. Concepts illustrated through programs developed in LISP or Prolog. Offered periodically. Prereq: CSCI 240, 362.

CSCI 456: 4 s.h.
Robotics and Computer Vision
Intelligent robotic systems that deal with physical world through visual, acoustic or tactile sensing. Fundamentals of robot vision including image acquisition and camera geometry, pattern recognition, representation and analysis of shape, pixel neighborhoods, connectivity, distance measures, arithmetic operations on pixels and images, computations of area, centroid, moments, axis of least inertia, correlation techniques, histogram computation, manipulation of robot end effectors, robot task coordination and simple Cartesian robot manipulation. Offered periodically. CSCI 362.

CSCI 466: 4 s.h.
Database Management Systems
Introduction to software design using a relational and pro-relational database management systems. Data modeling, data normalization, database and application design, foundations of relational implementation, SQL, embedded SQL, web-publishing of database contents. Offered periodically. Prereq: CSCI 362.

CSCI 467: 4 s.h.
Design and Analysis of Algorithms
Theory and techniques of algorithm design and analysis. For design, students will study variety of algorithmic solutions to problems from application areas including searching, selecting, sorting, graph theory, number theory and encryption. Design paradigms including greedy method, divide and conquer, dynamic programming, backtracking and branch-and-bound. For analysis, students will use formal techniques to classify execution time of an algorithm. Software tools are used to measure resources used by a program during execution. Offered periodically. Prereq: CSCI 240.

CSCI 476: 4 s.h.
Parallel Programming
Overview of parallel computing through study of parallel programming. Topics include message-passing, highly parallel computations, partitioning and divide-and-conquer strategies, pipelined and synchronous computations, load balancing and termination detection, programming with shared memory systems, parallel sorting algorithms, numerical algorithms, image processing, searching and optimization, parallel programming using current technology. Offered periodically. Prereq: CSCI 270, 362.

CSCI 498: 1-4 s.h.
Independent Study in Computer Science
Independent study is available for particularly well-qualified students. Students who receive approval for independent study are expected to complete a significant study or project in some area of computer science. A written report is required. Prereq: Departmental permission.
COOPERATIVE EDUCATION

For information on cooperative education and internships, see the Special Academic Opportunities section.

COURSE DESCRIPTIONS

* 200: 1-6 s.h.
Entry level cooperative education experience giving initial exposure to departmentally approved job assignment.

* 300: 1-6 s.h.
Cooperative education assignment with increased work responsibility over the COOP 200 level. Prereq: 200-level equivalent.

* 400: 1-6 s.h.
Cooperative education assignment with increased work responsibility over the COOP 300 level. Prereq: 300-level or equivalent.

* 500: 1-6 s.h.
Cooperative education assignment with increased work responsibility over the COOP 400 level. Prereq: 400 level or equivalent.

* Subject abbreviation is dependent upon the department through which the cooperative education credit is earned, e.g., CSCI 200.

CRIMINOLOGY
SEE SOCIOLOGY-ANTHROPOLOGY

EARTH SCIENCES

School of Science and Mathematics
Professor Clark, chairperson
Professors Scharnberger, Soong
Associate Professor Ramanantoandro
Assistant Professors Marquez, Muller, Yalda, DeCaria

The Department of Earth Sciences offers programs of study leading to the following degrees: bachelor of science in geology; bachelor of science in meteorology; bachelor of science in oceanography; bachelor of arts in the earth sciences and bachelor of science in education (B.S. Ed.) in earth sciences with secondary education certification. Oceanography majors must select one of the following options: biological oceanography, chemical oceanography, geological oceanography or physical oceanography. Geology majors may choose options in traditional geology, geochemistry, geophysics, engineering geology or environmental geology (B.A.).

The bachelor of science programs in meteorology, geology and oceanography are intended to prepare students for admission to graduate school or for professional employment upon graduation.

The bachelor of arts degree in earth sciences is designed to meet the needs of students who want exposure to all of the earth sciences but who do not intend to continue their studies in a particular academic area. However, by selecting additional appropriate courses as electives, it is possible for these graduates to meet the admission requirements of graduate schools in one of the earth sciences or to prepare for employment in an earth science field.

The program leading to the bachelor of science degree in education in earth sciences with secondary education certification prepares students for teaching careers in the secondary schools. The core of the curriculum provides a sound education in the traditional earth sciences areas of oceanography, meteorology, geology and astronomy. Completion of this curriculum leads to certification in earth and space science. In addition, graduates may teach general science.

Cooperative education programs in the earth sciences provide opportunities for majors to apply knowledge gained in the classroom to the challenges of professional employment.
Millersville University is a member of the Marine Science Consortium, and the earth sciences department actively participates in this program. Several oceanography courses are available through the Consortium. In particular, one course required in the oceanography major (Field Methods in Oceanography) must be taken through the Consortium at Wallops Island, Virginia. For more information see Marine Science Consortium in the Special Academic Opportunities section.

The Department of Earth Sciences is an academic affiliate in the University Corporation for Atmospheric Research and is a corporate member of the American Meteorological Society.

**COURSE REQUIREMENTS**

**Earth Sciences Major (B.A.): 120 s.h.**
ESCI 110, 221, 241, 261; plus 18 s.h. in one or more earth sciences disciplines (geology, meteorology or oceanography) as approved by adviser. Required related courses: CHEM 111, 112; PHYS 131, 132; MATH 161, 235.

**Earth Sciences Major (B.A.): 120 s.h.**
Environmental Geology Option
ESCI 110, 221, 222, 227, 261, 385. Required related courses: CHEM 111, 112; PHYS 131, 132; BIOL 211, 221, 241; MATH 161, 235

**Geology Major (B.S.): 125 s.h.**
ESCI 110, 221, 222, 227, 321, 325, 326, 328, 422, 425. Required related courses: MATH 161, 162, 235, PHYS 231, 232, CHEM 111, 112. Also 6 s.h. of geology electives and 15 s.h. of science electives.

**Geology Major (B.S.): 125 s.h.**
Geochemistry Option
ESCI 110, 221, 222, 227, 321, 328, 329, 422, 425, 426, 428. Required related courses: MATH 161, 162, PHYS 231, 232, CHEM 111, 112, 265 and one of the following pairs of courses: CHEM 231, 232, or CHEM 341, 342, or CHEM 235 plus either CHEM 326 or 375. Also 9 hours of science electives.

**Geology Major (B.S.): 125 s.h.**
Geophysics Option
ESCI 110, 221, 222, 227, 321, 328, 422, 423, 425, 428. Required related courses: MATH 161, 162, 261, 365, CHEM 111, 112, PHYS 231, 232. Also 17 s.h. of science electives, including at least three physics courses and one course from either physics, mathematics or computer science.

**Geology Major (B.S.): 125 s.h.**
Engineering Geology Option
ESCI 110, 221, 222, 225, 227, 321, 326, 329, 422, 423, 424, 425, 426, 427. MATH 235 may be substituted for either ESCI 225 or 326. CHEM 375 may be substituted for ESCI 329. Required related courses: MATH 161, 162, PHYS 231, 232, CHEM 111, 112, GEOG 281, 295, 434. Also 3 s.h. of science electives.

**Meteorology Major (B.S.): 125 s.h.**

**Oceanography Major (B.S.): 120 s.h.**
Biological Oceanography Option
ESCI 110, 221, 261, 267, 362, 363, 364, 380, 465. The following courses, which are offered only at Wallops Island Marine Science Center, are highly recommended: BIOL 295, 395, 396, 397. The following courses also are highly recommended: ESCI 222, 366. Required related courses: BIOL 295, 395, 396, 397 w/lab; MATH 161, 162, 261; PHYS 231, 232.

**Oceanography Major (B.S.): 122 s.h.**
Chemical Oceanography Option

**Oceanography Major (B.S.): 120 s.h.**
Geological Oceanography Option
Oceanography Major (B.S.): 126 s.h.

Physical Oceanography Option

Earth Sciences Major (B.S. Ed.): 131 s.h.
Certification in Secondary Education
ESCI 110, 221, 222, 241, 245, 261, 366, plus one additional 3 credit course approved by adviser, 497. Required related courses: 9-12 s.h. of biology; CHEM 111, 112; MATH 161; PHYS 131, 132, 117 or 317; EDFN: 211, 241, 330; EDSE: 321, 435, 461. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

Geology Minor
ESCI 221, 222, plus 12 s.h. of geology course work at the 200, 300 and/or 400-level. Total 20 s.h.

Meteorology Minor
ESCI 241, 245, 261, 340, 342, 441. Total 20 s.h.

Oceanography Minor
ESCI 241, 261, 267, 362, 363, 364. Total 20 s.h.

Earth Sciences Minor
ESCI 221, 241, 245, 261, plus ESCI 32_ or 42_ (geology choice), ESCI 36_ or 46_ (oceanography choice). Total 18 s.h.

COURSE DESCRIPTIONS

Introductory Courses

ESCI 101: 3 s.h.
Earth Systems and Natural Hazards (G2)
The scientific understanding of Earth systems as the causes of natural disasters, such as earthquakes, volcanoes, landslides, hurricanes, tornadoes, floods and tsunamis. 3 hrs. lecture. Does not count toward any ESCI major. Offered fall, spring and periodically in summer.

ESCI 102: 3 s.h.
Origin and Evolution of the Earth (G2)
The origin and evolutionary development of the universe, solar system and planet Earth. Geophysical behavior of the solid earth, including volcanism, mountain building and other manifestations of the earth’s dynamic interior. Does not count toward any ESCI major. Offered in fall, spring and periodically in summer.

ESCI 104: 3 s.h.
The World Ocean (G2)
A broad overview of the biological, chemical, geological and physical characteristics of the ocean, the importance of the oceans to mankind and the environment. Does not count toward any ESCI major. Offered in fall, spring and periodically in summer.

ESCI 105: 1 s.h.
World Ocean Laboratory (G2, L in conjunction with ESCI 104)
Methods and techniques used in the marine sciences, including introduction to navigation, plotting and evaluation of data pertaining to salinity, temperature, dissolved oxygen, primary productivity and current velocity. 2 hrs. lab. Optional field trip. Mandatory coreq: ESCI 104. ESCI 104/105 together constitute a single laboratory course in earth sciences for purposes of the general education curriculum. Does not count toward any earth sciences major. Offered in fall, spring and periodically in summer.

ESCI 107: 3 s.h.
The Atmosphere (G2)
Origin and evolution of the atmosphere; solar and terrestrial radiation; horizontal and vertical structure of the atmosphere; temperature, pressure and water in the air; vertical motion; cloud formation and cloud type; circulation systems, severe weather, climate and climate change. 3 hrs. lecture. Does not count toward any earth sciences major. Offered in fall, spring.
ESCI 109: 4 s.h.
The Atmosphere with Laboratory (G2)
Origin and evolution of the atmosphere; solar and terrestrial radiation; horizontal and vertical structure of the atmosphere; temperature, pressure and water in the air; vertical motion; cloud formation and cloud type; circulation systems, severe weather, climate and climate change. 3 hrs. lecture. Does not count toward any earth sciences major. Offered in fall, spring. 3 hrs. lecture 2 hrs. lab.

ESCI 110: 2 s.h.
Introduction to Earth Sciences Programs
General introduction to each of the earth sciences disciplines and to college life. 2 hours lecture. Offered in fall. Restricted to earth sciences majors.

ESCI/HNRS 202: 4 s.h.
The Earth in Space (G2,L)
A quantitative scientific experience directed toward an understanding of the dynamic earth, its origin and evolution and its place in the universe. Physical concepts from classical and modern physics, astronomy, cosmology, and the earth and atmospheric sciences, couched in the language of the calculus, are supported by observation, experiment and theory. 3 hrs. lecture, 2 hrs. lab. Offered in spring of odd-numbered years. Prereq: MATH 161 or MATH 163 or MATH 165. Restricted to students in the University Honors College, or who have at least a 3.35 GPA.

Geology

ESCI 221: 4 s.h.
Physical Geology (G2, L)
The nature and distribution of materials of the solid earth—the dynamic processes by which they are formed and modified and the character of resulting geologic structures. 3 hours lecture, 2 hours lab. Offered in fall, spring and periodically in summer.

ESCI 222: 4 s.h.
Historical Geology (G2, L)
Methods of interpreting the geologic rock record, chronologic study of earth history and study of fossils as records of ancient life. Emphasis on the history of North America. 3 hours lecture, 2 hours lab, field trips required. ESCI 221 recommended. Offered in fall.

ESCI 225: 3 s.h.
Geomorphology
Processes of landscape development in theory and in the context of the regional geomorphology of North America. 3 hrs. lecture. Offered in spring of even years. Prereq: ESCI 221.

ESCI 226: 3 s.h.
Surveying
Theory and practice of plane surveying, using a variety of instruments and techniques. 3 hours lecture plus field problems. Offered infrequently. Prereq: MATH 160, 161, 163.

ESCI 227: 4 s.h.
Mineralogy
Identification, crystal chemistry, crystallography and occurrence of common minerals; optical theory and interaction of light with crystals; mineral identification through use of transmitted polarized light and X-ray diffraction. 3 hrs. lecture, 2 hrs. lab. Offered in fall of even years. Prereq: ESCI 221, CHEM 112.

ESCI 320: 3 s.h.
Roads West: Geology, Technology, Society and the American Experience (P)
The development of geological science in Europe and its maturation in North America; the historical origins of geological ideas in the context of the American experience, especially westward expansion. Basic knowledge of world and U.S. history is assumed. 3 hrs. lecture. Field trips required. Offered in fall. Prereq: ESCI 101 or ESCI 102 or ESCI 221.

ESCI 321: 3 s.h.
Structural Geology (W)
Principles and processes of rock deformation; architecture of the earth’s crust and distribution of major structural elements. 2 hours lecture, 3 hours lab, field trips required. Offered in fall of even years. Prereq: ESCI 221.
ESCI 323: 3 s.h.
Paleontology
Principles of paleontology, especially associations and environmental significance of fossil organisms; methods of evaluating biological environments of the geologic past. 2 hours lecture, 2 hours lab. Offered in fall of even years. Prereq: ESCI 222.

ESCI 325: 3 s.h.
Stratigraphy
The character, age, distribution and interrelationships of sedimentary rock units deposited throughout geologic time, with emphasis on the stratigraphic record of North America. 2 hours lecture, 2 hours lab, field trips required. Offered in fall of odd years. Prereq: ESCI 222.

ESCI 326: 3 s.h.
Sedimentation
The origin and composition of sediments and sedimentary rocks, study of the processes involved in the sedimentary cycle, environments of deposition, and the interpretation of ancient environments from sedimentary rocks. 2 hours lecture, 2 hours lab, field trips required. Offered in spring of odd years. Prereq: ESCI 222.

ESCI 328: 4 s.h.
Petrography/Igneous and Metamorphic Petrology
Optical characteristics and identification of sedimentary, igneous and metamorphic rocks; petrogenesis of igneous and metamorphic rocks; introductory thermodynamics and phase equilibria as applied to igneous and metamorphic systems. 3 hrs. lecture, 2 hrs. lab. Offered in spring of even years. Prereq: ESCI 227.

ESCI 329: 3 s.h.
Aqueous Geochemistry (W)
Inorganic chemistry of surface waters; equilibrium thermodynamics, solubility and stability relationships of silicates and calcium carbonates; kinematics, acid-base reactions, redox equilibria; transport of contaminants in natural waters; weathering of surficial materials. 3 hrs. lecture. Offered in spring of even years. Prereq: ESCI 221, CHEM 112.

ESCI 349: 3 s.h.
Chemistry of the Atmosphere
Theory, application, methods of analysis, and instrumentation relevant to a study of the chemistry of the atmosphere. Three hours of integrated lecture/lab/working group activities. Prerequisites: Minimum of 36 credit hours, which must include 24 credit hours of Liberal Arts Core courses; ENGL 110; CHEM 104 or CHEM 111; and PHYS 132 or PHYS 232. Offered in fall of alternate years.

ESCI 422: 3-6 s.h.
Geological Field Mapping
Examination and interpretation of geologic materials and structures in the field. Students prepare a geologic map, stratigraphic column and structural cross-sections of an assigned field area. Offered summers of odd years. Prereq: ESCI 321.

ESCI 423: 3 s.h.
Engineering Geophysics
Geophysical methods applied to civil engineering and environmental sciences; seismic refraction and reflection, electrical resistivity and conductivity, gravity and geomagnetism. 2 hrs. lecture, 2 hrs. lab. Offered in fall of even years. Prereq: ESCI 221 and PHYS 232.

ESCI 424: 3 s.h.
Engineering Geology
Application of geology to civil engineering problems; landslides, soil mechanics, groundwater, waste disposal, flood and earthquake hazards, tunneling; legal, political and social aspects of professional geologic practice. 2 hrs. lecture, 2 hrs. lab. Offered in spring of odd years. Prereq: ESCI 321.

ESCI 425: 3 s.h.
Geodynamics
Composition and state of the Earth’s interior; recent contributions from geophysics and geochemistry; plate tectonics in relation to internal physical processes; evolution of the Earth before and during the Phanerozoic. 3 hours lecture. Offered in spring of even years. Prereq: ESCI 321 and 328, PHYS 231.
ESCI 426: 3 s.h.  
*Groundwater Geology*  
Occurrence, quality and extraction of groundwater; lithologic and structural characteristics of aquifers; elementary theory of wells and groundwater flow. 4 hrs. lecture/lab. Offered in fall of odd years. Prereq: ESCI 221, MATH 161.

ESCI 427: 3 s.h.  
*Engineering Properties of Earth Materials*  
Soil and rock as materials of construction; sampling and testing; problems encountered in unstable ground; prediction of performance and corrective measures. 3 hours lecture/lab. Offered in spring of even years. Prereq: ESCI 321.

ESCI 428: 3 s.h.  
*Planetary Geology*  
Terrestrial geology in the context of the solar system; geochemical evolution of the solar nebula; planetary formation and evolution; comparative planetology, meteoritics; asteroid/cometary impact phenomena. 3 hrs. lecture. Offered in fall of even years. Prereq: ESCI 222 and CHEM 111.

*Meteorology*  
ESCI 241: 4 s.h.  
*Meteorology (G2, L)*  
Atmospheric structure and motions; physics of weather processes; weather and motion systems. 3 hours lecture, 2 hours lab. Offered in fall. Prereq: MATH 161 or MATH 163; coreq or prereq: PHYS 131 or PHYS 231.

ESCI 245: 3 s.h.  
*Environmental Meteorology (G2, L)*  
Practical meteorological problems in air pollution, atmospheric experimentation and other aspects of the human environment. Instrumentation and data analysis methods in applied meteorology. Knowledge of basic trigonometry is assumed. 2 hours lecture, 2 hours lab. Offered in spring.

ESCI 340: 3 s.h.  
*Physical Meteorology*  
Distribution of meteorological variables in the atmosphere; governing principles in atmospheric science (gas laws, hydrostatic equilibrium, diffusion, conservation of energy, mass, and momentum); radiative transfer, cloud processes and atmospheric electrification. 3 hours lecture. Offered in spring. Prereq: ESCI 241, or PHYS 231; coreq or prereq: MATH 261.

ESCI 341: 3 s.h.  
*Atmospheric Thermodynamics*  
First and second principles of thermodynamics, water-air systems, equilibrium of small droplets and crystals, thermodynamic processes in the atmosphere, atmospheric statics, vertical stability, and aerological diagrams. 3 hours lecture. Offered in fall. Prereq: ESCI 241; coreq or prereq: MATH 261.

ESCI 342: 3 s.h.  
*Atmospheric Dynamics I*  
Meteorological coordinate systems; equations of motion; geostrophic, gradient and thermal winds; kinematics; circulation, vorticity and divergence theorems. 3 hours lecture. Offered in spring. Prereq: ESCI 241, coreq or prereq: MATH 261.

ESCI 343: 3 s.h.  
*Atmospheric Dynamics II*  
Diagnostics equations, viscosity and turbulence; energy equations and transformations; numerical weather prediction; general circulation. 3 hours lecture. Offered in fall. Prereq: ESCI 342.

ESCI 344: 3 s.h.  
*Tropical Meteorology*  
General circulation of the tropics; energy balance; boundary layer; cumulus convection; survey of tropical disturbances including tropical cyclones. 3 hours lecture. Offered in fall of odd years. Prereq: ESCI 241 and MATH 162.
ESCI 345: 3 s.h.
Storm and Cloud Dynamics
Physics and dynamics of cloud systems; fogs, stratocumulus clouds and severe convective storms; energetics, turbulent transport, radiative transport, nonhydrostatic dynamics, microphysical and precipitation processes. 3 hrs. lecture. Offered in spring of odd years. Prereq: ESCI 342 and either ESCI 340 or 341.

ESCI 347: 3 s.h. (G2)
Satellite Meteorology
Theory of weather satellites including orbital characteristics and signal receipt, synoptic weather interpretation, mesoscale features, precipitation signatures, fog, wind shear, tropical weather systems. Offered in fall of even years. Prereq: ESCI 241; MATH 161 or MATH 163.

ESCI 348: 1 s.h.
Broadcast Meteorology
Preparation and presentation of weather information to the public; graphics preparation, television and radio weathercasting; video production. 1 hr. lecture. Grading is satisfactory/unsatisfactory. Offered in spring of odd-numbered years. Prereq: ESCI 241 or COMM 320.

ESCI 441: 3 s.h.
Synoptic Meteorology Lecture-Laboratory I
Dynamics and physics of the atmosphere as revealed by observational data and numerical output; subjective and objective analysis of meteorological data; use of standard meteorological graphics software; current weather discussions. 2 hrs. lecture, 4 hrs. lab. Offered in fall. Prereq: ESCI 342.

ESCI 442: 3 s.h.
Synoptic Meteorology Lecture-Laboratory II
Weather forecasting concepts with focus on numerical weather prediction; forecasting of severe convective storms; current weather discussion. 2 hrs. lecture, 4 hrs. lab. Offered in spring. Prereq: ESCI 441.

ESCI 444: 3 s.h.
Mesoscale Meteorology
Primary circulations at scales between individual convective cells and large cyclones; jet streaks, gravity waves, mesoscale convective complexes, squall lines, dry lines. 3 hrs. lecture. Offered in spring. Prereq: ESCI 441.

ESCI 445: 3 s.h.
Numerical Modeling of the Atmosphere and Oceans
Methods and mathematical concepts of numerical weather and ocean prediction models. Students must be able to program in one of the following languages: Fortran90, C++, or IDL. 3 hrs. lecture. Offered in spring of odd-numbered years. Prereq: ESCI 343 or ESCI 365 or MATH 365; and ESCI 282 or CSCI 161 or permission of instructor.

ESCI 446: 3 s.h.
Statistical Meteorology
Frequency distributions, sampling theory, linear and multiple regression analysis, time series, space variations of meteorological variables, statistical weather forecasting, forecast verification. 3 hours lecture. Offered in fall. Prereq: MATH 235, MATH 261.

ESCI 447: 3 s.h.
Meteorological Instrumentation, Measurement, and Observing Systems (W)
Devices and platforms used to gather meteorological data; methods of data acquisition, reduction, error analysis, and quality assurance; description of instrumentation, measurement techniques, observing systems and their deployment. 2 hours lecture, 2 hrs. lab. Prereq: PHYS 232 and MATH 235.

ESCI 448: 3 s.h.
Boundary Layer Meteorology
Characteristics of mean, neutral, stable and convective boundary layers; micrometeorology, turbulent kinetic energy, turbulent production and dissipation, mixing length theory, K-theory, surface boundary layer and geographic effects. 3 hrs. lecture. Offered in spring of even-numbered years. Prereq: ESCI 342 and MATH 162.
ESCI 449: 3 s.h.

Radar Meteorology

Algorithms used in the display and interpretation of weather radar data; theory of electromagnetic radiation, principles of radar operation, Doppler radar and interpretation techniques; wind velocity, rainfall rates, and detection of individual cells, multiple cells and turbulence. 3 hours lecture. Offered in spring of even years. Prereq: ESCI 241, MATH 261; co- or prereq: ESCI 342.

Oceanography

ESCI 261: 4 s.h.

Introduction to Oceanography (G2, L)

Methods and techniques of oceanography; physical, chemical, biological and geological aspects of the oceans; unity of oceanographic science and its relationship to other environmental sciences. 3 hrs. lecture, 2 hrs. lab. Overnight field trip required. Offered in fall, spring. Prereq: MATH 160 or MATH 161 or MATH 163 or MATH 165.

ESCI 267 or MAR. SCI. 221: 3 s.h.

Field Methods in Oceanography

Work on board small research vessels in the dynamic marine environment; use and application of standard oceanographic instruments and sampling devices; opportunities for independent research. Offered only in summer at the Marine Science Consortium field station. Prereq: ESCI 261.

ESCI 362 or MAR. SCI. 362: 3 s.h.

Marine Geology

Sedimentary and tectonic characteristics of the continental margins and deep ocean basins; principles and processes of sediment transport and deposition in the marine environment; applications of geophysical methods at sea; marine mineral resources. 3 hrs. lecture. Offered in spring of odd years. Prereq: ESCI 221, 261.

ESCI 363 or MAR. SCI. 331: 3 s.h.

Chemical Oceanography

Oceanic chemical phenomena, including structure of water, salinity, sources and sinks of chemical constituents; chemical interactions at interfaces between hydrosphere and atmosphere, lithosphere and biosphere; geochemical processes at spreading centers; biogeochemical cycles of nutrients; applications of geochronology and tracers; the carbon-dioxide-carbonate system; origin and history of seawater; anthropogenic effects. 3 hours lecture. Offered in spring of odd years. Prereq: ESCI 261 and CHEM 112.

ESCI 364 or MAR. SCI. 364: 3 s.h.

Descriptive Physical Oceanography

Physical properties of seawater; mass and energy budgets of the ocean; typical distribution of water characteristics; dynamic computation of current; circulation and water masses of the ocean; nature of waves and tides; basic instrumentation in field work. 2 hours lecture, 2 hours lab. Offered in fall of even years. Prereq: ESCI 261 and PHYS 232.

ESCI 365: 3 s.h.

Dynamical Physical Oceanography

Fluid motion in rotating systems; principal balance and modifications; conservation of vorticity; quasi-geostrophy; wind-driven and thermohaline circulation; currents and eddies; classical tidal theory; generation and propagation of surface waves. 2 hours lecture. 2 hours lab. Offered periodically. Prereq: ESCI 364; co- or prereq: MATH 365 and PHYS 312.

ESCI 366: 3 s.h.

Ocean Resources

Actual and potential ocean resources and the feasibility of their exploitation; role of ocean science and engineering in accomplishing this; socio-economic and political issues affecting resources and conservation. 3 hours lecture. Offered infrequently. Prereq: ESCI 261.

ESCI 465 or BIOL 495: 3 s.h.

Biological Oceanography

Physical, chemical and biological factors controlling plant and animal populations in the marine environment; methods of sampling, identification and analysis. 2 hours lecture, 3 hours lab. Offered during summer at Marine Science Consortium field station. Prereq: ESCI 261 and BIOL 211 and BIOL 221.
ESCI 466: 3 s.h.
*Coastal Environmental Oceanography*

The interaction of chemical, physical, geological and ecological ocean processes as applied to coastal environments, with emphasis on environmental management issues. Offered only in summers at the Marine Science Consortium field station. Prereq: ESCI 261 and completion of 60 s.h.

*Courses for All Earth Sciences Majors*

ESCI 282: 3 s.h.
*The Applications of Computers in the Earth Sciences*

Programming in computational methods applied to the earth sciences; numerical solution of equations of motion; statistical properties of digital images; analysis of periodical phenomena; use of National Center for Atmospheric Research graphics library. 2 hrs. lecture, 2 hrs. lab. Offered in fall. Prereq: MATH 162 and PHYS 231.

ESCI 380: 3 s.h.
*Remote Sensing and Image Interpretation*

Principles of remote sensing; fundamentals of image enhancement; radiative transfer equation; use of Landsat and NOAA environmental satellite data in earth sciences; use of Environment for Visualizing Images (ENVI) software for image analysis and interpretation. Basic computer literacy is assumed. 2 hours lecture, 2 hours lab. Research project is required. Offered in spring of even years.

ESCI 385: 3 s.h.
*Global Change (W)*

Evolution of the Earth’s habitable atmosphere and oceans; mechanisms that control climate processes and change; past global climate change as deciphered through paleoclimatic and paleoceanographic methods; recent rapid climate fluctuations and possible future changes. 3 hrs. lecture. Offered fall of odd years. Prereq: ESCI 241 or 261 or GEOG 230.

ESCI 386: 3 s.h.
*Earth System Data Visualization and Modeling*

Overview of existing global data sets in geology, meteorology, and oceanography; HDF and Net CDF scientific data formats; use of Interactive Data Language (IDL) to analyze and display data. 2 hrs. lecture, 2 hrs lab. Offered in spring. Prereq: ESCI 282, MATH 162 and PHYS 231.

ESCI 485: 3 s.h.
*Air/Sea Interaction*

Physics of wind waves; turbulent fluxes at the air-sea interface; planetary boundary layers; low-frequency oceanic waves; storm surges; importance of the ocean for tropical climates; El-Niño-Southern Oscillation, monsoon circulations, tropical and extratropical cyclones. 3 hrs. lecture. Offered in spring of odd years. Prereq: ESCI 343 or 364.

*Problems and Seminar*

ESCI 390: 1-4 s.h.
*Topics in the Earth Sciences*

Detailed investigation of a topic of current research interest. Topic to be announced each time course is offered. Credit and meeting hours variable, depending on topic offered. Offered infrequently. Prereq: completion of 60 credits.

ESCI 497: 1 s.h.
*Seminar in the Earth Sciences*

The interrelationships of the earth sciences disciplines as environmental sciences, viewed in the context of contemporary science. Offered infrequently. Prereq: completion of 60 credits.

ESCI 498: 1-3 s.h.
*Independent Study in the Earth Sciences*

Supervised independent research in the earth sciences. Subject determined jointly by student and the problem supervisor. Permission of department chair and school dean required.

*Honors Course*

See course description as listed within this department. Also see *Honors* section of this catalog. ESCI/HNRS 202.
The Department of Economics offers a B.A. degree in economics with options in quantitative economics, financial economics, and political economics.

Economics is the study of how a society is organized to produce and distribute material goods and services. It is a combination of technical knowledge of industry and commerce as well as a broad theoretical and practical understanding of major aspects of the economy.

The economics major requirement includes a basic core of courses in economic principles and theory. The student, in consultation with an adviser, may then select courses based on individual interest and the wide variety of career options available to economics majors.

As one of the crucial fields in the government, manufacturing, and service sectors, students will find economics to be an especially attractive field to help them prepare for a future career. By virtue of its broad nature, economics readily widens students’ choices to join the work force and/or pursue their graduate studies. Students who wish to join the work force, attend law school or work toward advanced degrees in other applied areas are advised to choose the basic B.A. in economics, which emphasizes preparation in applied economics and data processing. Those who plan to do graduate studies in economics or business are advised to take the B.A. in economics–quantitative option, which offers more preparation in mathematics, statistics and theoretical economics. Students interested in government, politics and law may take the political economy option. Students interested in financial services and investments may take the financial economics option.

Potential areas of employment for economics students are diverse. They include the financial sector, government sector and manufacturing sector. The flexibility of the programs not only provides internship and cooperative education opportunities with local industry, but, with the proper advisement, also permits students to combine course work with computer science, mathematics, social sciences, business, humanities, natural sciences and communication arts.

The economics minor program is intended to provide a background in economics to the student with a major in another field. The technical economics minor is intended to serve the needs of students from mathematics and the sciences who are interested in combining their degrees with economics and related areas and/or planning to pursue their graduate studies in economics and related areas. This minor is open to all interested students.

Students should consult the department for the most recent curriculum and career information.

COURSE REQUIREMENTS

Economics Major (B.A.)
Core course requirements for all liberal arts economics majors: ECON 101, 102, 215, 231, 318, 319, 488 and 12 additional credit hours in economics electives; plus one required related course (3-4 credit hours): CSCI 111 or 121. Students may substitute a maximum of two selected business administration courses for elective courses in economics. See Economics Department for currently approved list.

Economics Major (B.A.)
Quantitative Option
Core course requirements ECON 101, 102, 215, 231, 235, 318, 319, 333 and 488; 6 additional credit hours in economics electives; and a minimum of 2 required related courses (6-8 credit hours): either MATH 161 and 162 or 165 and 166.

Economics Major (B.A.)
Financial Economics Option
Core course requirements ECON 101, 102, 215, 231, 318, 319, 325, and 333; 6 additional credit hours in economics electives; and 18 credit hours of required related courses BUAD 161, 162, 341, 342, 345, and CSCI 111 or 121.
Economics Major (B.A.)
Political Economy Option
Core course requirements ECON 101, 102, 225, 231, 316, 318, 319, and 365; 12 additional credit hours in electives; and 6 credit hours of required related courses CSCI 111 or 121, GOVT 111, 112, 205, 241, and 301.

Social Studies Major (B.S. Ed.)
Certification in Secondary Education
The social studies major is currently under review and pending changes. See the department chairperson for details. Also, refer to Admission to Advanced Professional Studies and Certification in this catalog for more information about education requirements.

Economics Minor: 18 s.h.
ECON 100 or 101, 102 and either ECON 215, 231 or 318 plus three other courses in economics including two 300-400 level courses.

Technical Economics Minor: 18 s.h.
ECON 101, 102, 235, 318, 319, and 333.

COURSE DESCRIPTIONS
ECON 100: 3 s.h.
Introductory Economics (G3)
Introduction to economics as a social science for non-majors or students interested in taking ECON 101 or 102 who would like a preparatory course. Introduction to fundamental economic concepts, economic policy and global markets. Class activities and simulations complement an emphasis on current events. Satisfies BSE Social Studies requirement. Offered in fall.

ECON 101: 3 s.h.
Principles of Economics I (G3)
Introduction to macroeconomic analysis concentrating on national income, price levels, employment, monetary policy and fiscal policy with introductory analysis of the global economy. Offered in fall, spring.

ECON 102: 3 s.h.
Principles of Economics II (G3)
Introduction to microeconomic analysis concentrating on consumer and producer behavior, competitive and other markets, public policy and government regulation. Offered in fall, spring.

ECON 103: 3 s.h.
Introduction to the World Economy (G3)
An introductory course analyzing and comparing global economies, trade and economic development. This course does not count toward the major, but qualifies for BSE-Economics and for the minor. Prereq: ECON 101 or 102. Offered in fall, spring.

ECON 206: 3 s.h.
Contemporary International Economic Problems (G3, W)
Analysis of contemporary global economic issues that are interdependent in nature: food problems; population explosion; global ecology; raw material crisis; energy problems; global poverty; role of multinational corporations; etc. Offered infrequently. Prereq: ECON 101 or 102.

ECON 207: 3 s.h.
Environmental Economics (G3, W)
Microeconomic theory applied to the problems of pollution and natural resource depletion. Topics include efficiency, externalities, public goods, benefit-cost analysis and environmental policy. Content includes economic analysis of current global, national, regional and local environmental problems. Offered in fall. Prereq: ECON 102.

ECON 215: 3 s.h.
Money, Credit and Banking (G3)
Survey of monetary and banking institutions, policies and practices, including study of monetary theory. Offered in fall; occasionally in spring. Prereq: ECON 101.
ECON 225: 3 s.h.  
Comparative Economic Systems (G3, W)  
Analysis of economic systems in France, the former Yugoslavia, China, Japan, the United Kingdom, the former Soviet Union and the United States. Emphasis varies with each offering at the discretion of the instructor. Offered in fall. Prereq: ECON 101.

ECON 226: 3 s.h.  
Area Studies (G3, W)  
Analysis of regional economies such as Africa, Asia or Latin America. The area of study will be specified by the instructor expected to teach the course. Offered infrequently. Prereq: ECON 101 or 102.

ECON 231: 3 s.h.  
Applied Statistics I (G3)  
Presentations of data; measures of central tendency and variation; and index numbers. Introduction to probability theory, sampling and inference, and regression and time series analysis. Offered in fall, spring.

ECON 235: 3 s.h.  
Mathematical Economics  
Static analysis in economics; consumer and firm equilibrium; marginal analysis; optimization problems. Preliminary use of algebra and calculus for business and economic applications. Offered infrequently. Prereq: ECON 101, 102, MATH 101 or equivalent.

ECON 246: 3 s.h.  
Economics of Health and Healthcare (G3, W)  
Analysis of consumer theory, firm theory and market failure within the context of health economics. Emphasis on the institutions involved in health care provision, labor markets for health care professionals, and market structure and government regulation. Offered in spring. Prereq: ECON 102.

ECON 310: 3 s.h.  
The Economics of Justice (P)  
Economic concepts and models are used to explain laws and legal situations. Economics is applied in some of the principal areas of the law: property, contracts, torts and crime. Offered infrequently. Prereq: ECON 102, BUAD 202, or permission of instructor.

ECON 316: 3 s.h.  
Public Finance (G3)  
Economic aspects of governmental budgeting emphasizing fiscal policy including impact of taxation and expenditures. Topics include the allocation, distribution and stabilization effects of the public household. Offered in spring. Prereq: ECON 101, 102.

ECON 318: 3 s.h.  
Intermediate Microeconomics (G3)  
Similar in scope to ECON 102 with major emphasis on the further development and refinement of tools of economic analysis. Offered in spring. Prereq: ECON 101, 102.

ECON 319: 3 s.h.  
Intermediate Macroeconomics (G3)  
Similar in scope to 101, with major emphasis on the determination of the economy’s total output, the price level and the level of employment. The course incorporates the interaction of the market for goods and services, the assets market and the labor market. Offered in fall. Prereq: ECON 101.

ECON 325: 3 s.h.  
International Economics (G3)  

ECON 326: 3 s.h.  
Economic Growth and Development (G3, W)  
Introduction to economic characteristics and problems of less developed countries and to the theories and policies applicable to the developing economy. Offered in fall. Prereq: ECON 101, 102.
ECON 327: 3 s.h.
Women and Global Economic Development (P)
Analysis of development theories from a multicultural perspective and an examination of the role of women in international development with specific case studies drawn from women’s lives in third world countries (India, China, etc.). Satisfies preq, or economics elective requirement. Offered infrequently.

ECON 330: 3 s.h.
Asian Economies (P)
Analyzes the growth and development of Asian economies which exhibit a vast array of socioeconomic, political and cultural diversities. Due to the vast size and diversity of the area, the emphasis will vary with each offering at the discretion of the instructor. Satisfies perspectives requirement, but not economics elective requirement. Offered infrequently.

ECON 332: 3 s.h.
Economic Statistics II
Continuation of ECON 231. Introduction to bivariate and multiple regression analysis. Time series analysis and other topics applied to business and economic problems. Offered infrequently. Prereq: ECON 231.

ECON 333: 3 s.h.
Econometrics
The estimation and hypothesis -testing of economic models, principally using regression techniques. Topics include linear models, time series analysis and simultaneous equations models. The uses and limitations of these models for economic forecasting are examined with the aid of computers. Offered in spring. Prereq: ECON 101, 102 and either 231 or 332.

ECON 345: 3 s.h.
Labor Economics (G3)
The labor market and labor forces; theories of wages and employment; security; determinants of trade union policy; and governmental manpower policies. Offered in spring. Prereq: ECON 101, 102.

ECON 365: 3 s.h.
History of Economic Thought (G3)
Development of economic thought from early thinkers to the twentieth century including economic theorists such as Adam Smith, Karl Marx and John Maynard Keynes. Offered in fall. Prereq: ECON 101, 102.

ECON 375: 3 s.h.
The Economics of Industrial Organization (G3, W)
The study of (1) how enterprises function within a variety of market structures and (2) how well the outcomes fit the public interest. Specific topics include market share, barriers, concentration, vertical power, economies of scale, pricing behavior, mergers and efficiency. Offered in spring. Prereq: ECON 101 and 102.

ECON 488: 3 s.h.
Seminar in Economics
Research on an economic problem including preparation of a paper and critical analysis thereof. Majors only. Offered in spring. Prereq: Minimum 12 hours of economics or permission of instructor.

ECON 489, 499: Variable Credit (1-3 s.h.)
Honors Thesis
ECON 498: Variable Credit (1-3 s.h.)
Independent Study
For further information on independent study, see the Special Academic Opportunities section.

ECON 586, 587, 588, 686, 687, 688: 3 s.h.
Topics in Economics
EDUCATIONAL FOUNDATIONS
School of Education
Professor Desmond, chairperson
Professors Smith, Stengel, Frerichs
Associate Professors Isaak, McDowell
Assistant Professors Deemer, McCotter, Seda, Scott, Ward
Instructors Lauris, Sperry

Millersville University provides certification in secondary education in the following fields: art education, biology, chemistry, earth and space science, English, foreign languages (French, German, Spanish), technology education, mathematics, music education, physics, public school nursing, social studies and mentally/physically handicapped. The requirements for these programs are listed under the individual disciplines (see Index). For further information, contact the chairperson of the educational foundations department.

COURSE REQUIREMENTS
Secondary Education Certification
(B.S. Ed.): 120-128 s.h.
Requirements of the major field are listed under the individual discipline. The following professional courses are also required: EDFN 211, EDFN 241, EDSE 321, EDFN 330, EDSE 461 and one instructional methods course. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

COURSE DESCRIPTIONS
EDFN 130: 3 s.h.
Technology in the Music Profession
Students explore the uses of technology and its application in the music classroom. Topics include computer basics, applications software, music hardware and software evaluation, music notation software, sequencing software, MIDI interface devices, telecommunications and multimedia presentation systems. Students are provided a series of hands-on experiences with hardware and software to develop the skills and competencies required of the music professional.

EDFN 211: 3 s.h.
Foundations of Modern Education
American school system; contemporary and historical influences; significance of education in society; contemporary problems in education, opportunities and requirements of the profession. Must be taken simultaneously with EDFN 241. Includes field experience.

EDFN 220: 3 s.h.
Instructional Technology in Elementary Education
Students use case studies to explore the uses of technology and its application in elementary education. Topics include computer basics, applications software, curriculum integration, evaluation of educational software, telecommunications and multimedia presentation systems. Students are provided a series of hands-on experiences with hardware and software to develop the skills and competencies required of the elementary education teacher.

EDFN 230: 3 s.h.
Instructional Technology in Art Education
Students explore the uses of technology and its application in art education. Topics include computer basics, applications software, evaluation and use of imagining hardware, evaluation of art education software, telecommunications and multimedia presentation systems. Students are provided a series of hands-on experiences with hardware and software to develop the skills and competencies required of the art teacher.

EDFN 241: 3 s.h.
Psychological Foundations of Teaching
Teaching and learning through the application of psychology to the activities of the classroom. Learning theory and practice, human growth and development, motivation, classroom management, evaluation and
principles of effective instruction. Must be taken simultaneously with EDFN 211. Includes field experience.

EDFN 312: 3 s.h.
**Women and Education: Socialization and Liberation (P)**
This course uses philosophical analysis and a sociology of knowledge approach to examine women’s and girls’ experiences with respect to educational institutions as they exist in contemporary America. These concerns are explored dialectically, examining not only how educational institutions and opportunities shape women, but also how the presence of women in educational activities alters the nature of that enterprise. Offered in fall.

EDSE 321: 3 s.h.
**Issues in Secondary Education**
Examines the role of the secondary teacher, issues encountered in the classroom and classroom interactions. Includes field experiences. Students should arrange their schedules to allow for at least two half days per week for public school experiences during the course. Offered in fall, spring. Prereq: EDFN 211, EDFN 241. Admission to Advanced Professional Studies. Must be taken simultaneously with one of the following: EDSE 433, EDSE 435, ENGL 485, FORL 480, MATH 315.

EDFN 330/530: 3 s.h.
**Introduction to Microcomputers in the Classroom**
An examination of the uses of microcomputers for classroom instruction and support functions. Curricular applications include tutorials, simulations, drill and practice programs and educational games. Other applications include word processing, classroom management and record keeping and test generation. Effective evaluation of hardware and software is also considered. Must be taken simultaneously with EDSE 321.

EDFN 333/533 3 s.h.
**Instructional Technology in Special Education**
Provides special education pre-service teachers with experiences in the use of technology for teaching and learning. Topics include basic computer systems (Macintosh and Windows platforms), evaluating instructional software for special needs students, computer applications software (word processing, spreadsheets, draw, paint and data bases), telecommunications (Internet and email), multimedia presentations, integrating technology into the curriculum, and field experiences.

EDFN 376: 3 s.h.
**Whose School is it, Anyway? The Struggle for Equity in American Schooling**
This course is an historical, political and legal investigation of American public schooling in the 19th and 20th centuries and of the issue of equal educational opportunity in regard to gender, class, race, and ethnicity. Students should have completed a lower level history, historiography, political science or educational history course. Offered in the spring.

EDSE 433: 3 s.h.
**Teaching of Social Studies**
Consideration of the goals of social studies in secondary schools; materials, instructional methods and strategies; recent developments; and field experiences. Offered in fall, spring. Prereq: EDFN 211, 241. Admission to Advanced Professional Studies. Must be taken simultaneously with EDSE 321.

EDSE 435: 3 s.h.
**Teaching of Science in Secondary Schools**
Current initiatives in science education; creativity, effective demonstrations, lab work and short/long range planning. Opportunities for realistic teaching and field experiences. Offered in fall, spring. Prereq: EDFN 211, 241. Admission to Advanced Professional Studies. Must be taken simultaneously with EDSE 321.

EDSE 461: 12 s.h.
**Student Teaching**
Student teachers are assigned full-time to cooperating teachers in schools and University supervisors to gain experience in the total activities of the teacher. Seventh or eighth semester. Offered in fall, spring. Prereq: EDFN 211, 241, EDSE 321 and EDSE 433 or 435 or one of the following: ENGL 485, FORL 480, MATH 315. Admission to Advanced Professional Studies. See Academic Policies: Student Teaching, Application and Eligibility; Student Teaching, Transfer Students.)
Urban Education Program 15 to 18 s.h.
The Urban Education Program provides students with the opportunity to have an overall understanding of urban communities, urban children and urban school teaching. The intensive part of the program is for one year during the sophomore year.

Prerequisites:
ELED Majors - ELED 100, SPED 101
Secondary Ed. Majors: You must have declared EDUCATION as your major.
If you have already taken EDFN 211 and 241 you do NOT qualify for the Urban Education Program.

Required Courses:

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>EDFN 211</td>
<td>EDFN 241</td>
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<tr>
<td>SOCY 211</td>
<td>HUMN 380</td>
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<tr>
<td>EDUC 220 (ELED only)</td>
<td>HIST 273</td>
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ELECTRONICS TECHNOLOGY
SEE INDUSTRY & TECHNOLOGY

ELEMENTARY & EARLY CHILDHOOD EDUCATION
School of Education
Associate Professor Wenrich, chairperson
Professors Berhow, Gray-Schlegel, Meckley
Associate Professors Kerper, King, Rudden
Assistant Professors Anthony, Hoffman, Hossain, Ritter, Smart, Topping, Valle, West

The program in elementary education is designed to provide the student with adequate depth in subject matter, appropriate teaching techniques in methodology and an extensive variety of field experiences. The field experiences culminate with a semester-long student teaching assignment in the elementary school classroom. Students may complete this requirement in a variety of settings which include urban, suburban and rural schools, and/or schools in different cultural settings, such as Navajo reservation schools or schools in foreign countries.
Students may also earn dual certification in the following areas: early childhood education N-3 and special education.

Refer to Admission to Advanced Professional Studies and Certification in this catalog for more information.

COURSE REQUIREMENTS

Elementary Education majors (B.S. Ed.): 124 s.h.
K-6 Certification
A. ELED 100: In this introductory course students study the roles and responsibilities of the teacher and are scheduled into an elementary school classroom for 15-18 hours.
SPED 101: An introductory course for students emphasizing various aspects of exceptional children. Included are historical considerations, educational and developmental needs of exceptional children, special education programs, services, resources and materials.
EDFN 220: The instructional technology in elementary education course explores the uses of technology and its application in elementary education.

B. Professional Block I: Students inquire into the teaching/learning process—the role of the teacher, the learner, the school environment and the classroom as a social setting. Foundations of Modern Education (EDFN 211), Psychological Foundations of Teaching (EDFN 241), Foundations of Reading (EDUC 220). Prerequisite: ELED 100 and SPED 101 with grades of C or better.

C. Professional Block II: The professional semester is an integrated program of professional education courses normally taken in the student’s junior or senior year. It is composed of 16 s.h.: ELED 325, 340, 351, 361 and EDUC 305.
Before enrolling in Professional Block II the student must satisfy the following prerequisites.

1. Gain admission to APS with a minimum of 60 credit hours and an overall Grade Point Average (GPA) of 2.8 or better (2002-2003 academic year) 3.0 or better (2003-2004 academic year)

2. Earn a qualifying score on the following Pennsylvania Certification (PRAXIS I) tests:
   - PPST Reading
   - PPST Writing
   - PPST Mathematics

3. Earn a C (2.0) or better in ENGL 110, and pass an additional 3 credit English course.

4. Earn a grade of C (2.0) or better in all courses completed in the major, including required related courses.

5. Pass a laboratory course in science.

6. Satisfactory Act 34 (criminal record check) report, satisfactory Act 151 (child abuse history clearance) report, and a completed background information sheet on file with the early field experiences office.

D. Professional Block III: EDEL 461, 462; Student Teaching and Seminar.

Prerequisites to Professional Block III are an overall GPA of 2.8 or better (2002-2003 academic year) 3.0 or better (2003-2004 academic year) in all University courses. In addition, the student must have earned grades of C or better in each course in Professional Block II.

E. Required Related Courses: ART 141, MATH 104, 105, MUSI 103, WELL 352.

F. Early Childhood Certification (N-3): Elementary education majors may also earn N-3 certification by completing the following courses with a C or better in each course: ELED 210, 312, 313, 314, 315, PSYC 227.

G. Dual Major/Certification-Elementary Education/Special Education: Students may earn a double major and dual certification in both elementary education and special education through a cooperative program offered by both departments.

H. MU students applying to the major: If space is available, admission into the Elementary Education major from other departments (including undecided students) is upon completion of 30.0 credit hours at Millersville University and upon meeting specific departmental and state requirements. Please contact the departmental chairperson for present requirements.

I. Students are strongly urged to complete an academic minor from the list of minors available at Millersville University.

COURSE DESCRIPTIONS

EDUC 090: 3 s.h.
**Improvement of Reading, Communication and Study Skills**
Improvement of reading, communication and study skills for students requiring additional instruction prior to formal University courses. The course is developmental in nature and will not be applicable toward elementary education requirements. After successfully completing this course a student would be prepared to begin courses at the 100-level or above. Offered in summer.

ELED 100: 3 s.h.
**Introduction to Elementary Education**
A realistic introduction to teaching in the elementary school. Throughout the course, student thinking is encouraged as prospective teachers reflect on goals and societal expectations of elementary schools, essential teacher knowledge, attitudes and skills, teacher roles and responsibilities, and teachers as planners and designers of curriculum. Students contemplate the consequences of critical teaching decisions on grouping, content and classroom management strategies. In the concurrent field experience, students reflect on their ability to cope with classroom reality as they affirm or deny their choice of teaching as a profession. Offered in fall, spring.

ELED 210: 3 s.h.
**The Young Child and the Curriculum**
An overview of the field of early childhood education. Historical and philosophical influences on past and current approaches to teaching young children are traced and analyzed. The developmental needs and characteristics of the young child, with emphasis on the pre-primary level, are related to current curriculum programs and practices. Emphasis is on the necessity of using developmentally appropriate learning
materials and teaching strategies. Weekly observation/participation in the Jenkins Early Childhood Center integrates theory with practice, and affords the student an opportunity to evaluate his/her commitment to a career in early childhood education. For Early Childhood Certification students only. Offered in fall, spring.

EDUC 215: 3 s.h.
The Young Child and Education
Elective for an education major, but not for an early childhood education certification student. Overview of the young child in educational settings. Emphasis on developmentally appropriate teaching techniques, learning materials and environments. Focus on developmental needs, individual characteristics and sociocultural considerations. Weekly observation/participation in an early childhood setting applies theory to practice. Offered in fall, spring.

EDUC 220: 3 s.h.
Foundations of Reading
Introduces topics in the field of teaching reading, including: emergent literacy, approaches to reading instruction, word recognition and vocabulary development, comprehension instruction, assessment techniques and reading instruction for the multicultural and the exceptional child. Supplemented by a field experience. Offered in fall, spring. Prereq: ELED 100 or SPED 101.

EDUC 305: 1-3 s.h.
Field Experiences
Specific work and study assignments constituting the field experience will be developed. Regular discussions, conferences and group seminars will be conducted by faculty members and field supervisors to clarify generalizations that link practice to theory. In most instances the assignments will be in public schools; however, social agencies may be included in this practicum program. Offered in fall, spring.

ELED 312: 3 s.h.
Seminar: Pre-Kindergarten
A practical application of pre-kindergarten teaching philosophies and methods. Includes field experiences in nursery schools, Head Start, public pre-K classrooms and/or day care centers. Includes group discussions, conferences, reading, independent study. Developmental characteristics of pre-K children and curriculum experiences studied in relation to research, program models and philosophies that influence early childhood programs. Emphasis on importance of play, the learning environment, behavior observation. For Early Childhood Certification students only. Offered in fall, spring. Prereq: ELED 210.

ELED 313: 3 s.h.
Seminar: Kindergarten
A practical application of kindergarten teaching methods. Includes field experiences in a kindergarten classroom. Includes group discussions, conferences, reading, independent study. Emphasis on programs and materials, use of screening and assessment procedures/tools toward developing a program that allows individualization, cultural diversity and the value of play in the K-3rd grade learning experiences. For Early Childhood Certification students only. Offered in fall, spring. Prereq: ELED 210.

ELED 314: 3 s.h.
The Parent-Teacher Relationship in Early Childhood Education (W)
A concentration on cooperation between teachers and parents of young children. Considers issues relevant to successful home-school-community relationship, such as home-based early childhood programs, infant-toddler development and education, parents as teachers, home-school communication techniques, conferencing, parent involvement in the classroom, family crisis and family agency services. For Early Childhood Certification students only. Offered in fall, spring. Prereq: ELED 210, ENGL 110.

ELED 315: 3 s.h.
Creative Experiences for the Young Child
An emphasis on making appropriate instructional and curricular decisions to provide creative opportunities for young children; special attention to rhythmic, aesthetic and dramatic avenues of expression; application of ideas through actual experiences with young children. Offered in fall, spring.

EDUC 316: 3 s.h.
The Parent Teacher Relationship in the Elementary School (W)
Focus on cooperation between teachers and parents in the elementary school. Considers issues relevant to successful home-school-community relationship, such as parenting education, parents as teachers, home-school communication techniques, conferencing, and parent involvement in the classroom. Covers
research, information, and teaching techniques for dealing with family issues and crisis as they affect students. Offered in fall, spring. Prereq: EDUC 215 or PSYC 227, ENGL 110.

**ELED 325: 6 s.h.**
The Teaching of Literacy: Processes, Skills and Strategies
Pedagogy as an interrelated and integrated format of reading, writing, listening and speaking. Understandings, teaching strategies and techniques presented, consistent with national and state standards, assessments and curriculum frame-works. Prereq: 60 s.h. and admission to Advanced Professional Studies (APS).

**EDUC 323: 3 s.h.**
Teaching Reading in the Content Areas (W)
An elective course designed to help students develop an understanding of the reading process in the major subject areas. Specific literacy strategies, study skills and reference techniques used in various subjects are investigated. Offered in fall. Prereq: EDUC 220.

**EDUC 333: 3 s.h.**
Children’s Literature
Introduction to the genres of children’s literature through numerous authors, poets and illustrators. Students select books based on standard literacy criteria and knowledge of child development. Emphasis on evoking children’s response to literature. Prereq: EDFN 241 or PSYC 227 or 228.

**ELED 340: 3 s.h.**
Teaching of Social Studies
An overview and examination of social studies curriculum for the elementary classroom. Emphasis on philosophy, methods and materials for the teaching of social studies. Special emphasis on integration of the social sciences, especially economics, history and geography. Offered in fall, spring. Prereq: 60 s.h. and admission to Advanced Professional Studies.

**ELED 351: 3 s.h.**
Teaching of Mathematics
For elementary education majors with emphasis on modern curricula and methods of teaching mathematics in elementary schools. Examinations of texts, supplementary teaching materials and teaching devices. Study of research findings. Offered in fall, spring. Prereq: MATH 105, 60 s.h. and admission to Advanced Professional Studies (APS).

**ELED 361: 3 s.h.**
Teaching of Science
An overview of the content and processes included in an elementary school science program, plus a study of methodology and instructional skills appropriate to the elementary school setting. Offered in fall, spring. Prereq: Laboratory course in the sciences, 60 s.h. and admission to Advanced Professional Studies (APS).

**ELED 371: 3 s.h.**
Teaching Gifted and Able Children (W)
Designed to acquaint prospective teachers with some viable techniques for dealing with gifted and able children in their classrooms. Some attention will also be paid to reviewing existing programs and means of identification. Some work with gifted students in the schools will be another component of the course. Offered infrequently.

**EDUC 376: 3 s.h.**
Strategies for Classroom Management
Covers contemporary classroom management in today’s elementary schools. Emphasis on prevention of management breakdown and developing a positive success-based environment. Offered in fall, spring.

**EDUC 403: 3 s.h.**
Cultural Diversity: Pluralism in the Classroom (W)
Provides historical and present day information about different racial, cultural and linguistic groups represented in our society. Explores the challenge of providing an equitable and effective education to all and provides methods and materials that can be used in the classroom. Offered in fall, spring.

**ELED 405: 3 s.h.**
Creative Activities in the Elementary School
General theory of creativity. Consideration of the basic principles of creative teaching as they relate to the various curricular areas in the elementary school. Activities and experiences applied to creative teaching. Offered in summer.
ELED 419: 3 s.h.
Seminar in Early Childhood Education
Investigation of contemporary goals of early childhood education. Provides analysis of organizational
plans, classroom environment, teaching strategies and resources, and noteworthy trends and innovations.
Application to individual situations is stressed. Focus will vary. Offered periodically.

EDUC 424: 3 s.h.
Diagnostic Reading (W)
The first of two elective courses in diagnostic reading for undergraduate students will be an introduction to
various formal and informal means to assess the reading strengths and needs of children. Offered in fall,
spring. Prereq: EDUC 220.

EDUC 425: 3 s.h.
Prevention and Correction of Reading Problems (W)
The prevention and correction of reading problems. Through practicum experiences students must then
make some instructional decisions about specific reading disabled children. Offered infrequently. Prereq:
EDUC 220.

EDUC 430: 3 s.h.
Teaching Reading Through Writing (W)
Instruction in the integration of reading and writing in the elementary grades. Discussion of the influence of
the writing process on reading. Offered in spring. Prereq: EDUC 220.

EDUC 433: 3 s.h.
Gender and Race Issues in Children’s Literature (P)
Children’s literature will be examined in the light of recent psychological, sociological and educational
research on sexism and racism. Offered in fall, spring.

EDUC 434: 3 s.h.
Creative Dramatics
Developing programs in creative dramatics for the classroom teacher who wishes to gain insight into the
dramatic process and learn how this process can stimulate language study and enhance the development of
a language arts program. Offered in summer.

EDUC 451: 3 s.h.
Measurement, Problem Solving and the Metric System
Implementation of the metric system in schools, techniques for problem solving, and applications of
mathematics to the world of measurement. Offered infrequently.

EDUC 475: 3 s.h.
Current Trends in Education
A survey of current and future curricular and instructional trends in education. Emphasis on identification,
examination and evaluation of topics, methods, strategies and issues affecting teaching and learning.
Offered infrequently.

EDUC 486: 3 s.h.
Topics in Education
In-depth investigation and development of one or more topics of current interest not normally covered in
regular courses. Special topics/methods will vary according to the needs of students and faculty. Offered
infrequently.

ELED 498: 1-3 s.h.
Independent Study
Conferences and seminars designed for special study of particular topics in elementary education.
Emphasis on new and emerging curriculum for teaching. Prereq: 60 s.h. and approval of the department
chairperson. Offered periodically.

EDEL 461: 6 s.h.
Student Teaching and Seminar–First half of semester.
Offered in fall, spring.

EDEL 462: 6 s.h.
Student Teaching and Seminar–Second half of semester.
Two separate student teaching experiences are required; one in grades K-3 and one in grades 4-6. Seminar
sessions are required. Students must complete satisfactorily both halves in order to qualify for certification.
Students in the dual certification Elementary and Early Childhood Program must have one experience at the
N-K level and the other in grades 1-3. Offered in fall, spring.
REQUIRED RELATED COURSES

ART 141: 3 s.h.
Fundamentals of Studio Art

WELL 352: 3 s.h.
Health Education in Elementary Schools

MATH 104: 3 s.h.
Fundamentals of Math I

MATH 105: 3 s.h.
Fundamentals of Math II

MUSI 103: 3 s.h.
Language of Music

GRADUATE LEVEL COURSES

All 500 level courses are open to qualified undergraduates with permission from the instructor. For course descriptions, please refer to the Graduate Catalog.

ELED 502: 3 s.h.
Education in Today’s Elementary School
Offered in summer.

ELED 505: 3 s.h.
Creative Activities in the Elementary School
Offered in summer.

ELED 519: 3 s.h.
Seminar in Early Childhood Education
Offered periodically.

ELED 533:
Nonfiction Literature and Literacy
Offered in spring.

EDUC 534: 3 s.h.
Creative Dramatics
Offered in summer.

EDUC 551: 3 s.h.
Measurement, Problem Solving and the Metric System
Offered infrequently.

EDUC 575: 3 s.h.
Current Trends in Education
Offered periodically.

EDUC 586-589 3 s.h.
Topics in Education
Offered periodically.

ENGINEERING

SEE CHEMISTRY, EARTH SCIENCES AND PHYSICS
ENGLISH

School of Humanities and Social Sciences
Professor Shields, chairperson
Associate Professor Foreman, assistant chairperson
Professors Belgrade, Carballo, Centola, Dilgard, T. Miller, Sheaffer
Associate Professors, Duncan, Germain, Kelly, McCollum-Clark, S. Miller, Schneller, Skinner
Assistant Professors Alden, Archibald, Craven, Halden-Sullivan, Masciale-Walmer, Mayers, Rosenthal, Shin, Widmayer
Instructors Anderson, Dougherty, Gardner, Homberger, Rineer

English majors may pursue a B.A. or B.S. Ed. degree.

Required 100-level and 200-level major courses must be completed by the end of the sophomore year. Liberal arts majors must complete ENGL 110, 220, 233, 231 or 238H or 235, 237 and 311 with a minimum ENGL GPA of 2.00. Secondary education majors must complete ENGL 110, 220, 233, 231, 235, 237, 311 and 321, with a minimum ENGL GPA of 2.00. These courses must be completed before English majors may enroll in 400-level courses, unless the department chairperson sanctions concurrent enrollment in lower and upper division courses.

A total of 42-45 credit hours in English (which may include ENGL 110) is required for graduation. If English composition competency is satisfied by examination without credit, one additional English elective is required.

The department participates in the prelaw advisory committee, School of Humanities and Social Sciences. English majors planning careers in law should contact the department’s prelaw adviser.

In planning a course of study, English majors must consult with their departmental academic advisers on a regular basis, because major revisions in programs of study offered in whole or in part by the English department may occur to modify or expand existing requirements.

COURSE REQUIREMENTS

English Major (B.A.): 120 s.h.
ENGL 220, 233, 231, 238H, or 235, 237, 311, 405; 3 s.h. of literature (400-level) prior to 1800, 3 s.h. of literature (400-level) after 1800; 3 s.h. of a literary genre (400-level); 3 s.h. in American literature (400-level); 12 s.h. of English electives, and either ENGL 110 or an additional English elective.

A minor should be declared by the end of the sophomore year (before the completion of 60 credits) in consultation with a department adviser. See the beginning of the Academic Programs section for a listing of currently approved minors.

English Major (B.S. Ed.): 124 s.h.
Certification in Secondary Education
ENGL 220, 233, 231, 238H, 235, 237, 311, 321, 405, 486; 3 s.h. of literature (400-level) prior to 1800; 3 s.h. of American literature (400-level); 3 s.h. of literary genre (400-level); 9 s.h. of English electives, and either ENGL 110 or an additional English elective. Required related courses: 3 s.h. of media (theatre or film), 3 s.h. of music (history or appreciation), 3 s.h. art (history or appreciation), 3 s.h. of history (English, American or European); EDFN 211, 241 and 330; EDSE 321 and 461; ENGL 487 (to be completed prior to the student teaching semester), and ENGL 485 (to be completed the semester immediately before student teaching.)

At least one required or elective course in the degree program must contain a substantial component in minority or female authors. A list of courses fulfilling this requirement is available from English advisers. Secondary education students must maintain a minimum ENGL GPA of 2.50 at the time they have completed 60-75 s.h. of course work. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

English Major (B.A. or B.S. Ed.) Comparative Literature Option
To facilitate the study of literature from an international perspective, the English and foreign languages departments offer an Option in Comparative Literature. The Comparative Literature Option is available for students who complete 18 hours selected from the English and foreign languages curricula. Candidates
must also complete at least two semesters study of one foreign language at the college level or demonstrate foreign language proficiency at the intermediate level.

Candidates will select from among the following courses:

**English Department (two):**
- ENGL 231 World Literature I
- ENGL 232 World Literature II
- ENGL 441 Poetry
- ENGL 442 Drama
- ENGL 443 Prose Fiction
- ENGL 451 Literary Criticism

**Humanities Series (two):**
- HUMN 210 French Literature
- HUMN 220 German Literature
- HUMN 221 German Authors
- HUMN 270 Russian Literature
- HUMN 280 Spanish Literature

Candidates will also select one of the following courses in the Foreign Languages Department:
- HUMN 202 Classical Mythology
- HUMN 240 Greek Literature
- HUMN 250 Latin Literature

All candidates will take ENGL 431: Comparative Literature.

Observation: Upon approval, a student may substitute an upper level foreign language course for a humanities series course. For further information about the Comparative Literature option, please contact Dr. Robert Carballo (English) or Dr. Leroy Hopkins (Foreign Languages).

**English Major (B.A. or B.S. Ed.) English as a Second Language (E.S.L.) Option**

This option allows both liberal arts and secondary education students to pursue concentrated study in the area of teaching English as a second language. Students enrolled in this option fulfill all existing departmental requirements (including ENGL 220: Introduction to Language Study), but they must complete the following courses, which can be credited as departmental electives:

- ENGL 221 Introduction to Linguistic Analysis or
- ENGL 322 History of English
- ENGL 463 Applied Linguistics
- ENGL 464 Teaching English to Speakers of Other Languages

All E.S.L. students are encouraged to seek opportunities for E.S.L. tutoring in addition to electing foreign language course work. Also, E.S.L. students enrolled in the secondary education program are encouraged to request a student teaching assignment which provides them with the opportunity to teach non-native speakers of English.

**English Major (B.A. or B.S. Ed.) Linguistics Option**

The linguistics option enables English B.A. or B.S. Ed. majors to pursue in a formal way an interest in language study. Students enrolled in this concentration fulfill all existing departmental requirements (including ENGL 220: Introduction to Language Study); but in lieu of 9-12 hours of free English electives, they complete the following program of study:

1. One course in theoretical linguistics:
   - ENGL 321; 3 s.h.
   - Transformational Grammar

2. One course in historical linguistics:
ENGL 322: 3 s.h.
History of the English Language; or
ENGL 465: 3 s.h.
Special Topics in Language: Seminar
(if its content is so oriented)

3. One course in applied linguistics:
   ENGL 463: 3 s.h.
   Applied Linguistics; or
   ENGL 465: 3 s.h.
   Special Topics in Language: Seminar
   (if its content is so oriented)

4. One other course in linguistics:
   ENGL 221: 3 s.h.
   Introduction to Linguistic Analysis;
   ENGL 462: 3 s.h.
   Dialects of American English;
   ENGL 464: 3 s.h.
   Teaching English to Speakers of Other Languages; or
   ENGL 465: 3 s.h.
   Special Topics in Language: Seminar

In addition, students complete the equivalent of two semesters of foreign language study. The foreign language requirement of this concentration simultaneously fulfills general education requirements.

English Major (B.A. or B.S. Ed.)
Print Journalism Option 12 s.h.

Required Courses 9 s.h.
ENGL 313 Fundamentals of Journalism
ENGL 315 Advanced Reporting
ENGL 317 Editing for Publication - or -
ENGL 318 Technical Skills for Journalists - or -
ENGL 330 Computer Assisted Journalism

Electives 3 s.h.
ENGL 250 The Press in its Societal Roles
ENGL 318 Technical Skills for Journalists
ENGL 327 Feature Writing, Magazine Journalism, Print Media Advertising
ENGL 435 Journalism Through Women’s Perspectives
ENGL 473 Special Topics in Journalism

Minor in Print Media Studies
Track 1 required for English Majors taking Print Journalism Option 18 s.h.

English majors who have chosen the option in Print Journalism and also wish to receive the minor in Print Media Studies must select six additional courses from the following list. Students may not count any course toward the minor in Print Media Studies that they have used to meet requirements for the Print Journalism Option.

ENGL 250 The Press in its Societal Roles
ENGL 318 Technical Skills for Journalists
ENGL 327 Feature Writing, Magazine Journalism, Print Media Advertising
ENGL 329 Practical Journalism (field experience)
ENGL 330 Computer Assisted Journalism
ENGL 435 Journalism Through Women’s Perspectives
ENGL 473 Special Topics in Journalism
ENGL 200 Cooperative Education in Journalism
ENGL 300 Cooperative Education in Journalism
Minor in Print Media Studies
Track 2 required for non-English Majors or English Majors without Print Journalism Option
18 s.h.

Required courses 12 s.h.
ENGL 313 Fundamentals of Journalism
ENGL 315 Advanced Reporting
ENGL 317 Editing for Publication - or -
ENGL 318 Technical Skills for Journalists - or -
ENGL 330 Computer Assisted Journalism
ENGL 473 Special Topics in Journalism

Electives 6 s.h.
ENGL 250 The Press in its Societal Roles
ENGL 318 Technical Skills for Journalists
ENGL 327 Feature Writing, Magazine Journalism, Print Media Advertising
ENGL 328 Ethics in Print Media Journalism
ENGL 329 Practical Journalism
ENGL 435 Journalism Through Women’s Perspectives
ENGL 200 Cooperative Education in Journalism
ENGL 300 Cooperative Education in Journalism

English Minor
General English Option
18 credits minimum (beyond the required composition courses) including at least one course in each of the following areas: language/linguistics, literature and writing. Selection of individual courses must be consistent with University-wide curricular policies for minors.

English Minor
American Literature Option
18 credits minimum (beyond required composition courses) including ENGL 233, 234, 237, and three of the following: ENGL 331*, 421, 422, 423, 424, 425, 426, 427, 428, 429, 482, HUMN 400*.
*When its primary focus is American Literature.

English Minor
British Literature Option
18 credits minimum (beyond required composition courses) including ENGL 233, 234, 237, 405 and two of the following: ENGL 331*, 403, 404, 406, 407, 408, 411, 412, 413, 414, 415, HUMN 400*.
*When its primary focus is British Literature.

English Minor
Film/Literature Option
18 credits minimum (beyond required composition courses) including ENGL 240, 232 or 431, 237 or 451, 481, 482, and one of the following: ENGL 331*, 424, 425, 426, 428, 429.
*When its primary focus is American Literature.

English Minor
Linguistics Option
18 credits minimum (beyond required composition courses) including ENGL 220, 321, 322, 462, 463, and one of the following: ENGL 221, 464, 465.

English Minor
Print Journalism Option
Please consult the earlier section entitled “English Major (B.A. or B.S. Ed.) Print Journalism Option.”

English Minor
Writing Option
18 credits minimum (beyond required composition courses) including ENGL 237, 311, 312, 313, and additional ENGL credits from the following courses to equal 18 s.h.: ENGL 312, 314, 315, 316, 471, 472.
COURSE DESCRIPTIONS

An (AW) indicates that the course counts toward the advanced writing part of the general education requirements.

**ENGL 010: 3 s.h.**
Fundamentals of Writing
Instruction in the fundamentals of writing standard English. Intended primarily for students who do not demonstrate proficiency, as measured by Departmental examination. Students are evaluated on their proficiency, not on progress, by the conclusion of the course. Prereq: Permission of instructor.

**ENGL 110: 3 s.h.**
English Composition
Required fundamentals course in general education. Introduces basic strategies of expository and argumentative writing and provides guided practice in the conventions of standard written English. Individual instructors use materials—print or nonprint—in achieving this goal. Evaluations on competency, not on progress, by the conclusion of the course. Minimum grade of C- designates competency.

**ENGL/HNRS 110: 3 s.h.**
Honors English Composition
Emphasis on development of research and analytical skills, presumes basic writing competence. Students who demonstrate competency in English 110 may be exempt from this requirement with written approval of the director. Offered in fall, spring.

**ENGL 220: 3 s.h.**
Introduction to Language Study (G1)
Linguistic science through a study of the historical development and present characteristics of the English language, the process of language learning, social and geographical dialects and semantics. An overview of the many fields of linguistic investigation. Offered in fall, spring.

**ENGL 221: 3 s.h.**
Introduction to Linguistic Analysis (G1)
An investigation of the sounds, word structure, syntax and semantics of American English from the point of view of modern linguistics. Offered periodically.

**ENGL 230: 3 s.h.**
Introduction to Literature (G1)
Reading, analysis and interpretation of various literary genres (poetry, fiction and drama) selected from different periods. Not for English major credit. Offered in fall, spring.

**ENGL 231: 3 s.h.**
World Literature (G1)
Survey of literary development from earliest records to 1650. Emphasis on historical, aesthetic and philosophical aspects of world literature. Offered in fall, spring.

**ENGL 232: 3 s.h.**
World Literature II (G1)
Continuation of ENGL 231 from 1650 to present. ENGL 231 is not a prerequisite. Offered annually.

**ENGL 233: 3 s.h.**
Early English Literature (G1)
Survey of English literature from Anglo-Saxon times to 1800. Offered in fall, spring.

**ENGL 234: 3 s.h.**
Later English Literature (G1)
Survey of English literature from 1800 to the present. ENGL 233 is not a prerequisite. Offered annually.

**ENGL 235: 3 s.h.**
Early American Literature (G1)
Survey of American literature from colonial times to 1865. Offered in fall, spring.

**ENGL 236: 3 s.h.**
Later American Literature (G1)
Survey of American literature from 1865 to present. ENGL 235 is not a prerequisite. Offered in fall, spring.
ENGL 237: 3 s.h.
Introduction to Techniques of Literary Research and Analysis
Textual, critical and rhetorical analyses of literary genres. The course is designed to familiarize the student with both the theory and the practice of genres through research and analytical writing. Offered annually.

ENGL/HNRS 238: 3 s.h.
The Western Literary Tradition I (G1, W)
Major works of the Western literary tradition from the Ancient World and through the Renaissance. Offered annually. Prereq: ENGL 110, Member University Honors College or 3.35 GPA.

ENGL/HNRS 239 3 s.h.
The Western Literary Tradition II (G1, W)
Major works of the Western literary tradition from the Neoclassical period through Modernism. Offered annually. Prereq: ENGL 110, Member University Honors College or 3.35 GPA.

ENGL 240: 3 s.h.
Introduction to Film (G1)
Introduces film as an art form and provides critical approaches to film texts. Includes technical and artistic aspects of film making, genres, auteur theory, and critical approaches to cinema. Offered in fall, spring. Prereq: ENGL 110.

ENGL 250: 3 s.h.
The Press in Its Societal Roles (G1, W)
In-depth analysis and critical evaluation of the print media in society. Focuses on the responsibilities, functions, influences and operations of the press in society. Includes press and public freedoms, press ethics and codes of conduct as these relate to the individual and groups within society. Offered in spring.

ENGL 292: 3 s.h.
Science Fiction (G1)
The nature and development of science fiction from Jules Verne and H. G. Wells to major writers of the present. Representative works, with emphasis on methods of extrapolation from both scientific knowledge and social patterns. Practical and theoretical methods of analysis and evaluation. Offered in spring.

ENGL 311: 3 s.h.
Advanced Composition (AW)
Practice in expository, descriptive and argumentative writing through reviews, critical reports, essays and analyses. Prereq: ENGL 110 or equivalent, 60 s.h.

ENGL 312: 3 s.h.
Technical Writing (AW)
Writing of scientific and technical reports, abstracts, journals, research. Emphasis on data collection, organization, style and manuscript preparation. Prereq: ENGL 110 or equivalent, 60 s.h.

ENGL 313: 3 s.h.
Fundamentals of Journalism (AW)
Journalistic writing with emphasis on news and feature writing for the print media. Includes course work in journalistic law and ethics. Prereq: ENGL 110 or equivalent, 60 s.h.

ENGL 315: 3 s.h.
Journalism Practicum II: Advanced Reporting (W)
A course in reporting news and features that emphasizes experience in the field completing authentic journalistic assignments. Course work includes the study of traditional and nontraditional journalistic forms. Offered periodically. Prereq: ENGL 313 or ENGL 314.

ENGL 316: 3 s.h.
Business Writing (AW)
Informative and persuasive writing in business and industry. Extensive practice in writing letters, memorandums, proposals, abstracts, reports, publicity announcements and advertisements. Emphasis on business writing strategies and processes, rhetorical analysis, data collection and organization and manuscript preparation. Prereq: ENGL 110 or equivalent, 60 s.h.

ENGL 317: 3 s.h.
Editing for Publication
Principles and practices of editing for publication. Develops skills in improving copy, writing headlines and cutlines, selecting and sizing photographs, page design and layout. Includes legal, ethical and philosophical aspects of editor’s role. Offered annually. Prereq: ENGL 110 or equivalent.
ENGL 318: 3 s.h.
Technical Skills for Journalists
In-depth study of technical factors necessary in journalistic endeavors. Focus on note-taking, instruction in shorthand, computerized news-gathering techniques, database usage, use of recorders/hidden microphones. Course is an elective for Print Media Studies minor. Offered periodically. Prereq: ENGL 110 or equivalent.

ENGL 321: 3 s.h.
Transformational Grammar (G1)
Analysis of the syntax of American English from the viewpoint of generative linguistics. Offered periodically. Prereq: ENGL 220 (120), 221 or permission.

ENGL 322: 3 s.h.
History of English (G1, W)
Processes of language change and their effects on the development of English phonology, morphology, syntax and semantics. Offered periodically.

ENGL 327: 3 s.h.
Feature Writing, Magazine Journalism, Print Media Advertising (W)
Writing and analysis of features and advertising for the print media, including features behind the news and advertisement supplements. Assessment and selection of appropriate illustrations and page design are also involved. Offered periodically.

ENGL 328: 3 s.h.
Ethics in Print Media Journalism
This is a comprehensive course that will cover ethics in every element of writing for print media publication. Course material focuses on the development of ethics in writing and changes in journalistic standards. The course will also provide students with the opportunity to engage in research of case histories.

ENGL 329: 3 s.h.
Practical Journalism (field experience)
Field experience in newspapers (including The Snapper), magazines, and other business or technical writing situations.

ENGL 330: 3 s.h.
Computer Assisted Journalism
Covers the use of email for journalistic purposes, accessing websites and databases, writing follow-up stories based on electronically-acquired data, plus contacting identified sources. Includes Quark Xpress editing techniques.

ENGL 331: 3 s.h.
Special Topics in Literature
A thematic investigation of a significant literary topic. Course structure and topics at the discretion of the instructor, to be announced prior to preregistration each semester. May be taken more than once for credit since the topic varies. Offered periodically.

ENGL 332: 3 s.h.
Literature of the Bible
A literary survey of the Bible in English emphasizing narrative, didactic and poetic forms within historical contexts. Not a course in religion. Offered periodically.

ENGL 333: 3 s.h.
African-American Literature I:
The Beginnings Through the Harlem Renaissance (G1, W)
Major writers and genres to circa 1935, with emphasis on the cultural roots and aesthetics within the American literary tradition. Offered in fall, spring.

ENGL 334: 3 s.h.
African-American Literature II:
The Depression Through the Black Arts Movement (G1, W)
Major writers from circa 1935 to the present, with emphasis on literary theory, critical discourses and literary movements. Offered in spring.
ENGL 337: 3 s.h.
Women Writers in the Middle Ages (P)
Students investigate the work of women who lived and wrote in the medieval period, primarily (though not entirely) in Europe. Offered periodically. Prereq: ENGL 110.

ENGL 338: 3 s.h.
Folklore and Literature (G1, W)
Folklore, with emphasis on literature, history, region, gender, and class. Ballads, tales, riddles, legends, proverbs, and other forms from American, English and international sources. Includes field collection projects. Offered periodically.

Honors Courses
See course descriptions as listed within this department. Also see Honors section of this catalog. ENGL/HNRS 110, ENGL/HNRS 238, ENGL/HNRS 239.

ADVANCED COURSES

British Literature
All classes listed in the British Literature section are offered periodically.

ENGL 401: 3 s.h.
Old English Language and Literature (G1, W)
An introduction to the structure of the Old English language and to Old English prose and poetry.

ENGL 402: 3 s.h.
Middle English Language and Literature (W)
An introduction to the structure of the Middle English language, and to Middle English prose and poetry exclusive of Chaucer.

ENGL 403: 3 s.h.
Chaucer
Chaucer’s life, times and important works; study of the language and pronunciation.

ENGL 404: 3 s.h.
The English Renaissance
Non-dramatic literature during the late 15th and 16th centuries from “Morte d’Artur” through the early 17th century, prose and verse during the reigns of Lancaster, York, Tudor.

ENGL 405: 3 s.h.
Shakespeare
Shakespeare’s life, works and times; detailed consideration of major plays.

ENGL 406: 3 s.h.
17th Century Literature Before the Restoration
Metaphysical and cavalier poetry and other non-dramatic literature from 1600 to 1660, exclusive of Milton’s poetry.

ENGL 407: 3 s.h.
Milton
A study of Milton’s major poetry and selected prose works against the background of the Puritan Revolution.

ENGL 408: 3 s.h.
Restoration and 18th Century Literature
English literature between 1660 and 1800, especially the rise and descent of neoclassicism.

ENGL 411: 3 s.h.
Romantic Literature
Rise of romanticism in later 18th century to the beginning of Victorianism; emphasis on poetry and criticism between years 1798 and 1832; influences descending to present.

ENGL 412: 3 s.h.
Victorian and Edwardian Literature
Literary figures and their works (exclusive of fiction) against social and political background from 1832 to 1914.
ENGL 413: 3 s.h.  
British Literature Since 1914  
Literary figures and works against the background of crisis in the 20th century from the onset of World War I to the present. New movements, attitudes and experimental techniques. Select from among such writers as Yeats, Joyce, Lawrence, Eliot, Woolf, Beckett, Auden, O’Casey, Pinter, Lessing, Waugh, Thomas, Larkin.

ENGL 414: 3 s.h.  
The English Novel  
Studies in the English novel. The course emphasis will vary from semester to semester, focusing on 18th, 19th or 20th century novels. May be taken more than once for credit since the content of the course varies.

ENGL 415: 3 s.h.  
Seminar in Selected British Writers  
Intensive study of the works of selected British writers. May be taken more than once for credit since the content varies.

ENGL 416: 3 s.h.  
The Woman Writer and Her World  
This course will focus on female authors of fiction and/or poetry and will be structured in a time period sequence, beginning with Aphra Behn and continuing into the present. Both well-known women writers as well as those who are lesser known will be read and discussed.

ENGL 418: 3 s.h.  
Literature of Scotland and Ireland: 18th Century to the Present  
A comprehensive course in the literature (poetry, fiction, some drama and mythology) of Scottish and Irish writers (18th century to present).

American Literature  
All classes listed in the American Literature section are offered periodically.

ENGL 421: 3 s.h.  
Early American Literature to 1830  
Examination of colonial and federal literature, with some discussion of the beginnings of Romanticism. Special attention to Bradstreet, Taylor, Edwards, Franklin, Wheatley, Brockden Brown, Irving and Cooper.

ENGL 422: 3 s.h.  
The American Renaissance  
Focus on Transcendentalism and such figures as Hawthorne, Poe, Thoreau, Melville, Emerson, Whitman and Dickinson.

ENGL 423: 3 s.h.  
Development of the American Novel: 19th Century  
Narrative fiction from early and middle parts of nineteenth century to “fin de siecle”: emphasis upon the Romance, the Gothic tale and the rise of the novel.

ENGL 424: 3 s.h.  
The Emergence of Modern American Fiction: Realism and Naturalism to 1920  
A study of stylistic, thematic and philosophic issues relating to literary realism and naturalism. Selections from writers such as Twain, Howells, James, Crane, Norris, London and Dreiser.

ENGL 425: 3 s.h.  
Modern American Fiction, 1920-1945  
Important American fiction writers of the twentieth century with emphasis on major developments in ideas and techniques. Special attention to Anderson, Fitzgerald, Hemingway, Faulkner, Steinbeck and others.

ENGL 426: 3 s.h.  
Modern American Drama (G1, W)  
American drama from World War I to the present, with emphasis on significant developments in styles and techniques explored by such dramatists as O’Neill, Hellman, Williams, Miller, Albee and others.

ENGL 427: 3 s.h.  
Modern American Poetry  
In depth study of several major American poets, including Eliot, Pound, Frost, Stevens, Williams, and others; or of a school such as the imagists, the Fugitives and others.
ENGL 428: 3 s.h.
Contemporary American Literature:
1945-Present
Major trends in poetry, fiction and drama since World War II, with emphasis on such prominent figures as Barth, Bellow, Mailer, Oates, Updike, Plath, Olson, Shepard, Mamet and others.

ENGL 429: 3 s.h.
Seminar in Selected American Authors
Intensive study of the works of selected American authors. May be taken more than once for credit.

ENGL 430: 3 s.h.
Studies in Ethnic American Literature Since 1945 (P)
A study of the representative works of various ethnic groups in contemporary America. Designed to develop an appreciation for and a critical understanding of multiculturalism and social tension reflected in contemporary ethnic literature and discuss complex issues, such as race, ethnicity, power, gender and identity, that are involved in the process of Americanization. Prereq: ENGL 110.

Comparative Literature, Genre, Literary Criticism
All classes listed in the Comparative Literature section are offered periodically.

ENGL 431: 3 s.h.
Comparative Literature I: 1850-1925
A foundation for the understanding of modernism in literature. Traces the development of symbolism through the aesthetic movement. Offers a wide, comparative perspective to the study of literature, familiarizing the student with the comparative method.

ENGL 435: 3 s.h.
Journalism Through Women's Perspectives
Literary journalism, a genre that combines literary techniques with journalistic techniques, that focuses on the circumstances of women from a variety of cultures as writers and subjects of the genre. Offered periodically. Prereq: Junior or senior status and ENGL 110.

ENGL 441: 3 s.h.
Poetry
The nature of poetry as genre; content as an extension of form; form as an extension of content; work in prosody, intensive reading in verse of all types and periods; contemporary trends in verse; introduction to various schools of poetry. Junior or senior elective.

ENGL 442: 3 s.h.
Drama
The nature of drama as a literary genre; examination of specimens of drama of all types and periods; emphasis on masterpieces of drama in the Western world. Junior or senior elective.

ENGL 443: 3 s.h.
Prose Fiction
A genre course in which a study of a variety of authors and types of fictional narrative such as the novel, novella and short story is combined with studies in style, structure and fictional techniques. Junior or senior elective.

ENGL 451: 3 s.h.
Literary Criticism
The nature of literature and literary genres, with readings in major critics and theorists from Plato and Aristotle through the Renaissance, the Enlightenment, the 19th century and selected modern critics. Concurrent readings in representative critical trends and controversies. Applied criticism. Junior or senior elective.
Linguistics

All classes listed in the Linguistics section are offered periodically.

ENGL 462: 3 s.h.
Dialects of American English (P)
A study of the origin and the features of the regional and social dialects of American English. Prereq: One course in linguistics or permission of instructor.

ENGL 463: 3 s.h.
Applied Linguistics (G1, W)
Application of linguistic theory to selected problems of language teaching and research. Prereq: One course in linguistics or permission.

ENGL 464: 3 s.h.
Teaching English to Speakers of Other Languages
Approaches, methods and techniques appropriate to teaching standard English to speakers of other languages. Includes international tutoring opportunities. Prereq: Permission of instructor.

ENGL 465: 3 s.h.
Special Topics in Language: Seminar
Investigation of topics on language, such as generative metrics, morphophonics, tagmemic analysis; investigation of English language problems selected by students in conference with instructor, to include reports, formal papers and class critiques. May be taken more than once for credit as topic varies. Prereq: 3 hours in English language study or permission of instructor.

Writing

ENGL 471: 3 s.h.
Creative Writing
Extensive practice in writing fiction and poetry. Inquiry into the social functions and purposes of fictional and poetic writing. Offered periodically.

ENGL 472: 3 s.h.
Writing Workshop
Extensive written work focused on particular topics, a theme in literature, or a specific genre in communication. Mini-research papers. Critiques of other student papers. Considerable discussion of other student papers. Offered periodically. Prereq: ENGL 311 or permission of instructor.

ENGL 473: 3 s.h.
Special Topics in Journalism
Techniques and problems in journalism. Offered in spring. Prereq: ENGL 313.

Film

ENGL 481: 3 s.h.
History of Film
Viewing/discussion of influential narrative films from early silents to recent independents. Offered in fall. Prereq: ENGL 110.

ENGL 482: 3 s.h.
Film and American Society
Viewing/discussion of significant American films in relation to social and historical context. Offered in spring. Prereq: ENGL 110.

Education

ENGL 485: 3 s.h.
Teaching Secondary School English
Specialized problems of English instruction. Required of students pursuing secondary English as a major, but not of English minors. Offered in fall, spring. Prereq: Successful completion of the Sophomore Education Bloc and admission to Advanced Professional Studies. Must be taken during semester immediately prior to EDSE 461, Student Teaching and Seminar. Must be taken concurrently with EDSE 321.
ENGL 486: 3 s.h.
Teaching Reading and Literature with Young Adults
Inquires into reading (as complex set of social, cognitive, personal behaviors and practices) and literature (texts, contexts, connections, and interpretive frameworks) in middle and high school classrooms. Special emphases on strategies for motivation, engagement, and support in reading; creating appropriate learning contexts; expanding student choice and book selection; and alternative methods of assessing reading/literature achievement. Required for BSE in English. Course should be taken prior to ENGL 485 and Junior Bloc (preferably as juniors or seniors). Offered in fall, spring.

ENGL 487: 3 s.h.
Seminar in Teaching Writing
Development, analysis and evaluation of instructional materials and approaches appropriate to the students being taught by each student teacher with special emphasis on understanding and implementing The Pennsylvania Comprehensive Reading/Communication Arts Plan. Must be taken prior to student teaching. Offered in fall, spring. Prereq: ENGL 110.

ENGL 498: 1-3 s.h.
Independent Study in English
For further information on independent study, see the Special Academic Opportunities section. Offered periodically.

GRADUATE LEVEL COURSES

All 500 level courses are open to qualified undergraduates with permission. For course descriptions, please refer to the Graduate Catalog.

ENGL 586-589: 3 s.h.
Special Topics
In addition to course requirements outlined by each department, there are additional degree requirements for all students. For more information, see the Curriculum section.

ENVIRONMENTAL STUDIES
SEE BIOLOGY, EARTH SCIENCES AND GEOGRAPHY

FINANCE
SEE BUSINESS ADMINISTRATION

FOREIGN LANGUAGES

School of Humanities and Social Sciences
Associate Professor Milovanovic, chairperson
Professor Caminero, Hopkins
Associate Professors Börger-Greco, Gaudry-Hudson
Assistant Professors Moine, Nimmrichter Rivera-Hernandez

For initial placement of freshmen the department advises that the following guidelines be used:

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<thead>
<tr>
<th>Years of High School</th>
<th>FORL Course</th>
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<tbody>
<tr>
<td>0-1</td>
<td>FORL 101</td>
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<td>2</td>
<td>FORL 102</td>
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<td>3-4</td>
<td>FORL 201</td>
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<td>4-5</td>
<td>FORL 202</td>
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A placement examination will be administered in the fall semester to incoming freshman language majors and to those non-majors intending to take FORL 201, 202, 351 or 352. Consult individual language sections for current policy.

Students who, in the first few class meetings, consider themselves improperly placed should discuss the matter with their instructor so that changes can be made promptly.

Attention is called to the Millersville Summer Schools of Foreign Languages, in which graduate students
live together in their own schools and speak the foreign language at all times. Well-prepared undergraduate students may participate following their junior year with a recommendation from their department chairperson.

All modern language majors are required to take, prior to graduation, oral proficiency interview portfolios.

**STUDY ABROAD**

Language majors considering spending their junior or senior year abroad at a foreign university are advised to discuss the matter with their advisers at an early date.

Millersville administers a fully accredited academic program at Marburg, Germany, where students from Millersville and other institutions in Pennsylvania and throughout the nation study under the supervision of a resident director. For other modern languages (French, Spanish, Russian) students are placed in accredited programs in Canada, Latin America, Spain, France and Russia.

**COURSE REQUIREMENTS**

**French, German or Spanish Major (B.A.): 120 s.h.**

Specialization in French, German and Spanish. A minimum of 36 s.h. in major language-FORL 201, 202, 311, 312, 351, 352, 470, plus courses in language, literature and civilization as approved by adviser. Four courses in a required second language (12 s.h.) and two courses in a third language (6 s.h.) are to be chosen from among the ancient or modern languages in consultation with adviser. **NOTE:** In lieu of the second and third languages requirements students may elect to minor in a language (a minimum of 18 credits; see minor requirements). Required related courses: one course each in English and history related to the foreign language area of study with adviser’s approval. Study abroad strongly recommended.

**French, German or Spanish Major (B.S. Ed.): 124 s.h.**

Certification in Secondary Education

FORL 201, 202, 311, 312 or 313, 331 (or 332 or 333), 351, 352, 470 and 480 and one course each in English and history related to the foreign language area of study with the adviser’s approval. Three courses (9 credits) in a second language. Certification may be earned in two language areas. Early planning with adviser is essential. For those seeking dual certification the 101 and 102 courses in the second language count toward certification.

In addition to the above, EDFN 211, 241, and 330; and EDSE 321 and 461 are also required.

Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

**Foreign Language Major (B.A. or B.S. Ed.): 120 s.h.**

**International Business Option**

(French, German, Spanish)

Foreign language majors who wish to prepare for a career in international business should take FORL 211, 212, 301 and 460. It is recommended that students exercising this option take one of the minors offered by the Business Department.

German majors with the International Business Option will be prepared to pass the “Zertifikat Deutsch als für den Beruf.”

French majors have been successful in achieving the Paris Chamber of Commerce Certificate.

Spanish majors have been successful in achieving the Madrid Chamber of Commerce Certificate.

Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

**French, German, Classics, Russian or Spanish Minor**

Consists of a minimum of 18 s.h. including 201, 202, 351, 352, plus 2 electives on the 300 or 400 level. (See Foreign Language adviser.)
COURSE DESCRIPTIONS

NOTE: All courses designated HUMN (Humanities) are designed for non-majors and may be credited in the Humanities and Fine Arts block (G1) as General Education, subject to distribution limits, unless you are a Foreign Language major.

French
FREN 101: 3 s.h.
Elementary French I (G1)

FREN 102: 3 s.h.
Elementary French II (G1)
Continuation of language and culture with emphasis on more complex syntactical structures while working toward greater proficiency in both productive (speaking and writing) and receptive (reading and listening) skills. Offered in fall, spring. Prereq: 101 or 2 years of h.s. French.

HUMN 210 (110) 3 s.h.
French Literature in English (G1, W)
Outstanding masterpieces taught in English by an instructor of French. Designed primarily as an elective for non-majors desirous of enriching their knowledge of foreign literature. It may be elected by majors and consent of adviser as a supplement to the department requirements. Offered infrequently.

FREN 201: 3 s.h.
Intermediate French I (G1)
Emphasis is placed on further developing the receptive and productive skills through varied realistic exercises and in authentic real-life situations. Contemporary cultural and literary texts provide the thematic basis for oral and written communication. Offered in spring. Prereq: FREN 102 or placement exam.

FREN 202: 3 s.h.
Intermediate French II (G1)
Continued receptive and productive skills begun in 201. Communication in speech and writing remains the primary goal; structures and vocabulary are studied in greater depth. Emphasis on developing a cross-cultural perspective by comparing the native with the target culture. Offered in spring. Prereq: FREN 201 or placement exam.

NOTE: The French section has an exciting, new way to earn some of your credits at the advanced level — in the virtual classroom. For more information, please contact Dr. Christine Gaudry-Hudson.

FREN 301: 3 s.h.
Commercial French
Commercial vocabulary and stylistics. The parts of the business letter; study of general types of business correspondence including letters requesting and offering information, mail orders, sales letters, applications for employment, complaints, claims, collection, credit, etc. Includes the opportunity to take the Certificat de Français Economique et Commercial given by the Paris Chamber of Commerce. Offered infrequently. Prereq: FREN 202 or 351.

FREN 311: 3 s.h.
Survey of Literature I
Life and work of foremost French writers through 18th century. Reading and discussion of selected works in various genres. Offered in fall. Prereq: FREN 351 and 352.

FREN 312: 3 s.h.
Survey of Literature II
Life and work of foremost French writers since 1800. Reading and discussion of selected works in various genres. Offered in spring. Prereq: FREN 311 or permission of instructor.

FREN 331: 3 s.h.
French Civilization I
History and development of French civilization from prehistoric times to 1789. Civilization and art of the Gauls, influence of the Roman Conquest, Germanic invasions, unification of the country through the various dynasties. The art of each period will be studied with emphasis on architecture. Considerable use of slides and films. Offered infrequently. Prereq: FREN 202 or 351.
FREN 332: 3 s.h.
French Civilization II
French history, art and culture from 1789 to modern times. Emphasis will be given to painting in the 19th and 20th centuries. Outside readings and class reports. Considerable use of slides and films. Offered infrequently. Prereq: FREN 202 or 351.

FREN 333: 3 s.h.
French Civilization III
All aspects of contemporary France: geography, economy, institutions, modern society. Emphasis on the study of the diversity of the different regions. Considerable use of slides and films. Offered infrequently and/or online. Prereq: FREN 202 or 351.

FREN 351 and 352: 3 s.h. each
Composition and Oral Expression (G1, W)
Systematic practice in the language designed to hone oral and written skills to a level of proficiency enabling expression with accuracy and fluency. A grammar review. Offered fall (351) and spring (352). Prereq: 202 or placement exam.

FREN 353: 3 s.h.
Introduction to Phonetics

FREN 361: 3 s.h.
Oral French I
Recommended particularly for secondary education foreign language majors. Considerable attention is given to the specific linguistic needs of prospective teachers. Intensive experience with the spoken language. Taped exercises in comprehension. Conversations dealing with everyday life with emphasis on acquisition of appropriate vocabulary. Treatment of phonetics. Offered infrequently. Prereq: FREN 202 or equivalent.

FREN 362: 3 s.h.
Oral French II
See Oral French I, first sentence. Fundamental elements of history and geography, accenting distinctive features of French culture. Emphasis on modern society and customs: schools, sports, holidays, literature, etc. Offered infrequently. Prereq: FREN 202 or equivalent.

FREN 411: 3 s.h.
French Poetry through the Ages
From Marie de France and Villon (medieval) to Char and Prévert (contemporary), French Letters can boast of an extraordinary range of poets. Their works, poetic techniques, forms, and cross-fertilization with music (the “chanson”) are studied. Offered infrequently. Prereq: FREN 311 and 312.

FREN 421: 3 s.h.
French Drama I
Medieval period to the 18th century. Masterpieces of age of classicism in French; emphasis on Molière, Corneille and Racine. Outside reading. Offered infrequently. Prereq: FREN 311 and 312.

FREN 422: 3 s.h.
French Drama II
The life and works of representative dramatists of the 18th and 19th centuries, including Marivaux, Voltaire, Beaumarchais, Hugo, Musset. Offered infrequently. Prereq: FREN 311 and 312.

FREN 423: 3 s.h.
French Drama III
Symbolist drama, existentialist drama and the theater of the absurd. The plays of Claudel, Giraudoux, Anouilh, Montherlant, Sartre, Camus, Beckett, Ionesco, Adamov and others will be included. Offered infrequently. Prereq: FREN 311 and 312.

FREN 431: 3 s.h.
French Prose I
Study of essays, letters, maxims, memoirs and novels to the end of the 17th century. Works of Rabelais, Montaigne, Pascal, La Bruyère will be included. Outside readings, class reports. Offered infrequently. Prereq: FREN 311 and 312.
FREN 432: 3 s.h.
French Prose II
Short stories, essays and novels by 18th and 19th century authors. Works of Voltaire, Rousseau, Diderot, Stendhal, Balzac, Hugo, Flaubert, Maupassant, Zola, etc., will be included. Outside readings, class reports. Offered infrequently. Prereq: FREN 311 and 312.

FREN 433: 3 s.h.
French Prose III
Essays, short stories and novels from the beginning of the 20th century to the present. Works by Camus, Gide, Malraux, Proust, Sartre, Saint-Exupéry and the “nouveau roman.” Outside readings and class reports. Offered infrequently and/or online. Prereq: FREN 311 and 312.

FREN 460: 3 s.h.
Introduction to Translation and Interpretation
Expert guidance for avoiding the pitfalls inherent in transposing thought from one language to another, for students with a firm oral and written command of French. Emphasis on idiomatic translation of newspaper and magazine articles. Offered infrequently. Prereq: FREN 351 and 352.

FREN 470: 3 s.h.
French Linguistics
Systematic study of French vocabulary through its morphology and semantics. Comparative study of methods and schools of grammatical analysis in a thorough review of French grammar. Basic introduction to modern linguistic science and its terminology. To be taken before or with FREN 480. Offered in fall. Prereq: FREN 351 and 352, ENGL 220 or 221.

FREN 470: 3 s.h.
Teaching of Foreign Languages in the Secondary School
Methodology for the teaching of the foreign language in the junior and senior high school. Observation of foreign language classes on all levels. Attention given to the theory and operation of the language laboratory, electronic classrooms and audio visual equipment; also the techniques used in the teaching of foreign languages. Must be taken simultaneously with EDSE 321. Offered in fall. Prereq: FREN 470, GERM 470, or SPAN 470.

FREN 490: 3 s.h.
Teaching of Foreign Languages in the Elementary School
Methodology, materials and techniques devised for teaching foreign languages to young children. Observation of FLES classes with opportunity for selected students to acquire teaching experience under guidance. Offered infrequently. Prereq: Applied Linguistics.

FREN 498: 1-3 s.h.
Independent Study
For further information on independent study, see the Special Academic Opportunities section.

Conversation: No Credit
French majors are offered the opportunity to participate 1 hour per week in a small conversation group under staff supervision.

NOTE: These graduate courses in French are open to undergraduates with recommendation of adviser and consent of instructor, program coordinator and graduate dean; (See Graduate Catalog for course descriptions). Undergraduate course number on left corresponds with graduate course number in parentheses.

FREN 401 (501): 2 s.h.
Modern Methods of Teaching French

FREN 403 (503): 2 s.h.
Activities for Class and Club

FREN 409 (509): 2 s.h.
Applied Linguistics

FREN 416 (512): 2 s.h.
Introduction to Phonetics

FREN 417 (513): 2 s.h.
Advanced Phonetics
FREN 441 (521): 2 s.h.
Functional Grammar Review

FREN 442 (522): 2 s.h.
Composition

FREN 443 (523): 2 s.h.
Stylistics and Composition

FREN 444 (524): 2 s.h.
Translation and Interpretation

FREN 445 (525): 2 s.h.
Advanced Oral Practice and Self-Expression

FREN 446 (541): 2 s.h.
History of France to 1789

FREN 447 (542): 2 s.h.
History of France from 1789 to the Present

FREN 451 (551): 2 s.h.
Geography of France, Physical and Economic

FREN 461 (561): 2 s.h.
Survey of French Art

FREN 462 (562): 2 s.h.
Survey of French Architecture

FREN 463 (531): 2 s.h.
Evolution of the French Language

FREN 471 (571): 2 s.h.
Aspects of Contemporary France

FREN 481 (581): 2 s.h.
Seminar in Medieval French Literature

FREN 482 (582): 2 s.h.
Seminar in Renaissance Literature

FREN 483 (583): 2 s.h.
Seminar in Seventeenth Century Literature

FREN 484 (584): 2 s.h.
Seminar in Eighteenth Century Literature

FREN 485 (585): 2 s.h.
Seminar in Nineteenth Century Literature

FREN 486 (586): 2 s.h.
Seminar in Twentieth Century Literature

FREN 491 (589): 2 s.h.
Current Topics

German

GERM 101: 3 s.h.
Elementary German I (G1)

GERM 102: 3 s.h.
Elementary German II (G1)
Continuation of GERM 101 with emphasis on more complex syntactical structures while working towards greater proficiency in both productive (speaking and writing) and receptive (reading and listening) skills. Offered in fall, spring. Prereq: GERM 101 or 2 years of h.s. German.
GERM 201: 3 s.h.  
**Intermediate German I (G1)**
Emphasis is placed on further developing skills through varied realistic exercises and in authentic real-life situations. Contemporary cultural and literary texts provide the thematic basis for oral and written communication. Systematic treatment of grammar. Offered in fall. Prereq: 102 or 3 years of h.s. German.

GERM 202: 3 s.h.  
**Intermediate German II (G1)**
Continuation of GERM 201. Communication in speech and writing. Structures and the vocabulary are studied in greater depth and breadth. Increased emphasis on developing a cross-cultural perspective by comparing the native with the target culture. Systematic treatment of grammar. Offered in spring. Prereq: GERM 201 or 4 years of h.s. German.

GERM 211: 3 s.h.  
**German for Business I (G1)**
Designed to introduce the student to the basic vocabulary and structure of business German. In addition to the employment of the four basic language skills, the course also includes a brief introduction to translation and provides a broad review of German grammar. Offered periodically. Prereq: GERM 102 or equivalent (3-4 yrs. of h.s. German).

GERM 212: 3 s.h.  
**German for Business II (G1)**
A continuation of GERM 211. Offered periodically.

HUMN 220: 3 s.h.  
**German Literature in English (G1, W)**
German masterpieces taught in English by an instructor of German. Designed primarily as an elective for non-majors with interest in foreign literature. May be selected by majors with consent of adviser as a supplement to the department requirements. Offered annually.

HUMN 221: 3 s.h.  
**Hermann Hesse in Translation (G1, W)**
Works from a major German writer of the 20th century taught in English by an instructor of German. Primarily intended as an elective for non-majors. May be elected by majors with consent of adviser as a supplement to the departmental requirements. Offered infrequently.

HUMN 230: 3 s.h.  
**The Amish and Other Pennsylvania Germans (G1)**
The Amish and other Pennsylvania Dutch, their history, culture, language and lifestyle, with emphasis on Lancaster County, Pa. Student written and oral reports on historical sites, museums and other subjects. Offered infrequently.

GERM 301: 3 s.h.  
**Business German**
Advanced study of the four skills and translation. Extensive use of German language tapes and articles from business periodicals, supplemented by an introduction to business correspondence and grammar. Offered periodically. Prereq: GERM 202 or equivalent.

GERM 311 and 312: 3 s.h.  
**Survey of German Literature I & II**
Orientation to various periods of German literature from the earliest times up to the present. Lectures on outstanding literary figures. Reading and discussion of representative work. Offered in fall, spring. Prereq: GERM 202 or equivalent.

GERM 331 and 332: 3 s.h. each  
**German Civilization I & II**
An introduction to German culture dealing with the history, economics, philosophy, religion, sciences, education, language, literature, art, architecture, sculpture and music of the German speaking peoples from 2,000 B.C. to the present. Offered annually. Prereq: GERM 202 or equivalent.

GERM 351 and 352: 3 s.h.  
**Composition and Oral Expression I & II (G1, W)**
Systematic practice in the language designed to hone students’ oral and written skills to a level of proficiency enabling them to express themselves with a high degree of accuracy and fluency on a variety of topics. Prereq: GERM 201 & 202 or placement test.
GERM 361: 3 s.h.
Oral German I
Recommended particularly for secondary education majors, as considerable attention is given to the
specific linguistic needs of prospective teachers. Intensive experience with the spoken language. Taped
exercises in comprehension. Conversations dealing with everyday life with emphasis on acquisition of
appropriate vocabulary. Remedial treatment of phonetics. Offered infrequently. Prereq: GERM 202 or
equivalent.

GERM 362: 3 s.h.
Oral German II
See Oral German I, first sentence. Fundamental elements of history and geography, accenting distinctive
features of German culture. Emphasis on modern society and customs: schools, sports, holidays, literature,
etc. Offered infrequently. Prereq: GERM 202 or equivalent.

GERM 370: 3 s.h.
Advanced Grammar and Stylistics
A condensed review of basic grammar and its terminology, a systematic and detailed treatment of the basic
elements of advanced grammar and an introduction to the basic elements of stylistics. Offered infrequently.
Prereq: GERM 351, 352.

GERM 411: 3 s.h.
German Poetry I
Study of representative poems from old high German to the death of Goethe. Biographical sketches of
poets. Lectures on metrics and genres. Student research papers. Offered infrequently. Prereq: GERM 311
and 312.

GERM 412: 3 s.h.
German Poetry II
From romanticism up to and including the present. Procedure similar to GERM 411. Question and answer
periods based on research papers. Offered infrequently. Prereq: GERM 311 and 312.

GERM 421: 3 s.h.
German Drama I
Dramas covering the 18th and first half of the 19th centuries. Lectures on dramatists and changes within the
structure of dramas. Student research papers. Offered periodically. Prereq: GERM 311 and 312.

GERM 422: 3 s.h.
German Drama II
Dramas covering the second half of the 19th century and into the 20th century. Procedure similar to GERM
421. Offered infrequently. Prereq: GERM 311 and 312.

GERM 431: 3 s.h.
The Novelle in German Literature
Lectures on the development and theory of the genre from its beginnings to about 1870. Reading and
discussion of outstanding Novellen as examples of a theory and a literary era. Research papers and oral
reports. Offered periodically. Prereq: GERM 311 and 312.

GERM 432: 3 s.h.
The Novelle and the Novel in German Literature
Lectures on the principal authors of Novellen from 1870 to the present day. Historical background of the
novel. Reading of representative Novellen and at least one novel. Research papers and oral
reports. Offered infrequently. Prereq: GERM 311 and 312.

GERM 460: 3 s.h.
Introduction to Translation and Interpretation
Intended for students with a firm oral and written command of German, who need expert guidance for
avoiding the pitfalls inherent in transposing thought from one language to another. Emphasis on idiomatic
translation of newspaper and magazine articles. Introduction to simultaneous oral interpretation. Offered
infrequently. Prereq: GERM 351 and 352.

GERM 470
German Linguistics
An introduction to basic concepts and major divisions of modern linguistics as it pertains to the historical
development of modern German. Phonetics, phonology, morphology, syntax and semantics seen both
diachronically and synchronically. To be taken before GERM 480. Offered annually.
FORL 480: 3 s.h.
Teaching of Foreign Languages
Study of current theories of second language acquisition and methods of teaching foreign languages in elementary and secondary school. Students will develop techniques for teaching language for proficiency in all skill areas; planning lessons and units; selecting, adapting and developing materials; assessment; and the use of new technologies. Must be taken simultaneously with EDSE 321 and EDFN 330. Offered in fall. Prereq: admission to Advanced Professional Studies.

GERM 490: 3 s.h.
See course description under FREN 490.

GERM 498: 1-3 s.h.
Independent Study
For further information on independent study, see the Special Academic Opportunities section.

Conversation: no credit
Juniors and seniors are offered the opportunity to participate in a small conversation group with staff supervision.

Special courses
Graduate German courses listed below are open to undergraduates with recommendation of adviser and consent of instructor, program coordinator and graduate dean: (See Graduate Catalog for course descriptions). Undergraduate course number on left corresponds with graduate number in parentheses.

Functional GERM 401: 2-3 s.h., (501): 2 s.h.
Modern Methods of Teaching German

GERM 403: 2-3 s.h., (503): 2 s.h.
Activities for Class and Club

GERM 405: 2-3 s.h., (505): 2 s.h.
Introduction to Literature

GERM 407: 2-3 s.h., (507): 2 s.h.
Theater Workshop

GERM 409: 2-3 s.h., (509): 2 s.h.
Applied Linguistics

GERM 416: 2-3 s.h., (512): 2 s.h.
Introduction to Phonetics

GERM 417: 2-3 s.h., (513): 2 s.h.
Advanced Phonetics

GERM 441: 2-3 s.h., (521): 2 s.h.
Grammar Review

GERM 442: 2-3 s.h., (522): 2 s.h.
Composition

GERM 443: 2-3 s.h., (523): 2 s.h.
Stylistics and Composition

GERM 444: 2-3 s.h., (524): 2 s.h.
Translation and Interpretation

GERM 445: 2-3 s.h., (525): 2 s.h.
Advanced Oral Practice and Self-Expression

GERM 446: 2-3 s.h., (541): 2 s.h.
History of the German-Speaking Peoples to the Congress of Vienna

GERM 447: 2-3 s.h., (542): 2 s.h.
History of the German-Speaking Peoples from the Congress of Vienna to the Present

GERM 451: 2-3 s.h., (551): 2 s.h.
Geography of the German-Speaking Countries, Physical and Economic

GERM 461: 2-3 s.h., (561): 2 s.h.
Survey of German Art
GERM 462: 2-3 s.h., (531): 2 s.h.
Evolution of the German Language

GERM 471: 2-3 s.h., (571): 2 s.h.
Aspects of Contemporary Germany

GERM 481: 2-3 s.h., (581): 2 s.h.
Seminar in Medieval German Literature

GERM 482: 2-3 s.h., (582): 2 s.h.
Seminar in the Literature of Humanism and the Reformation

GERM 483: 2-3 s.h., (583): 2 s.h.
Seminar in the Literature of the Baroque Period

GERM 484: 2-3 s.h., (584): 2 s.h.
Seminar in the Literature of the Classical Period

GERM 485: 2-3 s.h., (585): 2 s.h.
Seminar in Nineteenth Century German Literature

GERM 486: 2-3 s.h., (586): 2 s.h.
Seminar in Twentieth Century German Literature

GERM 491: 2-3 s.h., (589): 2 s.h.
Current Topics

Ancient Greek
GREK 101: 3 s.h.
Elementary Greek I (G1)

GREK 102: 3 s.h.
Elementary Greek II (G1)

HUMN 163: 3 s.h.
Latin and Greek Terminology (G1)
A systematic treatment of Latin and Greek components in English words. Study of prefixes, suffixes and roots integrated with the combinative principles, orthography and pronunciation of general and scientific vocabulary. Attention given to the history of the classical element in English. No prior knowledge of Latin and Greek required. Offered infrequently.

GREK 201: 3 s.h.
Intermediate Greek I (G1)
Review of elementary materials and progression into advanced forms and syntax. Readings in classical and koine Greek. Offered infrequently. Prereq: GREK 102.

GREK 202: 3 s.h.
Intermediate Greek II (G1, W)
Introduction to Greek literature through a variety of Greek authors, especially Homer’s Odyssey, Herodotus and Euripides’ Medea. Offered infrequently. Prereq: GREK 201.

HUMN 202: 3 s.h.
Classical Mythology (G1, W)
Major mythological materials from Greek and Roman civilization. Analysis and interpretation of myth together with its symbolic, allegorical and psychological implications and its treatment in art and literature from classical to modern times. Designed primarily as an elective for non-majors, it may be elected by majors with the consent of the adviser as a supplement to the department requirements. Offered in fall, spring.

HUMN 240: 3 s.h.
Greek Literature in Translation (G1, W)
The origins of Western culture from the perspective of Greek literature, illustrating the development of ideas from myth to rationalism. A cultural orientation for all degree programs. Course taught in English by an instructor of classical languages. Designed primarily as an elective for non-majors desirous of enriching
their knowledge of foreign literature. It may be elected by majors with consent of adviser as a supplement to the department requirements. Offered infrequently.

**GREK 311: 3 s.h.**  
*Survey of Literature I*  
Life and literature of prose writers in the area of history, oratory and philosophy. Offered infrequently. Prereq: GREK 202.

**GREK 312: 3 s.h.**  
*Survey of Literature II*  
Continuation of GREK 311; introduces Greek poetry and metrics. Offered infrequently. Prereq: GREK 311.

**FORL 480: 3 s.h.**  
See course description under French.

**GREK 498: 1-3 s.h.**  
*Independent Study*  
For further information on independent study, see the *Special Academic Opportunities* section.

**NOTE:** Major works of epic, tragedy, comedy, philosophy, oratory, history and lyric poetry constitute the advanced courses.

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**Latin**

**LATN 101: 3 s.h.**  
*Elementary Latin I (G1)*  
Introduction to language and culture of ancient Rome. Study of forms, syntax and idioms. Emphasis on analytical thinking and English vocabulary building. Intended for beginners. Offered in fall.

**LATN 102: 3 s.h.**  
*Elementary Latin II (G1)*  
Continuation of the approach used in the first semester. Supplementary readings in unadapted Latin prose and poetry. Offered in spring. Prereq: LATN 101.

**HUMN 163: 3 s.h.**  
*Latin and Greek Terminology (G1)*  
Latin and Greek components in English words. Study of prefixes, suffixes, and roots integrated with the combinative principles, orthography and pronunciation of general and scientific vocabulary. Attention given to the history of the classical element in English. No prior knowledge of Latin and Greek required. Offered infrequently.

**HUMN 202: 3 s.h.**  
*Classical Mythology (G1, W)*  
Major mythological materials from Greek and Roman civilization. Analysis and interpretation of myth together with its symbolic, allegorical and psychological implications and its treatment in art and literature from classical to modern times. Designed primarily as an elective for non-majors, it may be elected by majors with the consent of the adviser as a supplement to the department requirements. Offered in fall, spring.

**HUMN 302: 3 s.h.**  
*Confession, Apology, Memoir: Autobiography in the Greco-Roman World (P)*  
Investigates unique aspects of the Western intellectual tradition including literature of self-awareness and self-revelation in Classical Antiquity. Texts include autobiographies of politicians, writers, philosophers and religious leaders. Special attention to Late Antiquity and the interaction between paganism and Christianity. Main authors: Marcus Aurelius, Saint Augustine and Boethius. Offered periodically.

**LATN 201: 3 s.h.**  
*Intermediate Latin I (G1)*  
Review of elementary materials and progression into advanced forms and syntax. Offered in fall. Prereq: 2 yrs of secondary Latin or LATN 102.

**LATN 202: 3 s.h.**  
*Intermediate Latin II (G1)*  
Introduction to Latin literature through a variety of classical authors. Offered in spring. Prereq: LATN 201 or equivalent.
HUMAN 250: 3 s.h.
Latin Literature in Translation (G1, W)
Broad literary genres: comedy, epic, lyric and elegiac poetry, satire, oration, essay, letter and historical style, as molded by the Romans from their Greek prototypes. Cultural orientation for all degree programs. Course taught in English by an instructor of classical languages. An elective for non-majors; may be elected by majors with consent of adviser as a supplement to the department requirements. Offered infrequently.

NOTE: The following courses, LATN 310 through LATN 460, are all offered infrequently.

LATN 310: 3 s.h.
Historical Writings I
Livy (major author), also Cicero, Sallust, Caesar, Nepos. Roman history from the beginning to the end of the Republic seen through texts in the original language. Prereq: LATN 202 or equivalent.

LATN 320: 3 s.h.
Oratory
Cicero (major author), also Quintilian. History of Greek and Roman rhetoric with concentration upon selected orations of Cicero. Prereq: LATN 202 or equivalent.

LATN 330: 3 s.h.
Epic Poetry
Vergil (major author), also Ennius and Lucan. History of Greek and Roman epic with concentration upon Vergil’s “Aeneid.” Prereq: LATN 202 or equivalent.

LATN 340: 3 s.h.
Mythological Poetry
Ovid (major author), also Vergil, Horace and Catullus. Origins and development of Greek and Roman mythology with emphasis on Ovid’s “Metamorphoses.” Prereq: LATN 202 or equivalent.

LATN 351: 3 s.h.
Latin Oral Expression and Composition
Systematic practice of oral and listening skills. Basic techniques of writing connected prose. Study of complex syntactical structures of Latin classical style. Prereq: LATN 202 or equivalent.

NOTE: Instructor’s approval is required for admission to Latin 400 courses.

LATN 410: 3 s.h.
Historical Writings II
Tacitus and Suetonius. Roman history from Augustus to Domitian with special attention given to the “Annals” of Tacitus and to Suetonius’ Lives of the Caesars. Prereq: LATN 202.

LATN 420: 3 s.h.
Lyric Poetry
Catullus and Horace. History of Greek and Roman lyric poetry with concentration upon the poems of Catullus and the “Odes” and “Epodes” of Horace. Extensive study of metrics is included. Prereq: LATN 202.

LATN 430: 3 s.h.
Drama
Plautus, Terence (major authors), also Seneca. History of Greek and Roman drama with special emphasis upon the comedies of Plautus and Terence. Prereq: LATN 202.

LATN 440: 3 s.h.
Epistolary Literature
Cicero, Pliny (major authors), also Seneca and Ovid. Selected letters extant from the Republic and Early Empire, including poetic letters of Ovid, are read in Latin with attention to style and Roman political and social history. Prereq: LATN 202.

LATN 450: 3 s.h.
Philosophical Literature
Lucretius, Cicero (major authors), also Seneca. History of Greek and Roman philosophy with concentration upon Lucretius’ poetic interpretation of Epicurus and Cicero’s philosophical treatises. Metrical study is included. Prereq: LATN 202.
**LATN 460: 3 s.h.**  
**Satiric Literature**  
Horace, Juvenal, Martial (major authors), also Seneca and Petronius. History of satire with emphasis upon the satires of Horace and Juvenal and the epigrams of Martial. Metrical study is included. Prereq: LATN 202.

**FORL 480: 3 s.h.**  
See course description under French.

**LATN 490: 3 s.h.**  
See course description under FREN 490.

**LATN 498: 1-3 s.h.**  
**Independent Study**  
For further information on independent study, see the *Special Academic Opportunities* section.

**Italian**

**ITAL 101: 3 s.h.**  
**Elementary Italian I (G1)**  

**ITAL 102: 3 s.h.**  
**Elementary Italian II (G1)**  
Continuation of the introduction to language and culture with emphasis on more complex syntactical structures while working toward greater proficiency in both productive (speaking and writing) and receptive (reading and listening) skills. Prereq: ITAL 101 or 1 year h.s. Italian. Offered infrequently.

**Japanese**

**JAPN 101: 3 s.h.**  
**Elementary Japanese I (G1)**  

**JAPN 102: 3 s.h.**  
**Elementary Japanese II (G1)**  
Continuation of JAPN 101; emphasis on more complex syntactical structures while working toward greater proficiency in both productive (speaking and writing) and receptive (reading and listening) skills. Prereq: JAPN 101 or equivalent. Offered infrequently.

**JAPN 201: 3 s.h.**  
**Intermediate Japanese I (G1)**  

**JAPN 202: 3 s.h.**  
**Intermediate Japanese II (G1)**  
RUSS 101: 3 s.h.
Elementary Russian I (G1)
Introduction to language and culture. Fundamentals of grammar and syntax. Oral and written practice, short readings, and practice in aural comprehension. Emphasis is placed on learning useful everyday phrases and working toward accuracy in pronunciation. Offered in fall.

RUSS 102: 3 s.h.
Elementary Russian II (G1)
Continuation of the introduction to language and culture and further mastery of speaking, comprehension, reading and writing skills. Offered in spring. Prereq: RUSS 101 or 1 yr. h.s. Russian.

HUMN 270: 3 s.h.
Russian Literature in English (G1, W)
Representative short readings from major Russian writers, covering 19th and 20th centuries in alternating years. Consideration of themes and characteristics of Russian literature as influenced by history, politics and esthetic currents. Designed primarily as an elective for non-majors; may be elected by majors with the consent of the advisor as a supplement to the department requirements. Evaluation is by written examinations. Offered in fall.

HUMN 370: 3 s.h.
Russian Folk Culture (P)
An examination of Russian culture up to about 1700 with Peter the Great’s moves toward Westernization; the essence and foundations of the Russian world view as conditioned by events and as reflected in religion, arts and crafts, folklore, oral and written literature, daily life and rites of passage. Requirements include a crafts project, papers on aspects of folklore and literature, and written examination. A useful course for education majors. Knowledge of Russian is not required. Offered in spring.

RUSS 201: 3 s.h.
Intermediate Russian I (G1)
Further development of reading, writing, comprehension, and speaking skills and basic grammar, using contemporary cultural and situational material. Offered in fall. Prereq: RUSS 102 or 3 years of h.s. Russian.

RUSS 202: 3 s.h.
Intermediate Russian II (G1)
Continued development of the skills nurtured in 201. Emphasis on communication in speech and writing and improved control of grammatical structures, as well as increased vocabulary for daily life and reading. Offered in spring. Prereq: RUSS 201 or 4 years of h.s. Russian.

RUSS 311: 3 s.h.
Survey of Russian Literature I
Short works of Russian writers of the 19th and 20th centuries, with emphasis on reading for meaning and building useful vocabulary. Audiovisual background material. Offered periodically. Prereq: RUSS 202 or 4 years of h.s. Russian.

RUSS 312: 3 s.h.
Survey of Russian Literature II
Short works of Russian writers on a slightly more advanced level than in Russian 311, again with emphasis on reading for meaning and building vocabulary. Audiovisual background material. Offered periodically. Prereq: RUSS 202 or 4 years of h.s. Russian.

RUSS 331: 3 s.h.
Russian Civilization I
Cultural and historical developments from the beginnings of Russia up to the time of Peter the Great, with attention to the evolution of the Russian language and writing system, religion, folk arts and the oral tradition. Extensive use of supplementary audiovisual materials. Offered periodically. Prereq: RUSS 202 or 4 years of h.s. Russian.

RUSS 332: 3 s.h.
Russian Civilization II
Cultural and historical developments from the time of Peter the Great to the present, with emphasis on culture, cuisine, architecture, theater, social institutions and the arts in the 19th and 20th centuries. Extensive use of supplementary audiovisual materials. Offered periodically. Prereq: RUSS 202 or 4 years of h.s. Russian.
RUSS 351 and 352: 3 s.h. each
Composition and Oral Expression I and II (G1, W)
Systematic practice in oral and written skills, using mainly current materials from Russian life. Selection of topics depends on the interests of the group. Offered periodically. Prereq: RUSS 202 or 4 years of h.s. Russian.

RUSS 431 and 432: 3 s.h. each
Russian Novel
Development of novel in Russia. Extensive reading with reference to works of 18th, 19th and 20th century Russian novelists. Oral and written reports. Either semester may be taken for credit. Offered infrequently. Prereq: RUSS 352 or equivalent.

RUSS 460: 3 s.h.
Introduction to Translation and Interpretation
Written translation of texts such as literature, the press or history, selected by the student. Emphasis on building general and specialized vocabulary; reviewing grammar, and producing a polished and graceful English equivalent. Offered infrequently. Prereq: RUSS 352 or equivalent.

RUSS 470: 3 s.h.
Russian Linguistics
Diachronic (historical development) aspects of Russian: stages in the life of the language, the development of the writing system, exposure to older texts such as Avvakum, foreign influences and layers of borrowings. Introduction to the synchronic (modern structure) aspects: basic intonation, phonology, phonetic transcription and morphology. Offered infrequently.

FORL 480: 3 s.h.
See course description under French.

RUSS 490: 3 s.h.
See course description under FREN 490.

RUSS 498: 1-3 s.h.
Independent Study
For further information on independent study, see the Special Academic Opportunities section.

Spanish
SPAN 101: 3 s.h.
Elementary Spanish I (G1)

SPAN 102: 3 s.h.
Elementary Spanish II (G1)
Continuation of SPAN 101; emphasis on more complex syntactical structures while working toward greater proficiency in both productive (speaking and writing) and receptive (reading and listening) skills. Prereq: SPAN 101 or 2 years of h.s. Spanish.

SPAN 201: 3 s.h.
Intermediate Spanish I (G1)
Emphasis is placed on further developing the receptive and productive skills through varied realistic exercises and in authentic real-life situations. Contemporary cultural and literary texts provide the thematic basis for oral and written communication. Systematic treatment of grammar. Offered in fall, spring. Prereq: SPAN 102 or 3 years of h.s. Spanish.

SPAN 202: 3 s.h.
Intermediate Spanish II (G1)
Continuation of SPAN 201. Communication in speech and writing; structures and the vocabulary are studied in greater depth and breadth. Increased emphasis on developing a cross-cultural perspective by comparing the native with the target culture. Systematic treatment of grammar. Offered in fall, spring. Prereq: SPAN 201 or 4 years of h.s. Spanish.
SPAN 211: 3 s.h.
Spanish for Business I (G1)
The Spanish language, culture and civilization needed to perform basic business transactions in Spanish-speaking countries. Prereq: SPAN 102 or 3 years of h.s. Spanish. Offered annually.

SPAN 212: 3 s.h.
Spanish for Business II (G1)
Continuation of SPAN 211. Emphasis on business terminology, commercial correspondence, similarities and differences in business transactions and international procedures. Prereq: SPAN 201 or 4 years of h.s. Spanish. Offered annually.

HUMN 280: 3 s.h.
Spanish Literature in English
Outstanding Spanish and Hispanic American literary works. Course taught in English by an instructor of Spanish. An elective for non-majors; may be elected by majors with consent of adviser as a supplement to the departmental requirements. Offered infrequently.

SPAN 301: 3 s.h.
Commercial Spanish
Commercial vocabulary and stylistics. Presentation of the parts of the business letter. General types of business correspondence such as letters requesting and offering information, mail orders, sales letters, applications for employment, complaints, claims, collection, credit, etc. Offered annually. Prereq: SPAN 202 or 351.

SPAN 311: 3 s.h.
Survey of Literature I
Life and works of outstanding literary figures and movements in Spain through the 17th century. Lectures, outside readings and reports. Offered annually. Prereq: SPAN 351 or 352.

SPAN 312: 3 s.h.
Survey of Literature II
Life and works of outstanding literary figures and movements in Spain from 1700 forward. Lectures, outside readings and reports. Offered annually. Prereq: SPAN 351 or 352.

SPAN 313: 3 s.h.
Survey of Latin American Literature
Life and works of outstanding literary figures and movements in Latin America from its discovery and colonization to the present. Lectures, outside readings and reports. Offered annually. Prereq: SPAN 351 or 352.

SPAN 331: 3 s.h.
Spanish Civilization I
History and development of Spain from prehistoric times to 1700. Includes the civilization, art and influence of the Romans, Visigoths and Moslems; unification of the country and the Hapsburgs. A study of the art of each period. Considerable use of slides and films. Offered annually. Prereq: SPAN 202 or 351.

SPAN 332: 3 s.h.
Spanish Civilization II
Spanish history and culture from 1700 forward from the Bourbon dynasty through the present. Emphasis on the intellectual, social, cultural and political aspects of life in Spain. Outside readings, class reports. Considerable use of slides and films. Offered annually. Prereq: SPAN 202 or 351.

SPAN 333: 3 s.h.
Spanish Civilization III
History of pre-Columbian Americans, the discovery, exploration and colonization of the New World to modern times. Includes a history of Spanish American cultures, societies and institutions. Generous use of audio visual materials to emphasize the differences among countries. Offered annually. Prereq: SPAN 202 or 351.

SPAN 351/352: 3 s.h. each
Composition and Oral Expression 1 and II (G1, W)
Systematic practice in the language, designed to hone students’ grammar, oral and written skills to a level of proficiency enabling them to express themselves with accuracy and fluency. Extensive grammar review. Prereq for SPAN 351: SPAN 201 & 202 or equivalent (4 yrs. h.s. Spanish). Offered every semester (351) and fall (352). Prereq for SPAN 352: SPAN 351.
SPAN 361: 3 s.h.
Oral Spanish I for Secondary Education
Intensive experience with the spoken language, recommended particularly for secondary education foreign language majors. Taped exercises in comprehension. Conversations concerning everyday life, with emphasis on appropriate vocabulary. Treatment of phonetics. Offered in spring. Prereq: SPAN 351 or equivalent.

SPAN 362: 3 s.h.
Oral Spanish II
See Oral Spanish I, first sentence. Fundamental elements of history and geography, accenting distinctive features of Hispanic culture. Emphasis on modern society and customs; schools, sports, holidays, literature, etc. Offered infrequently. Prereq: SPAN 202 or equivalent.

HUMN 380: 3 s.h.
Identity Issues in Latino Writings (P)
An overview of the Latino perspective in today’s world. Examines a variety of poetry, fiction, short stories, and essays produced by U.S. Latino/a writers and artists. Films and newspaper clippings related to the Latino experiences will also be viewed and discussed. Offered annually.

SPAN 411: 3 s.h.
Spanish Poetry I
Development of principal types of Spanish or Latin American poetry from the early Kharjas and Cantar de Mio Cid to the Renaissance. Study of the main works of representative poets. Class discussions, lectures, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 412: 3 s.h.
Spanish Poetry II
Continuing development of Spanish or Spanish American poetry from the Golden Age to the end of the 19th century. Main works of representative poets are studied. Class discussions, lectures, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 413: 3 s.h.
Spanish Poetry III
A study of the representative works of 20th century Spanish or Spanish American poets, such as Juan Ramón Jiménez, Gabriela Mistral, García Lorca, César Vallejo, Pablo Neruda and others. Class discussions, lectures, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 421: 3 s.h.
Spanish Drama I
Traces the development of Spanish drama from its beginnings with a study of representative plays of Spain’s Golden Age. Lecture, discussions, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 422: 3 s.h.
Spanish Drama II
A study of the Spanish theater from 1700 through the 19th century. Includes the neoclassic, romantic and realist dramatists such as Echegaray, Tamayo y Baus and Zomilla. Lecture, discussions, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 423: 3 s.h.
Spanish Drama III
Reading of representative plays of 20th-century Spanish or Spanish American dramatists. Lecture, outside readings, discussions and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 428: 3 s.h.
Women in 19th Century Peninsular Drama
An advanced Spanish literature course which examines the development of romantic and realist peninsular theater and focuses specifically on the female protagonists of the genre. The course is given in Spanish: readings are in Spanish. Lectures, discussions, outside readings and reports. Offered annually. Prereq: SPAN 311, 312 or 313 or permission of instructor.

SPAN 431: 3 s.h.
Spanish Prose I
Development of narrative in Spain from the 13th century origins of these forms to the end of the 17th century. Includes historical, didactic, narrative, pastoral, picaresque, mystic and novels of chivalry. Lecture, discussion, outside readings and reports: Offered annually. Prereq: SPAN 311, 312, or 313.
SPAN 432: 3 s.h.
Spanish Prose II
Study of Spanish narrative forms from the 18th century to the present day. Lecture, discussions, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 433: 3 s.h.
Latin American Prose
A study of Latin American prose-forms—history of discovery, conquest, exploration and colonization, romanticism, realism, naturalism, the essay and fiction to the present day. Lectures, outside readings and reports. Offered annually. Prereq: SPAN 311, 312, or 313.

SPAN 460: 3 s.h.
Introduction to Translation and Interpretation
Intended for students with a firm oral and written command of Spanish, who need expert guidance for avoiding the pitfalls inherent in transposing thought from one language to another. Emphasis on idiomatic translation of newspaper and magazine articles. Offered in spring. Prereq: SPAN 351, 352.

SPAN 470: 3 s.h.
Spanish Linguistics

FORL 480: 3 s.h.
See course description under French.

SPAN 490: 3 s.h.
See course description under FREN 490.

SPAN 498: 1-3 s.h.
Independent Study
For further information on independent study, see the Special Academic Opportunities section.

Special Courses
The graduate courses in Spanish listed below are open to undergraduates with recommendation of adviser and consent of instructor; program coordinator and graduate dean: (See the Graduate Catalog or course descriptions). Undergraduate course number on left corresponds with graduate course number in parentheses.

SPAN 401 (501): 2 s.h.
Modern Methods of Teaching Spanish

SPAN 403 (503): 2 s.h.
Activities for Class and Club

SPAN 409 (509): 2 s.h.
Applied Linguistics

SPAN 416 (512): 2 s.h.
Introduction to Phonetics

SPAN 417 (513): 2 s.h.
Advanced Phonetics

SPAN 441 (521): 2 s.h.
Functional Grammar Review

SPAN 442 (522): 2 s.h.
Composition

SPAN 443 (523): 2 s.h.
Composition and Stylistics

SPAN 444 (524): 2 s.h.
Translation and Interpretation

SPAN 445 (525): 2 s.h.
Advanced Oral Practice and Self-Expression
SPAN 446 (541): 2 s.h.
History of Spanish Civilization

SPAN 447 (542): 2 s.h.
History of Spanish-American Civilization

SPAN 451 (551): 2 s.h.
Geography of Spain, Physical and Economic

SPAN 452 (552): 2 s.h.
Spanish-American Geography

SPAN 461 (561): 2 s.h.
History of Hispanic Art

SPAN 462 (531): 2 s.h.
Evolution of the Spanish Language

SPAN 471 (571): 2 s.h.
Aspects of Contemporary Spain

SPAN 472 (572): 2 s.h.
Aspects of Contemporary Latin America

SPAN 481 (581): 2 s.h.
Seminar in Medieval Spanish Literature

SPAN 482 (582): 2 s.h.
Seminar in Renaissance Literature

SPAN 483 (583): 2 s.h.
Seminar in Golden Age Literature

SPAN 484 (584): 2 s.h.
Seminar in Eighteenth Century Literature

SPAN 485 (585): 2 s.h.
Seminar in Nineteenth Century Literature

SPAN 486 (586): 2 s.h.
Seminar in Twentieth Century Literature

SPAN 487 (587): 2 s.h.
Seminar in Spanish-American Literature

SPAN 491 (589): 2 s.h.
Current Topics

FRENCH
SEE FOREIGN LANGUAGES

GEOGRAPHY
School of Humanities and Social Sciences
Associate Professor Shanahan, chairperson
Professor Hiraoka
Associate Professors Geiger, Thompson, Schreiber
Assistant Professor Cuthbert

Geography is the study of how people relate to their natural and human surroundings. Geography is a bridge discipline: an environmental science which brings together principles of physical sciences and other social sciences; a social science which looks at the spatial characteristics of culture, history, politics, economies and business decisions; and a liberal arts discipline which provides background for study in art, languages, literature, music, education and many other subjects. Geographers can bring to analyses of current issues an understanding of global interrelationships and specialized map-related skills. Many geographers develop professional skills in map interpretation, cartography and computer-based mapping and analysis. Geographic understanding and skills create the potential for employment in such diverse areas as planning and other government agencies, environmental and cartographic service companies, and the business community. Contact the department chairperson for more detailed information on career opportunities.
The liberal arts program in geography offers emphases in environmental studies, global studies and applied geography (technical skills and planning) for geography majors and minors. A minor in geography brings an added dimension to any major, and current geography minors hold majors in many different university departments. The program in secondary education, providing certification for social studies teaching with a geography emphasis, is also serving a growing demand. Every student will benefit from the liberal arts value of the introductory and regional geography courses. Individualized programs for geography majors and minors may be arranged in consultation with the department chairperson.

**COURSE REQUIREMENTS**

**Geography Major (B.A.): 120 s.h.**

**Environmental Studies Option**
GEOG 202, 220, 230, 281; three from GEOG 20x, 30x, 23x, 33x, 43x or GEOG 372; one from GEOG 22x; one from GEOG 24x, 34x, 44x; 200 or 488; 6 s.h. in geography electives. Required related courses: MATH 130 or 235; an approved minor.

**Geography Major (B.A.): 120 s.h.**

**Global Studies Option**
GEOG 220, 227, 230, 241, 281; two from GEOG 22x, 301, 23x; two from GEOG 24x, 34x, 44x; GEOG 200 or 488; 6 s.h. in geography electives. Required related courses: MATH 130 or 235; an approved minor.

**Geography Major (B.A.): 120 s.h.**

**Applied Geography Option**
GEOG 220, 230, 281, 292, 372; two from GEOG 28x, 29x, 38x, 39x; two from GEOG 304, 329, 336, 434; one from GEOG 24x, 34x, 44x; 200 or 488; 3 s.h. in geography electives. Required related courses: MATH 130 or 235; an approved minor.

**Social Studies Major (B.S.Ed.): 120 s.h.**

**Secondary Education Certification:**
The social studies major is currently under review and pending changes. See the department chairperson for details. Also, refer to *Admission to Advanced Professional Studies and Certification* in this catalog for more information about education requirements.

The professional education courses required are: EDFN 211, 241, and 330; EDSE 321, 433, and 461.

**Geography Minors (Four programs: Environmental Studies, Global Studies, Applied Geography, and General Geography): 18 s.h.**
GEOG 101 and 281; two GEOG 200 level courses and two GEOG 300-400 level courses (some courses prescribed within certain minor programs) with approval of geography department chairperson.

**COURSE DESCRIPTIONS**

**GEOG 101: 3 s.h.**

The Global Environment (G3)
Global survey of cultures and the environment focusing on people’s use of natural resources and major related issues, including scarcity and environmental impacts. Comparisons between developing and developed countries, and across cultures. Offered in fall, spring.

**GEOG 200, 300, 400: 3 s.h.**

Cooperative Education in Geography
Assignment with a public agency or private organization. Requirements include design of an approved job description relevant to employer’s functions and student’s program, and a planned program of contact with the faculty supervisor. Performance evaluation by sponsor used in assigning satisfactory/unsatisfactory grade.

**GEOG 202: 3 s.h.**

Resources and the Environment (G3)
Critical resources and environmental issues of North America examined. Topics are analyzed from the perspective of interrelatedness and implications for culture and society, development and policy formation. Offered in fall, spring.
GEOG 220: 3 s.h.
**Human Geography (G3)**
Cultural geography of race, ethnicity, gender and political systems. Emphasis on processes that create and maintain cultures, and the geographies that these processes produce. Offered annually.

GEOG 222: 3 s.h.
**Economic Geography (G3)**

GEOG 226: 3 s.h.
**Political Geography (G3, W)**
Political boundaries of the world map. Covers violent conflicts from which countries were formed. Colonization (1400-1900), de-colonization (1800-1970), and the Cold War are discussed. Offered annually.

GEOG 227: 3 s.h.
**Urban Geography (G3, W)**
External relations and internal structure of urban areas throughout the world. Analysis of economic activities and growth of urban areas; environmental and social problems; public policy demands. Offered in fall.

GEOG 230: 3 s.h.
**Physical Geography (G3)**
Study of earth’s physical environment including atmosphere, hydrosphere, lithosphere and biosphere. Viewing earth as an integrated system: global patterns and processes are analyzed. Offered in fall, spring.

GEOG 241: 3 s.h.
**Comparative Regional Geography (G3)**
Examination and comparison of the spatial patterns of environmental, cultural, social, economic and political developments in selected regions of the world. Emphasis on developed and less developed parts of the world. Selected regions will be identified in advertised course title. Offered in fall, spring.

GEOG 281: 3 s.h.
**Map Interpretation and Analysis (G3)**
Introduction to maps as the basic analytical tool of geographers. Map reading, measurement, interpretation, and basic spatial data collection and analysis are examined in the contexts of general map use and of geographic research. Offered in fall, spring.

GEOG 292: 3 s.h.
**Quantitative and Spatial Analysis (G3)**
Advanced spatial analytical techniques in a computer environment. Data collection methods and sources are reviewed. Descriptive and inferential statistical methods are surveyed and are applied to spatial analytical problem solving. Offered in frequently. Prereq: GEOG 281.

GEOG 295: 3 s.h.
**Geographic Information Systems**
Introduction to Geographic Information Systems (GIS) computer technology and software. Combines understanding of geographic data and research with training in digital mapping, geographic databases and spatial analysis. Prereq: GEOG 281; and CSCI 101 or equivalent experience. Offered in fall, spring.

GEOG 301: 3 s.h.
**Global Issues (G3, W)**
Issues related to urban, cultural and resource problems are analyzed globally. Emphasis on spatial nature of these problems and emerging global interdependence. Focus on a single current issue which will be identified in advertised course title. Offered annually.

GEOG 304: 3 s.h.
**Water Resources Management (P)** An interdisciplinary study of how we plan, manage and use water in the United States. Topics range from water law to hydrology. Offered periodically. Prereq: GEOG 101 or 202.
GEOG 305: 3 s.h.
Geography of Energy (G3, W)
The importance of energy in spatially organizing world politics, economies, societies and cultures is examined. Energy and its attendant benefits and problems are examined as physical and technical phenomena and as social issues. Offered periodically. Prereq: GEOG 202, GEOG 230 or any General Education or Perspectives course (3 s.h. or greater) in earth science, physics or chemistry.

GEOG 321: 3 s.h.
Human Settlement Patterns (P)
The history, evolution, form and functions of human settlement systems in the United States and other selected countries over time. Consideration of policy issues for future settlement patterns. Offered infrequently. Prereq: GEOG 101 or PSCI 101 or 111.

GEOG 329: 3 s.h.
Geography of Recreation and Tourism (G3, W)
An investigation of the areal distribution of recreation and tourist activities and their positive and negative impacts; emphasis on environmental and economic aspects of leisure within a locational framework. Planning methodology to alleviate problems and create higher quality recreation experiences. Offered biannually.

GEOG 333: 3 s.h.
Biogeography (G3)
Interactions between environmental, biological and human processes which have led to current geographical distributions of flora and fauna. Field trip required. Offered periodically. Prereq: GEOG 230 or BIOL 100.

GEOG 336: 3 s.h.
Climate and Society (G3)
Human interrelationships with the atmospheric environment. Includes microclimatological applications in agriculture, water resources, human health and architecture to analysis of global climate change issues. Offered periodically.

GEOG 342: 3 s.h.
Europe (G3, W)
Introduction to Western Europe as a region. Emphasis on its delimitation and cultural, economic and political spatial patterns relating to the desire to form a European community. Europe within a global framework also considered. Offered annually.

GEOG 343: 3 s.h.
Latin America (P)
Study of contemporary economic, social and environmental issues. Topics like population growth, land use changes, industrialization, urbanization and regional ecological changes are discussed. Offered periodically. Prereq: GEOG 101, 220, or 241.

GEOG 344: 3 s.h.
North America (G3, W)
Introduction to geography of the U.S. and Canada using the tools and concepts of regional geography. Various physical, population and economic patterns are analyzed, and regional social and environmental issues addressed. Offered in fall, spring

GEOG 346: 3 s.h.
Pacific Asia (G3, W)
Examination and comparison of environmental, social/cultural, economic and political issues in the Pacific Asian region; contrasts between developed Japan and less developed countries of East and Southeast Asia; role of the region in the global economy. Offered infrequently.

GEOG 372: 3 s.h.
Urban and Regional Planning (G3, W)
Introduction to land use and other types of planning in urban and rural areas. Assessment of development suitability and environmental impact. Techniques for implementing different types of plans. Offered biannually.

GEOG 384: 3 s.h.
Cartography
Introduction to concepts and techniques of map making. Skill developed in computer-based compilation, layout, drawing and lettering of maps. Offered periodically. Prereq: GEOG 281, 295.
**GEOG 434: 3 s.h.**  
**Hydrology**  
A drainage basin-scale analysis of the hydrologic system. Topics include precipitation, evaporation, soil water, ground water and streamflow. Offered periodically. Prereq: GEOG 230 and MATH 235, or consent of instructor. MATH 101 recommended.

**GEOG 447: 3 s.h.**  
**Japan: People and Environments (G3, W)**  
Introduction to contemporary Japan, its people and environments. Selected issues, including population, economic systems, sociocultural patterns and effects of globalization are considered. Offered periodically.

**GEOG 488: 3 s.h.**  
**Senior Thesis**  
Investigation of selected topic with individual research assignment; focus varies but related to environmental analysis. Prereq: Senior standing and completion of basic courses. Offered as needed.

**GEOG 489, 499: 1-3 s.h.**  
**Honors Thesis**  
Investigation of selected topic with individual research assignment; focus varies but related to environmental analysis. Prereq: Senior standing and completion of basic courses and eligibility for departmental honors. See *Special Academic Opportunities*, Departmental Honors section of catalog.

**GEOG 498: 3 s.h.**  
**Independent Study in Geography**  
Investigation of selected topic with individual research assignment; focus varies but related to environmental analysis.

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**GEOLOGY**  
SEE EARTH SCIENCES

**GERMAN**  
SEE FOREIGN LANGUAGES

**GERONTOLOGY**  
Professor Gregoire, Coordinator

The associate of science degree program in gerontology is an interdisciplinary major offered by faculty from various University academic departments. The purpose of the program is to provide students with perspectives from the biological, psychological and social science areas as they relate to the understanding of the process of aging and to aged people themselves. Students are prepared for beginning entry or paraprofessional positions within the aging network. More information on this program can be obtained through the office of the coordinator of the gerontology program.

The interdepartmental minor in gerontology is intended to help prepare students to function at entry level in the rapidly developing field of services to the aging, and to relate and work with elderly people in general social and work environments. In combination with any of several baccalaureate degrees, it facilitates an appreciation of the special strengths and needs of the elderly and the range of services and problems that relate to them.

**COURSE REQUIREMENTS**

**Gerontology major (A.S.): 60 s.h.**  
GERT 100, 201 and 210; HPED 395, NURS 350; PSYC 401; SOCY 214; 2 of the following courses; BIOL 204, PHIL 280, SOWK 306.

The program requires 21 s.h. of general education, 6 s.h. from each area. BIOL 100, SOCY 111 and PSYC 100 are required general education courses. University competencies in English composition, speech and health and physical education are also required in this program.
Interdepartmental Minor in Gerontology: 18 s.h.
GERT 100, GERT 210, NURS 350, PSYC 401, SOWK 306; 1 of the following courses: GERT 201, PHIL 280, SOCY 214. Other topics courses approved by the Program Coordinator.

COURSE DESCRIPTIONS

GERT 100: 3 s.h.
Interdisciplinary Introduction to Gerontology (G3)
An introduction to the field of aging, and an examination of the aging process from the physiological, sociological, psychological and economic perspectives. This course also focuses on problems of the aged at levels of self, interaction with others and the broader societal context.

GERT 200/201: 3 s.h.
Field Practicum
Supervised practicum in cooperating agencies and organizations active in serving the elderly, for a minimum of 150 hours (10 hours/week). Involvement in meeting physiological and/or psychological and/or social needs of the elderly. Prereq: GERT 100 and at least 30 s.h. of general education and gerontology courses. Faculty involvement in and approval of practicum plan. Malpractice liability insurance required.

GERT 210: 3 s.h.
Aging and the Law (G3, W)
Introduction to legal concepts and thinking. Study of laws, regulations, social policies and psychological factors that affect delivery of services to the elderly in areas of economic security, employment, health care, wills, mental health, housing, criminal justice, consumer protection. Offered in fall of odd years.

GOVERNMENT AND POLITICAL AFFAIRS

School of Humanities and Social Sciences
Professor Madonna, chairperson
Professor Lee
Associate Professors K. Bookmiller, Glenn, Greenawalt, Risser
Assistant Professors R. Glenn, R. Bookmiller

The Department of Government and Political Affairs offers a liberal arts major and minor and a social studies education major. Pre-law advising is available and a departmental honors option is available to qualified majors. Internship opportunities are available as well.

COURSE REQUIREMENTS

Government and Political Affairs (B.A.): 120 s.h.
Complete both A and B:

A. 33 s.h. in government and political affairs, including 15 s.h. at the 300-level or above. Students must complete GOVT 111: Introduction to American Government, GOVT 221: Introduction to Comparative Political Systems, GOVT 231: Introduction to Global Affairs.

Students should check course description portion of the catalog for prerequisites and recommended courses.

It is recommended that students planning graduate or other advanced study government and political affairs complete GOVT 301.

B. Students must complete any University approved minor (18 s.h.). A second major will also fulfill this requirement.

Social Studies Major (B.S.Ed.): 123 s.h.
Secondary Education Certification
The social studies major is currently under review and pending changes. See the department chairperson for details. Also, refer to Admission to Advanced Professional Studies and Certification in this catalog for more information about education requirements.

Government and Political Affairs Minor: 18 s.h.
18 s.h. with at least one course in each of the two following areas: American politics and international/comparative politics. 6 s.h. at the 300 level or above are required.
COURSE DESCRIPTIONS

GOVT 101: 3 s.h.
Introduction to Political Studies (G3)
Fundamental problems of politics and government. The involvement of human beings in the exercise of power and influence, conflict, political leadership, political groups. Offered in fall, spring.

GOVT 111: 3 s.h.
Introduction to American Government (G3)
Introduction to the major tenets of the American political system: (1) the leading questions of politics and government; (2) the Constitution; (3) federalism; (4) civil liberties; (5) civil rights; (6) political parties; (7) interest groups; (8) campaigns and elections; (9) Congress; (10) the presidency; (11) the bureaucracy; and (12) the judiciary. Offered in fall, spring.

GOVT 112: 3 s.h.
Introduction to State and Local Government (G3)
The federal system and state and local governmental problems. Emphasis on Pennsylvania when possible. Offered in fall, spring.

GOVT 205: 3 s.h.
Introduction to Public Policy (G3)
Decision making by governments in response to public problems. The policy process. Current policy issues, selected from such possible examples as education, abortion, energy and environment. Some problems of policy evaluation. Offered in fall, spring.

GOVT 215: 3 s.h.
The American Presidency (G3, W)
Examination of the presidency and the executive branch of national government. Emphasis on the growth and development of presidential power. Offered in fall.

GOVT 221: 3 s.h.
Introduction to Comparative Political Systems (G3)
Introduction to the comparative analysis of government and politics through an examination of different political systems including advanced democracies and developing nations. Offered in fall, spring.

GOVT 231: 3 s.h.
Introduction to Political Theory (G3)
Representative philosophers and concepts in the history of Western political theory from antiquity through the 19th century. Offered in fall, spring.

GOVT 241: 3 s.h.
Public Administration and The Public Service (G3, W)
A study of intergovernmental relations, organizational theory, decision making, personnel, management, budgeting, program evaluation and policy analysis. Offered in fall, spring. Recommended: GOVT 111.

GOVT 251: 3 s.h.
Introduction to Global Affairs (G3, W)
The nation-state system. Military, political, economic, organizational and legal relations among states. Power and the pursuit of national goals. Offered in fall, spring.

GOVT 301: 3 s.h.
Methods of Political Science
The logic of scientific methods in political science. The development of empirical theory, explanation and causation, formation of concepts, hypothesis testing, problems of political research. Offered in spring.

GOVT 312: 3 s.h.
American Political Parties and Interest Groups (G3, W)
Comparative studies of interest groups. Intergroup rivalry and conflict. Tensions between parties. Offered in spring. Recommended: GOVT 111.

GOVT 314: 3 s.h.
The American Judiciary
Examination of state and federal courts. Primary emphasis on federal courts, and especially the U.S. Supreme Court. Offered in fall, spring. Recommended: GOVT 111.
GOVT 315: 3 s.h.  
Congress and Lawmaking (G3, W)  
A study of the organization, rules and procedures of the Senate and House of Representatives and extensive analysis of the internal and external environment for policy making by Congress. State legislatures are also examined in the same manner. Offered in spring. Recommended: GOVT 111.

GOVT 325: 3 s.h.  
Politics of East Asia (G3)  
Introduction to the politics of China, Japan, and Korea with emphasis on political institutions, formal and informal political processes, political culture, major issues in each country and their economic significance. Offered in spring.

GOVT 327: 3 s.h.  
Canadian Government and Politics (P)  
Government and politics of Canada and an examination of how its geography, history, economics and culture have affected its governance. Consideration of major policy issues and their impact on Canada’s future. Offered every other fall.

GOVT 332: 3 s.h.  
Recent Developments in Political Theory  
Selected issues and problems and an examination of the works of various contemporary political theorists. Offered in spring. Prereq: GOVT 231.

GOVT 333: 3 s.h.  
American Political Thought  
Study of the history and development of democracy in an American setting. Emphasis on different and often conflicting versions of democratic theory and practice. Offered in fall. Recommended: GOVT 111.

GOVT 341: 3 s.h.  
Introduction to City Planning (P)  
Study of the dynamics of human settlement patterns in the country and abroad. Examine public policy alternatives regarding land use and development patterns. Introduce methods and techniques used in designing settlement systems, and study values reflected in human settlement patterns. Offered every other spring.

GOVT 351: 3 s.h.  
International Law  
Classical sources and recent developments in international law. Evaluation of law in the context of world politics. Offered in fall. Recommended: GOVT 251.

GOVT 352: 3 s.h.  
International Organizations (G3)  
Study of various intergovernmental and nongovernmental associations representing a number of multinational groupings serving humanitarian, economic and security functions. Emphasis on organizations such as the United Nations and European Union. Offered in spring. Recommended: GOVT 251.

GOVT 355: 3 s.h.  
American Foreign Policy (G3)  

GOVT 408: 3 s.h.  
Seminar in Political Science  
Analysis of critical problems in the discipline. Research and preparation of a written report. Seminar may be taken for credit more than once provided content is different each time. Offered periodically.

GOVT 411: 3 s.h.  
Constitutional Law I: Separation of Powers and Federalism  
Focus on the allocation of power between branches and among levels of government as interpreted through significant cases of the U.S. Supreme Court. Offered in fall. Prereq: GOVT 111, recommended: GOVT 314.
GOVT 412: 3 s.h.
Constitutional Law II: Civil Rights and Civil Liberties
Focus on individual rights and liberties protected by the U.S. Constitution and Bill of Rights. Topics include freedom of expression, religious freedom, rights of the accused, due process, equal protection of the laws and right to privacy. Offered in spring. Prereq: GOVT 111, recommended: GOVT 314.

GOVT 498: Variable Credit
Independent Study
For further information on independent study, see the Special Academic Opportunities section.

GRAPHIC COMMUNICATIONS TECHNOLOGY
SEE INDUSTRY & TECHNOLOGY

GRAPHICS
SEE ART

GREEK
SEE FOREIGN LANGUAGES

HEALTH & PHYSICAL EDUCATION
SEE WELLNESS AND SPORT SCIENCES

HISTORY
School of Humanities and Social Sciences
Professor Fischel, chairperson
Professors Bremer, Clark-Newman, Downey, Osborne, Thornton, Suziedelis
Associate Professor Weis
Assistant Professors McLarnon, Kevorkian, Mao, Sayre

The Department of History offers courses in U.S. and world history and major degrees in both the liberal arts and secondary education. In addition, it offers applied history, which enables students to learn skills in historical editing, museum work and other related areas. A history minor is also available to the non-history majors. The department’s program in secondary education provides teaching certification. Academic counseling is available for students choosing careers in history.

COURSE REQUIREMENTS

History Major (B.A.): 120 s.h.
HIST 101, 102, 105, 106, 406. Then 27 s.h. of history electives according to departmental guidelines with at least 9 s.h. of these at the 300 level or above.

History Minor: 18 s.h.
Students who choose a minor in history are required to take a minimum of 18 s.h. of history courses distributed according to departmental guidelines. All history courses except applied history will count toward a minor.

General Guidelines for the Minor
- Each minor shall consist of a minimum of 18 s.h. of history courses.
- All regular history courses may count.
- At least two courses must be taken in U.S. history.
- At least two courses must be taken in world history.
- No more than three one hundred-level courses may be taken.
- At least two courses at the 300 or above level must be taken.
Social Studies (B.S. Ed.): 126 s.h.
Secondary Education Certification
The social studies major is currently under review and pending changes. See the department chairperson for details. Also, refer to Admission to Advanced Professional Studies and Certification in this catalog for more information about education requirements.

Department Honors
Minimum of 18 s.h. of history courses and approval of department chair required to submit an Honors thesis.

Liberal Studies (A.A.): 60 s.h.
Applied American History Option
APHI 201, 202, 203, 204, 205; choose three from HIST 260, 456, 458, ART 313, ANTH 123; choose two from ART 310, GEOG 220, M USI 267, ANTH 121.

COURSE DESCRIPTIONS

HIST 101: 3 s.h.
Europe and the World, 1350-1789 (G3)
Europe and its world relationships during the centuries of the Reformation, the scientific revolution, overseas expansion and revolution. Offered in fall, spring.

HIST 102: 3 s.h.
Europe and the World, 1789 to Present (G3)
Europe and its world relationships in the age of industrialization and democratization. Offered in fall, spring.

HIST 105: 3 s.h.
Introduction to the Craft of History
This course introduces students to the philosophy of history, major schools of historiography, and skills of research and writing history. This course does not count for General Education requirements.

HIST 106: 3 s.h.
Contours of US History
A survey of United States history from the peopling of the Americas to the present. Identifies and examines the key themes in the creation and transformation of the nation and its peoples.

HIST 206: 3 s.h.
The World to 1500 (G3)
Survey of world history from known beginnings to 1500. Offered in fall, spring.

HIST 210: 3 s.h.
History of Women in Western Civilization (G3, W)
History of women in Europe. Ideas about women, education, suffrage and feminist movements, economic and family roles. Offered periodically.

HIST 211: 3 s.h.
Greek Civilization (G3, W)
Greek civilization provides the students with a survey of Greek history, thought and culture. Offered infrequently.

HIST 212: 3 s.h.
Roman Civilization (G3)
The rise of the Roman Republic to a position of Mediterranean domination, the Roman Revolution, the triumph of Christianity and the decline and fall of the empire. Offered infrequently.

HIST 220: 3 s.h.
Modern France (G3, W)
Political, social, economic and intellectual forces that have shaped France since 1600, with stress on the period since 1789. Offered annually.

HIST 221: 3 s.h.
England to 1688 (G3, W)
Medieval, Tudor and Stuart England: The political, social, economic and cultural development of England from early medieval times to 1688. Offered annually.
HIST 222: 3 s.h.
Modern Britain (G3, W)
Modern England: the political, social, economic and cultural evolution of England from 1688 to the present. Offered annually.

HIST 223: 3 s.h.
Traditional Germany (G3, W)
The evolution of the German people and their political, cultural and socio-economic institutions from Roman times to 1806. Offered annually.

HIST 224: 3 s.h.
Modern Germany (G3, W)
German developments from 1806 to the present. Offered annually.

HIST 241: 3 s.h.
Imperial Russia
Political, cultural, economic and social history from Peter the Great to the Russian Revolution. Offered annually.

HIST 242: 3 s.h.
The Soviet Union (G3, W)
Political, cultural, economic and social history from the Russian Revolution to the present. Offered in spring.

HIST 244: 3 s.h.
History of Eastern Europe
The historical development of the nations of East Central Europe in their larger European context. Offered in fall of even years.

HISTORY 250: 3 s.h.
Women in U.S. History (G3, W)
History of women in the United States from the early 16th century through the late 20th century, with a particular emphasis on the significance of race, class, religion and region in the shaping of women’s experiences. Offered periodically.

HIST 251: 3 s.h.
History of Violence in the United States (G3)
The historical roots of violence as well as the social and cultural significance of violence in American history. Offered periodically.

HIST 253: 3 s.h.
American Business History
The rise and development of American business enterprise from the colonial period to the modern multinational corporation. Offered infrequently.

HIST 254: 4 s.h.
American Economic History
A survey of the economic growth and development of the United States from the colonial period to the present. This survey stresses the importance of land, labor and capital, as well as the entrepreneurial spirit, in the historical development of the American economy. Offered infrequently.

HIST 260: 3 s.h.
History of Pennsylvania (G3, W)
Historical development and contributions of Pennsylvania from colonial beginnings to present. Offered annually.

HIST 270: 3 s.h.
History of American Political Parties (G3, W)
Formation/historical analysis of American political parties. Offered annually.

HIST 271: 3 s.h.
The American Presidency (G3, W)
An historical study of the growth and development of presidential leadership and power. Offered infrequently.
HIST 272: 3 s.h.
African-American History I (G3, W)
History of African Americans from their first arrival in the Americas through the Civil War, with a particular emphasis on the process of enslavement, the formation of African American communities and institutions and the evolution of Black abolitionism. Offered annually.

HIST 273: 3 s.h.
African-American History II (G3, W)
History of African Americans from the Civil War through the present, with a particular emphasis on the processes of emancipation, urbanization and enfranchisement. Offered annually.

HIST 281: 3 s.h.
African History (G3, W)
A survey of African history; special emphasis on the period since 1500. Offered annually.

HIST 283: 3 s.h.
Colonial Latin America (G3, W)
From pre-Columbian America to the independence of Latin America (1825). Offered annually.

HIST 284: 3 s.h.
Modern Latin America (G3, W)
Continuation of HIST 283 from 1826 to the present. Offered annually.

HIST 290: 3 s.h.
The Far East in Modern Times
The cultural, political and socio-economic traditions of China, Japan, Korea and southeast Asia and the results of Western impact upon them in the 19th and 20th centuries. Offered infrequently.

HIST 291: 3 s.h.
Modern Middle East (G3, W)
Covers 1500 to present, with special emphasis on the period after 1850. Offered annually.

HIST 308: 3 s.h.
Topics
A thematic investigation of a significant historical topic with course structure and topic determined by the instructor prior to the preregistration period. Offered periodically.

HIST 313: 3 s.h.
History of the Middle Ages (G3, W)
Major political, cultural and socio-economic developments in Europe, c. 500-1300 A.D. Offered in fall of even years.

HIST 320: 3 s.h.
Renaissance and Reformation (G3, W)
Cultural, social and political history of Europe, 1300-1650, with emphasis on Renaissance arts and literature and 16th-century religious upheaval. Offered in spring of odd years.

HIST 332: 3 s.h.
The French Revolution and Napoleon (G3, W)
Origins, progress and culmination of the French Revolution. Napoleonic France and Europe through 1815. Offered in fall of odd years.

HIST 334: 3 s.h.
Victorian England
The political, social, economic and intellectual development of England and the British Empire from the accession of Victoria to the outbreak of World War I. Offered in fall of odd years.

HIST 340: 3 s.h.
Twentieth-Century Europe (G3, W)
The political, socio-economic, cultural and diplomatic transformation of Europe, 1900 to the present. Offered in spring of odd years.

HIST 342: 3 s.h.
Hitler and Nazism (G3, W)
The origins, development and impact upon Germany and the rest of the world of national socialist theory and practice, with special emphasis on a character study of Adolf Hitler. Offered annually.
HIST 343: 3 s.h.
Modern Jewish History (G3, W)
The religious, social and political history of the Jewish people from the time of the French Revolution to
the present. Offered periodically.

HIST 456: 3 s.h.
Intellectual and Cultural History of U.S. (G3, W)
The intellectual ideas and cultural trends that have helped shape American history. Offered in fall of odd
years.

HIST 351: 3 s.h.
17th Century British America (G3, W)
The founding and growth of the British Colonies to the Glorious Revolution of 1688, with particular
attention devoted to society, beliefs and government. Offered annually.

HIST 352: 3 s.h.
Provincial and Revolutionary America, 1689-1789 (G3, W)
America from the Glorious Revolution to the completion of the American Revolution, with particular
attention to social, cultural and political developments such as the Enlightenment, the Great Awakening
and the War for Independence. Offered annually.

HIST 354: 3 s.h.
The New Nation (G3, W)
The United States 1789-1850: The formation of a national vision and culture, the development of political
parties, the market revolution and social turmoil, westward movement, sectionalism, and reform, including
abolitionism and the women’s movement. Offered annually.

HIST 355: 3 s.h.
Civil War and Reconstruction (G3, W)
The social, political and economic causes of the Civil War, the military and social events of the war and the
postwar developments of Reconstruction, with particular emphasis on the place of African Americans in
U.S. society. Offered annually.

HIST 356: 3 s.h.
The New Era, 1876-1919 (G3, W)
Responses to industrialization from populism through progressive era. Changes in thought and culture.
World War I and American society. The rise of America as a world power. Offered annually.

HIST 357: 3 s.h.
Modern U.S. History (G3, W)
The United States from 1919 to present. Offered annually.

HIST 380: 3 s.h.
U.S.-Latin American Relations (G3, W)
Traces the historical evolution of the inter-America organizations. Emphasis on U.S.-Latin American
relations. Offered infrequently.

HIST 401: 3 s.h.
Cultural Interactions in the Atlantic World, 1450-1820 (P)
This perspectives course will compare the social, economic, political and religious relations of three areas:
Africa, Europe and the Native Societies of the Americas in and during the period of the formation of the
Atlantic World. Offered in fall, spring.

HIST 406: 3 s.h.
Senior Seminar
Students will prepare and defend a seminar paper of approximately 25 pages. Seminar will be offered in the
Fall semester with a United States history theme and in the spring semester with a world history theme.
Limited to students who have completed at least 24 hours of history courses or by permission of the
instructor.

HIST 410: 3 s.h.
European Cultural and Intellectual History (G3, W)
History of European philosophy, political and social thought, the arts and literature from the Enlightenment
to the present. Offered in fall of even years.
**HIST 458: 3 s.h.**  
United States Social History (G3, W)  
A thematic survey of American social development since colonial times. Offered annually.

**HIST 490: 3 s.h.**  
Community and Culture in 17th Century Anglo-America (P)  
This perspectives course introduces students to the use of anthropological methods in studying past societies through examinations of small communities in England and America. Offered annually.

**HIST 492: 3 s.h.**  
When Worlds Collide: A Clash of Cultures During the Age of Encounter, 1450-1650 (P)  
This perspectives course is a cross-cultural study of the encounter of European, Native American and African peoples with emphasis on subsequent cultural interplay. Offered in fall, spring.

**HIST 493: 3 s.h.**  
Chaos and Order in Classical Greece (P)  
An interdisciplinary exploration of the ancient Greeks' use of literature, religion, history, philosophy, politics, art and architecture in an attempt to bring order to the chaos of their world. Offered infrequently.

**HIST 498: 1-3 s.h.**  
Independent Study  
For further information on independent study, see the *Special Academic Opportunities* section.

**GRADUATE LEVEL COURSES**

The following 500-level courses are open to qualified undergraduates with permission. Students should check with the department for further information.

**HIST 501**  
Readings in United States History, Beginnings to 1815

**HIST 502**  
Readings in United States History, 1815-1919

**HIST 503**  
Readings in United States History 1919 to the Present

**HIST 505**  
Readings in Early Modern Europe, 1500-1789

**HIST 506**  
Readings in the European Age of Revolution, 1789-1914

**HIST 507**  
Readings in Modern Europe, 1914 to the Present

**HIST 508**  
Readings in Regional History

**HIST 510**  
Topics in United States History

**HIST 511**  
Topics in European History

**HIST 512**  
Topics in Regional History

**APPLIED HISTORY COURSE DESCRIPTIONS**

Program being re-evaluated. Check with department for information on course offerings.

**APHI 201: 3 s.h.**  
Historical Editing  
Editing of various forms of historical manuscripts and publications with emphasis on practical experience through student participation in writing and editing. Offered in spring of odd years.
**APHI 202: 3 s.h.**  
**Historical Archives**  
Function of archives, methods of preserving archival material, cataloguing, special problems or oral history archives and related issues. To be taught by adjunct faculty with expertise in the area. Offered in fall of even years.

**APHI 203: 3 s.h.**  
**Historical Preservation**  
Techniques and practices of historic preservation on the local, state and national level. An orientation to architectural history, site inspection, and local history research. Offered in fall of odd years.

**APHI 204: 3 s.h.**  
**American Material Culture**  
A survey of American history illustrating aspects of the American experience by means of artifacts, field trips and similar resources. Offered in spring of even years.

**APHI 205: 1-6 s.h.**  
**Practicum**  
A work-study experience at an historical museum, agency or library. Offered periodically.

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**HONORS COLLEGE**  
Associate Professor Steven Max Miller, director

Regulations governing admission, retention and graduation in the University Honors College are found in the *Special Academic Opportunities* section.

**COURSE REQUIREMENTS**

To graduate in the University Honors College students must demonstrate competence in English Composition and Calculus. They are required to take either HNRS/SSCI 201 or 202, either HNRS/ENGL 238 or 239, an honors laboratory science course, an honors perspectives course, nine hours of honors electives and HNRS 489/499 (Honors Independent Study and Senior Thesis). Students must pass honors courses with grades of B- or higher to receive honors credit for their work. A minimum of 30 credit hours of honors classes is required to graduate in the Honors College.

**COURSE DESCRIPTIONS**

The Honors College and the academic departments cosponsor courses in a variety of disciplines on a regular basis. Also see class schedules each semester and listings in departments for additional honors courses.

**BIOL/HNRS 108: 1 s.h.**  
**Honors Freshman Biology Seminar**  
Emphasis on the intellectual and historical context of the core ideas of BIOL 100 and in-depth exploration of ideas raised in lecture and laboratory. Satisfies the honors lab when taken with Biology 100. Offered in fall, spring. Prereq or coreq: BIOL 100.

**BIOL/HNRS 212: 1 s.h.**  
**Honors Zoology Seminar**  
Continuation of BIOL 211. Original investigations and/or readings and discussions of the zoological literature about the diverse adaptations of animals to their environments. Completion of both BIOL/HNRS 212 and BIOL 211 earns 5 credits to be counted as one course in the G2 block. BIOL/HNRS 212 may not be used independently to fulfill a G2 requirement. Offered periodically. Prereq: completion of BIOL 211 with a grade of B or higher and member of University Honors College or 3.35 GPA or instructor’s permission.

**BIOL/HNRS 222: 1 s.h.**  
**Problem Solving in Botany**  
An opportunity to define a problem with a botanical basis, search appropriate literature, formulate hypothesis and collect appropriate information to test hypothesis through experimentation and data gathering. Completion of both BIOL/HNRS 222 and BIOL 221 earns 5 credits to be counted as one course in the G2 block. BIOL/HNRS 222 may not be used independently to fulfill a G2 requirement. Offered
periodically. Prereq: BIOL 221 with a grade of B- or higher and member of University Honors College or 3.35 GPA or instructor’s permission.

**BIOL/HNRS 266: 1 s.h.**
**Advanced Principles of Cell Biology**
Cellular operations and processes (hormonal control of cell physiology, secretory activities and vesicular trafficking, control of cell division, neurotransmission, control of muscle contraction, signal transduction, interrupted genes, cell recognition, etc.) Students explore and lead discussions on one of these topics. Completion of both BIOL/HNRS 266 and BIOL 263 earns 5 credits to be counted as one course in the G2 block. BIOL/HNRS 266 may not be used independently to fulfill a G2 requirement. Offered periodically. Prereq: completion of BIOL 263 with a grade of B- or higher and member of University Honors College or 3.35 GPA or instructor’s permission.

**ESCI/HNRS 202: 4 s.h.**
**The Earth in Space (G2, L)**
A quantitative scientific experience directed toward an understanding of the dynamic earth, its origin and evolution and its place in the universe. Physical concepts from classical and modern physics, astronomy, cosmology, and the earth and atmospheric sciences, couched in the language of the calculus, are supported by observation, experiment and theory. 3 hrs. lecture, 2 hrs. lab. Offered spring of odd years. Prereq: MATH 165 or equivalent introductory calculus course and member of the University Honors College or a 3.35 GPA.

**ENGL/HNRS 110: 3 s.h.**
**Honors English Composition**
Emphasis on development of research and analytical skills; presumes basic writing competence. Students who demonstrate competency in English 110 may be exempt from this requirement with written approval of the director. Offered in fall, spring.

**ENGL/HNRS 238: 3 s.h.**
**The Western Literary Tradition I (G1, W)**
Major works of the Western literary tradition from the Ancient World and through the Renaissance. Offered annually. Prereq: ENGL 110, Member University Honors College or 3.35 GPA.

**ENGL/HNRS 239 3 s.h.**
**The Western Literary Tradition II (G1, W)**
Major works of the Western literary tradition from the Neoclassical period through Modernism. Offered annually. Prereq: ENGL 110, Member University Honors College or 3.35 GPA.

**MATH/HNRS 163: 5 s.h.**
**Honors Calculus (G2)**
Concepts of calculus intended primarily for students majoring in mathematics and the sciences. The notions of limit, derivative, definite and indefinite integral are developed in detail as well as underlying philosophy of the mathematics and use of calculus in a modern computational environment. Offered in fall. Prereq: permission of instructor.

**MATH/HNRS 165: 3 s.h.**
**Honors Applied Calculus I (For Non-Science/Math Majors) (G2)**
Provides the nontechnical honors students with introductory survey of calculus as applied to the business, social and life sciences. Relevant and factual applications demonstrate how differential calculus serves as an indispensable tool for modeling and problem solving. No credit for math requirement for any major in the School of Mathematics/Sciences. Offered in fall. Prereq: Permission of instructor.

**MATH/HNRS 166: 3 s.h.**
**Honors Applied Calculus II (For Non-Science/Math Majors) (G2)**
Continuation of MATH/HNRS 165 emphasizing integral calculus and differential equations and their applications in the real world. No credit for math requirement for any major in the School of Mathematics/Science. Honors students in nontechnical majors are required to pass both Math 165 and Math 166 with grades of B or higher in order to fulfill the honors calculus requirement. Offered in spring. Prereq: Math 165.

**SCMA/HNRS 383: 3 s.h.**
**Issues in Science and Religion (P)**
History of the interaction of science and religion in Western culture from the 17th through the 20th centuries, methods employed by each enterprise, religious issues posed by scientific theories. 3 hrs. lecture. Offered fall. Prereq: 45 s.h. including at least one G1 and one G2 course.
SSCI/HNRS 201: 3 s.h.
The Western Intellectual Tradition I (G3, W)
Main currents of thought in Western civilization from the ancient world through the Enlightenment, focusing on seminal thinkers and their impact on the culture of the West. Offered in fall. Prereq: Member University Honors College or 3.35 GPA.

SSCI/HNRS 202: 3 s.h.
The Western Intellectual Tradition II (G3, W)
Main currents of thought in Western civilization since the French Revolution, focusing on seminal thinkers and their impact on the culture of the West. Offered in spring. Prereq: Member University Honors College or 3.35 GPA.

HUMANITIES
School of Humanities & Social Sciences
HUMN 401: 3 s.h.
Humanities
An interdisciplinary course offered intermittently by any two or more departments in the Humanities Division (e.g., English and Philosophy, Art and Music, etc.). The course offers the student an opportunity to pursue related themes or cultural movements as they are manifested in more than one field of study. Offered infrequently.

INDUSTRY & TECHNOLOGY
School of Education
Professor Gemmill, chairperson
Professor Litowitz, EDTE coordinator
Professor David, ITEC coordinator
Professor Anna, OSEH coordinator
Professors Hibberd, Johnson, Lauderbach, McCade
Associate Professors David, Kerekgyarto
Assistant Professors Anna, Bell, Hauber, Wright

The mission of the Department of Industry and Technology is to prepare industry and technology professionals, develop a perspective of technology within the University and provide relevant services to the educational and private communities.

The department offers an Associate of Technology in Industrial Technology and a Bachelor of Science in Education - Technology Education, a Bachelor of Science in Industrial Technology and a Bachelor of Science in Occupational Safety and Environmental Health. Minors are available in industrial technology and occupational safety. The department also offers a post-baccalaureate teacher certification program in technology education.

Students may participate in the activities of the Technology Education Collegiate Association, National Association of Industrial Technology, Society of Manufacturing Engineers, American Society of Safety Engineers, Human Powered Submarine Club, Electric Motorcycle Team, and Marauder Graphics Club. An invitation to join Epsilon Pi Tau, the international honorary for professions in technology, may also be extended to department majors who excel.

Technology Education (EDTE), B.S.Ed.
The EDTE program is a teacher preparation program for persons seeking Pennsylvania teacher certification in technology education, K-12. EDTE majors are broadly prepared in general education, technology and professional teacher education. Emphasis is on understanding, applying, managing, and assessing design, communication, energy and power, transportation and production technologies. Students may specialize in a technical area of their choice and must devote one semester to full-time student teaching in a public school. An Advisory Committee of technology education teachers and supervisors assists with providing program relevancy. This program is accredited and recognized as an outstanding technology teacher education program by the international Council on Technology Teacher Education (CTTE).
**Industrial Technology (ITEC), A.T., B.S.**

The ITEC associate’s degree program prepares technicians with the liberal arts, technological literacy and technical preparation for either direct employment or the seamless continuation in a bachelor’s degree program in industrial technology or occupational safety and environmental health (OSEH). Technical options in the Associate of Technology program include computer-aided drafting and design (CADD), electronics, graphic communications, manufacturing, mechanical technology and occupational safety.

The Bachelor of Science degree program prepares technologists and technical managers with qualifications in general education, technological literacy, a technical option and management. Technical options are available in CADD, electronics, graphic communications, manufacturing, mechanical and general industrial technology. The National Association of Industrial Technology has accredited this program.

Supervised technical and management oriented internships in industry are elective in both the A.T. and B.S. programs to enable relevant work experiences and the transition into employment. Managers that represent each of the technical options serve as an advisory committee for the program. Graduates are commonly employed in design, production, training, sales and service careers in business, industry, education and government.

An ITEC minor complements majors in art, business administration, speech communication, computer science, economics, physics and OSEH. This minor enables specialization in one of the six baccalaureate degree technical options.

**Occupational Safety and Environmental Health (OSEH), B.S.**

The OSEH program is designed for persons interested in the safety, industrial hygiene and environmental health professions. OSEH includes general education studies with emphasis on the sciences and core studies in the technical and managerial aspects of industrial safety and hygiene. An internship is required in industry or in an insurance or government agency. Continuous improvement of the program is guided by an advisory committee of safety professionals. Graduates of this program typically work as safety and health managers, industrial hygienists, loss control consultants, compliance officers and environmental safety specialists. The OSEH minor should be an attribute to majors in biology, business administration, chemistry, industrial technology, political science and nursing. OSEH is accredited by the Accreditation Board of Engineering and Technology (ABET).

**COURSE REQUIREMENTS**

**Technology Education (EDTE) Major (B.S.Ed.): 130 s.h.**

- **K-12 Teacher Certification**
  - Technology literacy courses (12 credits required): ITEC 110, 120, 130, 135. Technical courses (36 credits required): ITEC 241, 251, 261, 262, 271, 281 required; choice of (one) 242, 243, 346, 350, 355, 356; choice of 325 or 326; choice of (one) 335, 375, 376, 385 and three advanced technical laboratory electives in communication, transportation/energy/power and/or production technology. One of the advanced courses must include a research and development (R&D) component. Professional courses (28 credits required): EDTE 291, EDFN 211, EDFN 241 in the sophomore year; EDTE 391 and EDSE 321 as a block in the junior year; and EDTE 461 and EDTE 491 in the senior year. Students must be admitted to advanced professional studies (APS) prior to entering EDTE 391.
  - Required Related Courses (9-10 credits): ENGL 312 or ENGL 316; PHYS 103, CHEM 103 or CHEM 205; and two General Education MATH courses.
  - Recommended Perspectives courses: ITEC 301 and ITEC 302.

**Post-baccalaureate Teacher Certification in EDTE**

Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

**Industrial Technology (ITEC) Major (A.T.): 64-65 s.h.**

Technology Literacy courses (12 credits required): ITEC 110, 120, 130 and OSEH 120. Technical laboratory courses (21-22 credits required).

Technical Option (choose one):

- **CADD** (27 credits): ITEC 241, 242, 243, 346, 466 and two ITEC laboratory electives.
- **Graphic Communications** (21 credits): ITEC 243, 251, 350, 356 and three ITEC or other graphic communication related laboratory electives.
- **Electronics** (21 credits): ITEC 261, 262, 325, 363, 364 and two ITEC laboratory electives.
• **Manufacturing** (21 credits): ITEC 241, 242, 271, 281, 486 and two ITEC laboratory electives.

• **Mechanical Technology** (21 credits): ITEC 241, 261, 271, 281, 325 and two ITEC laboratory electives.

• **Occupational Safety** (22 credits): CHEM 104, OSEH 220, 221, 320, 321, 323 and a safety-related elective.

**Required Related Courses (16-17 credits):** Science (7 credits — CHEM 103 or 205 or 205, PHYS 103 or 131; Math (3-4 credits)—MATH 130 or 151 or 160; BAUD 251 and ENGL 312 or 316.

**Industrial Technology (ITEC) Major (B.S.): 123 s.h.**

Technology Literacy courses (9 credits required): ITEC 110, 120, 130. Technical laboratory courses (27 credits required).

**Technical Option (choose one):**

• **General Industrial Technology** (27 credits): ITEC 241, 251, 261, 271, 281, 325 and three ITEC laboratory electives at 300 level or above including one research and development (R&D) course

• **CADD** (27 credits): ITEC 241, 242, 243, 343, 344, 346, 446, 448 and one ITEC laboratory elective.

• **Graphic Communications** (27 credits): ITEC 243 251, 343, 350, 355, 356, 455, 456, and one related laboratory elective.

• **Electronics** (27 credits): ITEC 261, 262, 325, 363, 465, 466, 467 and one ITEC laboratory elective.

• **Manufacturing** (27 credits): ITEC 241, 271, 281, 486 and two of ITEC 375, 376, 385 and two of ITEC 325, 336, 425, 448 and one of ITEC 476 or 485.

• **Mechanical Technology** (27 credits): ITEC 241, 242, 261, 271, 281, 325, 326, 336, and 448.

**Management Courses** (24 credits required): Core (15 credits) OSEH 120, BUAD 251, 452, ITEC 492, 494 and Electives (9 credits) ITEC 300, 400, 392, 495, OSEH 221, 320, 323, 333, BUAD 161, 352 or 353.

**Required Related Courses** (15-18 credits): Science (6-8 credits)—CHEM 101, 103, 131 or 132; Math and Computer Science (6-7 credits)—MATH 130 and MATH 151, 160 or CSCI general education course; and ENGL 312 or 316.

Recommended Perspectives Courses: ITEC 301 and 302.

**Industrial Technology Minor: 18 s.h.**

Select one of the following Industrial Technology options:

• **General Industrial Technology**: ITEC 110, 120, 130 and three additional ITEC laboratory courses (two required at 300 level or above).

• **CADD**: ITEC 241, 242 and four of ITEC 243, 343, 344, 346, 446 or 448.

• **Graphic Communications**: ITEC 110, 251 and four of ITEC 243, 343, 350, 355, 356, 455 or 456.

• **Electronics**: ITEC 261, 262, and four of ITEC 363, 364, 465, 466 or 467.

• **Manufacturing**: ITEC 130, 271, 281; two of ITEC 375, 376 or 385 and one of ITEC 476, 485 or 486.

• **Mechanical Technology**: ITEC 120, 130, 241, 261 and two of ITEC 242, 325, 326, 336, 425 or 448.

**Occupational Safety and Environmental Health (OSEH) Major (B.S.): 122 s.h.**

OSEH Courses (41 credits required): OSEH 120, 220, 221, 320, 321, 323, 333, 410, 422, 440.

Required Related Courses (39 credits): BIOL 100, CHEM 103 and 104, PHYS 131 and 132, MATH 130 and 151 or higher, CSCI 101 or higher, PSYC 100, ITEC 130 and 392, ENGL 312 or 316.

**Occupational Safety Minor: 18 s.h.**

OSEH Courses (18 credits required): OSEH 120, 220, 221, 320, 323, 410.
COURSE DESCRIPTIONS

Technology Education

EDTE 291: 3 s.h.
Foundations of Technology Education
An introduction to the social, historical and philosophical foundations of technology education leading to contemporary programs. Field experiences within a variety of subject areas in elementary and secondary schools. Offered in fall, spring. Prereq: Sophomore status; to be taken concurrently with EDFN 211 and EDFN 241.

EDTE 391: 3 s.h.
Curriculum and Instruction in Technology Education (W)
Professional teacher preparation in curriculum design and instructional planning and delivery. Major topics involve developing a philosophical basis for contemporary curriculum writing, content selection, instructional objective design, lesson planning and the use of instructional technology and computers in conjunction with several technology education teaching strategies. Field experiences provided within technology education classes in local schools. Offered in fall, spring. Prereq: EDTE 291, EDFN 211 and EDFN 241. Admission to advanced professional studies (APS) required.

EDTE 461: 12 s.h.
Student Teaching
Student teachers are assigned full-time to selected cooperating teachers in the Lancaster area. They are supervised by University faculty and gain experience in the responsibilities of the teacher. Offered in fall, spring. Prereq: EDTE 391. (See Special Academic Opportunities: Student Teaching, Application and Eligibility; Academic Requirements: Other Curricula Policies, Transfer Students.)

EDTE 462: 6 s.h.
Intern Teaching
Designed for individuals who possess an Intern Certificate and are teaching technology education in Pennsylvania. They are supervised by University faculty as they develop competencies in teaching. Prereq: Permission of EDTE program coordinator and department chairperson.

EDTE 491: 1 s.h.
Seminar in Technology Education
Professional education issues and effective teaching and learning during student teaching. Emphasis on the legal basis of education and planning, teaching, managing and assessing technology education. Offered fall, spring. Prereq: EDTE 391 and EDTE 461 or 462 taken concurrently with student or intern teaching.

COURSE DESCRIPTIONS

Industrial Technology

ITEC 100: 3 s.h.
Introduction to Technology
Structural and creative nature of technological systems and the impact of technological choices on humans and the natural environment. Offered fall, spring.

ITEC 110: 3 s.h.
Communication Systems
Communication technology to compose, store, send, receive and understand ideas and information using sketching and drafting; graphic design, graphic reproduction, desktop publishing and photography; videotaping and electronic recording; microwave, satellite, laser and fiber optic transmission. Covers relevant developments, materials, products, occupations and impacts. 2 hours lecture, 3 hours lab. Offered fall, spring.

ITEC 120: 3 s.h.
Energy, Power and Transportation Systems
Principles of radiant and potential energy; electrical, fluid and mechanical power; and land, air, space and sea transportation. Includes propulsion methods and environmental concerns. 2 hours lecture, 3 hours lab. Offered fall, spring.

ITEC 130: 3 s.h.
Production Materials and Processes
The integration and interrelationships of materials and processes for construction and manufacturing, including the application of math and scientific principles and the technological impacts on industry and
society. Requires experiences in materials processing and production tooling. 2 hours lecture, 3 hours lab. Offered fall, spring.

ITEC 135: 3 s.h.
Production Systems
Student-centered analysis of goals, inputs, processes and outputs of manufacturing and construction systems. In-plant activities emphasized. Organizational structures and management strategies studied through the simulated organization and operation of a manufacturing and/or construction enterprise. 2 hours lecture, 3 hours lab. Offered fall, spring. with) and ITEC 130.

ITEC 241: 3 s.h.
Drafting Communications
Introductory engineering drawing. Includes lettering, English and metric measurement, engineering geometry, multi-view drawings, sectioning, pictorial representation, dimensioning, detail and assembly drawings, computer-aided drafting applications, reproduction of drawings, and selection of equipment and supplies. 2 hours lecture, 3 hours lab. Offered in fall, spring.

ITEC 242: 3 s.h.
Engineering Drafting
Intermediate engineering drawing. Includes basic descriptive geometry, pictorial projection systems, development drawings, computer-aided drafting (CAD), dimensioning and tolerances, and working drawings. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: ITEC 241.

ITEC 243: 3 s.h.
Technical Sketching and Design
Freehand sketching, shading and basic elements of two-dimensional design. Includes elements and principles of design, methods of designing, and evaluation and design of products. 2 hours lecture, 3 hours lab. Offered annually.

ITEC 251: 3 s.h.
Graphic Communications
Graphic reproduction including graphic design, computerized image composition, continuous tone and process photography, prepress production, image transfer and finishing. Covers applications in offset lithography, flexography, gravure and screen printing. 2 hours lecture, 3 hours lab. Offered in fall, spring.

ITEC 261: 3 s.h.
Electrical/Electronic Systems I
Survey of electrical and selected electronics principles, typical applications, safe practices and technological impacts. Practical applications include breadboarding, problem solving, use of test equipment and printed circuit board fabrication. 2 hours lecture, 3 hours lab. Offered in fall, spring.

ITEC 262: 3 s.h.
Electronic Systems II
In-depth study of semiconductor theory, including diodes, transistors, field effect transistors, SCRs, triacs and unijunction transistors. Overview of integrated circuits provided. Contains hands-on activities with breadboarding and fabrication of electronic circuits. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: ITEC 261.

ITEC 271: 3 s.h.
Processing Nonmetallic Materials
Various nonmetallic materials, processes, products and impacts, including polymers, ceramics, wood, clay, composites and glass. Instruction and experiences provided on safety and the use of tools and machines associated with nonmetallics. Includes production activities in each of the specified nonmetallic material areas. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: ITEC 130.

ITEC 281: 3 s.h.
Processing Metallic Materials
Metallic materials, processes, products and impacts. Specific experiences include the safe utilization of the tools and machines associated with the processing of metallic materials. Mathematical and scientific concepts stressed for transforming metallic materials into products. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: ITEC 130.

ITEC 301: 3 s.h.
Technology and Its Impact on Humans (P)
Analysis of the development of technology and its impact on humans and a realization of the importance of human technological behavior on the environment, social/cultural systems and the future. Students use
analytical skills on a written independent research project and oral skills to present and defend positions on technological problems facing our society. Offered in fall, spring. Prereq: ENGL 110 or equivalent and 24 credits of liberal arts core.

ITEC 302: 3 s.h.
*Futurology: Technology, Society and Change (P)*
A nontechnical interdisciplinary course to help students identify and analyze forces causing technological and social change. Using an understanding of the processes of technological and social change and research techniques for forecasting the future, students complete a written independent research project. Develops skills to project future technological and social developments and their impacts. Offered periodically. Prereq: ENGL 110 or equivalent and 24 credits of liberal arts core.

ITEC 325: 3 s.h.
*Power Conversion and Control*
Applications of energy and power conversion devices and control systems. Includes disassembly and diagnosis of fluid motors and electric motors. Power circuitry is designed to perform specific industrial applications. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prerequisite: ITEC 120.

ITEC 326: 3 s.h.
*Fluid Power*
Control and transmission principles, including an investigation of cylinders, valves, pumps and accessories used in fluid circuits and their application in hydraulic and pneumatic fluid power systems. A research and development component required. 2 hours lecture, 3 hours lab. Offered annually. Prereq: ITEC 120 or permission of instructor.

ITEC 335: 3 s.h.
*Construction Technology*
Utilization of materials for the construction of residential and light commercial structures. Includes the effects of these changes on people and their environment. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 271 or permission of instructor.

ITEC 336: 3 s.h.
*Characteristics & Testing of Production Materials*
Examination of industrial materials, including fibrous, polymer, ceramic/glass, metallic, hydrosetting, composite and textile. Tests conducted on the application of adhesives, mechanical fasteners and cohesives comparing various strengths and weaknesses of each under controlled conditions. A research and development activity required. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 271 and 281.

ITEC 343: 3 s.h.
*Technical Illustration and Rendering*
Broad-based experiences in illustration and rendering techniques using a wide variety of mediums such as pencil, colored pencils, pastels, inks, watercolors, paints and dyes. Employs a variety of support materials: paper, illustration board, cloth and three-dimensional surfaces. Single and double action airbrushes are incorporated into various projects, along with layout, frisket and masking techniques. 2 hours lecture, 3 hours lab. Offered annually. Prereq: ITEC 243 or permission of instructor.

ITEC 344: 3 s.h.
*Product Design*
Aesthetic and design dimensions of visual communication. Includes elements and principles of design, methods of designing, various concepts of the design process and evaluation of designs. A research and development activity required. 2 hours lecture, 3 hours lab. Offered annually. Prereq: ITEC 241.

ITEC 346: 3 s.h.
*Architectural Drawing and Design*
Principles of residential design. Emphasizes the development of a complete set of original working drawings; computer-aided design (CAD); presentation drawings and model building; architectural styles and regional differences in materials and construction practices. 2 hours lecture, 3 hours lab. Offered in fall. Prerequisite: ITEC 241.

ITEC 350: 3 s.h.
*Still Photography*
Black and white photography, including operation of a camera, lighting, developing film, making contact prints and enlargements and mounting prints for display. Emphasis on aesthetic and technical aspects. Student must supply 35 mm camera with light meter. Single-lens reflex style with fully manual Prereq:
ITEC 110, ITEC 120 (may be taken focusing and exposure capability preferred. 2 hours lecture, 3 hours lab. Offered in fall, spring.

ITEC 355: 3 s.h.
Contemporary Printing Technology
Advanced study of today’s major printing processes, especially offset and screen. Experiences include layout and design, computerized electronic composition, copy preparation, line and halftone photography, special effects photography, exposure unit calibration, image assembly, platemaking, printing and finishing complex graphic products. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 251.

ITEC 356: 3 s.h.
Desktop Publishing (W)
Utilization of desktop microcomputer systems to design, compose and publish graphic materials. A research and development activity required. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: ENGL 110.

ITEC 363: 3 s.h.
Analog Electronics
Theory and applications to develop concepts in the use of both discrete and integrated components. Includes transistors, diodes, thyristors, operational amplifiers, timers, phase-locked loops and voltage regulators. Amplifiers, oscillators and other applications featured. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 262 or permission of instructor.

ITEC 364: 3 s.h.
Digital Electronics
Practical applications of digital logic for processing electronically encoded information. Covers numbering systems, logic design, basic gates, sequential and combination logic, and digital troubleshooting. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 262 or permission of instructor.

ITEC 375: 3 s.h.
Polymer and Ceramic Technology
Design, development and production of polymer and ceramic products. Covers contemporary pattern and molding materials along with industrial forming processes. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 271.

ITEC 376: 3 s.h.
Wood Technology
Use of hand tools and machine woodworking techniques to fabricate wood products. Covers technological problems and contributions of using wood in daily living. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 271.

ITEC 385: 3 s.h.
Metal Technology
Metal forming, welding fabrication, casting, heat treatment and machine tool metalworking. Includes designing for casting, welding fabrication and machining. Considers the visual elements of design and the relationship of metal processes to scientific principles. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 281.

ITEC 392: 3 s.h.
Introduction to Industrial Training (W)
Techniques and procedures required to conceptualize, prepare, deliver and evaluate training programs. Includes experiences in preparing instructional media, presenting a unit of instruction and developing appropriate evaluation instruments. Offered in fall, spring. Prereq: ENGL 110.

ITEC 420: 3 s.h.
Aviation and Aerospace Systems
Aviation and aerospace topics normally covered in the FAA Private Pilot ground school. Includes laboratory experiences in the GAT-1 flight simulator, field trips and limited in-flight experience. 2 hours lecture, 3 hours lab. Offered periodically.

ITEC 425: 3 s.h.
Robotic Systems
Robotics and flexible automation. Includes the evaluation, justification, programming and integration of multiple control technologies to improve an industrial process. A research and development activity required. 2 hours lecture, 3 hours lab. Offered annually. Prereq: ITEC 120 and ITEC 261 or permission of instructor.
ITEC 426: 3 s.h.  
Automotive Systems  
Characteristics, functions, preventive maintenance procedures and basic problems related to automotive transportation. 2 hours lecture, 3 hours lab. Offered infrequently. Prereq: ITEC 120.

ITEC 427: 3 s.h.  
Designing Industrial Control Systems  
A synthesis of production systems, electricity and the basics of control systems. Students design, construct and troubleshoot a variety of industrial control systems utilizing programmable logic controllers, networks, control loops and off-line programs. A research and development component required. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 261 and 325.

ITEC 446: 3 s.h.  
Computer-Aided Drafting/Design  
Advanced aspects of computer-aided drafting/design (CADD) and information on features and application capabilities of numerous software packages. Includes a series of activities on solids modeling, menu customization, attribute files, advanced dimensioning and editing features. Requires completion of major projects and research activities. 2 hours lecture, 3 hours lab. Offered annually. Prereq: ITEC 242 or permission of instructor.

ITEC 448: 3 s.h.  
Machine Tool Design  
Analysis, planning, design, construction and application of tools, methods and procedures necessary to increase manufacturing productivity. Integrated with machining and fabrication practices. 2 hours lecture, 3 hours lab. Offered annually. Prereq: ITEC 242.

ITEC 455: 3 s.h.  
Color Separation and Reproduction  
Color theory, color separations and color reproduction, covering mechanical separations, process color separations, color corrections and quality control methods. Experiences also in stripping, proofing, platemaking and printing color separations. Includes a research and development component. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 251.

ITEC 456: 3 s.h.  
Digital Imaging  
Digital images developed for printed and electronic publications and presentations. Emphasis on hardware and software technologies, their applications and interfaces. Hands-on activities require designing, composing and converting of printed and electronic images and establishing a digital workstation and electronic publishing site. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 356 or permission of instructor.

ITEC 465: 3 s.h.  
Instrumentation and Control  
Utilization of electronics instrumentation and mechanical systems to make quantitative determinations and control functions for detecting the physical presence or activity of light, heat, fluids and force. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 262 or permission of instructor.

ITEC 466: 3 s.h.  
Electronic Communication Systems  
Common communication and broadcast systems. Emphasis on AM/FM radio and monochrome television, including transmission, resonance, heterodyning action, detection and troubleshooting/problem solving procedures. A research and development activity required. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 262 or permission of instructor.

ITEC 467: 3 s.h.  
Microprocessor Electronics  
Introduction of the microprocessor, microprocessor systems, programming and interfacing for practical applications. Covers a variety of microprocessors, including their structure, communication language, and how the processor communicates with the system under its control. A research and development activity required. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 364 or permission of instructor.

ITEC 476: 3 s.h.  
Wood Manufacturing Processes  
Experiences to develop proficiency in wood furniture construction and technology. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 271 or permission of instructor.
ITEC 485: 3 s.h.
Metal Manufacturing Systems
Metal manufacturing, including the design of products, control of quality, design and construction of production tooling, machine tool operations and setups, and manufacturing systems and automation. Laboratory activity involves advanced level production experiences. Includes a research and development component. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 281.

ITEC 486: 3 s.h.
CNC Machining
Theoretical concepts and industrial applications of CNC machining. Emphasis on manual and computer programming of machinable parts and the integration of computer aided design (CAD) and computer aided manufacturing (CAM). Student design and programming solutions verified through actual part production using CNC turning and milling machines. A research and development activity required. 2 hours lecture, 3 hours lab. Offered periodically. Prereq: ITEC 241 and 281 or permission of instructor.

ITEC 489: 1 s.h.
Honors Independent Study
For the definition of honors course and student eligibility, refer to the Special Academic Opportunities section of this catalog. EDTE, ITEC and OSEH majors may enroll in the Department of Industry & Technology Honors Program. Contact the Department office for guidelines and an application.

ITEC 492: 3 s.h.
Industrial Organization
A student-centered exploration of industry and technology using the line-production and group project methodologies. Students sample a variety of industrial personnel positions through role playing and simulation. 2 hours lecture, 3 hours lab. Offered in fall, spring. Prereq: ITEC 110, 120, 130.

ITEC 494: 3 s.h.
Total Quality Management
The history and development of quality movements; factors influencing the total quality concept; the scope of modern quality systems; management organization and strategies for quality; engineering technology for quality; and statistical tools for measurement and monitoring of quality. Offered annually.

ITEC 495: 3 s.h.
Energy Management and Conservation
Techniques and methods for managing and retrofitting energy systems in existing residential, commercial and industrial environments. Emphasis on practical approaches that can result in significant increases in efficiency throughout all systems and all forms of energy or power. Offered infrequently. Prereq: ITEC 325 or permission of instructor.

ITEC 498: 1-3 s.h.
Independent Study in Industry and Technology
For further information on independent study, see the Special Academic Opportunities section. Written permission of faculty sponsor and department chairperson required.

ITEC 499: 1-3 s.h.
Department Honors Thesis (W)
For the definition of departmental honors and eligibility, refer to the Academic Policies section of this catalog. Contact the Department of Industry & Technology office for guidelines.

COURSE DESCRIPTIONS

Occupational Safety and Environmental Health
OSEH 120: 3 s.h.
Fundamentals of Safety, Health and Environmental Issues
Introduction to safety, health and environmental issues that impact people and workplaces. Includes the historical development of safety, the impact of accidents on society, a legislative overview and basic principles of personal risk assessment and management. Offered in fall, spring.

OSEH 220: 3 s.h.
Legal Aspects of Safety and Hygiene
Legal issues relative to occupational safety and environmental health. Includes federal and state legislation, resolution of legal and ethical challenges, product safety and professional liability. Offered annually.
OSEH 221: 3 s.h.
Industrial Fire Prevention, Protection and Control
Basic principles, chemistry of fire, fire hazards determination, workforce notification, alarm and sprinkler systems, protective equipment, evacuation procedures and fire fighting methods. Offered in fall, spring.

OSEH 320: 3 s.h.
Safety Engineering Principles
Methods for the identification and analysis of industrial hazards. Emphasis on application of basic safety engineering principles for the control of losses in an industrial environment. Offered in fall, spring. Prereq: OSEH 120, MATH 101 or higher, or permission of instructor.

OSEH 321: 4 s.h.
Environmental and Industrial Hygiene I
Fundamental theory and methods used in identifying, evaluating and controlling the health risks of chemical contaminants and biological agents. Includes coverage of toxicology, exposure standards, medical surveillance, toxic air emissions, air sampling techniques, air pollution control, and protective equipment. Offered in fall. Prereq: MATH 101 or equivalent, OSEH 120, CHEM 104.

OSEH 323: 3 s.h.
Ergonomics
Study of interaction between people and their work. Emphasis on the application of biological sciences to engineering principles in an effort to optimize efficiency, productivity, and safety. Topics include anthropometrics, biomechanics, design principles, physiological and cognitive capabilities, and task evaluation techniques. Offered in fall, spring. Prereq: OSEH 120 or permission of instructor.

OSEH 324: 3 s.h.
Hearing Conservation and Industrial Acoustics
Physical characteristics of sound and its effects on the human body. Topics include quantitative measurement of sound, engineering techniques for the control of noise, audiometric testing and the development of educational programs to promote hearing conservation. Offered infrequently. Prereq: OSEH 321 or permission of instructor.

OSEH 333: 3 s.h.
Introduction to System Safety
Qualitative and quantitative system safety methods used to analyze and control risk. Includes a variety of analytical engineering techniques that are applied to practical system analysis problems. Offered fall. Prereq: OSEH 320 and Math 130.

OSEH 410: 3 s.h.
Safety and Environmental Health Program Management
Principles and practices of occupational safety and environmental health management. Includes the development of safety objectives and policy, evaluation and management of risk, and program implementation and evaluation. Offered annually. Prereq: OSEH 220 and 320 or permission of instructor.

OSHM 422: 4 s.h.
Environmental and Industrial Hygiene II
Fundamental theory and methods used in the evaluation and control of the physical agents of noise, ionizing and nonionizing radiation, and thermal stress. Covers regulatory standards, control technology, industrial and general ventilation, and compliance methods related to indoor air quality, water quality, industrial waste and environmental management programs. Offered in spring. Prereq: PHYS 132, OSEH 321 or permission of instructor.

OSEH 430: 3 s.h.
Topics in Occupational Safety and Environmental Health
Investigation of one or more topics that vary according to needs and interests of students and staff. Offered periodically. Prereq: Senior OSEH majors and practitioners, or permission or instructor.

OSEH 440: 6 s.h.
Internship in Occupational Safety and Environmental Health
Students work full-time for nine weeks or more, under the direct supervision of an OSEH professional in industry, insurance, government agencies or other approved location. University supervision, seminars and evaluation are provided. Students experience problems, practices and principles in the management of occupational safety and/or industrial hygiene programs. To be taken twice, concurrently or consecutively, with increased work and research responsibilities. Prereq: Senior OSEH majors and permission of OSEH coordinator.
GRADUATE LEVEL COURSES

NOTE: Undergraduate students may elect 500-level courses in lieu of 300- or 400-level elective courses with permission of academic adviser, department chairperson and the instructor involved. See Graduate Catalog for course descriptions.

EDTE 590: 3 s.h.
Information Literacy: Creating Independent Learners

EDTE 591: 3 s.h.
Experiences in the School-to-Work Transition

EDTE 592: 3 s.h.
Teaching Technology in the Elementary School

ITEC 515, 525, 535: 3 s.h.
Advanced Problems in Communication, Transportation/Energy/Power or Production Technology

ITEC 518, 528, 538: 3 s.h.
Seminar in Communication, Transportation/Energy/Power or Production Technology

ITEC 541: 3 s.h.
Aviation/Aerospace Education-Flight Experience

ITEC 586-9: 1-3 s.h.
Topics in Industry and Technology

INTERNATIONAL STUDIES

Associate Professor Bookmiller, director
Assistant Professor Nissly

Millersville University offers a major and minor in international studies. Many faculty from various disciplines teach in the program.

International studies offers students a valuable perspective and useful skills for careers in government, international relations, foreign service, law, business, teaching, journalism, communications, or for proceeding to higher degrees. For students working toward other degrees, including degrees in the sciences, mathematics or the technical disciplines, a minor or a second major in international studies will provide a global frame of reference and preparation for future work with international colleagues.

International studies prepares students for success in a world made smaller by the steady increase of international contact in society, politics and business. The international studies major and minor emphasize comparative social, cultural, economic, environmental, historical and political systems worldwide. Comparative studies of music, literature, religion and education also are offered. Through these studies, students acquire knowledge and tools that enable them to analyze and understand the complex world in which we live.

COURSE REQUIREMENTS

International Studies Major (B.A.): 120 s.h.

A. Major Field Requirements: 39 credits

1. Required courses (6 s.h.): INTL 201 and INTL 488.

2. Required core courses (12 s.h.): ANTH 121; ECON 103; GEOG 101; GOVT 251.

3. International Studies Electives (12 s.h.): Students choose two from the following four areas and take two courses from each area.

   Comparative Societies (ANTH 322, 323, 324, 325, 328; EDFN 511; GEOG 220, 227, 329; MUSI 368; PHIL 313).

   Economic Interdependence (BUAD 357, 435; ECON 206, 325, 326; GEOG 220).

   Global Environmental Issues (ANTH 342; BIO 208, 247, 340; ESCI 104; GEOG 230, 305; SOCY 216).

   International Relations (GEOG 226; HIST 102, 392; GOVT 221, 351, 352).
4. Area Studies Electives (9 s.h.): Students choose one of the following areas and take three courses from that area.

**East Asian Area Studies** (BUAD 457; ECON 226, 330; GEOG 346, 447; MUSI/SOCY 342; PHIL 361; GOVT 325).

**Latin American Area Studies** (ANTH 221; GEOG 343; HIST 283, 284, 380; SPAN 313).

*NOTE:* Consult the Curriculum Record Form or DARS for distribution requirements.

B. Required Related Courses: 0-18 foreign language credits

Students are required to take one foreign language. They must complete or test out of 101, 102, 201 and 202. Two additional courses are required beyond 202 in that same language. (If a student is eligible to use English to satisfy the foreign language component, the foreign language requirement is waived.)

Students desiring more in-depth study of particular topics may register for **INTL 491: Topics in International Studies** (1-6 s.h.) and **INTL 498: Independent Study** (1-6 s.h.). Students also may register for seminar, topics, and contemporary issues courses from various departments that change from semester to semester. These latter courses, along with the topics and independent study credits may count under any of the major field categories with the approval of the International Studies curriculum coordinator.

Majors are strongly encouraged to study abroad. Study abroad courses and international internship experiences may be counted toward the requirements of the major with the approval of the International Studies curriculum coordinator.

**International Studies Minor:** 18 s.h.

Required courses: **INTL 201** and **INTL 488**.

International Studies electives: (12 s.h.): Students choose two from the following four areas and take two courses from each area. These courses cannot count toward the student’s major.

- **Comparative Societies** (ANTH 121, 322, 323, 324, 325, 328; EDFN 511; GEOG 220, 227, 329; MUSI 368; PHIL 313).
- **Economic Interdependence** (BUAD 357, 435; ECON 103, 206, 325, 326; GEOG 222).
- **Global Environmental Issues** (ANTH 342; BIO 208, 247, 340; ESCI 104; GEOG 101, 230, 305; SOCY 216).
- **International Relations** (GEOG 226; HIST 102, 392; GOVT 221, 251, 351, 352).

*NOTE:* Consult the Curriculum Record Form or DARS for distribution requirements.

Students minoring in international studies are strongly encouraged to study abroad and to study a foreign language.

**COURSE DESCRIPTIONS**

**INTL 201:** 3 s.h.

**Introduction to International Studies**

Study of global cultural diversity, economic interdependence, environmental issues and international relations. Offered in fall, spring.

**INTL 488:** 3 s.h.

**Senior Seminar**

Research, discussion and analysis of current global issues. Offered in spring.

**INTL 491:** 1-6 s.h.

**Topics in International Studies**

Topics in Occupational Safety and Investigation of topics on economic, environmental or political global systems or in-depth comparative study of international issues, cultures or the arts. Offered in fall.

**INTL 498:** 1-6 s.h.

**Independent Study**

For further information, see the *Special Academic Opportunities* section.

Descriptions of other courses approved for international studies may be found under the appropriate departmental listing of courses.
MANAGEMENT
SEE BUSINESS ADMINISTRATION, INDUSTRIAL TECHNOLOGY, AND OCCUPATIONAL SAFETY AND HYGIENE MANAGEMENT

MANUFACTURING TECHNOLOGY
SEE INDUSTRY & TECHNOLOGY

MARINE BIOLOGY
SEE BIOLOGY

MARKETING
SEE BUSINESS ADMINISTRATION

MATHEMATICS
School of Science and Mathematics
Professor Smith, chairperson
Professor Denlinger, assistant chairperson
Professors Kittappa, Schroeder, Schultz, Shoemaker, Umble
Associate Professors Anderson, Blum, Buchanan, Fenwick, France, Hearn, McDevitt, Shao, Tsutsui
Assistant Professors Ikenaga, Wismer
Instructors Brislin, Sigler

The Department of Mathematics offers three baccalaureate degree programs with a major in mathematics. It also offers minors in mathematics and statistics.

The recommended course sequences in the three mathematics programs are virtually identical through the first two years. The B.A. degree program in mathematics is a flexible curriculum designed to accommodate the widest possible range of career objectives. It is structured according to the traditional liberal arts approach to college education. The second semester of a foreign language is required in the B.A. program. The B.S. degree program is more specifically applications-oriented. With more required courses in mathematical analysis and science, it is somewhat less flexible than the B.A. program. The B.S.Ed. degree program is the degree and certification program for prospective secondary teachers of mathematics. In addition to having mathematics course requirements comparable to those of the two other programs, the B.S. in Education requires appropriate educational methods courses.

Mathematics majors may elect an option in Actuarial Science, Applied Mathematics or Statistics, designed to prepare students for careers in these allied fields.

For admission as a major in mathematics, a student is expected to have a sound preparation in high school academic mathematics: algebra I and II, plane geometry, and precalculus (trigonometry and analytic geometry.) Such students normally begin their mathematics sequence with Calculus I. Students who have completed a calculus course in high school are encouraged to take the College Board Advanced Placement Exam and have their score sent to MU for evaluation. University credit for freshman-level mathematics course(s) will be offered to students with grades of 3 or higher. For further information, see Advanced Placement Examinations in the Admissions section.

In an effort to ensure that each student is properly placed, the department administers a mathematics placement test to all new students during their respective orientation programs. For more information, see the Curriculum section.

The cooperative education program allows students valuable experience in a full-time or part-time professional position related to their career goals, adding practical relevance to their program of study as well as significant financial remuneration. This often leads to full-time employment after graduation. Students may elect one or more cooperative education experiences.
COURSE REQUIREMENTS

Mathematics Major (B.A.): 120 s.h.
A. Mathematics Courses Required: 43-44 s.h.
   1. Required core courses: MATH 161 or 163, 162, 220, 261, 242, 345, 464.
   2. Six of the following: MATH 335, 342, 353, 355, 365, 370, 375, 393, 395, 435, 445, 457, 465, 467,
      471, 483, 4X8, 535, 536, 566, 592. Selected 500-level courses may be substituted with departmental
      permission.

These six courses must include: either MATH 335 or 365; and at least one of MATH 342, 435, 445, 465 or
467. Other courses may be substituted by departmental permission.

B. Required Related Courses 13-20 s.h.
   1. CSCI 161.
   2. The second semester of a foreign language.
   3. One of the following options:
      a. Two courses (at least 3 credits each) chosen from the biology, chemistry, computer science, earth
         sciences and physics departments, which count toward the major in that department or PHIL 312.
      or
      b. Three courses (at least 3 credits each) from a single department, chosen from courses counting
         toward the major in that department.

Mathematics Major (B.S.): 120 s.h.
A. Mathematics Courses Required: 43-44 s.h.
   1. Required core courses: MATH 161 or 163, 162, 220, 261, 242, 335, 345, 365, 375, 464.
   2. Any three of the following: MATH 342, 353, 355, 370, 393, 395, 435, 445, 457, 465, 467, 471, 483,
      4X8, 535, 536, 566, 592. Selected 500-level courses may be substituted with departmental permission.

These 3 courses must include at least one of MATH 342, 435, 445, 465 or 467; others may be substituted
by departmental permission.

Required Related Courses: 18-22 s.h.
   1. CSCI 161.
   2. PHYS 231.
   3. One of the following options:
      a. Three courses (at least 3 credits each) chosen from the biology, chemistry, computer science, earth
         sciences and physics departments, which count toward the major in that department to include at least
         one of: BIO 375, CSCI 162, ESCI 340, 341, 342, or PHYS 232.
      or
      b. Four courses (at least 3 credits each) chosen from a single department, which count toward a major
         in that department.

Mathematics Major (B.S.Ed.): 120 s.h.
Secondary Education Certification
A. Mathematics Courses Required: 43-46 s.h.
   1. Required core courses: MATH 161 or 163, 162, 220, 261, 242, 238 (or 335/435), 345, 353 or 355, 464, 315.
   2. At least two additional math courses chosen from: MATH 342, 353, 355, 365, 370, 375, 393, 395,
      435, 445, 457, 465, 467, 471, 483, 4X8, 535, 536, 566, 592. Selected 500-level courses may be substituted
      with departmental permission.

Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog
for more information.

B. Required Related Courses: 10-14 s.h.
   1. CSCI 161.
   2. Any two of the following courses: BIOL 375, ECON 235, 318, ESCI 241, 340, 341, 342, PHYS
      231**, 232, CSCI 140*, 162, PHIL 312.
* Recommended, ** Highly recommended
Actuarial Science Option
A student fulfills this option by including the following required courses as part of his/her B.A., B.S., or B.S.Ed. mathematics program: MATH 269, 335, 375, 435, 535. In addition, the following courses are recommended: MATH 342, 536, ECON 101, 102; BUAD 161, 162.

Applied Mathematics Option
A student fulfills this option by including the following required courses as part of his/her B.S. mathematics program: MATH 467, 471, either 370 or 478, and one of: PHYS 232, ESCI 341, 342. In addition, the following courses are recommended: CSCI 406 (FORTRAN or C), PHYS 311, 312.

Statistics Option
A student fulfills this option by including the following required courses as part of his/her B.A., B.S. or B.S.Ed. mathematics program: MATH 335, 435, 535, 536, 537. In addition, the following courses are recommended: MATH 342, 370, 375.

Mathematics Minor 22-23 s.h.
A. Required Mathematics Courses: MATH 161 or 163, 162, 261, 242.
B. Mathematics Electives: Any two mathematics courses at the 300 level or above that count toward the B.A. mathematics major. Math 238 can also satisfy one of these requirements.

Statistics Minor 23-26 s.h.
A. Required Mathematics Courses: MATH 161 or 163, 162, 261.
B. Core Statistics Courses: Either MATH 335 and 435, or MATH 238.
C. Applied Statistics Courses: MATH 535, 536 (or 438), 537.

COURSE DESCRIPTIONS
MATH 090: 3 s.h.
Basic Mathematics
For students who are unprepared to successfully complete a regular college mathematics course. Remedial in nature, and not applicable toward the science/math requirement. After successfully completing MATH 090, students are prepared to take courses that fulfill this requirement. No credit toward 120 s.h. needed for graduation.

MATH 100: 3 s.h.
Survey of Mathematical Ideas (G2)
A liberal arts course for students who will not be scheduling a technical/professional math course. A survey of mathematics important to the history of Western civilization and to the modern world. Introductory modules covered usually include: number theory, geometry, topology, probability, statistics, computers, consumer mathematics and set theory. No credit in math/science block for math and science majors.

MATH 101: 3 s.h.
College Algebra
For students who need to improve their algebraic skills before taking a higher level course such as MATH 151, 160 or 161; focuses on algebraic topics needed for success in college mathematics and its applications. Includes the real number system, linear equations and inequalities, word problems, polynomials and factoring, rational algebraic expressions, exponents and radicals, quadratic equations, irrational equations, graphs of equations, systems of equations, and logarithmic and exponential functions. Prereq: high school Algebra I, II and Geometry or Math Placement Testing/Evaluation before registration.

MATH 102: 3 s.h.
Survey of Mathematical Ideas in Non-European Cultures (G2)
A survey of mathematical ideas developed by non-European cultures including, but not limited to, those of Africans, Asians, and native North, Central and South Americans. Includes culture, specific examples from the following areas of mathematics: number theory, topology, probability, group theory and logic. No credit under block G2 for math or science majors. MATH 100 and MATH 102 may not both be taken for general education credit. Offered periodically.

MATH 104: 3 s.h.
Fundamentals of Math I (G2)
Mathematics content which elementary and special education teachers of mathematics at any level need to know and understand before beginning to teach. Designed to equip all such majors with sufficient knowledge and facility in mathematics for teaching it effectively. Includes sets and logic, number systems,
structure of algorithms, number theory, properties of integers, rational numbers and real numbers, and beginning geometry and measurement. Emphasis on problem solving and reasoning within each topic. Required of all elementary education and special education majors. Math Placement Testing/Evaluation before registration.

Math 105: 3 s.h.
Fundamentals of Math II (G2)
An extension of MATH 104; covers additional mathematics topics relevant to teaching elementary mathematics. Includes algebra, additional study in geometry and measurement, probability and statistics, graphing, and further emphasis on problem solving and reasoning. Required of all elementary education majors. Prereq: MATH 104.

Math 107: 1 s.h.
College Algebra Enrichment
This course is designed for students taking MATH 101 College Algebra who, according to departmental placement criteria need additional tutoring, practice, and reinforcement in order to master the material of that course. Topics covered include linear equations and inequalities, word problems, polynomials and factoring, rational algebraic expressions, exponents and radicals, quadratic equations, rational equations, graphs of equations, systems of equations, and logarithmic and exponential functions. Corequisite: MATH 101.

MATH 110: 2 s.h.
Trigonometry
For students preparing to take calculus who are deficient in trigonometry. Beginning with angles, numerical trigonometry and triangle-solving, it develops the concepts and analytical skills required in calculus: identities, inverse functions, trigonometric equations, graphs and applications. Prereq: MATH 101 or high school algebra I, II and geometry.

MATH 130: 3 s.h.
Elements of Statistics I (G2)
Derivation of basic formulas; measures of central tendency and variability; probability and normal curve; sampling and hypothesis testing; confidence intervals. No credit toward a math or four-year computer science major nor under block G2 for majors in the School of Science and Mathematics except for nursing majors. Prereq: High School Algebra II or MATH 101.

MATH 151: 4 s.h.
Calculus for the Management, Life and Social Sciences (G2)
Elementary calculus and its applications in business, economics, life and social sciences. Functions, limits and continuity. The derivative; applications in marginal analysis, optimization, differentials and error estimation. Exponential and logarithm functions; applications to growth and decay problems. Improper integrals. No credit toward a major or minor in mathematics. Prereq: MATH 101 or equivalent, with a grade of C- or better or Math Placement Testing/Evaluation before registration.

MATH 160: 4 s.h.
Precalculus (G2)
Designed for persons intending to continue into calculus, who are not adequately prepared to begin their mathematics sequence with Calculus I (Math 161). Covers topics in which beginning calculus students are often deficient: elementary functions, curve sketching, theory of equations, inequalities, trigonometry and analytic geometry. No credit toward a math major. Prereq: 2 years of high school algebra, 1 year of high school geometry and trigonometry; or MATH 101, 110 with a grade of C- or better, or Math Placement Testing/Evaluation before registration.

MATH 161: 4 s.h.
Calculus I (G2)
Introduces concepts and techniques of calculus, beginning with limits. Major emphasis is on the theory and applications of continuity, derivatives, antiderivatives and the definite integral. Includes introductory calculus of trigonometric, exponential and logarithmic functions. Prereq: C- or better in MATH 160 or Math Placement Testing/Evaluation before registration.

MATH 162: 4 s.h.
Calculus II (G2)
Continuation of MATH 161. Transcendental functions, techniques of integration, applications of the definite integral, improper integrals, parametric equations, polar coordinates, sequences and infinite series. Prereq: C- or better in MATH 161, or 163.
MATH/HNRS 163: 5 s.h.
Honors Calculus (G2)
Concepts of calculus intended primarily for students majoring in mathematics and the sciences. The notions of limit, derivative, definite and indefinite integral are developed in detail as well as underlying philosophy of the mathematics and use of calculus in a modern computational environment. Offered in fall. Prereq: permission of instructor.

MATH/HNRS 165: 3 s.h.
Honors Applied Calculus I (G2)
Provides nontechnical honors students with an introductory survey of calculus as applied to the business, social and life sciences with emphasis on limits and differentiation. Intended for students in the University Honors College. No credit for math requirement for any major in the School of Science and Mathematics. Offered in fall. Prereq: MATH 160 or permission of instructor.

MATH/HNRS 166: 3 s.h.
Honors Applied Calculus II (G2)
Optimization, integration, modeling. Frequent use of real applications demonstrates how calculus is used as a tool in the real world. No credit for math requirement for any major in the School of Science and Mathematics. Honors students in nontechnical majors are required to pass both MATH 165 and MATH 166 with grades of B- or higher in order to fulfill the honors calculus requirement. Offered in spring. Prereq: Math 165.

MATH 171: 1 s.h.
Freshman Seminar in Mathematics
This seminar, reserved for freshman mathematics majors with placement in MATH 161 (Calculus I) or higher, will introduce students to a mathematical way of thinking, through a sequence of exploratory problem assignments drawn from the areas of elementary calculus, probability, number theory, linear algebra, etc. Students will experience problem solving and mathematical research in a structured environment using discussion, collaboration, abstraction, and technologies. Offered in fall. Corequisite: MATH 161 or 163.

MATH 220: 3 s.h.
Introduction to Mathematical Proof (W)
Emphasizes mathematical reasoning and communication of mathematical ideas both orally and in writing. Symbolic logic, Techniques of mathematical proof. Algebra of sets, binary relations and functions. Infinite sets, both countable and uncountable. Offered in fall, spring. Prereq: MATH 162.

MATH 235: 3 s.h.
Survey of Statistics (G2)
A survey of elementary probability theory, estimation, hypothesis testing and simple regression and correlation. Interpretation of statistical inference in the analysis of data. Emphasis on applications in both behavioral and physical sciences. Prereq: MATH 151 or 160.

MATH 236: 3 s.h.
Elements of Statistics II
An extension of MATH 235. Includes estimation, hypothesis testing, design of experiments with analysis of variance, regression analysis, covariance analysis and nonparametric approaches. Includes experiences using a variety of computing devices. A solid methods course for any major who needs to use statistical techniques. No credit toward math major. Offered in spring. Prereq: MATH 130 or MATH 235.

MATH 238: 4 s.h.
Introduction to Probability and Statistics
Designed for mathematics education majors. A rigorous study of probability, distribution theory and the basics of statistical inference. Includes probability, expectation, discrete and continuous distributions, descriptive statistics and both estimation and hypothesis testing for one and two-sample problems. No credit for both MATH 238 and MATH 235 or for both MATH 238 and MATH 335. Offered in fall, spring and periodically in summer. Prereq: MATH 261.

MATH 242: 4 s.h.
Linear Algebra I (G2)
A rigorous introduction to linear algebra. Includes systems of linear equations, matrix algebra, determinants, vector spaces, inner product spaces, geometry in R, linear transformations, orthogonal transformations, eigentheory and diagonalization. Offered in fall, spring and periodically in summer. Prereq: (or co-req.): MATH 261; MATH 220 recommended.
MATH 261: 4 s.h.
Calculus III (G2)
Continuation of MATH 162. Vector calculus, functions of several real variables, partial differentiation, implicit functions, multiple integrals, line and surface integrals, and applications. Prereq: C or better in MATH 162.

MATH 269: 1 s.h.
Calculus and Actuarial Science Problem Solving Seminar
An extension and synthesis of the calculus sequence that provides students with the problem solving skills emphasized in such examinations as the Society of Actuaries Exam 100, the Graduate Record Exam and the Advanced Placement Calculus Exams. Does not count as an upper division elective for the mathematics major or minor. Offered in spring. Prereq: MATH 261.

MATH 270: 3 s.h.
Operations Research Models
Principles of model building; examples from linear optimization, network analysis, probabilistic decision theory, Markov chains, queues, simulation and inventory models. Emphasis on application with a minimum of proof technique. Offered infrequently. Prereq: MATH 242.

MATH 301: 3 s.h.
History of Mathematics (P)
The progression of mathematical concepts, in the context of the thought and civilization of the time, from the Babylonians to the 20th century. Focus on the contributions of the Hellenic and Alexandrian Greeks as a point of departure for the evolution of geometry, number theory, analysis and logic. Proofs of some of the great theorems. Offered in fall, spring and periodically in summer. Prereq: MATH 151 or 161 or 163 or 166.

MATH 314: 3 s.h.
Mathematics for the Mentally & Physically Handicapped, K-12
Specifically designed for the special education major; emphasizes the content, methods, strategies and materials for use in an effective educational program for LD, ED, EMR, TMR, SPMR and physically handicapped students. MATH 314 helps students become more competent and confident when working with mathematics in special education. Offered in fall. Prereq: MATH 104 and completion of 60 s.h. For special education majors only.

MATH 315: 5 s.h.
Teaching of Mathematics in the Secondary School
Place and function of mathematics in secondary education; evaluation and improvement of instruction; current trends in objectives, methods and subject matter of junior and senior high school mathematics. A considerable portion of class time is devoted to teaching mathematics to secondary school students. Must be taken simultaneously with EDSE 321. Offered in fall, spring. Prereq: MATH 238 (or 335/435), 345, and MATH 353 or 355.

MATH 335: 3 s.h.
Mathematical Statistics I
Probability, random variables and probability distributions, mathematical expectation, special probability distributions and probability densities. MATH 335 may be considered as an introductory course in probability theory. Offered in fall, periodically in summer. Prereq: MATH 261.

MATH 342: 3 s.h.
Linear Algebra II
A continuation of Math 242. Topics include further theory of linear transformations and their matrix representations: invariant subspaces, equivalent and similar matrices, canonical forms. The vector space L (V, W). Orthogonal transformations and isometries; analysis of Euclidean motions in \( \mathbb{R} \). Least squares approximation and theory of generalized inverses. Bilinear and quadratic forms and their matrix representations; applications to conic sections in \( \mathbb{R} \) and quadric surfaces in \( \mathbb{R} \). Complex vector spaces. Offered periodically. Prereq: MATH 242.

MATH 345: 3 s.h.
Abstract Algebra I
MATH 353: 3 s.h.  
Survey of Geometry  
Various examples of axiom systems, brief exposition of Euclidean geometry using Hilbert’s axioms.  
Growth and development of geometry, non-Euclidean geometries and projective geometry. Elementary  
projective geometry from both the synthetic and analytic points of view. Offered in fall. Prereq: MATH  
220 and 242 or permission of instructor.

MATH 355: 3 s.h.  
Transformational Geometry  
The study of geometry from a transformational point of view. The group of affine transformations, with the  
subgroups of similarities and motions, is studied with investigation of invariant properties. Some exposure  
to transformations in the complex plane. Offered in spring and periodically in summer. Prereq: MATH  
220 and 242 or permission of instructor.

MATH 365: 3 s.h.  
Ordinary Differential Equations  
First order differential equations, linear first and second order initial-value problems, power series  
solutions; applications. Also includes at least one of the following topics: special functions of mathematical  
physics, Laplace transforms, systems of 1st order equations. Prereq: MATH 261.

MATH 370: 3 s.h.  
Operations Research  
Principles of model building; examples from linear optimization, network analysis, dynamic programming,  
probabilistic decision theory, Markov chains, queuing theory, simulation and inventory models.  
Applications and theory will be examined. Offered periodically. Prereq: MATH 242 and one of MATH  
235, 238 or 335.

MATH 375: 3 s.h.  
Numerical Analysis  
Numerical methods for solving systems of linear equations, solving nonlinear equations, integration,  
interpolation, approximation, and least squares curve fitting. Error theory. Offered in fall. Prereq: CSCI  
161, MATH 261 and 242.

MATH 393: 3 s.h.  
Number Theory  
The study of the properties of integers with respect to the fundamental operations. Primary emphasis on the  
logical derivations of these properties. Includes: induction, divisibility, congruencies, theorems of Fermat  
and Euler, continued fractions and quadratic reciprocity. Offered periodically. Prereq: MATH 242.

MATH 395: 3 s.h.  
Introductory Combinatorics  
Mathematical foundation for the concepts and techniques used in combinatorics. Topics include recurrence  
relations, finite differences, generating functions, pigeonhole principle, special sequences of integers (such  
as Fibonacci, Sterling and Bell sequences), principle of inclusion and exclusion, and an introduction to the  
theory of graphs. Applications will be indicated. Offered periodically. Prereq: MATH 242.

MATH 435: 3 s.h.  
Mathematical Statistics II  
A continuation of Math 335. Functions of random variables, sampling distributions, point estimation,  
interval estimation, hypotheses testing theory and applications. Offered in spring. Prereq: MATH 335.

MATH 445: 3 s.h.  
Abstract Algebra II  
Continuation of MATH 345. Introduction to field theory, rings of polynomials, introduction to Galois  
thory. Offered periodically. Prereq: MATH 345.

MATH 457: 3 s.h.  
Elementary Differential Geometry  
Frenet frames; curvature and torsion of curves in 3 space. Calculus of vector fields; geodesics and curvature  
of surfaces in 3-space. Surface area and volume. The Euler characteristic of a surface and the Gauss-Bonnet  
theorem. Rigid motions and isometries. Riemannian metrics, parallelism, non-Euclidean geometries and  
MATH 464: 3 s.h.
Real Analysis I
Rigorous development of the concepts and methods of calculus. The real number system and its topology; theory of limits and continuity; differentiable functions and their properties, the Reimann integral. Offered in fall, spring and periodically in summer. Prereq: MATH 220, 242, 261. MATH 345 recommended.

MATH 465: 3 s.h.
Real Analysis II
Continuation of MATH 464. Topics chosen from the following: convergence and uniform convergence of infinite sequences and series of functions; topology of Euclidean n-space Rn; differential calculus of functions Rn → R and Rn → Rm; extreme values; implicit and inverse function theorems; Riemann integration in Rn; metric spaces; function spaces; Riemann-Stieltjes integration. Offered periodically. Prereq: MATH 464.

MATH 467: 3 s.h.
Partial Differential Equations
Fourier series and the method of separation of variables; the wave equation, heat equation and Laplace’s equation; d’Alembert’s formula. Maximum principles, energy integrals and uniqueness. Sturm-Liouville problems and eigenfunction expansions. Offered in spring. Prereq: MATH 365.

MATH 471: 3 s.h.
Mathematical Modeling
Applications of mathematics to real-world problems drawn from industry, research laboratories, the physical sciences and engineering and the scientific literature. May include parameter estimation, curve fitting, elementary probability, optimization, computer programming, and ordinary and partial differential equations. Offered periodically. Prereq: MATH 365.

MATH 483: 3 s.h.
Point-Set Topology
Foundation course for extensive study in modern higher analysis, topology and related areas. Infinite set theory, metric spaces, topological spaces, separation properties, continuous mappings, homeomorphisms, convergence theory, product spaces, quotient spaces, connectedness, compactness, function spaces, applications. Offered periodically. Prereq: MATH 464 or permission of instructor.

MATH 498: variable credit
Independent Study in Mathematics
For further information on independent study, see the Special Academic Opportunities section.

MATH 408-488 variable credit
Mathematics Topic Courses
Topics courses are scheduled by arrangement with the instructor; semester hours of credit and meeting times for those courses are set by agreement.

MATH 408: Topics in Mathematics
MATH 418: Topic in Mathematics Education
MATH 438: Topics in Statistics
MATH 448: Topics in Algebra
MATH 458: Topics in Geometry
MATH 468: Topics in Analysis
MATH 478: Topics in Applied Mathematics
MATH 488: Topics in Topology

Honors Courses
See course descriptions as listed within this department. Also see Honors section of this catalog. MATH/HNRS 163, MATH/HNRS 165, MATH/HNRS 166.

GRADUATE LEVEL COURSES
These 500-level courses are open to qualified undergraduates with permission of the department. For course descriptions, please refer to the Graduate Catalog.
MATH 520: 3 s.h.  
Logic and the Foundations of Mathematics  
MATH 525 (595): 3 s.h.  
Axiomatic Number Systems  
MATH 535: 3 s.h.  
Statistical Methods I  
MATH 536: 3 s.h.  
Statistical Methods II  
MATH 537: 1 s.h.  
Statistical Problem Solving Seminar  
MATH 566: 3 s.h.  
Complex Variables  
MATH 577 (597): 3 s.h.  
Problems in Applied Mathematics  
MATH 592: 3 s.h.  
Graph Theory

MECHANICAL TECHNOLOGY  
SEE INDUSTRY & TECHNOLOGY

MEDICAL TECHNOLOGY  
SEE BIOLOGY

MEDICINE  
SEE BIOLOGY AND CHEMISTRY

METEOROLOGY  
SEE EARTH SCIENCES

MOLECULAR BIOLOGY  
SEE BIOLOGY

MUSIC  
School of Humanities and Social Sciences  
Professor Houlahan, chairperson  
Associate Professors Bradel, Heslink, Renfroe  
Assistant Professors Ardrey, Brye, Corley, Darmiento, James, Tackavik  
Instructors Behrens, A. Brandon, Englart, Staherski

The Department of Music offers two degree programs leading to the baccalaureate degree with a major in music.  
The bachelor of science in education degree (B.S.Ed.) in music education has been given accreditation by the National Association of Schools of Music and the Pennsylvania Department of Education. Completion of the degree requirements leads to certification by the Commonwealth of Pennsylvania for the recipient to teach all music: kindergarten through high school, vocal and instrumental.  
The unique and internationally recognized cadet teaching program sets this curriculum apart. From the first year, music education students gain experience in the classroom through observation, team teaching, mini-teaching and, finally, student teaching.  
A second degree program in music is in liberal arts (B.A.) in music and (B.A.) with music industry studies emphasis.
The B.A. in music consists of a liberal arts curriculum designed to provide students with a broad coverage of courses in music. The emphasis on music literature develops basic musicianship and the ability to perform the literature, as well as providing a fuller intellectual grasp of the art.

The B.A. with emphasis in music industry studies is a program designed for students who want to prepare for careers in the music industry including music retailing, publishing, entertainment and arts promotion. The curriculum consists of courses in music and business as well as specialized courses dealing with the music industry. An intern program provides the student with field experiences prior to graduation.

The department is cognizant of the desires of many students from all segments of the University to participate in music. Accordingly, both beginning and advanced courses are available to students enrolled in any curriculum. The music department also provides opportunity for student performance and participation in a variety of vocal and instrumental organizations. Some of these organizations are: University Choir, University-Community Orchestra, Symphonic Band and Wind Ensemble, the Marauder Marching Unit, and Mixed Chorus, as well as Chamber (String) Ensemble, West African Drum and Dance Ensemble, Jazz Ensemble and various other ensembles. A description of these organizations is included in the student handbook.

The music department offers a music minor. The music minor requires a minimum of 21 credits with at least 6 credits at the upper-division level (300-400).

**COURSE REQUIREMENTS**

Both new and transfer students interested in the music education curriculum are advised to read the General Requirements for Admission to Degree Programs in this catalog. Department handbooks are available on request for prospective bachelor of arts and music education students.

**Music Education Major (B.S.Ed.): 135.5 s.h.**

**K-12 Certification**

60.5 s.h. in music: MUSI 112, 131, 141, 151, 152, 153, 156, 162, 171, 181, 212, 231 or 377, 251, 271, 281, 312, 331, 362, 372, 373, 381, 412, 462, 481; two music electives; seven semesters of major performance and applied musicianship courses. Professional studies courses: EDFN 211, 241, 330; EDMU 461. One required course in related area: PHYS 205. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

**Music Major (B.A.): 124 s.h.**

64 s.h. in music: MUSI 112, 212, 131, 162, 181, 191, 192, 231 or 377, 281, 312, 315, 331, 362, 381, 411, 412, 462; eight semesters of major performance and applied musicianship courses. 6 credits music electives, 6 credits same foreign language, BUAD 101, PHYS 205, and 6 credits general electives.

**Music Major (B.A.): 123.5 s.h.**

**Music Industry Studies Emphasis**

57.5 s.h. in music: MUSI 112, 131, 162, 181, 191, 192, 204, 212, 231 or 377, 281, 291, 292, 315, 331, 381, 411; 6 semesters of major performance and applied musicianship courses, 10 semester hours of music electives and one semester private guitar instruction. Courses in related areas include PHYS 205, ECON 102, BUAD 101, 161, 251, ENGL 316, one computer science course and 9 semester hours of internship.

**Music Minor: 21 s.h.**

MUSI 100, 112, 212, 131; four semesters of major performance and applied musicianship courses, 6 semester hours elective courses at upper division level.

**COURSE DESCRIPTIONS**

**MUSI 100: 3 s.h.**

**Music and Culture (G1)**

A general study of art music with emphasis on listening to the compositions of Western composers. The development of music, its relationship to the other arts and its cultural influences will be examined. Designed for students with a limited musical background. Offered in fall, spring.

**MUSI 103: 3 s.h.**

**The Language of Music (G1)**

A course designed to develop a keen sensitivity to the language of musical sounds through creating, performing, conducting music, listening with sensitive awareness. The use of a broad range of musical materials, active exploration and personal discovery will lead the student to grasp the nature of the
interactions and relationships that bring meaning to music. Language of music is structured to provide the student with a means to developing greater awareness and accuracy in musical reading and hearing. Designed for students with little or no academic musical background. Offered in fall, spring.

**Note Regarding Credit for Applied Musicianship Courses**
A block of any six Applied Musicianship courses (total of 3.0 credits) count as one General Education (G1) course. No more than two such blocks of six Applied Musicianship courses count for General Education credit.

**MUSI 108, 109, 208, 209, 308, 309, 408, 409: .5 s.h.**

**Private Music Instruction**
(By selection of the staff.) Private lessons in piano, organ, voice, instrument or composition through the advanced level. Offered in fall, spring.

**MUSI 112: 3 s.h.**

**Solfège, Harmony and Analysis I**
This course provides an introduction to the structures and aesthetics of common-practice harmony for music majors and minors. The course begins with a review of elements of pitch, elements of rhythm, and progresses to the introduction of triadic harmony through Roman numeral analysis as well as figured bass realization. This course will investigate the harmonization of melodies and harmonic progressions through singing, playing, and keyboard performance. Musical materials to be studied will include selected multicultural folk music and art music examples. Offered in spring. Prereq: MUSI 162.

**MUSI 120, 121, 220, 221, 320, 321, 420, 421: .5 s.h.**

**Applied Musicianship in Symphonic Band**
Music literature, ensemble technique and performance practice through musical performance in Symphonic Band. Offered in fall, spring.

**MUSI 122, 123, 222, 223, 322, 323, 422, 423: .5 s.h.**

**Applied Musicianship in Orchestra and Chamber Ensemble**
Music literature, ensemble technique and performance practice through musical performance in Orchestra and Chamber Ensemble. Offered in fall, spring.

**MUSI 124, 125, 224, 225, 324, 325, 424, 425: .5 s.h.**

**Applied Musicianship in Jazz Ensemble**
Music literature, ensemble technique and performance practice through musical performance in Jazz Ensemble. Offered in fall, spring.

**MUSI 126, 127, 226, 227, 326, 327, 426, 27: .5 s.h.**

**Applied Musicianship in Choir**
Music literature, ensemble technique and performance practice through musical performance in Choir. Offered in fall, spring.

**MUSI 128, 228, 328, 428: .5 s.h.**

**Applied Musicianship in Marching Band Workshop**
The study of music literature, ensemble technique, and performance practice through musical performance in marching band. Offered in fall.

**MUSI 129, 229, 329, 429: .5 s.h.**

**Applied Musicianship in Marching Band**
Music literature, ensemble technique and performance practice through musical performance in Marching Band. Offered in fall, spring.

**MUSI 131: 2 s.h.**

**Class Piano I**
Practical keyboard facility, sight reading, elementary improvisation and harmonization of folk melodies and song. 1 hour lecture and 2 hours lab. Offered in spring. Music major or permission of instructor.

**MUSI 134, 135, 234, 235, 334, 335, 434, 435: 1-2 s.h.**

**Major Performance (Piano)**
Includes private study and participation in Master Classes. Music majors and minors only. Offered in fall, spring.

**MUSI 136, 137, 236, 237, 336, 337, 436, 437: 1-2 s.h.**

**Major Performance (Organ)**
Includes private study and participation in ensembles. Music majors only. Offered in fall, spring.
MUSI 141: 1 s.h.
Vocal Methods
A basic study of the technique of singing to adequately train the voice for practical and aesthetic reasons. Development of range quality, projection, control, and the fundamentals of correct breathing is pursued through the use of suitable solo and choral literature. 2 hours lab per week. Enrollment limited to Music Education Majors, or permission of the instructor. Offered fall.

MUSI 144, 145, 244, 245, 344, 345, 444, 445: 1-2 s.h.
Major Performance (Voice)
Includes private study and participation in Master Classes. Music majors and minors only. Offered in fall, spring.

Instrumental Class Instruction
The instruments of the band and orchestra. Emphasis on basic skills for performance through materials and methods suitable for school instruction. 2 hours lab. MUSI 151 through 253, below, are offered periodically.

MUSI 151: 1 s.h.
Strings I, Violin, Viola

MUSI 251: 1 s.h.
Strings II, ‘Cello, String bass

MUSI 152: 1 s.h.
Woodwinds I

MUSI 252: 1 s.h.
Woodwinds II

MUSI 156: 1 s.h.
Brass I

MUSI 256: 1 s.h.
Brass II

MUSI 153: 1 s.h.
Percussion I

MUSI 253: 1 sh.
Percussion II

MUSI 154, 155, 254, 255, 354, 355, 454, 455: 1-2 s.h.
Major Performance (Instrument)
Includes private study and participation in Master Classes. Music majors and minors only. Offered in fall, spring.

MUSI 162: 2 s.h.
Introduction to Art Music
Entry level investigation for music majors and minors. The repertoire of masterworks in art music. Emphasis on the perception of musical shapes and how they combine to create musical communication, and on cultural and social influences in music. Offered in fall.

MUSI 171: 1 s.h.
Introduction to Music Education
Introduction to music teaching for prospective music educators, (K-12). Emphasis on philosophical psychological, historical, social and practical issues affecting the process of music teaching and learning. 2 hours lab. Offered in fall.

MUSI 181: .5 s.h.
Dalcroze Eurhythmics I
The physical expression of musical rhythm. Large bodily movements form the reference for rhythmic analysis. Listening, performance and analysis. Emphasis on tempo, dynamics and the realization and improvisation of simple patterns and phrases. 2 hours lab. Offered in spring.

MUSI 191: 3 s.h.
Music Business for the Pop Musician
The “pop” music industry from the creation of the song by the songwriter/lyricist through its various promotional steps until it reaches the consumer. Includes making demos, copyright, publishing, licensing,
record companies, agents, unions and concert promotion. Current trends and issues of the “pop” music industry also examined. Offered periodically. Prereq: BUAD 101.

**MUSI 192: 3 s.h.**  
**Music Business for the Classical Musician**  
Artist promotion, record keeping, publishing, record production, agencies and music presentation as they relate to the orchestra, school, church and chamber music fields. Includes the music products industry—demographics, products, wholesale and retail operations, advertising and salesmanship. Offered periodically. Prereq: BUAD 101.

**MUSI 203: 3 s.h.**  
**The Language of Music II (G1)**  
This course provides an in-depth coverage of the fundamentals of music. Music materials include western and non-western music. This is a performance-based class. Prereq: MUSI 103 or equivalent background with permission of instructor. This course is structured to provide the student with a means to developing greater awareness and accuracy in musical reading, writing and hearing. 203 fulfills 103 requirements.

**MUSI 204: 3 s.h.**  
**Electronic Music (G1)**  
Explores electronic music as a major cultural expression in the 20th century through cultural trends, listening, analysis and theoretical study. Creative projects are integral to the course. Offered periodically.

**MUSI 212: 3 s.h.**  
**Solfege, Harmony and Analysis II**  
This course provides an in-depth coverage of the structures and aesthetics of common practice harmony. Reviews basic triadic progressions in keyboard style, introduces principles of voice leading, non-chord tones, seventh chords, secondary dominants and modulations using diatonic common chords. Investigates the harmonization of melodies and harmonic progressions through singing, ear training, creative writing, improvisation, composition, analysis, and keyboard performance. Musical materials will include selected multicultural folk music and art music examples. Offered in fall. Prereq. MUSI 112.

**MUSI 231: 2 s.h.**  
**Class Piano II**  
Intermediate course in practical keyboard facility, sight reading, elementary improvisation and harmonization of folk melodies and songs. 1 hour lecture, 2 hours lab. Offered in fall. Prereq: MUSI 131.  
*NOTE:* Music students with a major in piano take MUSI 377 instead of MUSI 231.

**MUSI 263: 3 s.h.**  
**Popular Music (G1)**  
Musical derivatives and development of pop, jazz and rock styles. Lecture, live and recorded musical demonstration, discussion and analysis. Offered in fall, spring.

**MUSI 265: 3 s.h.**  
**Symphonic Music (G1, W)**  
Development of symphonic music from the mid-18th century through the present. Relationships between the symphony and other musical genres. Emphasis on listening and analytical observation. Offered in fall, spring. Prereq: MUSI 100 or 162.

**MUSI 267: 3 s.h.**  
**Survey of American Music (G1, W)**  
American music from the colonization period to the present. Composers, their works, musical organizations and folk music in relation to historical developments which have shaped America’s cultural heritage. Analysis of recorded musical examples is an integral part of this course. Offered in fall, spring. Prereq: MUSI 100 or permission of instructor.

**MUSI 271: 3 s.h.**  
**Elementary Methods (K-5)**  
This course is designed to prepare students for teaching general music through the integration of multicultural content and practices related to the learner in an elementary school environment. Emphasis is on leading the young learner to understand musical concepts through a variety of behaviors (singing, moving, creating and listening). Also included are issues related to musical literacy development for young students. The course includes a field experience component (observation and teaching) that is intended to allow participants to apply theoretical principles in a practical setting. Offered in spring. Prereq: MUSI 212, 141, 171 or permission of instructor.
MUSI 281: .5 s.h.
Dalcroze Eurhythmics II
Continuation of MUSI 181. Prepares students for the application of the principles of Dalcroze Eurhythmics to performing, conducting and music teaching. 2 hours lab. Offered in fall.

MUSI 312: 3 s.h.
Solfege, Harmony and Analysis III
This course provides an in-depth coverage of the structures and aesthetics of common practice harmony with particular emphasis on the classical style and Baroque period. Reviews diatonic progressions and chromatic harmony. This course investigates the harmonization of melodies and selected harmonic progressions through singing, ear training, creative writing, improvisation, composition, analysis and keyboard performance. Musical materials will include selected multicultural folk music and art music examples. Prereq: MUSI 212.

MUSI 315: 1 s.h.
Music Composition
The art of music composition through examination of the creative process, rhythmic manipulation, melodic development, counterpoint and harmonic motivation. Creative composition is an integral part of the course. May be repeated for credit. Offered periodically. Prereq: MUSI 212 or permission of instructor.

MUSI 331: 2 s.h.
Class Piano III
Techniques in advanced keyboard analysis and improvisation, transposition, score reading and composition. Encompasses requirements of the piano proficiency test. 1 hour lecture, 2 hours lab. Offered in spring. Prereq: MUSI 231.

MUSI 347: 2 s.h.
Choral Methods
This course is for advanced music students who wish to study specific procedures for teaching vocal music in the choral ensemble. Emphasis is placed on developing music literacy teaching strategies while at the same time teaching fundamentals of good singing. Secondly, in order to attempt the development of a concept of sound aesthetic judgment regarding the vocal idiom, selected listening, reading and writing assignments. Offered in fall.

MUSI 362: 3 s.h.
Music History and Literature I
Study of Western music in it’s cultural historical, and philosophical contexts ca. 500 BC to ca. 1750 AD, including its relationship to other art forms. Introduction to research in music history. Writing projects about music. Offered in fall. Prereq: MUSI 100 or 162 and 312.

MUSI 365: 3 s.h.
Richard Wagner and Society (P)
Explores the late music dramas of Richard Wagner by examining the political climate during which they were created, the philosophical and religious influences on their creator, the literary origins of the texts, and the influences these works have had on the generations since their creation. History of 19th century Germany; philosophical influences of Schopenhauer, Hegel and Feuerbach; Wagner’s views of Christianity and Judaism; mythology and universal truths; socialism; fascism; the aesthetic writings of Wagner and their influence on literature, poetry, drama and painting; and the unification of music and drama through the use of leitmotifs are the basis of discussion. Offered infrequently. Prereq: MUSI 100 or 162.

MUSI 368: 3 s.h.
World Music (P)
Introduction to terminology and cultural areas of the world. General introduction to the study of world music, the ethnomusicological approach, and classification and symbolism of musical instruments. The process of musical innovation and acculturation in the world, and the impact of technology and the communications media on contemporary musical styles of non-European cultures. Topics include the musics of South and West Africa, Ethiopia and folk musics of the Arabic Near East, the classical musics of Iran and Asia, and the musical cultures of North and South India. Offered in spring.

MUSI 369: 3 s.h.
Introduction to West African Music
Survey course designed to provide an in-depth analysis of West African culture and history focusing on the musical traditions found in this region of the world. General introduction to the study of West African music and dance, the ethnomusicological approach, and classification and symbolism of musical
instruments will be presented. Moreover, the process of musical innovation and acculturation in West Africa and the impact of technology and the communications media on traditional and contemporary musical styles will be examined.

**MUSI 372: 3 s.h.**
**Middle and Secondary School Methods**
Study of the organization, pedagogy, and practice of the middle and secondary school general classroom. Field experiences include teaching 6th, 7th, and 8th grade general music classes and observing high school level orchestra, band and choral rehearsals. Students learn basic guitar skills throughout the semester while also reviewing their keyboard skills. 2 hours lecture, 2 hours lab. Offered in fall. Prereq: MUSI 271 or permission of instructor.

**MUSI 373: 3 s.h.**
**Instrumental Methods**
Acquaints the prospective instrumental music instructor with the information, materials and techniques for effective teaching and efficient administration of a successful instrumental music program via seminar and field experiences. 2 hours lecture, 2 hours lab. Offered in spring. Prereq: MUSI 152, 153, 156, 171, 381 or permission of instructor.

**MUSI 377: 2 s.h.**
**Piano Pedagogy and Instructional Materials**
Designed to equip the piano student with techniques for setting up a studio and teaching beginning and intermediate levels in private and class situations. The course includes a survey of current instructional methods, and observation of different pedagogical approaches to piano instruction. 1 hour lecture, 2 hours lab per week. Prereq: MUSI 331 or permission. NOTE: Music students with a major in piano take this course instead of MUSI 231.

**MUSI 381: 2 s.h.**
**Conducting I**
Includes fundamentals of conducting with emphasis on movement and developing score reading technique. Choral music is used throughout this course. 1 hour lecture, 2 hours lab. Offered in spring. Prereq: MUSI 212, 281 or permission of instructor.

**EDMU 461: 12 s.h.**
**Student Teaching and Seminar**
Student teachers are assigned full time to cooperating teachers to gain experience in the total activities of the school. Seminar is held every Thursday from 4:30 - 6:30 p.m. Offered in fall, spring. Prereq: MUSI 151, 251, 331, 372, 373, 412, 481; EDFN 211, 241, 330.

**MUSI 462: 3 s.h.**
**Music History and Literature II**
The history, literature and aesthetics of Western art music from 1750 through the present. Knowledge of stylistic trends and representative literature will be emphasized. Includes a unit on the theoretical and creative processes of electronic music. Offered in spring. Prereq: MUSI 162 or 100; 412.

**MUSI 478: 1 s.h.**
**Seminar in String Teaching Techniques and Materials**
Individual and group performance on string instruments; care and minor repair of instruments; analysis of string methods (including Suzuki), solo literature and string orchestra music. Arranging for various
ensembles is included. Offered periodically. 2 hours lab. Prereq: MUSI 151, 251 or permission of instructor.

**MUSI 481: 2 s.h.**  
Conducting II  
An advanced course with emphasis on movement and score reading using instrumental music. 1 hour lecture, 2 hours lab. Offered in spring. Prereq: MUSI 381 or permission of instructor.

**MUSI 498: 1-3 s.h.**  
Independent Study  
For further information on independent study, see the *Special Academic Opportunities* section.

**MUSI 587: 3 s.h.**  
Music in the Kindergarten and Preschool Classroom  
Offered periodically in summer.

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**NUCLEAR MEDICINE TECHNOLOGY**  
**SEE BIOLOGY**

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**NURSING**

School of Science and Mathematics  
Associate Professor Davis, chairperson  
Associate Professors Haus, Palmer, Zimmerman  
Assistant Professors Castellucci, Gillmore,  
Instructor Hartman

The Department of Nursing offers an NLNAC-accredited upper division program in nursing leading to a bachelor of science in nursing (B.S.N.) degree. This program is designed for registered nurses who are graduates of accredited diploma or associate degree nursing programs with a GPA of 2.0. Nursing courses may only be taken after attaining junior level status (60-90) credits. NURS 320, Conceptual Basis of Professional Nursing Practice, is the introductory course for the nursing major and should be taken first.

The goals of the nursing program are to provide an atmosphere and opportunities that develop intellectual curiosity, critical thinking, and sound reasoning and judgment; provide knowledge from the humanities, the physical, biological, psychological and social sciences to complement nursing theory and practice; provide a theoretical and clinical foundation in nursing to prepare a professional nurse who provides rational and humanistic health care within institutional and community settings; and provide a basis for graduate education in nursing.

**COURSE REQUIREMENTS**

**Nursing Major (B.S.N.): 122 s.h.**

NURS 320, 322, 325, 423, 424, 426, 428, 438; 3 s.h. of nursing electives, 11 s.h. of biol., 3 s.h. of statistics, 3 s.h. of departmentally related courses, 27 s.h. lower division nursing credits on admission.

**School Nurse Certification (K-12)**

Approved Pennsylvania Department Education School Nurse Certification Program is a post baccalaureate certification program. A BSN and PA registered nurse license is required. In addition, undergraduate evidence of: N322, N423, BIOL 256, PSYC 227/228, MATH 130, MATH (3 s.h.), ENGL 110, ENGL (3s.h.) literature and GPA 3.0 upon BSN graduation. Applicants desiring admission should request information from MU Certification Office. Graduate evidence of GRE results, PSYC 505, EDFN 545, NURS 560, PRAXIS II and GPA 3.0 upon completion are required.
COURSE DESCRIPTIONS

Junior Level (60-90 credits)

NURS 315: 3 s.h.
Scientific Advances in Health Care: An Integrated Perspective (P)
Analyses of 5 major contemporary health issues. Each specific issue will identify the integration of certain biological, chemical, psychosocial, educational and nursing components as they impact on the client/family unit. Open to all majors. Offered in fall, spring. Prereq: ENGL 110, COMM 100, 24 s.h.

NURS 316: 3 s.h.
Women, Health, and Health Care: Controversies and Dilemmas (P)
Examines the physical, psychosocial, economic, cultural, ethnic, racial and political factors that impact on women’s health. Case studies of current health dilemmas that affect women in today’s society will be analyzed. Offered fall, spring. Prereqs: ENGL 110, COMM 100, 24 s.h. Open to all majors.

NURS 320: 3 s.h.
Conceptual Basis of Professional Nursing Practice
Nursing theories, change and systems theories with application to health care delivery. Emphasis on decision-making and the nurse as change agent. 3 hours lecture. Offered in fall, spring.

NURS 322: 4 s.h.
Nursing Assessment of the Well Adult
The assessment process of the holistic adult client utilizing physical assessment skills such as the techniques of inspection, palpation, percussion and auscultation are presented and practiced. Appropriate screening tests will be presented. 3 hours lecture, 2 hours lab. Offered in fall, spring. Prereq: BIOL 161.

NURS 325: 3 s.h.
Adaptation Within the Wellness-Illness Continuum
Focus on promotion of effective individual and family adaptation to stressors in the achievement of optimal wellness. Family, stress, nursing, crisis and systems theories as they relate to the holistic person’s adaptation throughout the life cycle to continuous stressors in the environment. 3 hours lecture. Offered fall, spring.

NURS 340: 3 s.h.
Environmental Factors Affecting Health Status
Discussion of environmental factors that influence the holistic person’s health. Emphasis on health effects of air, water and soil pollution; environmental safety hazards and nursing responsibilities for intervention in a personal, community and political realm. Effects of pollution and safety hazards from a nursing perspective. 3 hours lecture. Nursing elective. Offered periodically.

NURS 350: 3 s.h.
Pathways to Healthy Aging (G2)
In-depth study of health needs of the elderly. Health is viewed in its broadest biopsychosocial context. Review of physiologic and psychosocial changes that occur with aging and the adaptations necessary to cope with such changes. 3 hours lecture. Open to all majors. Offered in fall, spring.

NURS 360: 3 s.h.
Transcultural Nursing Care
Provides an opportunity for examination of the major concepts related to transcultural nursing and allows learners to critically analyze current therapeutic nursing interventions as well as their communications with clients belonging to various ethnic groups in nursing practice situations. 3 hours lecture. Nursing elective. Offered periodically.

Senior Level (91-125 credits)

NURS 423: 5 s.h.
Dimensions of Community Health Nursing
History and philosophy of community health nursing are explored. Role of preventive and promotive health teaching for individuals, families and the community is emphasized. Application of nursing practice and public health sciences occurs in community agencies. 3 hours lecture, 4 hours lab. Prereq: NURS 320, 322.

NURS 424: 5 s.h.
Health Promotion and Rehabilitation Nursing
The nurse’s role in promoting healthful adaptation of clients across the life span with chronic health problems is explored. The impact of chronic illness and disability on the individual and the family is addressed. The need for an interdisciplinary approach and utilization of the nursing process in providing
rehabilitative care is stressed. Clinical experiences afford the student an opportunity to use critical thinking and creativity when providing care to clients and families faced with chronic health problems and disability in rehabilitation hospitals, therapy settings and community agencies. 3 hours lecture, 4 hours lab. Offered in fall, spring. Prereq: NURS 320, 322/Coreq 325.

NURS 426: 4 s.h.
Nursing Leadership and Management (W)
Discussion of current leadership, management and organizational theories and concepts and their usefulness in studying various problems in nursing. Emphasis is placed on integration of the problem-solving process and the nurse’s role in decision-making and evaluation. 3 hours lecture, 2 hours lab. Offered in fall, spring. Prereq: NURS 320; senior standing.

NURS 428: 3 s.h.
Nursing Research
Emphasis on critique of nursing research studies. Major components of a nursing research proposal are identified. Qualitative and quantitative aspects of research and their application to professional nursing practice are presented. 3 hours lecture. Offered in fall, spring. Prereq: MATH 130.

NURS 435: 1-3 s.h.
Topics in Nursing
In-depth investigation of topics of current interest in the nursing field. Topics to be announced when course is offered. Offered periodically.

NURS 438: 3 s.h.
Issues in Nursing
Discussion of the political, economic, legal, ethical and related societal issues that influence nursing practice and education. Professional nursing roles and responsibilities are emphasized. 3 hours lecture. Offered in spring, summer.

NURS 498: 1-3 s.h.
Independent Study in Nursing
An individualized experience based on the student’s particular interests. Provides an opportunity to demonstrate creativity and initiative to investigate further an area of interest in practice, research or education in nursing. Offered periodically. Prereq: NURS 423, 428.

GRADUATE LEVEL COURSES
Several 500 level nursing courses are open to qualified undergraduates with permission from the instructor. For course descriptions, please refer to the Graduate Catalog.

NURS 501: 3 s.h.
Theoretical Foundation of Advanced Practice

NURS 503: 3 s.h.
Issues and Roles in Advanced Nursing Practice

NURS 511: 3 s.h.
Pathophysiology for Advanced Practice

NURS 514: 2 s.h.
Family Health Nursing

NURS 530: 3 s.h.
Vulnerable Populations

NURS 560: 5 s.h.
School Nursing

OCCUPATIONAL SAFETY AND ENVIRONMENTAL HEALTH
SEE INDUSTRY AND TECHNOLOGY

OCEANOGRAPHY
SEE EARTH SCIENCES
PHILOSOPHY
School of Humanities and Social Sciences
Associate Professor Smith, chairperson
Associate Professors Allen, Stameshkin
Assistant Professors Miller, Ward

Philosophy courses are open to all students and present an opportunity for students to develop their critical
thinking skills on a broad range of issues. Traditional subjects include Philosophy of Religion, Introduction
to Logic, and Ethical Theories. Nontraditional courses include Thanatopsis: Viewing Death and Philosophy
in Film.

A major in philosophy is designed to acquaint students with a wide range of philosophers, philosophic
concepts and philosophic problems. Such a major can provide adequate training for those who wish to
attend graduate school in philosophy or it can be used as a pre-professional or pre-theological degree. In
order to supplement knowledge obtained in another major, some students choose philosophy as a second
major or as a minor.

COURSE REQUIREMENTS

Philosophy Major (B.A.): 120 s.h.
PHIL 321, 322, 328, 371, either 211 or 312, plus at least 6 s.h. of courses numbered 300 or above to make
up the required 30 s.h. Competency in a foreign language through the elementary level, two semesters or
equivalent. (Does not apply to double majors.)

Philosophy-Psychology Double Major (B.A.): 120 s.h.
30 credits of philosophy and the required related courses as listed above for the major. PSYC 454 may be
credited as an elective in philosophy.
30 credits of psychology and the required related courses as listed under the psychology major. PHIL 201
may be credited as an elective in psychology.

Philosophy Minor
PHIL 321, 322; either 211 or 312; either 328 or 371; two philosophy electives to make up the required 18
s.h.

COURSE DESCRIPTIONS

PHIL 100: 3 s.h.
Introduction to Philosophy (G1)
A beginning study of some of the major philosophical issues and thinkers.

PHIL 201: 3 s.h.
Philosophical Psychology (G1, W)
Intensive study of selected problems, figures or movements in psychology with emphasis on the
philosophical foundations or implications. May be taken any number of times for credit. Offered
infrequently.

PHIL 202: 3 s.h.
Philosophies of Love and Sexuality (G1)
Various viewpoints regarding both the nature of love and of human sexuality. Offered annually.

PHIL 211: 3 s.h.
Introduction to Logic (G1)
Principles of correct thinking; deductive inference; use and misuse of language in reasoning; introduction
to legal logic.

PHIL 280: 3 s.h.
Philosophies of Death and Dying (G1)
Various ways people have confronted death and have sought to understand it. Offered periodically.
PHIL 285: 3 s.h.
Moral Problems in Medicine (G1)
A study of biomedical moral and ethical problems. Offered annually.

PHIL 311: 3 s.h.
Computer Logic (G1)
Introduces digital logics including a detailed study of logic gates and switching circuits. Prereq: computer science or science major or PHIL 211. Offered infrequently.

PHIL 312: 3 s.h.
Mathematical Logic (G1)
First-order predicate calculus with identity and functional symbols. Offered annually. Prereq: PHIL 211 or some background in mathematics.

PHIL 313: 3 s.h.
World Religions (G1, W)
A study of the contents of certain living world religions. Offered infrequently.

PHIL 314: 3 s.h.
Philosophy of Science (G1, W)
The structure of scientific explanation; the logic character of scientific laws and theories; convention and description in science; probability and induction; the scientific method in the behavioral sciences. Offered periodically.

PHIL 321: 3 s.h.
Ancient Philosophy (G1, W)
The pre-Socratics, Socrates, Plato and Aristotle. Offered in fall.

PHIL 322: 3 s.h.
Modern Philosophy (G1, W)
Descartes, Leibniz, Spinoza, Locke, Berkeley, Hume and Kant. Offered in spring.

PHIL 327: 3 s.h.
Philosophy in Film
Investigation of philosophical themes, problems and questions raised in film. The medium of film provides a rich and lively context to explore traditional and current issues pertinent to the discipline of philosophy. Offered annually.

PHIL 328: 3 s.h.
Philosophical Classics (G1, W)
One or more major works or of a major philosopher or philosophers. May be taken any number of times for credit. Offered periodically.

PHIL 331: 3 s.h.
American Philosophy (G1, W)
A study of philosophy in America. Offered infrequently.

PHIL 341: 3 s.h.
Philosophical Analysis (G1, W)
The origin and development of the analytical movement in philosophy. The relation among philosophy, logic and linguistics. Criticism from and comparison with other philosophical movements. Offered infrequently.

PHIL 351: 3 s.h.
Contemporary European Philosophy (G1, W)
A study of the European philosophical traditions of hermeneutics, phenomenology, existentialism and structuralism in their historical context, their relations to contemporary culture, particularly to psychology, literature, theology and political action. Offered infrequently.

PHIL 361: 3 s.h.
Asian Philosophy (G1, W)
A study of significant ideas in the philosophical thought of Asia. Offered infrequently.
PHIL 371: 3 s.h.
*Philosophy Workshop on the Foundations of Philosophy (G1, W)*
Explores the core philosophical issues concerning theories of truth, knowledge and objective values. Emphasizes the development of the skills of critical reading and writing as well as performing philosophical research. May be taken any number of times for credit. Offered periodically.

PHIL 373: 3 s.h.
*Metaphysics (G1, W)*
Description and criticism of various metaphysical theories of reality. Offered infrequently.

PHIL 381: 3 s.h.
*Ethical Theories (G1, W)*
A study of selected moral issues and a critical analysis of the principal ethical theories. Offered infrequently.

PHIL 382: 3 s.h.
*Philosophy of Religion (G1, W)*
An examination of the justifiability of religion and of the nature of the religious experience, especially religious language. Offered infrequently.

PHIL 383: 3 s.h.
*Philosophy of Art and Aesthetics (G1, W)*
The history of the philosophy of art; an analysis of the aesthetic experience, the aesthetic object and the creative act. Emphasis will be placed on an analysis of the concepts employed in the criticism of literature, painting and music. Offered annually.

PHIL 391: 3 s.h.
*Gender, Utopia and Human Nature (P)*
Utopian thought, from classical philosophy to contemporary science fiction. Shows how different cultures have portrayed gender and gender roles as fixed by human nature or as manifestations of alterable social institutions. Prereq: junior standing and two courses in one area of the social sciences, or two courses in philosophy. Offered annually.

PHIL 407: 3 s.h.
*Political and Social Philosophy (G1, W)*
An examination of political and social philosophies with a view to discovering their relation to present political and social realities. Offered infrequently.

PHIL 498: Variable Credit
*Independent Study*
For further information on independent study, see the *Special Academic Opportunities* section.

**PHYSICS**

*School of Science and Mathematics*

Professor Nolan, chairperson
Professors Cooney, Dooley, Grosh, Miziumski, Price, Uy
Assistant Professor Dixon

The Department of Physics offers eight programs leading to the baccalaureate degree with a major in physics. The course structure recommended by the department is essentially identical during the first two years of all programs so that a revision in a student’s plan need not involve any loss of time.

The greatest flexibility is found in the liberal arts (B.A.) program, which invites interdisciplinary studies in areas such as biophysics, geophysics, physical oceanography, chemical physics, mathematical physics or astronomy. The program can also be tailored to prepare a student for immediate employment or for graduate study in various areas such as medicine, law, engineering, business management, scientific journalism and others for which an undergraduate major in physics is valuable.

The bachelor of science degree in physics involves the greatest depth in physics and mathematics. This program prepares the student for employment in a technical position upon graduation and provides as well a solid foundation for entrance into a graduate program in physics.

The physics-3/2 cooperative engineering option requires three years of study at Millersville in the liberal arts curriculum with a physics major plus two years in residence in the engineering program at one of the
cooperating institutions: Pennsylvania State University, the University of Pennsylvania or the University of Southern California. At the end of the five years, the student receives two baccalaureate degrees: a B.A. in physics from Millersville and a B.S. in engineering from the cooperating engineering school.

The physics-4/1 cooperative engineering option, offered in cooperation with the University of Pennsylvania, combines undergraduate study in physics with graduate study in engineering. A student with a satisfactory academic performance in the physics curriculum (B.A. or B.S.) at MU, upon application and recommendation by the physics department, may matriculate in the graduate engineering program at the University of Pennsylvania. The M.S. in engineering degree requirements are ordinarily completed in one or two years, and the student may apply to continue studies through the doctorate degree.

The program in secondary education prepares students for careers in precollege teaching, providing certification in physics.

The cooperative education program in physics is an optional arrangement whereby students combine practical on-the-job experience with their formal classroom instruction. After the freshman year, the Co-op program is available to all physics majors in the B.A. and B.S. programs who satisfy the departmental admission requirements. For more information, see “Cooperative Education” in the Special Academic Opportunities section.

Outstanding students majoring in physics may pursue departmental honors during their senior year. Participation in the departmental honors program is highly selective and offers students in each of our major programs an opportunity to strengthen their background in physics and to work closely with a faculty mentor on an extended research project. General information on departmental honors is found in the Special Academic Opportunities section of this catalog. Specific requirements for honors in each of our major programs are available from the department chairperson.

A minor program is also available for students who do not elect a major in physics. The minor offers students an exposure to physics through the intermediate level of our major program.

The department has prepared a student handbook which provides more detailed information on our programs, faculty and resources. This handbook, as well as additional information on any of the above programs, is available from the physics department.

COURSE REQUIREMENTS

Students majoring in physics are required to attain a grade of C- or better in MATH 161-162 and PHYS 231-232 before moving on to courses which have these courses as prerequisites.

**Physics Major (B.A.): 120 s.h.**
32 s.h. in physics: PHYS 198, 231, 232, 233, 311, 321, 334, 335, 351, 491, 492. Required related courses: CHEM 111, 112, MATH 161, 162, 261, 365; plus four additional 200, 300 and 400 level courses selected from any department with approval of adviser. Foreign language competency required through elementary level. Students presenting two years of successful high school study in one language may have this requirement waived.

**Physics Major (B.S.): 120 s.h.**
46 s.h. in physics: PHYS 198, 231, 232, 233, 266, 311, 321, 334, 335, 351, 352, 451, 495, 491, 492; plus 6 credits including one 400 level physics course and either PHYS 312 or 322. Required related courses: CHEM 111, 112, MATH 161, 162, 261, 365; plus an additional 6 credits in mathematics at or above the 200 level.

**Physics Major (B.A.): 123 s.h.**
**Physics/Meteorology Option**
32 s.h. in physics: PHYS 198, 231, 232, 233, 311, 321, 334, 335, 351, 491, 492. Required related courses: CHEM 111, 112; FORL 101, 102; MATH 161, 162, 261, 365; ESCI 241, 261, 340, 342, 343, 441, 442. (The ESCI courses fulfill the requirements for a Minor in Meteorology. Substitution of ESCI 343 for ESCI 245 will be accepted by the Earth Science Dept. The courses fulfill the minimum course requirements for employment by the National Weather Service.)

**Physics Major (B.A.): 121 s.h.**
**Physics/Philosophy Option**
35 s.h. in physics: PHYS 198, 231, 232, 233, 311, 321, 334, 335, 351, 435 or 471, 491, 492. Required related courses: CHEM 111, 112; FORL 101, 102; MATH 161, 162, 261, 365; PHIL 312, 314, 321, 322, 328 or 371, and one PHIL elective. (The PHIL courses fulfill the requirements for a minor in Philosophy.)
Physics Major (B.A.): 120 s.h.
Physics-3/2 Cooperative Engineering Option
32 s.h. in physics at MU: PHYS 198, 231, 232, 233, 311, 321, 334, 335, 351, 491, 492. Required related courses: CHEM 111, 112; MATH 161, 162, 261, 365; ENGL 312. Specific engineering curricula have additional requirements. Students MUST consult their advisers or the Physics Department Coordinator for Cooperative Engineering.

Physics Major (B.S.Ed.): 133 s.h.
Secondary Education Certification
39 s.h. in physics: PHYS 198, 231, 232, 233, 266, 311, 317 or ESCI 241, 321, 334, 335, 351, 352, 491, 492. Required related courses: CHEM 111, 112; MATH 161, 162, 261, 365; One of the following: BIOL 100, 211, 221. Professional Education: EDFN 211, 241, 330; EDSE 435, 461. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

Physics Minor
22 s.h. in physics: PHYS 231, 232, 233, 334, 335, 351; Prereq or coreq: MATH 161, 162, 261.

COURSE DESCRIPTIONS

PHYS 103: 4 s.h.
Elements of Physics (G2, L)
An elementary treatment of fundamental concepts of classical and modern physics. Selected examples from classical mechanics, electromagnetism, thermodynamics, relativity and quantum mechanics. The solving of numerical problems is de-emphasized. 3 hours of lecture plus 2 hours of lab. No credit in block G2 for majors in the School of Science and Mathematics. Offered in fall, spring.

PHYS 117: 3 s.h.
General Astronomy (G2)
Astronomy for a general audience; emphasis on the physical nature of the universe. Terrestrial astronomy, light, telescopes, spectra, stars, stellar evolution, galaxies, cosmology, the solar system. 3 hours of lecture and discussion. No credit in block G2 for majors in the School of Science and Mathematics. Offered in fall, spring.

PHYS 131: 4 s.h.
Physics I with Algebra (G2, L)
An introductory algebra-based course. Fundamental laws and properties of matter, mechanics and heat. Problems dealing with these laws. 3 hours lecture, 1 hour recitation and 2 hours lab. Competence in algebra and trigonometry is assumed. Offered fall, summer.

PHYS 132: 4 s.h.
Physics II with Algebra (G2, L)
Continuation of Physics 131. Fundamental laws and properties of electricity, magnetism, waves, sound, light and radiation. 3 hours lecture, 1 hour recitation and 2 hours lab. Offered spring, summer. Prereq: PHYS 131.

PHYS 198: 1 s.h.
Seminar: Perspectives in Physics
An overview of the history, practice, philosophy and unity of physics and its application to other disciplines, orienting beginning physics majors to the study of physics. Mandatory for and only open to physics majors in their freshman year. Offered in fall.

PHYS 205: 3 s.h.
Musical Acoustics (G2, L)
Intended for musicians dealing with the physical nature of sound and sound sources and the relation of these to music and musical instruments. The use of mathematics is kept to a minimum. 2 hours lecture-recitation and 2 hours lab. Prereq: MUSI 112. Offered in spring.

PHYS 230H: 1 s.h.
General Physics Seminar (G2)
The ideas of introductory physics in extended depth, in the language of calculus, using problems, laboratory exercises, readings and discussion. Grades of B or better in both PHYS 231 and PHYS 230H will result in honors designation for the pair. The pair of courses counts as one entry in the science component of the curriculum record form and results in six hours of general education credit. Coreq:
Concurrent registration in PHYS 231 required, and either good standing in the Honors Program or a 3.35 GPA or permission of instructor. Offered in fall, spring.

**PHYS 231: 5 s.h.**  
**Physics I with Calculus (G2, L)**  
An introductory course in classical physics dealing with mechanics, fluids, waves and thermodynamics. 3 hours lecture plus 1 hour of recitation and one 3-hour lab. Prereq: MATH 161.

**PHYS 232: 5 s.h.**  
**Physics II with Calculus (G2, L)**  
Continuation of PHYS 231. An introductory course in classical physics dealing with electricity, magnetism and optics. 3 hours lecture plus 1 hour of recitation and one 3 hour lab. Prereq: PHYS 231. Coreq: MATH 162.

**PHYS 233: 4 s.h.**  
**Modern Theories of Waves and Particles**  
Selected topics from the areas of waves and optics, special relativity, an introduction to the concepts and development of modern physics and single particle quantum mechanics. 4 hours of lecture. Prereq: PHYS 232. Coreq: MATH 261. Offered in spring.

**PHYS 266: 3 s.h.**  
**Electronics**  

**PHYS 302: 3 s.h.**  
**Physics and the Evolution of Western Civilization (P)**  
The history of the mechanization of the world picture. A study of physics in the evolution of Western civilization and thought to the time of Newton, relating the impact of the Newtonian revolution on Western society and thought. Prereq: A physical science course. Offered periodically.

**PHYS 311: 3 s.h.**  
**Mechanics I**  
Lectures, problems, and demonstrations developing the fundamental principles and concepts of classical mechanics, including Newton’s laws of motion, oscillating systems, central force problems, conservation laws, and an introduction to Lagrangian dynamics. 3 hours lecture. Prereq: PHYS 232. Coreq: MATH 365. Offered in fall.

**PHYS 312: 3 s.h.**  
**Mechanics II**  
A continuation of PHYS 311. Includes classical analysis of rigid body motion, non-inertial frames of reference, Lagrangian and Hamiltonian dynamics, systems of coupled oscillators, plus special topics. 3 hours lecture. Prereq: PHYS 311. Offered in spring.

**PHYS 317: 3 s.h.**  
**Introduction to Astronomy and Astrophysics**  
An overview of astronomy and astrophysics for students majoring in the sciences or mathematics, emphasizing selected areas such as terrestrial astronomy, celestial mechanics, stellar evolution, cosmology and the solar system. 3 hours lecture. Prereq: A year of college-level physics and calculus. Offered in fall of odd years.

**PHYS 321: 3 s.h.**  
**Electromagnetic Fields I**  
Electrostatic and magnetic fields in vacuum and in dielectric and magnetic materials. Maxwell’s equations are developed. 3 hours lecture. Prereq: PHYS 233, 334. Coreq: MATH 365. Offered in spring.

**PHYS 322: 3 s.h.**  
**Electromagnetic Fields II**  
Consequences of Maxwell’s equations. Solutions to Laplace’s equation, electromagnetic radiation, and relativistic electrodynamics are discussed. 3 hours lecture. Prereq: PHYS 321. Coreq: PHYS 335. Offered in fall.
PHYS 334: 4 s.h.
Macroscopic Phenomena and Thermodynamics
Lectures, problems and demonstrations which develop the basic ideas of classical continuum physics and the macroscopic behavior of solids, liquids and gases, including an introduction to fluid dynamics, stress-strain relationships in solids, electric and magnetic properties of materials, phase transitions, superconductivity and the classical laws of thermodynamics. 4 hours lecture and discussion. Prereq: PHYS 232. Coreq: MATH 261. Offered in spring.

PHYS 335: 3 s.h.
Multi-Particle Quantum Systems and Statistical Physics
Multi-electron atoms, statistical mechanics of classical and quantum systems, and introduction to nuclear physics. Principles are applied to selected examples. 3 hours lecture. Prereq: PHYS 233, 334. Offered in fall.

PHYS 345: 3 s.h.
Symbolic Computational Methods in Physics
Symbolic computational methods involving procedural, functional, rule-based programming and pattern matching using the graphical and numerical capabilities of Mathematica or other integrated mathematical software systems, with applications to a broad range of computationally challenging problems in physics. Prereq: PHYS 233; Coreq: PHYS 311 and MATH 365. Offered in fall of odd years.

PHYS 351: 1 s.h.
Intermediate Physics Laboratory I
Selected experiments in classical and modern physics introducing a variety of experimental techniques. 3 hours of lab. Prereq: PHYS 233. Offered in fall.

PHYS 352: 1 s.h.
Intermediate Physics Laboratory II
Continuation of PHYS 351. 3 hours of lab. Prereq: PHYS 351, 266. Offered in spring.

PHYS 360: 4 s.h.
Linear Circuit Analysis
Mathematical analysis of linear circuits in the complex domain. Differential equations, operators, transfer functions, Laplace transforms and computer simulation with SPICE. 4 hours lecture. Prereq: PHYS 266; MATH 365. Offered periodically.

PHYS 365: 3 s.h.
Digital Electronics
Introduction to digital electronics and microprocessors. Design and analysis of combinatorial and sequential digital circuits, microcomputer interfacing and assembly programming. Two 3-hour labs. Prereq: CSCI 226 or permission of instructor. Offered periodically.

PHYS 366: 3 s.h.
Micro-Electronic Circuit Analysis
Continuation of PHYS 266. Analysis and design of microelectronic circuits. Analytical treatment of discrete and integrated analog and digital circuits. 3 hours lecture. Prereq: PHYS 266, 360 or permission of instructor. Offered periodically.

PHYS 431: 3 s.h.
Solid State Physics
Classical and quantum analyses of solid matter. Topics include crystal structure, the reciprocal lattice and X-ray diffraction; mechanical properties-phonons; semiclassical analysis of electrical and magnetic properties of insulators and metals; electron band theory of metals, insulators and semiconductors. 3 hours lecture. Prereq: PHYS 335. Offered in spring of odd years.

PHYS 435: 3 s.h.
Statistical Mechanics
Lectures, problems and computer simulations developing the fundamental principles of classical and quantum statistical mechanics. Subjects include probability theory, the foundations of ensemble development and their application to classical, Fermi and Bose systems. Of special interest is the phenomenology of phase transitions and the modern development of the renormalization group. Prereq: PHYS 335. Offered in fall of even years.
PHYS 451: 1 s.h.
Advanced Physics Laboratory I
Selected experiments in classical and modern physics with opportunities to apply sophisticated techniques
to extended experimental problems. 3 hours lab. Prereq: PHYS 352. Offered in fall.

PHYS 452: 1 s.h.
Advanced Physics Laboratory II
Continuation of PHYS 451. 3 hours lab. Prereq: PHYS 451. Offered in spring.

PHYS 462: 3 s.h.
Advanced Electronics
Microprocessor applications and interfacing, real-time programming. Topics are selected from computer
design, control loops, phase-locked loops and communications. Two 3-hour labs. Prereq: PHYS 266, 365
or permission of instructor. Offered periodically.

PHYS 471: 3 s.h.
Quantum Mechanics
An introduction to formal quantum theory in terms of operators on a Hilbert space. Dirac notation is
introduced and used in the solution of the eigenvalue problems for the harmonic oscillator and angular
momentum by operator techniques. Other topics include the dynamics of a spin-1/2 particle, the addition of
angular momentum and perturbation theory. Prereq: 335 or permission of instructor. Offered in spring of
even years.

PHYS 491: 1 s.h.
Physics Research and Seminar
The first semester of an independent research experience supervised by a faculty mentor. Attendance at
weekly seminars is also required. Prereq: PHYS 335 and 351 or permission of instructor. Offered in fall,
spring.

PHYS 492: 2 s.h.
Physics Research and Seminar
The second semester of an independent research experience supervised by a faculty mentor. Attendance at
weekly seminars is also required. Prereq: PHYS 491. Offered in fall, spring.

PHYS 493: 1-3 s.h.
Topics in Astronomy and Astrophysics
Selected topics chosen from the areas of astronomy and astrophysics. Permission of instructor. Offered
periodically.

PHYS 494: 1-3 s.h.
Topics in Classical Physics
Selected topics chosen from the areas of classical physics. Permission of instructor. Offered periodically.

PHYS 495: 3 s.h.
Topics in Mathematical Physics
Treatment of advanced mathematical techniques applied to selected areas of physics. Prereq: PHYS 233,
MATH 365. Offered in spring.

PHYS 496: 1-3 s.h.
Topics in Applied Physics
A study of the application of selected physics concepts in experimental physics. Permission of instructor.
Offered periodically.

PHYS 497: 1-3 s.h.
Topics in Modern Physics
Topics chosen from areas of modern physics. Permission of instructor. Offered periodically.

PHYS 498: 1-4 s.h.
Independent Study in Physics
For further information on independent study, see the Special Academic Opportunities section in this
catalog. Offered periodically.
POLITICAL SCIENCE
SEE GOVERNMENT AND POLITICAL AFFAIRS

PRE-MEDICINE
SEE BIOLOGY AND CHEMISTRY

PRE-OPTOMETRY
SEE BIOLOGY

PRE-PODIATRY
SEE BIOLOGY

PSYCHOLOGY
School of Education
Associate Professor Tuleya-Payne, chairperson
Associate Professor Haferkamp, assistant chairperson
Professors Green, Kelly, Luek, Moyer, Smith, Woo
Associate Professors Benns-Suter, Foster-Clark, Hill, Szollos, Thyrum
Assistant Professors Best, Garner, Grosh, Lopez, Meyer
Instructor Forsyth

The Department of Psychology offers a B.A. degree in psychology, double majors with sociology, philosophy, and special education, a departmental honors program, and a selection of elective courses for all Millersville University students. Psychology majors, through departmental advisement, usually plan a program that leads to one of three goals: (1) graduate with a bachelor’s degree and enter the human service field, (2) graduate with a bachelor’s degree and enter the business/industrial field, or (3) graduate with a bachelor’s degree and enter graduate school for advanced study in psychology or related fields.

A minor in psychology is also available to undergraduate students. It provides a general survey of the field and training in psychological research methods.

The undergraduate psychology courses are open to liberal arts and teacher education students. However, a few laboratory and specialized courses are open only to psychology majors and minors.

The Cooperative Education program in psychology is an optional arrangement whereby students combine practical on-the-job experience with their formal classroom instruction. The Co-op program is available to all psychology majors who satisfy the departmental admissions requirements. For further information, see “Cooperative Education” in the Special Academic Opportunities section of this catalog.

DEPARTMENTAL POLICIES

Admission-to-the-Major Policy
Readmitted students must have a 2.25 or higher grade-point average at Millersville University since readmission in order to be admitted to the psychology major. Current students at Millersville University will be permitted to declare psychology as a major only if they have a cumulative grade-point average of 2.25 or higher based on at least 15 credit hours including PSYC 100 and if space is available.

Retention-in-the-Major Policy
At the end of each semester, the Psychology Department will review the academic performance of its majors. If any student with zero to 29.5 earned credits has a grade-point average below 2.0 or if any student with 30 to 59.5 earned credits has a grade-point average below 2.25, he/she will be notified by the department that he/she has been placed on probation-in-the-major status for the semester in which notification is made. The department will specify what the student must achieve that semester to be continued in the major. If the student is not successful in meeting the requirements during the probationary semester, he/she will be removed from the major.
Completion-of-the-Major Policy
Completion of the psychology major at Millersville University requires that 50% of the major field of study
courses must be completed at Millersville University. Students must obtain a grade-point average of 2.25 or
higher in courses in the major field of study as well as an overall grade-point average of 2.0 in order to
graduate as psychology majors.

Policy Regarding Advanced Placement (AP) Credit in Psychology
Entering students who receive a score of 3 on the Advanced Placement (AP) Examination in Psychology
shall be awarded three credits for an elective course designated PSYC 991. Entering students who receive a
score of 4 or 5 on the AP examination shall be awarded three credits for PSYC 100.

Pass/Fail Restriction on Courses for Psychology Majors and Minors
Psychology majors may not take any psychology courses or any required related courses on a pass/fail
basis. Psychology minors may not take any psychology courses on a pass/fail basis.

Policy on Credit Restriction for Developmental Psychology Courses
The Psychology Department offers three undergraduate developmental psychology courses—PSYC 227;
PSYC 228; and PSYC 229. Credit is awarded for any of the individual courses. Credit is also awarded for
the combination of PSYC 227 and PSYC 229, but not for any other combination of developmental
psychology courses.

Policy Regarding Cooperative Education and Directed Projects in Psychology
A limit of 6 s.h. of Cooperative Education or PSYC 495, or any combination of the two may be taken by a
student and counted in the psychology major. In unusual circumstances, and with written permission of the
student’s faculty adviser, the Directed Projects instructor, and the Psychology Department’s Cooperative
Education advisor, up to 6 additional s.h. may be taken; however, these credits may not be counted toward
the psychology major.

COURSE REQUIREMENTS

Psychology Major (B.A.): 120 s.h.
33 s.h. in psychology. Required Psychology Courses (15 s.h.) are: PSYC 100, 211, 212; one of PSYC 314,
315, 316; an additional four courses (12 s.h. minimum) of Psychology Core Electives (PSYC 227; 228;
229; 314; 315; 316; 317; 329; 335; 415; 417; 437; 454) and 6.0 s.h. of Psychology General Electives
(PSYC 234; 256; 311; 318; 319; 328; 346; 350; 356; 403; 447; 455; 489; 490; 495; 496; 498; 499).
Advanced laboratory courses (PSYC 314; 315; 316) not taken as part of the 15 s.h. of Required Psychology
Courses may be counted in the block of Core Electives. Required related courses are BIOL 100, MATH
100 or any advanced mathematics course or a computer science course (none of the following satisfies this
requirement: MATH 090, 104, 105, 110, 313, 314, 315); one philosophy course; one sociology course.

The following categories are suggested to help the student organize his/her curriculum in psychology.

Human Services: Select courses from among the following psychology electives: PSYC 227, 228, 229,
234, 256, 328, 335, 346, 356, 403, 417, 437, and 447. Recommended related courses are: BIOL 256; SPED
212; SOCY 210, 214, 217, 219, 314.

Business and Industrial: Select courses from among the following psychology electives: PSYC 234, 256,
311, 317, 318, 319, 329, 335, and 346. Recommended related courses are: CSCI 100, 142; BUAD 101,
231, 251, 351, 352, 353, 455.

Preparation for Graduate Study: In addition to the required psychology courses, all of the following are
strongly recommended: PSYC 314, 315, 316, 317, 335, 415, 417, 437, and 454.

Psychology-Sociology Double Major (B.A.): 120 s.h.
Psychology requirements: 33 credits of psychology and the required related courses as listed above for the
major. Two courses from SOCY 210 (Sociology of the Family), SOCY 214 (Aging and the Aged: Social
Gerontology), SOCY 315 (Race and Ethnic Relations), SOCY 316 (Social Psychology), SOCY 230
(Criminology), SOCY 338 (Sociology of Deviance), ANTH 323 (Culture and Personality), or ANTH 328
(Male/Female) may be credited as general electives in psychology.

Sociology requirements: 30 credits of Sociology and the required related courses as listed under the
sociology major. One course from PSYC 227 (Development of the Child and Adolescent), PSYC 228 (Life
Span Human Development), PSYC 317 (Social Psychology), or PSYC 335 (Personality Theory) may be
credited as an elective in sociology. PSYC 211 (Principles of Statistics and Experimental Design I) or
PSYC 212 (Principles of Statistics and Experimental Design II) may be substituted for MATH 130 (Elements of Statistics).

**Psychology-Philosophy Double Major (B.A.): 120 s.h.**
Psychology requirements: 33 credits of psychology and the required related courses as listed above for the major. PHIL 201 (Philosophical Psychology), PHIL 202 (Philosophies of Love and Sexuality), and PHIL 211 (Introduction to Logic) may be credited as psychology general electives, as long as neither is used as the required related philosophy course.

Philosophy requirements: 30 credits of philosophy and the required related courses as listed under the philosophy major. PSYC 454 (History and Systems of Psychology) may be credited as an elective in philosophy.

**Psychology-Special Education Double Major (B.A. or B.S.Ed.): 133 s.h.**
Special Education requirements: See the Special Education section of the catalog.
Psychology requirements: 33 s.h. of psychology as listed above for the psychology major. PSYC 437 (Abnormal Psychology) may be counted as both a special education elective and as a psychology core elective. PSYC 227 (Development of the Child and Adolescent) or PSYC 228 (Life Span Human Development) may be counted as both a special education required related course and as a psychology core elective. Both SPED 212 (Psychological Aspects of Exceptional Populations) and SPED 325 (Principles of Behavior Management) may be counted as both special education required courses and as psychology general electives. Required related courses are the same as for a psychology major. Refer to Admission to Advanced Professional Studies and Certification (Education Majors) in this catalog for more information.

**Social Studies Major (B.S.Ed.): 120 s.h.**
Secondary Education Certification
The social studies major is currently under review and pending changes. See the department chairperson for details. Also, refer to Admission to Advanced Professional Studies and Certification in this catalog for more information about education requirements.

**Psychology Option**
PSYC 100, 211, 228, 335, 437, and PSYC 234 or 317. At least 6 s.h. of psychology electives. Recommended related courses should be discussed with your advisor. For divisional requirements, refer to the Social Studies section of this catalog.

**Psychology Minor: 19 s.h.**
19 s.h. in psychology. Required psychology courses are: PSYC 100 and PSYC 211; an additional 12 s.h. of psychology electives, at least two courses of which must be at the 300 level or above.

**COURSE DESCRIPTIONS**

**PSYC 100: 3 s.h.**
*General Psychology (G3)*
An introduction to the study of behavior and mental activity, including such aspects as motivation, emotions, sensation and perception, individual differences, the nervous system, learning, and personality with a view of understanding behavior.

**PSYC 211: 4 s.h.**
*Principles of Statistics and Experimental Design I*
An introduction to research methods and design and to statistical analysis of psychological data. 3 hours lecture, 2 hours lab. Prereq: PSYC 100.

**PSYC 212: 4 s.h.**
*Principles of Statistics and Experimental Design II*
A study of standard experimental designs and statistical procedures widely used in psychological research. 3 hours lecture, 2 hours lab. Prereq: PSYC 211.

**PSYC 227: 3 s.h.**
*Development of the Child and Adolescent (G3, W)*
A study of the theory and research pertaining to the growth, development, and behavior of children through adolescence. Prereq: PSYC 100. No course credit given if credit earned for separate course in Child Psychology or Adolescent Psychology. No credit given if credit earned for PSYC 228.
PSYC 228: 3 s.h.
Life Span Human Development (G3, W)*
A focus upon the major stages of human development beginning with infancy and continuing through the
developmental changes of childhood, adolescence, and adulthood through to old age and death. Cognitive
and psychosocial aspects of human development are emphasized. Offered annually. Prereq: PSYC 100. No
credit given if credit earned for PSYC 227 or 229.

PSYC 229: 3 s.h.
The Adult Years (G3)*
An examination of the years from young adulthood to retirement. Focuses on intimate relationships, family,
parenting and other enduring commitments. Offered periodically. Prereq: PSYC 100. No credit given if
credit earned for Psyc. 228.
[*Psychology majors may count only one of these three courses as a Core Elective.]

PSYC 234: 3 s.h.
Human Relations (G3)
An examination of human interactions, both historically and currently, in diverse structures (e.g., family,
social, educational, political, economic, etc.) Course content targets increased awareness and understanding
of values, traditions, and rites of dominant and minority groups and their effect upon interpersonal and
inter-group relations.

PSYC 256: 3 s.h.
Psychology of Human Adjustment (G3, W)
An examination of factors that shape personal and social behavior with a focus on basic issues, problems,
and therapies as they relate to personal adjustment. Offered annually. Prereq: PSYC 100.

PSYC 311: 3 s.h.
Psychology of Drug Addiction (G3, W)
An investigation of the problems associated with drug addictions. Evaluations of opiates, stimulants,
barbiturates, depressants, hallucinogens, marijuana and alcohol, with consideration of the effects of these
drugs on the individual. Offered in fall, spring. Prereq: PSYC 100 or SOWK 211.

PSYC 314: 4 s.h.
Cognitive Psychology
A laboratory course designed to examine the nature of human memory, perception, and thought and to
provide an introduction to the techniques used to study these phenomena. 3 hours lecture, 2 hours lab.
Offered annually. Prereq: PSYC 212.

PSYC 315: 4 s.h.
Sensation and Perception
A laboratory course designed to develop an understanding of the models and theories of the sensory and
perceptual systems. 3 hours lecture, 2 hours lab. Offered annually. Prereq: PSYC 212.

PSYC 316: 4 s.h.
Learning and Motivation
A theoretical laboratory course designed to investigate and apply the concepts of learning and motivation to
both human and animal behavior. 3 hours lecture, 2 hours lab. Offered annually. Prereq: PSYC 212.

PSYC 317: 3 s.h.
Social Psychology
A review of the principles of social psychology derived from experimental study. Offered in fall or spring.
Prereq: PSYC 100, PSYC 211 recommended.

PSYC 318: 3 s.h.
The Psychology of Racism (P)
Examination of individual and institutional racism in all its aspects with an emphasis on the various
psychological explanatory theories and supporting research as well as the various techniques for alleviating
this problem. Additional overview of resultant effects on the victims. Prereq: PSYC 100.

PSYC 319: 3 s.h.
Psychology of African Americans (G3, W)
History of psychology in relation to African Americans and approaches to African-American psychology.
Examinations of theories, concepts and issues related to the behavior of African Americans. Offered
annually.
PSYC 328: 3 s.h.
Selected Issues in Psychology and Religion: The Western Search for Meaning (P)
An exploration of psychological and religious questions, issues, and processes in the search to give meaning to one's personal and shared journey. Prereq: PSYC 100.

PSYC 329: 3 s.h.
Industrial/Organizational Psychology (G3, W)
A study of research and applications of psychology to the work setting. Knowledge of the psychological processes of learning, motivation, perception and assessment is used to analyze selection, training, work design and performance. Offered annually. Prereq: PSYC 100.

PSYC 335: 3 s.h.
Personality Theory
An introduction to historic and contemporary theories of the human personality. Offered in fall, spring. Prereq: PSYC 100.

PSYC 346: 3 s.h.
Behavior Modification
An examination of theory, research and techniques related to the modification of behavior with special emphasis placed on the application of behavior modification procedures in a variety of settings, e.g., family, school and industry. Offered periodically. Prereq: PSYC 211 or permission of instructor.

PSYC/CSCI 350: 3 s.h.
Cognitive Science (P)
Basic introduction to cognitive science. Reviews attempts to understand cognition using insights from psychology, artificial intelligence, philosophy, linguistics and the neurosciences. Examines the synthesis of those attempts in the emergent field of cognitive science. Offered infrequently. Prereq: completion of fundamentals component of general education plus 24 s.h. in the liberal arts core.

PSYC. 356: 3 s.h.
Health Psychology
A review of research and theory linking psychological factors to health. Discussion of psychosocial aspects of health behavior, pain, stress, and the impact on biological systems. Evaluation of psychological and behavior interventions for health behavior change and chronic illness. Offered in fall, spring. Prereq: PSYC 100 and PSYC 227, 228, or 256.

PSYC 403: 3 s.h.
Family Systems: A Psychological Approach
An investigation of the impact of the multi-generational family system on the individual. Assessment of functional and dysfunctional family systems. Emphasis upon theorists and their orientations and intervention strategies. Offered in spring. Prereq: PSYC 100 and junior or senior standing.

PSYC 415: 3 s.h.
Physiological Psychology
A systematic examination of the nervous and sensory systems and their regulation of human behavior. May not be used in place of PSYC 314, 315, or 316 to fulfill the laboratory requirement. Offered in fall. Prereq: PSYC 100 and one course in biology. Chemistry helpful. Junior or senior standing.

PSYC 417: 3 s.h.
Tests and Measurements
An introduction to the basic principles of psychological testing and measurement. Focus upon issues in test construction and design, evaluations of psychometric properties, and applications of tests in various fields of psychology. Offered fall or spring. Prereq: PSYC 211 or permission of instructor.

PSYC 437: 3 s.h.
Abnormal Psychology (G3, W)
A comprehensive study of the etiology, characteristics, and treatment in the categories of abnormal behavioral manifestation. Offered in fall, spring. Prereq: PSYC 100.

PSYC 454: 3 s.h.
History and Systems of Psychology
Study of the development of psychology from a branch of philosophy to a modern science. Offered in fall. Prereq: PSYC 100.
PSYC 447: 3 s.h.
Counseling Strategies
An introduction to the process and practice of counseling. Emphasis is placed on learning counseling theories and on counseling skills. Offered in fall, spring. Prereq: PSYC 100.

PSYC 455: 3 s.h.
Senior Seminar in Psychology
An advanced course devoted to critical analysis of student and professional research using staff consultant leadership. Offered periodically. Prereq: Senior psychology majors only.

PSYC 489: 1-4 s.h.
Honors Course
For the definition of honors course and student eligibility, refer to the Special Academic Opportunities section of this catalog.

PSYC 490: 1 s.h.
Honors Seminar
Examination and discussion of current research issues in psychology. May be taken a maximum of three times. Enrollment limited to students with at least 45 s.h. who are applying to the Psychology Department honors program and to those already admitted to that program. Offered in fall, spring. Prereq: Permission of instructor.

PSYC 495: 1-6 s.h.
Directed Projects in Psychology
Supervised field experience involving the application of psychological principles. For advanced psychology majors. Offered in fall, spring. Prereq: Permission of instructor.

PSYC 496: 1-3 s.h.
Topics in Psychology
Detailed investigation of a topic of current research interest. Topic to be announced each time course is offered. Credit and meeting hours variable, depending on topic offered. May be taken more than once for credit as topic varies. Offered periodically. Prereq: Junior or senior standing and permission of instructor.

PSYC 498: 1-3 s.h.
Independent Study in Psychology
For further information on independent study, see the Special Academic Opportunities section of this catalog.

PSYC 499: 1-4 s.h.
Departmental Honors
For the definition of departmental honors and eligibility, refer to the Academic Policies section of this catalog.

GRADUATE LEVEL COURSES
The following 500-level courses are open to qualified undergraduates with permission. For course descriptions, please refer to the Graduate School Bulletin.

PSYC 505: 3 s.h.
Recent Developments in Psychology
PSYC 525: 3 s.h.
Advanced Child Psychology
PSYC 526: 3 s.h.
Advanced Adolescent Psychology
PSYC 530: 3 s.h.
The Child in the Family System
PSYC 537: 3 s.h.
Introduction to Assessment and Intervention
PSYC 546: 3 s.h.
Learning Theories and Their Application
PSYC 547: 3 s.h.
Applied Social Psychology
PSYC 536: 3 s.h.
Applications of Biopsychology
PUBLIC RELATIONS
SEE COMMUNICATION & THEATRE

RESPIRATORY THERAPY
SEE BIOLOGY

RUSSIAN
SEE FOREIGN LANGUAGES

SCIENCE & MATHEMATICS

SCMA/HNRS 383: 3 s.h.
Issues in Science and Religion (P)
History of the interaction of science and religion in western culture from the 17th through the 20th
centuries, methods employed by each enterprise, religious issues posed by scientific theories. Term paper
required. 3 hrs. lecture. Offered in fall. Prereq: 45 s.h. including at least one G1 and one G2 course.

SECONDARY EDUCATION
SEE EDUCATIONAL FOUNDATIONS

SOCIAL STUDIES
School of Humanities and Social Sciences
The social studies major is currently under review and pending changes. See the Dean of Education.

SOCIAL WORK
School of Humanities and Social Sciences
Professor Gregoire, chairperson
Professors Fulmer, Heintzelman, Kruse
Assistant Professor Sewell
Instructor Gantt

The social work program at Millersville University leads to a bachelor of arts degree in social work. Based
on the general education curriculum, the social work curriculum is designed to prepare students for
beginning professional practice in social agencies and other settings where social workers are employed.
The program educates the general practitioner; therefore, it is built on basic required courses. However, it
also allows students to explore areas of interest through elective courses and field instruction assignments.

Affirming the mission of Millersville University, the social work department provides a learning
environment designed to prepare social work practitioners as lifelong learners able to live in an increasingly
diverse, multicultural, and technologically complex society. Building on a liberal arts foundation, we seek
to develop educated, ethical productive professional social workers able to meet human needs, enhance
human well being, and promote social and economic justice through generalist social work practice and
social action.

Goal 1: To help students integrate liberal arts and professional knowledge, values and skills into competent
being generalist practice.

Goal 2: To sensitize students to issues of human diversity and populations at risk, and assist them in
pursuing equity in professional and institutional relations.

Goal 3: To prepare students to understand social policy issues and participate in efforts directed toward
their resolution.

Goal 4: To prepare students to be ethical practitioners.

Goal 5: To motivate and prepare students for continuing professional development and education.
The curriculum is designed to help students integrate knowledge and theories from many academic disciplines with social work concepts, values and practice skills. Courses in the social work program attempt to develop an understanding of the human condition and human diversity.

The social work major needs to understand biological, psychological and sociocultural aspects of human development; characteristics of human interaction with the social environment; the role, structure and function of social welfare policies and programs; social work intervention methods; and social work research findings and methods.

In addition to theoretical instruction, students are given ample opportunity for practical experience. The experiential requirements begin in the introductory courses and carry through to formal work in advanced courses. The culmination is a year-long practicum experience—40 hours during fall semester and 450 hours during spring semester—wherein the student can integrate knowledge and skills in a social agency or other social service setting in the community.

A formal screening and selection process takes place for each student prior to placement in a social service setting for field instruction. Qualifications are based on academic performance, oral and written communication skills, demonstrated ethical behavior, values and commitment to social work as a career. The social work faculty has the right to dismiss from the program at any time students found not qualified for social work practice.

Millersville’s social work baccalaureate program was first professionally accredited by the Council on Social Work Education in 1981 and is currently accredited through June 2003.

There is no foreign language requirement for the social work major; however, fluency in Spanish can be an asset for field placement and for future employment.

**COURSE REQUIREMENTS**

**Social Work Major (B.A.)**  
SOWK 102, 202, 203, 301-302, 303, 310-311, 401-402, 403-404, 405. Nine additional elective credits from SOWK 304, 305, 306, 307, 308, 309, 312, 350. A grade of C or above must be attained in all required social work courses. SOWK 401-402 must be taken concurrently with 404 in spring semester. Required related courses: BIOL 100; ECON 101, GOVT 112; PSYC 100; SOCY 101, 211.

**COURSE DESCRIPTIONS**

**SOWK 102: 3 s.h.**  
Modern Social Welfare Dilemmas (G3)  
Introduction to social work’s approach to social problems including how public policy decisions affect individuals and families; overview of competing public policy agendas in social welfare and alternative strategies for problem resolution, societal values and trends affecting service delivery; understanding social work in action; examining core concepts, values and ethics.

**SOWK 202: 3 s.h.**  
Social Welfare as a Social Institution  
Introduction to the structure of the social services delivery system and the role of social policy in it; social systems perspective; analysis of agencies as systems; introduction to professional and legal references; analysis of a social problem. Agency volunteer work required. Prereq: SOWK 102 and sophomore status, or permission of instructor.

**SOWK 203: 3 s.h.**  
Human Behavior and the Social Environment I  
Examines the life span approach to human development with focus on interaction between the individual’s biopsychosocial functioning and the social environment. Analyzes the impact of human diversity on behavior in social situations with particular emphasis on populations at risk. Studies how factors of human diversity affect social policy. Volunteer work required. Prereq: BIOL 100, PSYC 100, SOCY 101, SOWK 102.

**SOWK 211: 3 s.h.**  
Alcoholism: A Multi-disciplinary Approach (G3, W)  
Major social health problems from a holistic point of view, integrating social, psychological, cultural, physiological factors with information about alcohol and alcoholism. Not for credit toward social work major. Offered infrequently.
SOWK 301: 3 s.h.
Social Work Practice I (W)
Study of the wide range of activities that constitute the generalist social work approach. Designed to assist students to develop basic entry level professional social work competencies within a systems framework. Junior field experience required. Offered in fall. Prereq: SOWK 102, 202 and 203 or permission of instructor. SOWK majors only.

SOWK 302: 3 s.h.
Social Work Practice II
In-depth examination of the knowledge, values and skills that form the base of social work practice; method selection and skill development in social work intervention; practice with social work communication skills. Emphasis on practice with groups and vulnerable populations. Junior field experience required. Offered in spring. Prereq: SOWK 301. SOWK majors only.

SOWK 303: 3 s.h.
Social Welfare and the Law
Significant legislation, court decisions and regulatory language that shape public social policy and affect the legal base for social work practice. Among substantive areas discussed are: family law, mental health law, constitutional and civil rights, poverty law (including landlord-tenant relations), legal regulations of human reproduction and sex behavior, education and professional licensing. Offered in fall. Prereq: SOWK 102 or permission of instructor.

SOWK 304: 3 s.h.
Social Work and Corrections
Public policy issues and problems in juvenile and adult corrections. Historical perspective, rehabilitation approaches, de-institutionalization, community-based programs and other trends. The correctional system as a subsystem of the criminal justice system; legal offenders and their families as a vulnerable population group. Roles of the social worker in institutional settings, probation and parole, group homes. Field trips to state prisons, county jails and juvenile facilities. Offered in spring.

SOWK 305: 3 s.h.
Social Work and Child Welfare
Concepts, policies and practices in child welfare services as response to needs of children and their families; focus on services designed to support, supplement or substitute for the care usually given by biological parents; social work practices and public policy issues in foster care, adoption, day care, institutional care, protective services, teenage pregnancy and juvenile delinquency. Offered in spring.

SOWK 306: 3 s.h.
Social Work and Aging
A developmental approach to the aging process as one phase of the life cycle; biological, psychological, social and economic needs of the elderly; analysis of societal provision for these needs; public policy issues and pertinent social legislation; community-based programs of social and health services; techniques of generic social work with older persons; advocacy and policy planning for the aging. Lectures and discussion supplemented with audiovisual material, speakers and field visits as available. Volunteer experience with an older person or persons required. Offered in fall.

SOWK 307: 3 s.h.
Social Work and Health Care
Scope and contribution of professional social work in comprehensive health care settings focusing on individual and community health needs, social and behavioral aspects of illness, essential practice components and skills required of social workers, health care policy, issues and trends, alternative health care programs and research needs. Offered in fall.

SOWK 308: 3 s.h.
Social Work and Alcoholism
Concept, policies, issues, trends, theories and social work practice skills in the setting of alcoholism services. Focuses in interaction of affected individuals with other in family, social, economic, educational, legal and political systems. Examines role of social worker in identification, intervention and use of network of community resources. Offered in spring.

SOWK 309: 3 s.h.
Social Work and Mental Health (W)
Application of theory and social work values to practice with mentally disordered people, their families and service systems relating to their needs. Consideration of various practice modalities, including direct
intervention as well as social policy analysis, research and prevention. Lectures and discussion supplemented with audiovisual material, speakers and field visits as available. Offered in fall.

**SOWK 310: 3 s.h.**
**Social Work Research I**
Emphasis on the scientific method in development of beginning evaluative skills that contribute to practice competence. Knowledge to evaluate critically the research findings of others; use of research methods to improve practice. Students are required to participate in a research study. Offered in spring. Prereq: SOWK 102.

**SOWK 311: 3 s.h.**
**Social Work Research II (W)**
Social work research skills, values and knowledge. Research design, statistical usage and data analysis in social work practice and research. Students develop a research proposal. Offered in fall. Prereq: SOWK 310.

**SOWK 312: 3 s.h.**
**Social Work and Women’s Issues (W)**
Scope and contribution of professional social work in regard to women’s issues and concerns in contemporary society. Emphasis on the analysis of individual and community women’s needs, the social and behavioral aspects of women’s concerns, the essential practice components and skills required of social workers, social welfare policy and women, issues and trends, alternative women’s programs and research needs. Offered in fall.

**SOWK 350: 3 s.h.**
**Encounters in Human Diversity: Dynamic Problem-Solving in the Context of Diversity (P)**
An upper-level, multicultural, interdisciplinary, interactive course designed to enhance students’ knowledge, skills and values relative to working with people in professional situations, within a diversity-embracing atmosphere. Focus on the various differences in communication styles brought about by gender and culture. Discussion, lecture, readings and a series of in-class and out-of-class exercises. Designed for students whose anticipated careers are primarily oriented to direct work with people. Offered in fall. Prereq: COMM 100, ENGL 110, 24 s.h. Gen. Ed.

**SOWK 401-402: 6 s.h. each**
**Field Instruction I and II**
Supervised placement in social service agencies for 450 hours of social work practice; concurrent with SOWK 404. Offered in spring. Prereq: 24 credit hours of social work professional courses. Malpractice liability insurance required. SOWK majors only.

**SOWK 403: 3 s.h.**
**Social Work Practice III**
Theoretical aspects of the skills knowledge, and values in social work practice at the macro level involving organizations and communities. Integration of abstract knowledge with concrete experience in the field, including community, agency and “change-effort” papers. 40-hour field experience required. Offered in fall. Prereq: SOWK 302. SOWK majors only.

**SOWK 404: 3 s.h.**
**Senior Seminar**
The “capstone” course for social work majors, to be taken concurrently with SOWK 401-402. A bridge between the roles of student and practitioner, the course examines issues and concerns facing social workers entering professional practice, synthesizes and integrates knowledge, value and method components with field experiences. Offered in spring. Prereq: SOWK 403.

**SOWK 405: 3 s.h.**
**Human Behavior & the Social Environment II**
The second of two courses in human behavior and the social environment, emphasizing 1) the interaction of social and economic forces with individuals and social systems; 2) traditional and alternative theories about systems as they interact with people, promoting and impeding health, welfare and well-being, in context of human culture and diversity; and 3) knowledge about opportunity structures and how they promote and deter human development and meeting needs. Offered in spring. Prereq: 18 credits of social work professional courses including SOWK 203.

**SOWK 498: 1-3 s.h.**
**Independent Study**
For further information on independent study, see the *Special Academic Opportunities* section.
SOWK 489, 499:1-3 s.h.
Independent Study, Department Honors

SOCIOMETRY/ANTHROPOLOGY
School of Humanities and Social Sciences
Professor Casselberry, chairperson
Professors Arnold, Counihan, Fischer, Stine
Associate Professor Glazier
Assistant Professors Mahaffy, Schaffer, Rosenberg, Schmitt

The Department of Sociology/Anthropology offers both a major and minor in sociology, a major and minor in anthropology, an option in archeology and a minor and option in criminology.

Anthropology Major
The departmental major in anthropology emphasizes a holistic approach to the study of humans, located in all parts of the world through all periods of time. Anthropology consists of four separate but interrelated subdisciplines: cultural anthropology, physical anthropology, archeology and anthropological linguistics. Our program focuses primarily on the subdisciplines of archeology and cultural anthropology. The department encourages its majors to undertake field study in one or more of the subdisciplines of anthropology. A major in anthropology provides the student with a holistic and comparative perspective on problems and situations, which employers find very valuable. An undergraduate degree prepares the student for employment in the area of human services, entry-level work with local or federal government agencies and employment in the business community. Our program also prepares students for more advanced study which leads to careers in teaching and research at colleges, universities or museums, or research/consultative careers with local, national or international organizations.
Sociology Major
Sociology is the rigorous, scientific study of human interaction and social organization. The sociologist is primarily interested in discovering the social patterns affecting and resulting from human group behavior. In that effort, the sociologist focuses on the influences of the social as well as the physical and biological environment on individual behavior and personality formation, on group interaction and on social organization and institutions. Within this general framework, sociological interests are extremely varied. The subject matter of sociology includes crime and its causation, family problems and interaction patterns, variations in the aging process, the impact of social class on life chances, the influence of mass media on human behavior, the social construction of gender, and the transition from adolescence to adulthood. The sociology major is selected by those students primarily interested in pursuing careers in the following areas: college/university teaching and research, research in a public or private organization or business and employment in community, state or federal or government agencies.

Minors and Department Options
The department offers three minors, one in criminology, one in sociology and one in anthropology. These minors provide the student with insight into the principles governing human interaction and social organization. The criminology minor is the most specific of the three, focusing exclusively on the American criminal justice system. The sociology minor, in broad terms, examines American society, while the student minoring in anthropology can focus on either archeology or cultural anthropology. All of these minors should facilitate career advancement and intellectual breadth, regardless of the student’s major field of study.

For sociology majors wishing to concentrate their studies in the areas of criminal behavior and criminal justice, the department has a criminology option within the sociology major. This program provides the student not only with a thorough knowledge of the American criminal justice system, but combines that knowledge with a broad understanding of American society and the principles of sociological method and theory.

The archeology option within the anthropology major offers students a broad view of contemporary archeology, with emphasis on contract archeology, artifact analysis, current method and theory, field experience and independent research.

The department strongly encourages all of its majors to acquire practical experience as part of their degree program. This experience may take a variety of forms, depending on the student’s major or minor. Along with other activities, the department recommends participating in faculty supervised research (ongoing research projects are conducted out of both the archeology and social research labs), cooperative education/internships (see Cooperative Education in the Special Academic Opportunities section), studying abroad for a semester or summer term, or department tutoring.

There is an honors program for superior students. Further information may be obtained from the department or the Departmental Honors section of this catalog.

For the most recent curriculum and career information, students should consult the latest sociology/anthropology student handbook.

COURSE REQUIREMENTS

Anthropology Major (B.A.): 120 s.h.
Required courses: ANTH 121, 122, 123, 220, 422; 3 additional ANTH credits at the 200 level above 220; 3 ANTH credits at the 300 level; 3 additional ANTH credits at the 400 level; 6 additional s.h. in ANTH to equal 30 s.h. Required related: one of the following options: Foreign Language (6 s.h.), Area Option (9-12 s.h.), Statistics and Computer Science (9-11 s.h.), or a minor.

Anthropology Major/Archeology Option (B.A.): 120 s.h.
Required courses: ANTH 121, 122, 123, 220, 233, 320, 422 and 425 and 6 s.h. at the 200-level or above (excluding ANTH 201).

Sociology Major (B.A.): 120 s.h.
Required courses: SOCY 101, 250, 301, 401, 448 and 15 s.h. of electives in sociology. Required related course: Math 130 (prereq: for SOCY 250).

Sociology Major/Criminology Option (B.A.): 120 s.h.
Required courses: SOCY 101, 250, 301, 401, 448 or co-op/internship and SOCY 230, 231, 232 and 3 s.h. of SOCY 330-339 and 3 s.h. of electives in sociology. Required related courses: MATH 130 (prereq: for SOCY 250) and 9 s.h. of related criminology electives.
Social Studies Major (B.S.Ed.): 120 s.h.
Secondary Education Certificate
The social studies major is currently under review and pending changes. See the department chairperson for details. Also refer to Admission to Advanced Professional Studies and Certification in this catalog for more information about education requirements.

Sociology-Psychology Double Major (B.A.): 120 s.h.
One course from PSYC 227, 228, 317, 335, SOCY 316, 319, ANTH 323 or 342 may be credited toward both majors. PSYC 211 may substitute for MATH 130.

Anthropology Minor: 18 s.h.
General Anthropology Option: ANTH 201, 220 422 and 3 s.h. at the 200 level and 6 additional s.h. in anthropology; Archeology Option: ANTH 121, 123, 320, 425 (6 s.h.) and 3 additional s.h. of anthropology; Cultural Anthropology Option: ANTH 121, 220, 422 or 458, 3 s.h. at the 300 level and 6 additional s.h. in anthropology.

Sociology Minor: 18 s.h.
Required courses: SOCY 101, 6 s.h. at the 200 level, and 9 additional s.h. of sociology at the 300 or 400 level.

Criminology Minor: 18 s.h.
Required courses: SOCY 101, 230, 231, and 232, plus 6 s.h. from SOCY 330-339 and/or 3 s.h. of criminal justice co-op/internship.

COURSE DESCRIPTIONS

Sociology

SOCY 101: 3 s.h.
Introduction to Sociology (G3)
Presentation of subjects as a method of inquiry and as a systematic body of demonstrable propositions about society, its structure and functioning.

SOCY 210: 3 s.h.
Sociology of the Family (G3, W)
The “fit” between relational needs of the individual and institutional-societal demands is explored. Topics include the family in mass society, experimental family systems, human sexuality, typologies of love, mate selection, husband-wife interaction, parent-child interaction, family disorganization and American ethnic families. Specific topics may vary.

SOCY 211: 3 s.h.
Social Problems (G3, W)
A sociological examination of problem areas or human concerns such as poverty, work and alienation, substance abuse, domestic violence, crime and justice, health, the environment and discrimination. Topics may vary.

SOCY 212: 3 s.h.
Sociology of Education (G3, W)
Analysis of education as a social institution and its relationship to other institutions, the roles of educator, administrator, student and parent; implications of subcultures, social stratification and social change. Offered infrequently.

SOCY 214: 3 s.h.
Aging and the Aged: Social Gerontology (G3, W)
Introduces human aging, with emphasis on social and sociopsychological aspects; an orientation to social gerontology as a multi-disciplinary social science; examination of scientific studies and theories of aging; social situations faced by aging people; societal responses to older people; the prospects of aging in the future. Offered periodically.

SOCY 216: 3 s.h.
Human Population (G3, W)
Analysis of population processes such as fertility, mortality, composition, distribution and migration patterns; relationship of population processes to social, economic and political development; effects of status differences; trends in population change. Offered periodically.
SOCY 230: 3 s.h.
Criminology (G3, W)
The nature and etiology of criminal behavior and the types of social response to law violation. Offered in fall, spring. Prereq: SOCY 101.

SOCY 231: 3 s.h.
Introduction to the Criminal Justice System (G3)
An overview of the American system for the administration of justice focusing on the processes of apprehending, prosecuting and adjudicating criminal defendants. Offered in all. Prereq: SOCY 101, 230. Sociology/criminology majors and criminology minors only.

SOCY 232: 3 s.h.
Modern Corrections (G3)

SOCY 250: 3 s.h.
Social Statistics (G3)
Emphasis on learning and presenting findings from applied statistical techniques including frequency tables and graphs, contingency tables, measures of central tendency and dispersion, hypothesis testing, confidence intervals, analysis of variance, correlation, linear regression (bivariate and multiple). SPSS software package used. Offered in fall. Prereq: C- or better in Math 130 and 9 s.h. in sociology/anthropology.

SOCY 301: 3 s.h.
Social Research Methods
Overview of major research methods: survey analysis, personal interview, participant observation, content analysis, and experimental design. Each student designs and completes a research project. Offered in spring. Prereq: C- or better in Sociology 250.

SOCY 310: 3 s.h.
Sociology of Religion (G3, W)
The sociological approach to understanding and interpreting religious phenomena including the development of insight regarding the place of religion in society; the functional and conflict orientation to religion; religion and the individual; institutionalization of religion; religion and social change; and the secularization of religion. Offered annually. Prereq: 3 s.h. in sociology or junior/senior status.

SOCY 313: 3 s.h.
Sociology of Disaster
Focuses on the behavioral and organizational response to environmental hazards and disasters. Case studies of major natural disasters and hazardous materials incidents provide illustrations of individual, group and societal challenges faced in such events. Issues include: building a disaster resistant community, the impact of the media, governmental successes and failures. Offered annually. Prereq. SOCY 101 or SOCY 211. A required course for the EHEM minor.

SOCY 315: 3 s.h.
Race and Ethnic Relations (G3, W)
Study of racial and cultural contact, comparative analysis of systems of race and ethnic relations, modes of adaptation of minorities and cross-cultural examinations of dominant-minority relations. Offered periodically. Prereq: 3 s.h. of sociology or junior/senior status.

SOCY 316: 3 s.h.
Social Psychology (G3, W)
Introduction to sociological social psychology: how social interactions are created, become patterned and susceptible to change; how society is structured through social interaction, and how social identities are formed. Topics include, but are not limited to, managing emotions, stigma and gender. Offered annually. Prereq: 3 s.h. of sociology or junior/senior status.

SOCY 317: 3 s.h.
Sociology of Health (G3, W)
Social and cultural factors in health and illness; the social organization of the medical care system; structural and interactional aspects of health care. Prereq: 3 s.h. sociology or junior/senior status. Offered infrequently.
SOCY 318: 3 s.h.
Sociology of Complex Organizations
Social interaction processes in business and industry; the nature and effects of complex industrial organization; interrelationships among industry and other social subsystems. Offered infrequently. Prereq: 3 s.h. sociology or junior/senior status.

SOCY 319: 3 s.h.
Social Stratification (G3, W)
Examines the development of social inequality by race, class, and gender. Focuses on the social construction of race and gender, as well as various theories of class distribution. Inequality in education, housing and the workplace are discussed. Offered annually. Prereq: 3 s.h. of sociology and junior/senior status.

SOCY 334: 3 s.h.
Juvenile Delinquency (G3, W)
The nature and extent of juvenile crime; theories of causation; techniques of control and prevention. Offered annually. Prereq: SOCY 101, 230.

SOCY 338: 3 s.h.
Sociology of Deviance
Questions what it means to be deviant in American society. Discusses how the definition of deviance has changed over time, how people become labeled “deviant,” and the utility of numerous theories of deviancy. Offered annually. Prereq: SOCY 101.

SOCY 339: 3 s.h.
Topics in Criminology (W)
The nature, extent, origins and possible “solutions” to selected contemporary criminology topics. Offered periodically. Prereq: SOCY 101 and SOCY 230 or permission of instructor.

SOCY 342: 3 s.h.
Japanese Society (P)
An interdisciplinary approach to Japanese culture and society focusing on the arts, humanities and social sciences. Includes traditional culture, social institutions, socialization and Japanese national character. Offered annually. Prereq: a sociology course (101 or any number not above 216) OR an anthropology course (any course number between 220 and 323); and at least one course from another social science.

SOCY 401: 3 s.h.
Sociological Theory
Examination and verification of contemporary sociology: classical and modern theoretical traditions; relevance of sociology to everyday life; works of selected theorists such as Durkheim, Marx, Weber, Merton. Offered in fall, spring. Prereq: 12 s.h. of sociology.

SOCY 441: 3 s.h.
Urban Society
Historical development from the pre-industrial city to the metropolitan community; structure and ecology of the city; urban culture, subcultures and personality patterns. Offered infrequently. Prereq: SOCY 101.

SOCY 448: 3 s.h.
Seminar in Sociology
Research and group discussion for advanced students on various topics of interest. A total of 6 s.h. may be taken. Offered in fall, spring. Prereq: permission of instructor.

SOCY 489, 499: 1-4 s.h.
Departmental Honors in Sociology
Two to four semesters of supervised research through independent projects. Prerequisite 3.0 GPA and recommendation by a faculty mentor. For further information, see the Special Academic Opportunities section.

SOCY 498: 1-6 s.h.
Independent Study in Sociology
For further information, see the Special Academic Opportunities section. Prereq: 3.00 GPA. Prereq: permission of faculty member.

SOCY 586: 3-6 s.h.
Topics in Sociology
Offered periodically.
Anthropology

ANTH 121: 3 s.h.
Cultural Anthropology (G3)
Introduces basic concepts and topics: culture, fieldwork, communication, sex roles, social organization, politics, economics, belief systems, culture change and applied anthropology. Offered in fall, spring.

ANTH 122: 3 s.h.
Physical Anthropology (G3)
The anthropological study of human evolution: paleoanthropology, primatology and human population genetics; and the study of human variation: the ways humans adapt biologically to their environments. Offered in fall.

ANTH 123: 3 s.h.
Introduction to Archeology (G3)
Introduces methods and theory of contemporary archeology using examples from Old and New World prehistory. The relationship of farcheology to anthropology is emphasized. Offered in spring.

ANTH 201: 3 s.h.
People, Primates and Prehistory (G3)
A general introduction to the four subdisciplines within anthropology-physical anthropology, archeology, cultural anthropology and anthropological linguistics—taking an evolutionary and comparative perspective of the human condition. Offered annually.

ANTH 220: 3 s.h.
Ethnographic Methods
Introduces ethnographic research methods through individual or group fieldwork, emphasizing the ethnographic interview and participant observation. Offered in fall. Prereq: permission of instructor.

ANTH 221: 3 s.h.
Peoples and Cultures of Mexico (G3, W)
Examines the cultures of the native and peasant societies of Mexico from an archeological, ethno-historic and ethnographic perspective. The culture-ecological evolutionary approach is emphasized. Offered periodically.

ANTH 222: 3 s.h.
North American Indians (G3, W)
Past and present cultures of the native peoples of North America, using archeological and ethnological data. Historic culture-ecological relationships are stressed, as well as culture change among the American Indians today. Offered annually.

ANTH 223: 3 s.h.
Peoples and Cultures of the Mediterranean (G3)
Comparison and contrast of the history and culture of rural and urban society in the Mediterranean region. Focus is on topics and themes of importance to the circum-Mediterranean culture area. Offered periodically.

ANTH 226: 3 s.h.
Comparative Societies (G3, W)
Comparative investigations of a topic or region of current interest in the field of anthropology. Offered annually.

ANTH 227: 3 s.h.
Culture Through Film (G3, W)
Comparative study of cultures through the medium of film using anthropological theories, perspectives and texts. Offered annually.

ANTH 233: 3 s.h.
Topics in Archeology (G3)
Examines human cultural evolution before and after the advent of writing, using archeological and related records. Topics vary from the rise of civilization to the decline of local communities. Offered annually.

ANTH 320: 3 s.h.
Archeological Method and Theory (W)
Focus on current developments in archeological method and theory with specific emphasis on contract archeology, survey methods, artifact analysis and contemporary theoretical approaches. Offered annually. Prereq: ANTH 123 plus 3 additional hours of anthropology or permission of instructor.
ANTH 322: 3 s.h.
Food and Culture (G3, W)
Cross-cultural study of food habits and beliefs in tribal societies and the U.S. Examines the extent and causes of hunger in the U.S. and the Third World and considers religious fasting, anorexia nervosa and famine. Offered annually.

ANTH 323: 3 s.h.
Culture and Personality (G3, W)
Cross-cultural study of the relationship between culture and personality development. Theory, method and applications of psychological anthropology. Comparative studies of patterns of ethnic behavior, mental disorders, addiction and the crisis cult phenomenon. Offered periodically.

ANTH 324: 3 s.h.
Human Spatial Behavior (P)
Examines humankind’s perception and use of space. Primary focus is on the comparative study of social organization and its relation to spatial characteristics. Spatial behavior is examined from the perspectives of archeology, ethnography, psychology, ethnology and architecture. Offered periodically. Prereq: junior/senior status.

ANTH 325: 3 s.h.
Medical Anthropology
Cross-cultural study of health and healing, including comparative medical systems, theories of disease, patients/healers in the context of culture, mental health, bioethics, interaction of culture, biology and environment and the effects of cultural change. Offered periodically.

ANTH 328: 3 s.h.
Male/Female (G3)
Cross-cultural study of sex roles among western and non-western societies, including social concepts of the masculine and feminine and biological aspects of gender. Offered periodically.

ANTH 342: 3 s.h.
World Hunger (P)
Cross-cultural and interdisciplinary study of famine and world hunger. Critical examination of the political, economic and ecological causes of famine and the psychological and social effects of starvation. Offered periodically. Prereq: junior/senior status.

ANTH 344: 3 s.h.
Gender, Race and Class (P)
The intersecting role of gender, race and class on human social life in the U.S. and other cultures. An interdisciplinary and comparative examination of the ways social categories define, limit and liberate human potential. Offered annually. Prereq: junior/senior status and at least two social science courses.

ANTH 422: 3 s.h.
History of Anthropological Theory
Examines in a developmental fashion the attempts made by anthropologists to explain human similarities and differences and the dynamics of culture change. Offered in spring. Prereq: junior/senior status and a minimum of 9 s.h. in anthropology.

ANTH 425: 1-6 s.h.
Field/Research Experience in Anthropology
Individual or group research in any of the subdisciplines of anthropology which include the summer archeological field school and ethnographic field projects. Offered periodically. Prereq: Permission of instructor.

ANTH 458: 3-6 s.h.
Senior Seminar in Anthropology
Research and group discussions for advanced students on various topics of interest. A total of 6 s.h. may be taken. Offered annually. Prereq: Permission of instructor.

ANTH 489, 499: 1-4 s.h.
Departmental Honors in Anthropology
Two to four semesters of supervised research by highly motivated students capable of conducting independent research projects. Prerequisite 3.0 GPA and recommendation by faculty mentor. For further information, see the Special Academic Opportunities section.
ANTH 498: 1-6 s.h.
Independent Study in Anthropology
For further information, see the Special Academic Opportunities section.

ANTH 586: 3-6 s.h.
Topics in Anthropology
Offered periodically.

SPANISH
SEE FOREIGN LANGUAGES

SPECIAL EDUCATION

School of Education
Associate Professor Beakley, chairperson
Professor Ridley
Assistant Professors Edeh, Hight, Neuville, Papalia-Berardi, Rohena

The special education program at Millersville University prepares students to teach individuals with disabilities. Students who complete the special education program at Millersville receive a Bachelor of Science in Education degree and may apply for a Pennsylvania Instructional I teaching certificate. This comprehensive certificate allows students to teach children from kindergarten through 12th grade (K-12), specifically individuals identified as learning disabled, mentally retarded, seriously emotionally disturbed, autistic or pervasively developmentally disordered, physically disabled, health impaired, neurologically impaired or multiple handicapped. According to current Pennsylvania regulations and standards, this certificate may be made permanent upon the completion of 24 post-baccalaureate credits, three years of satisfactory teaching in one’s field of certification and completion of an induction year program.

Students may elect a double major (special education and elementary education) with dual certification (special education and elementary education) through a cooperative program offered by both academic departments. Both majors will be recorded on the student’s transcript. In addition, the Special Education Department encourages individuals with minors to focus on such areas as criminology, foreign languages, psychology and art. A dual major is also possible in special education and psychology.

The department offers students an opportunity to choose elective courses in special education depending upon individual students’ areas of interest.

Practicum experiences in the local schools are required during the junior-senior years in conjunction with five courses of the special education methods block. The student teaching program offers two different training experiences during the senior year. Students then demonstrate effective teaching skills by applying them in individual, small and large group teaching formats to maximize the educational outcomes achieved by individuals with disabilities.

Prerequisites for Student Teaching
A student shall successfully complete with a C or better all major required courses (i.e., PSYC 100, 227 or 228, ELED 424 or 425, MATH 104 and 314, SPED 101, 102, 212, 325, 326, 327, 328 and two electives) and attain a 3.0 GPA in the major before engaging in pre-student teaching block (SPED 431, 432, 433, 434, and 436) or student teaching. Proposed exceptions to these requirements will be processed as follows: The student shall present a written petition to both the coordinator of the professional block and the department coordinator of student teaching. The two coordinators will transmit the petition and their individual recommendations to the full faculty of the Department of Special Education for a final decision. Upon successful completion of the program at MU, a graduate will be able to perform satisfactorily as a self-contained classroom teacher, as a resource room teacher, as an itinerant teacher and/or as a professional resource/consultant to regular classroom personnel.

An important independent learning program is available to all special education majors, in addition to regular course work. Students may complete the Program for Independent Learning in Special Education (PILS) to experience firsthand involvement in the education process. Fulfillment of the PILS Program is not mandatory. The PILS option involves students in observation, tutoring, visitations and further experiences with children with exceptionalities, as outlined in eight block areas of concentration in the student packet. Work on PILS requirements may be done during regular semesters or summers in any sequence of completion.
The department encourages all the special education majors to join the University student chapter of the Council for Exceptional Children (CEC), which has been chartered by the national CEC and which has been active on the MU campus since 1965 (Chapter No. 440). The University CEC chapter offers students opportunities to work directly with individuals with disabilities on and off campus, receive professional newsletters, publications and information, attend state, national and international conferences regarding exceptional children as well as develop leadership abilities.

The Special Education Department also offers 500-level elective courses at the graduate level for its upperclass majors and other interested upperclass students. (See the Graduate Catalog for course descriptions.)

**COURSE REQUIREMENTS**

**Special Education Major (B.S.Ed.):** 126 s.h.

**K-12 Certification in Mentally/Physically Handicapped**

Major Sequence Requirements: SPED 101, 102, 212, 325, 326, 327, 328 and two electives: SPED 313, 314, 315, 316; 318 or 435; Professional Education Core: EDUC 220, EDFN 211, EDFN 241, EDFN 333; Required Related Courses MATH 104 and 314, PSYC 100 and 227 or 228; EDUC 424 or 425; Special Education Block: Must be taken after all required courses have been completed with a C or better: SPED 431, 432, 433, 434, 436; Student Teaching, EDSP 461, 462. Admission to Advanced Professional Studies requires student to have earned 60 credits and have overall 3.0 GPA and completion of PRAXIS Part 1 (PPST). See specific courses for this requirement. Refer to *Admission to Advanced Professional Studies and Certification (Education Majors)* in this catalog for more information.

**COURSE DESCRIPTIONS**

**SPED 101:** 3 s.h.

*Orientation to Special Education*

Introduction for special education majors and other students interested in individuals with disabilities emphasizing various theoretical aspects in the field. Includes historical considerations, educational and developmental needs of students with exceptionalities, special education programs, services, resources and materials. Emphasis on practical exposure to individuals with disabilities and their learning and behavioral challenges. Offered in fall, spring.

**SPED 102:** 3 s.h.

*National, State and Community Resources*

Acquaints students with national, state and community organizations and services available for families and individuals with disabilities. May include visits and guest lectures focusing on interest groups and organizations whose major goals involve helping persons with disabilities. Emphasis on the role of the teacher in facilitating and organizing resources and people. Offered in fall, spring.

**SPED 212:** 3 s.h.

*Psychological Aspects of Children with Disabilities*

Includes mental retardation, emotional disturbance and neurological and physical disabilities. Environmental and bio-physiological factors are emphasized and analyzed in relation to human adjustment. Past, present and future processes of assessment, educational environments and community learning are considered in the context of social devaluation. Offered in fall, spring. Prereq: SPED 101.

**SPED 313:** 3 s.h.

*Psychological and Sociological Aspects of Students with Mental Retardation (W)*

Includes lectures, discussions, and research reports concerning etiology, theoretical approaches, education and historical and sociological perspectives related to mental retardation, persons with mental retardation and syndromes associated with mental retardation. Offered annually. Prereq: All SPED 100 and 200 level courses or permission of instructor.

**SPED 314:** 3 s.h.

*Psychological and Sociological Aspects of the Students with Behavior Disorders*

Includes the conceptual models, classification and assessment, social and biological factors; covers the main facets of disordered behavior and their implications in education. Offered annually. Prereq: All SPED 100 and 200 level courses or permission of the instructor.
SPED 315: 3 s.h.
Psychological, Sociological and Educational Aspects of Students with Learning Disabilities (W)
Includes lectures, discussions, research reports and “field” assignments concerning etiology, behavioral characteristics, theoretical approaches, adjustment problems and educational interventions related to persons with learning disabilities. Offered annually. Prereq: All SPED 100 and 200 level courses or permission of instructor.

SPED 316: 3 s.h.
Psychological and Sociological Aspects of Students with Physical Disabilities (W)
Includes lectures, discussions and research reports concerning etiology and syndromes, symptom groupings, theoretical approaches, education and adjustment problems related to persons with physical and multiple disabilities. Offered annually. Prereq: All SPED 100 and 200 level courses or permission of instructor.

SPED 317: 3 s.h.
Expressive Disorders for Students with Disabilities
Develops competencies in identifying and teaching students with disabilities who also have expressive disorders in speech and/or language. The etiology and identification of expressive disorders will be noted with emphasis on how to reinforce in the classroom setting the recommendations provided by speech clinicians and/or language clinicians. Offered annually. Prereq: All SPED 100 and 200 level courses or permission of instructor.

SPED 318: 3 s.h.
Special Education for Infants, Toddlers and Preschoolers with Developmental Disabilities (W)
The implications of federal mandates for providing educational and supportive services for infants/toddlers/preschoolers with disabilities. Includes identification of and leadership responsibilities of personnel involved with infant and early intervention programs for young children with disabilities. Assessing, analyzing and interpreting data from formal and informal sources to be utilized in developing the Individualized Family Service Plans (IFSPs) are discussed. Offered annually. Prereq: All SPED 100 and 200 level courses or permission of instructor.

SPED 325: 3 s.h.
Principles of Behavior Management
Fundamental knowledge and skills in teaching individuals with disabilities using behavioral intervention strategies. Includes analysis of student classroom behaviors, assessing strengths and needs in these behaviors and determining behavioral objectives via the application of learning principles. Offered in fall, spring. Prereq: All SPED 100 level courses; all 200 level courses including Professional Block I; admission to Advanced Professional Studies.

SPED 326: 3 s.h.
Teaching Reading and Communication Skills to Students with Mild and Moderate Disabilities
Methods for teaching reading and the language arts to individuals with mild and moderate disabilities. Skills will be taught through class exercises, lectures, discussion and development of student materials. Refinement of skills will take place through field experiences. Offered annually. Prereq: All SPED 100 level courses; all 200 level courses including Professional Block I; admission to Advanced Professional Studies.

SPED 327: 3 s.h.
Teaching Inquiry Skills to Students with Mild and Moderate Disabilities
Methods for determining strategies, environments and resources for supporting students with disabilities acquiring science and social studies content. Emphasis is on relevant content, meeting curricular standards, and establishing citizenship behavior. Offered annually. Prereq: All SPED 100 level courses; admission to Advanced Professional Studies; all 200 level courses including Professional Block I.

SPED 328: 3 s.h.
Formal and Informal Assessment in Special Education
The administration, scoring and interpretation of assessment devices typically used in psychometric evaluations are stressed. Critical evaluation of such devices in terms of reliability, validity and norming groups is also developed. The integration of the interpretive results of psychometric evaluation with behavioral observation, task analysis and other types developed in prerequisite courses is demonstrated. Offered in fall, spring. Prereq: All SPED 100 level courses; all 200 level courses including Professional Block I; admission to Advanced Professional Studies.
SPED 431: 3 s.h.
Prescriptive Teaching for Students with Severe and Multiple Disabilities
Best teaching practices for individuals with severe disabilities functioning at the early childhood through secondary level and requiring intervention strategies for basic skill development and community based domains. Offered in fall, spring. Prereq: SPED 100-, 200- and 300-level courses; admission to Advanced Professional Studies.

SPED 432: 3 s.h.
Curriculum and Methods for Students with Mild and Moderate Disabilities at the Primary and Preschool Level (W)
Develops competencies to identify the curriculum content and implement effective methodologies needed to direct the educational program for individuals with exceptionalities whose mental, physical, social and/or emotional levels are pre-academic. Offered in fall, spring. Prereq: SPED 100-, 200- and 300-level courses; admission to Advanced Professional Studies.

SPED 433: 3 s.h.
Current Issues and Trends in Special Education
Designed for students to use emerging concepts, current issues, and practices in the education of students with disabilities. Explores: teaching variables, instructional materials, information technology, materials and service delivery models. Students will acquire professional skills for communicating and collaborating with parents and colleagues, and for dealing effectively with affective job related issues. Offered in fall, spring. Prereq: SPED 100-, 200- and 300-level courses; admission to Advanced Professional Studies.

SPED 434: 3 s.h.
Transition Planning and Secondary Programming for Individuals with Disabilities
Students survey, develop, plan and select pre-vocational, vocational and career goals for individuals with mental and physical disabilities. Individualized Transitional Planning is discussed and incorporated into the class. Includes techniques and procedures for referring and placing individuals with disabilities in potential training and job settings. Offered in fall, spring. Prereq: SPED 100-, 200- and 300-level courses; admission to Advanced Professional Studies.

SPED 436: 3 s.h.
Individual Programming and Instructional Management for Students with Mild and Moderate Disabilities
Develops competencies in individual program planning and instructional management. Consists of those strategies which make possible the delivery of curricula in special education settings. Offered in fall, spring. Prereq: SPED 100-, 200- and 300-level courses; admission to Advanced Professional Studies.

EDSP 461: 6 s.h.
Student Teaching-Special Education: 1st Half Semester

EDSP 462: 6 s.h.
Student Teaching-Special Education: 2nd Half Semester
Two full-time practicum experiences where students have an opportunity to apply educational strategies and interventions for students with mild, moderate and severe disabilities. (See Academic Policies; Student Teaching, Application and Eligibility; Student Teaching, Transfer Students).

SPED 498: 1-3 s.h.
Independent Study
For further information, see the Special Academic Opportunities section.

SPED 499: 1-4 s.h.
Departmental Honors
For the definition of departmental honors and eligibility, refer to the Special Academic Opportunities section of this catalog.
GRADUATE LEVEL COURSES

The following 500-level courses are open to qualified undergraduates with permission. For course descriptions, please refer to the Graduate Catalog.

SPED 527: 3 s.h.
Exact Signing: Methods of Nonverbal Communication for Individuals with Disabilities

SPED 575: 3 s.h.
Training and Utilization of Paraeducators in Special Education

SPED 576: 3 s.h.
The Student with Disabilities in the Regular Education Classroom

SPED 578: 3 s.h.
Special Education Law for Students with Disabilities

SPED 580: 3 s.h.
Diagnostics and Assessment Strategies for Students with Disabilities

SPED 586-598: 3 s.h.
Topics in Special Education

STATISTICS

SEE MATHEMATICS

TECHNOLOGY EDUCATION

SEE INDUSTRY AND TECHNOLOGY

WELLNESS AND SPORT SCIENCES

School of Education
Assistant Professor Kabacinski, chairperson
Associate Professors Audette, Lombardi, Mowrey, Wushanley
Assistant Professors Halawa, Keefer, Nesbitt, Ruszak, Shaeffer
Instructor McAfee

The Department of Wellness and Sport Sciences seeks to improve the well being of all students through the development of physical fitness and the study of health sciences. Students will be afforded various opportunities through department courses to develop self understanding and expression, to acquire positive lifetime changes, to understand concepts related to the health and wellness of the total person and to develop relationships which promote and encourage a full life of healthful living in our complex society. The program will encompass all aspects of one’s behavior as they interact with the environment including the physical, emotional, social, intellectual, and spiritual dimensions.

The department focuses primarily on the undergraduate teaching of wellness, which is required for graduation of all Millersville University students. In addition, the department offers a minor in athletic coaching for those wishing to develop the knowledge and skills necessary to safely coach athletes. Students are eligible to receive certification in the American Sport Education Program. Further, the department offers a variety of elective courses, which grant national certification in first aid, lifesaving activities, and advanced aquatics. The department also offers a graduate program with a master’s degree in sport management with an emphasis in athletic management and athletic coaching.

Students are required to pass three credits in wellness to qualify for degrees. Any of the (G) courses listed below may be used to satisfy the degree requirement. Only WELL 175 - Wellness: Concepts of Health and Fitness or WELL 352 - Health Education in Elementary Schools may be used to satisfy the General Education (G4) degree requirement.
COURSE REQUIREMENTS

Minor in Athletic Coaching: 18 s.h.
The Athletic Coaching Minor is designed to develop coaches with relevant skills who are capable of functioning proficiently in a domain characterized by stress, risk and continual demands for high achievement. Completion of the minor could result in American Sport Education Program certification.

Required: 12 s.h.
WSSD 311: 3 s.h.
First Aid & CPR
WSSD 450: 3 s.h.
Kinesiological & Physiological Foundations of Coaching
WSSD 480: 3 s.h.
Theory & Techniques of Coaching
WSSD 483: 3 s.h.
Medical-Legal Aspects of Coaching
Choose one of the following: 3 s.h.
WSSD 486: 3 s.h.
Topics: Coaching Effectiveness II
WSSD 486: 3 s.h.
Topics: Performance Enhancement Techniques
WSSD 582: 3 s.h.
Sport Psychology
WSSD 484: 3 s.h.
Psycho-Social Foundations of Coaching
Electives: 3 s.h.
WSSD 350: 3 s.h.
Sport in America
WSSD 486: 3 s.h.
Topics*
WSSD 590: 3 s.h.
Drug & Alcohol Symposium

*A topics course can be taken multiple times for credit, but no topic may be repeated.

COURSE DESCRIPTIONS

A (G4) indicates that the course counts toward the wellness part of the general education requirements.

WELL 175: 3 s.h.
Wellness: Concepts of Health and Fitness (G4)
This course offers a comprehensive discussion of the dimensions of wellness including such topics as physical fitness, nutrition, psychological well-being, stress management, AIDS and STDs prevention, addictive behaviors and chronic diseases. The course also includes useful and practical advice for adopting a wellness lifestyle that takes into account individual interests, goals and life situations.

WELL 352: 3 s.h.
Health Education in Elementary Schools (Education Majors Only) (G4)
A survey of health content, history, philosophies, curriculum, textbooks and teaching aids for elementary and special education majors. Offered in fall, spring.
ELECTIVES

WSSD 124: 2 s.h.
Water Safety Instruction
Standard Red Cross water safety instructor course with an opportunity for practice instruction leading to certification in swimming and water safety. Prereq: Advanced swimming ability. Offered periodically.

WSSD 310 3 s.h.
Physical Education for the Elementary School
Methods, materials, facilities and equipment for programs of health and physical education in elementary schools. Opportunities for observation of children at play, making equipment, program planning and teaching. Offered in fall, spring.

WSSD 311: 3 s.h.
Standard First Aid and CPR
Preparation of students to develop skill and knowledge enabling them to administer first aid in the case of an accident or sudden illness. Certification in CPR and standard first aid according to American Red Cross standards.

WSSD 323: 3 s.h.
Lifeguard Training
Instruction in advanced Red Cross Lifesaving course leading to Red Cross certification. Certification in CPR and first aid are required by the completion of the course. Offered periodically.

WSSD 325: 2 s.h.
Scuba Diving
Instruction in underwater breathing apparatus, the use and care of equipment. This course has a special fee for equipment rental. National certification is an optional part of the course. Offered periodically.

WSSD 350: 3 s.h.
Sport in America (W)
Examines selected major issues in American sport. Emphasis on developing an historical perspective of the origins and implications of recent developments in modern sport. Study of various issues that have influenced the development of sport-religion, economy, education, race, gender, social class, and politics; and explanation of ways sport has contributed to shaping the larger culture. Offered in fall, spring.

WSSD 450: 3 s.h.
Kinesiological and Physiological Foundation of Coaching
The study of movement, specifically dealing with movement of the human body; including mechanics, laws of motion, anatomy and the detailed analysis of coaching activities. The functions of the various systems of the human body under stress of muscular activity; basic for the development and maintenance of physical fitness and sport. Offered in fall.

WSSD 480: 3 s.h.
Theory and Techniques of Coaching
Theory and techniques of the function, organization and administration of athletics in the total education program. Certification in Coaching Principles and Sport First Aid is available through the American Sport Education Program. Offered in fall, spring.

WSSD 483: 3 s.h.
Medical-Legal Aspects of Coaching
Instruction in prevention, treatment and care of athletic injuries. Legal and moral responsibilities in supervising elementary and secondary student-athletes are discussed. Certification in Sport Law is available through the American Sport Education Program. Offered in fall, spring.

WSSD 484: 3 s.h.
Psycho-Social Foundations of Sport
The psycho-social factors affecting human behavior in modern society as applied to coaching situations and the historical development of sports programs. Offered in fall.

WSSD 486: 1-3 s.h.
Topics
A thematic investigation of a significant athletic coaching topic with course structure and topic determined by the instructor prior to the preregistration period. The athletic coaching topics course can be taken multiple times for credit, but no topic may be repeated for credit. Offered in fall, spring.
WSSD 551: 3 s.h.  
Coaching of Sport  
Open to coaches or prospective coaches of any sport. Develops the major area of knowledge pertinent to the profession of coaching. Presents the American Sport Education Program (ASEP), dealing with sport philosophy, sport psychology, sport pedagogy, sport physiology, sport first aid and sport management. Students may take the ASEP Level I certification exam. Offered periodically.

WSSD 582: 3 s.h.  
Sport Psychology  
Focuses on the latest psychological skills training techniques for both coaches and athletes. Information from the annual conference on sport psychology for coaches will be presented. The latest techniques in neuro-linguistic programming and its implications for coaches and athletes will be utilized. Students will be introduced to and learn the latest mental training techniques of Olympic and professional athletes. Offered periodically.

WSSD 590: 3 s.h.  
Drug and Alcohol Symposium  
Designed for educators, counselors, social workers, clergy and other persons interested in the study of alcoholism and drug addiction. Participants gain a basic understanding of the nature and treatment of drug and alcohol addiction. Lectures, discussions and field trips are supplemented by participant involvement in task groups. Offered periodically.

WOMEN’S STUDIES  
Assistant Professor Weis, director  
Women’s Studies is an 18 credit interdisciplinary minor that involves courses in a wide array of traditional fields including history, anthropology, communication, business, health, education and literature. The goal of the minor is to inform students about women’s contributions, perspectives and visions in our own and other cultures; to validate women’s experiences; and to challenge the economic, political and social devaluation of women. Students electing the minor must take Introduction to Women’s Studies (WSTU 220) and the Women’s Studies Senior Seminar (WSTU 488) as well as four other electives from an approved list. The minor complements many majors and can be completed as students fulfill general education requirements. Students taking courses in women’s studies will benefit by having a more complete education, a greater appreciation for women’s contributions, a greater sense of life options for women, and a fuller understanding of gender and its role in human life. Expertise in women’s studies will help students successfully handle gender-based power dynamics in all professions as well as prepare them for jobs in women-centered areas of health, social work, education, psychology, journalism, politics, public administration and business.

Women’s Studies Minor: 18 s.h.  
Required courses: WSTU 220 and WSTU 488, plus four courses to be selected from the list of approved courses, at least one of which must be at the 300-level or above. Students will pick courses to satisfy the electives after consultation with their Women’s Studies adviser.

COURSE DESCRIPTIONS  
WSTU 220: 3 s.h.  
Introduction to Women’s Studies (G3)  
Interdisciplinary and multi-cultural study of women’s roles and relationships, and the ways these differ among women by race, ethnicity, class and sexual orientation. Overview of theoretical perspectives on gender and examination of contemporary issues facing women.

WSTU 488: 3 s.h.  
Women’s Studies Senior Seminar (G3, W)  
Interdisciplinary and multi-cultural examination of how feminist perspectives and a focus on women can restructure social institutions, ways of thinking and academic disciplines. Prereq: junior or senior standing and WSTU 220 or another approved women’s studies course, or permission of instructor.
WSTU 491/591: 1-6 s.h.
Topics in Women’s Studies
Investigates topics related to women’s studies in history, literature, music, art, anthropology, sociology, communications, business, science or other field.

WSTU 498: 1-6 s.h.
Independent Study
Allows students to pursue an academic area of interest not available through an established course with faculty supervision and guidance. For further information, see the Special Academic Opportunities section of the catalog and consult with the director of women’s studies.

APPROVED WOMEN’S STUDIES COURSES
Descriptions of these courses may be found under the appropriate departmental listing.

ANTH 322
Food and Culture (G3, W)

ANTH 328
Male/Female (G3)

ANTH 344
Gender, Race and Class (P)

ART 314
The Family Album (P)

COMM 330
Media and Women’s Culture: The Politics of the Popular (P)

ECON 327
Women & Global Development (P)

EDFN 312
Women and Education: Socialization or Liberation? (P)

EDFN 376
Whose School Is It, Anyway? (P)

EDUC 433
Children’s Literature: Race, Class and Gender (P)

ENGL 337
Women Writers in the Middle Ages (P)

ENGL 416
The Woman Writer and Her World (G1)

ENGL 429
Black Women Writers

ENGL 435
Journalism through Women’s Perspectives

HIST 209
Women in U.S. History (G3, W)

HIST 210
Women in Western Civilization (G3, W)

WSSD 486
Women in Sport

HUMN 280
Spanish American Women Writers

NURS 316
Contemporary Women’s Health (P)

PHIL 391
Gender, Utopia and Human Behavior (P)

SOCY 339
Gender and the Law
SOWK 312
Social Work and Women’s Issues (G3, W)

SS 212
The Black Woman (G3)

WSSD 486
Women in Sport
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.......................................................................................... to be announced
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Retired January 2002


Ambler, Julie Weills (1992). B.S., University of Washington, 1969; M.S., Ibid., 1972; Ph.D., Texas A&M University, 1982. Associate Professor of Biology


Anna, Laura J. (1999). B.S., Indiana University, 1991; Ph.D., University of Michigan, 1996. Assistant Professor of Chemistry

Anthony, Christine M. (2001). B.S., Pennsylvania State University, 1986; M.S., University of Tennessee, Knoxville, 1994; Ph.D., Ibid., 1999. Assistant Professor of Elementary and Early Childhood Education

Anttonen, Ralph G. (1971). B.S., Tufts University, 1963; Ph.D., University of Minnesota, 1967. Professor of Developmental Studies; Coordinator of Undecided Program; Adviser for WIXQ;
Chairperson, Department of Developmental Studies
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Retires May 2002

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Assistant Professor of Music

Professor of Anthropology
Director, Leadership Institute

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Director of Men’s Athletics

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Chairperson, Department of Counseling and Human Development

Associate Professor of Special Education;
Chairperson, Department of Special Education

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Associate Professor of Psychology

Assistant Professor of Librarianship

Assistant Professor of Art

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Assistant Professor of Psychology

Professor of Business Administration


Blum, Dorothee J. (1988). B.S., University of North Carolina, 1972; M.S., Virginia Polytechnic Institute and State University, 1977; Ph.D., Ibid., 1982. Associate Professor of Mathematics

Boal, Jean G. (1999). B.S., Stanford University, 1979; Ph.D., University of North Carolina-Chapel Hill, 1993. Assistant Professor of Biology (Marine)

Bookmiller, Kirsten N. (1992). B.A., Pennsylvania State University, 1986; M.A., University of Virginia, 1988; Ph.D., Ibid., 1992. Associate Professor of Government & Political Affairs; Director of International Affairs; Coordinator of International Studies Curriculum


Brye, Peter J. (1981). B.M., University of Oregon, 1974; M.Mu., Pennsylvania State University, 1981. Assistant Professor of Music; Conductor of the University-Community Orchestra


Caminero, Rosario (1990). B.A., Instituto del Vedado (Cuba), 1956; M.A., University of Pittsburgh, 1983; Ph.D., Ibid., 1985. Professor of Foreign Languages (Spanish)

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Chairperson, Department of Sociology/Anthropology

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Professor of Communication and Theatre

Assistant Professor of Developmental Studies;
Director of Act 101 Program

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Assistant Professor of Communication and Theatre

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Professor of Biology

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Director of the M.B.A. Program

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Cross, Doris E. (1982). B.S., Southern Illinois University, 1974; M.S., Ibid., 1980. Assistant Professor, Developmental Studies; Director of Upward Bound Program

Cuthbert, Angela L. (2001). B.E.S., University of Waterloo (Canada), 1995; M.E.S., Ibid., 1996; Ph.D., McMaster University (Canada), 2001. Assistant Professor of Geography


David, Barry (1983). B.S., State University College at Oswego, 1977; M.S., Ball State University, 1978; Ed.D., Temple University, 1990. Associate Professor of Industry and Technology


Davis, Ruth E. (1993). B.S.N., Thomas Jefferson University, 1975; M.S.N., University of Pennsylvania, 1982; D.Ed., Pennsylvania State University, 1993. Associate Professor of Nursing; Chairperson, Department of Nursing

DeCaria, Alex J. (2000). B.S., University of Utah, 1985; M.S., Naval Postgraduate School-Monterey, 1992; Ph.D., University of Maryland, 2000. Assistant Professor of Earth Sciences (Meteorology)

Deemer, Sandra A. (2000). B.A., Millersville University, 1992; M.A., University of Delaware, 1997; Ph.D., Ibid., 1999. Assistant Professor of Educational Foundations


Denny, Charles G. (1964). A.B., Elizabethtown College, 1961; M.S., University of Illinois, 1963; Ph.D., Michigan State University, 1971. Professor of Mathematics; Assistant Chairperson, Department of Mathematics

Desmond, Cheryl T. (1990). A.B., Muhlenberg College, 1970; M.S., Syracuse University, 1978; Ph.D., Ibid., 1990. Professor of Educational Foundations; Chairperson, Department of Educational Foundations


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Associate Professor of Mathematics

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Chairperson, Department of History

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Assistant Chairperson, Department of English;
Coordinator, English Tutorial Services

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Retires May 2002

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Associate Professor of Mathematics

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Coordinator of Field Experiences

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Assistant Professor of Business Administration

Assistant Professor of Psychology

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Associate Professor of English

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Associate Professor of Government & Political Affairs

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Professor of Chemistry

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Director, School Psychology Program
Greenawalt, Charles E. II (1987). B.A., Millersville University, 1975; M.A., University of Virginia, 1979; Ph.D., Ibid., 1984. Associate Professor of Government & Political Affairs

Gregoire, Kathryn A. (1979). B.A., University of South Dakota, 1967; M.S.S.W., University of Tennessee, 1969; Ph.D., University of Maryland-Baltimore, 1988. Professor of Social Work; Chairperson, Department of Social Work; Coordinator, Gerontology Program

Grosh, Bea Gattuso (1993). B.A., Indiana University, 1982; Ph.D., Indiana University at Bloomington, 1987. Assistant Professor of Psychology


Guo, Enyang (1990). B.S., Jiangxi University of Finance and Economics (China), 1982; M.S., Virginia Tech, 1987; Ph.D., Ibid., 1990. Associate Professor of Business Administration

Haferkamp, Claudia J. (1992). B.A., Towson State University, 1975; M.S., Central Missouri State University, 1977; Ph.D., Ball State University, 1987. Associate Professor of Psychology Assistant Chairperson, Department of Psychology

Halawa, Abdelhadi (1998). B.S., Helwan University (Egypt), 1975; M.S., University of Michigan-Ann Arbor, 1984; Ph.D., Springfield College, 1988. Assistant Professor of Wellness & Sport Sciences


Hauber, George D. (1969). B.S., Millersville University, 1965; M.A., Ball State University, 1966. Assistant Professor of Industry and Technology


Hearne, Ximena Catepillán (1991). B.S., Catholic University of Chile, 1973; M.S., Technical University of Chile, 1976; M.S., University of Iowa, 1988; Ph.D., Ibid., 1991. Associate Professor of Mathematics


Henke, James S. (1976). B.S., Western Michigan University, 1974; M.F.A., Florida State University, 1976; Ph.D., University of Michigan, 1987. Professor of Communication and Theatre; Technical Director


Hopkins, Leroy T. Jr. (1979). B.A., Millersville University, 1966; Ph.D., Harvard University, 1974. Professor of Foreign Languages (German); Chairperson, Department of Foreign Languages

Houlahan, Michéal (1992). M.M., The Catholic University of America; Ph.D., Ibid., 1989. Professor of Music; Chairperson, Department of Music

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Ikenaga, Bruce M. (1994). B.S., Massachusetts Institute of Technology, 1976; M.S., Cornell University, 1978; Ph.D., Ibid., 1982. Assistant Professor of Mathematics


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Keefer, Daniel J. (2001). B.S., East Stroudsburg University, 1993; M.S., University of Tennessee, 1995; Ph.D., University of North Carolina at Greensboro, 2001. Assistant Professor of Wellness and Sport Sciences


King, Yvonne M. (1986). B.A., West Chester University, 1964; M.A., Sacramento State University, 1969; Ed.D., University of Georgia, 1981. Associate Professor of Elementary and Early Childhood Education


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Lynch, Joseph F. (1992). B.A., Villanova University, 1983; M.S., Radford University, 1985; Ph.D., University of Virginia, 1989. Associate Professor of Counseling and Human Development


Madonna, G. Terry (1967). B.S., Millersville University, 1964; M.A., University of Delaware, 1967; Ph.D., Ibid., 1975. Professor of Government & Political Affairs; Director, Center for Politics and Public Affairs; Chairperson, Department of Government & Political Affairs

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Miller, Steven Max (1985). B.A., College of William and Mary, 1972; M.A., Indiana University (Ind.), 1974; Ph.D., Ibid., 1985. Associate Professor of English; Director, Honors Program


Moncé, James P. (1994). B.S., Colorado State University, 1982; M.T. (ASCP), 1982; M.S., Texas Tech University, 1987; Ph.D., Ibid., 1990. Associate Professor of Biology

Mowrey, Rebecca J. (1996). B.A., Mount Union College, 1982; M.S., West Virginia University, 1983; D.P.E., Springfield College, 1989. Associate Professor of Wellness & Sport Sciences


Muller, Andrew C. (1998). B.S., Adelphi University, 1989; M.S., Old Dominion University, 1992; Ph.D., Ibid., 1999. Assistant Professor of Earth Sciences (Oceanography)

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Director of Campus Recreation and Intramurals

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Professor of Physics;
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Professor of Art

Assistant Professor of Counseling and Human Development

Professor of History

Professor of Biology

Assistant Professor of Wellness and Sport Sciences

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Assistant Professor of Special Education

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University of Pennsylvania, 1972; Ph.D., Ibid., 1977.
Professor of Biology

Professor of Physics

Professor of Art
Professor of Chemistry

Associate Professor of Earth Sciences

Assistant Professor Computer Science

Professor of Biology

Associate Professor of Music

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Ruszak, Adele S. (1976). B.S., Salem College, 1974; M.S., West Virginia University, 1975. Assistant Professor of Wellness & Sport Sciences

Schaeffer, Scott Edward (2001). B.A., University of California-San Diego, 1992; M.A., University of California-Irvine, 1994; Ph.D., York University (Canada), 2000. Assistant Professor of Sociology and Anthropology

Schaeffer, Stratton (Chip) Jr. (2000). B.S., West Chester University, 1984; M.Ed., University of Texas-El Paso, 1991; Ph.D., Texas A&M University, 1998. Assistant Professor of Wellness and Sport Sciences


Schreiber, Kathleen V. (1994). B.A., University of Delaware, 1983; M.S., Ibid., 1990; Ph.D., Ibid., 1996. Associate Professor of Geography


Scott, Dominic (2001). B.A., New University of Ulster (North Ireland), 1971; M.A., Western New Mexico University, 1997; M.Ed., Ibid., 1994; Ph.D., Mexico State University, 2002. Assistant Professor of Educational Foundations


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Chairperson, Department of Geography

Associate Professor of Mathematics

Professor of English

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Chairperson, Department of Library

Associate Professor of Chemistry

Associate Professor of Librarianship
Chairperson, Department of Library

Professor of English;
Chairperson, Department of English

Assistant Professor of English

Professor of Mathematics

Assistant Professor of Art

Associate Professor of English

Professor of Foreign Languages (German);
Resident Director, Junior Year in Marburg
Retired December 2000

Professor of Industry and Technology
Retired August 2001

Assistant Professor of Elementary and Early Childhood Education

Assistant Professor of Economics

Professor of Educational Foundations

Smith, William G. (1983). B.A., Millersville University, 1969; M.A., University of Delaware, 1973; Ph.D., University of New Mexico, 1977. Associate Professor of Philosophy; Chairperson, Department of Philosophy


Solera, Rodrigo (1970). A.B., Central Missouri State College, 1953; M.A., University of Kansas, 1958; Ph.D., Ibid., 1964. Professor of Foreign Languages (Spanish) Retires May 2002

Soong, Yin S. (1977). B.S., National Taiwan University (Taiwan, Republic of China), 1969; M.S., Florida State University, 1974; Ph.D., Ibid., 1978. Professor of Earth Sciences (Oceanography)

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Suliman, Osman (1993). B.S., University of Khartoum (Sudan); M.A., Indiana University, 1979; Ph.D., Ibid., 1984. Professor of Economics; Chairperson, Department of Economics


Swope, Jerry J. (1970). B.S., Lock Haven University, 1966; M.S., East Stroudsburg University, 1969. Associate Professor of Wellness & Sport Sciences; Retired January 2002


Tacka, Philip V. (2002). B.S., Towson State University, 1971; M.M., Catholic University, 1979; D.M.A., Ibid., 1982. Assistant Professor of Music


Thyrum, Elizabeth Towner (1994). B.A., Millersville University, 1986; M.S., Rutgers University, 1989; Ph.D., Ibid., 1992. Associate Professor of Psychology


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Turchi-Dooley, Sandra L. (1983). A.B., Rosemont College, 1964; M.S., Villanova University, 1968; M.S., Ibid., 1982; Ph.D., Ibid., 1983. Professor of Chemistry; Chairperson, Department of Chemistry


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Assistant Professor of Educational Foundations

Professor of Librarianship

Professor of Computer Science

Associate Professor of History

Associate Professor of Librarianship

Associate Professor of Elementary and Early Childhood Education; 
Chairperson, Department of Elementary and Early Childhood Education

Assistant Professor of Elementary and Early Childhood Education

Associate Professor of Counseling and Human Development

Professor of Biology

Assistant Professor of Librarianship

Assistant Professor of English

Assistant Professor of Music; 
Director of Jazz Ensemble; 
Assistant Chairperson, Department of Music

Assistant Professor of Communication and Theatre

Assistant Professor of Mathematics

Professor of Chemistry
Assistant Professor of Art  

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Professor of Psychology  

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Professor of Biology; Chairperson, Department of Biology  

Assistant Professor of Chemistry  

Professor of Biology  

Professor of English  
Retired July 2001  

Professor of Biology  

Associate Professor of Nursing  

REGULAR PART-TIME FACULTY  

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