USING THIS BULLETIN

Introduction
The Undergraduate Bulletin is Penn State’s comprehensive source for undergraduate academic information and program requirements.

Use this section and navigation tools throughout the site to become familiar with general Bulletin information and discover new ways to explore academic opportunities across Pennsylvania and the world.

Students should follow the edition of the Bulletin that is active on their first day of class at the University. Past versions can be found on the Archive (http://bulletins.psu.edu/undergraduate/archive) page.

New Features

Program Page Layout
• Consistent layout of program information organized within the following tabs:
  • Overview
  • How to Get In
  • Program Requirements (University Degree, Bachelor of Arts Degree, General Education, and Major requirements)
  • Integrated Undergrad-Grad Program
  • Learning Outcomes
  • Academic Advising
  • Suggested Academic Plan
  • Career Paths
  • Contact

Begin and End Campus
At the top each program page, you will find a box that indicates where you can begin and end a program. Programs may have different begin and end campuses, so it is important to use this information to determine program availability at each campus.

How to Get In
This section describes requirements on how to enter your major. Common examples include, but are not limited to, minimum GPA and/or successful completion of a skills test, coursework, or preparation programs.

Suggested Academic Plan
The course series provided in the Suggested Academic Plan provides only one of many possible ways to move through the curriculum. To create a personalized academic plan, begin by taking the following steps:

• Consult with a Penn State academic adviser on a regular basis to develop and refine your academic plan.
• Use the Suggested Academic Plan in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report).
• Familiarize yourself with information available in this Bulletin to learn about academic opportunities.
• Explore resources available on your college and campus websites.

Please note that the University may make changes in policies, procedures, educational offerings, and requirements.

Changes Page
• Real-time amendments to information in the Bulletin will be tracked on the Changes (p. 6) page.
• Currently or previously enrolled students should consult the Bulletin Archive (http://bulletins.psu.edu/undergraduate/archive), their adviser, and degree audit reports for specific requirements.

Course Bubble
When a course link is clicked, a course bubble will appear with important course information including, but not limited to:

• course title, description, and credits;
• prerequisites;
• course attributes and General Education learning objectives;
• if the course is repeatable;
• if the course is cross-listed;
• if the course can be counted towards General Education requirements.

Statement of Nondiscrimination
The University is committed to equal access to programs, facilities, admission, and employment for all persons. It is the policy of the University to maintain an environment free of harassment and free of discrimination against any person because of age, race, color, ancestry, national origin, religion, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, sexual orientation, marital or family status, pregnancy, pregnancy-related conditions, physical or mental disability, gender, perceived gender, gender identity, genetic information, or political ideas. Discriminatory conduct and harassment, as well as sexual misconduct and relationship violence, violates the dignity of individuals, impedes the realization of the University’s educational mission, and will not be tolerated. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Office, The Pennsylvania State University, 328 Boucke Building, University Park, PA 16802-5901; Email: kfl2@psu.edu; Tel 814-863-0471.

Penn State encourages qualified persons with disabilities to participate in its programs and activities. If you anticipate needing any type of accommodation or have questions about the physical access provided, please contact the Office for Disability Services, 814-863-1807, in advance of your participation or visit.

Start Exploring
The Undergraduate Bulletin is Penn State’s comprehensive source for undergraduate academic information and program requirements. Using the search features, explore options to design your own, unique academic path at one of the world’s leading research institutions. Discover new opportunities as you pursue your academic passion. Search boxes are located on the Undergraduate Bulletin landing page and throughout the website.

Narrow your search by using the following fields:

Degree Type
Choose the degree type to begin your search. Information on the following degrees are included in the Undergraduate Bulletin:

Associate Degree
Two-year majors that, with few exceptions, provide concentrated instruction to prepare graduates for specialized occupational assignments.
Baccalaureate Degree
Baccalaureate programs of study consist of no less than 120 credits and typically take four years to complete.

Minor
An academic program of at least 18 credits that supplements a major. A minor program may consist of course work in a single area or from several disciplines.

Undergraduate Certificate
Undergraduate certificates can reflect emerging academic areas, necessary professional development requirements, or groups of courses that do not constitute a degree program.

Learn more in the Definitions and Abbreviations (p. 2) section.

Campus
Penn State has over 20 campuses across Pennsylvania. Visit the Campus (http://bulletins.psu.edu/undergraduate/campuses) page to see the full listing and a brief description of each campus.

Interest
Search broad topics to discover programs associated with your interests. From helping people, to science, or business, select an area to help narrow down your academic choices.

College
Academic colleges at Penn State grant degrees and are generally organized around a subject matter. All Penn State majors are divided among academic colleges, which are the units from which students receive their degrees. Visit the College (http://bulletins.psu.edu/undergraduate/colleges) page to see the full listing.

Academic Authority
The University Faculty Senate has responsibility for, and authority over, all academic information contained in the Undergraduate Bulletin.

Each step of the educational process, from admission through graduation, requires continual review and approval by University officials. The University, therefore, reserves the right to change the requirements and regulations contained in this Bulletin and to determine whether a student has satisfactorily met its requirements for admission or graduation, and to reject any applicant for any reason the University determines to be material to the applicant’s qualifications to pursue higher education.

MORE INFORMATION ABOUT ACADEMIC AUTHORITY (http://senate.psu.edu/aappm/P-8-program-descriptions-catalog.html)

Definitions and Abbreviations
Described below are definitions referring to degrees, majors, options, minors, concurrent or sequential majors programs, and integrated undergraduate-graduate degree programs:

Associate Degree
Two-year majors that, with few exceptions, provide concentrated instruction to prepare graduates for specialized occupational assignments.

Baccalaureate Degree
Penn State offers more than 160 majors with four-year baccalaureate degrees. A baccalaureate program of study shall consist of no less than 120 credits. Students may elect to take courses beyond the minimum requirements of a degree program. Particular types of baccalaureate degrees identify educational programs having common objectives and requirements. Degree programs may provide academic, pre-professional, or professional experiences and preparation. Majors lead to a baccalaureate degree. Each student must select a major within a baccalaureate degree type. If options are offered within a major, a student selects one. The student may also elect to enroll in a minor to supplement the major. Alternatively, the student may seek to enroll in multiple majors within the same type of baccalaureate degree or to enroll in a simultaneous degree program.

Undergraduate majors offered at Penn State lead to one or more of the following baccalaureate degrees: Bachelor of Arts, Bachelor of Science, Bachelor of Architectural Engineering (five-year program), Bachelor of Architecture (five-year program), Bachelor of Design, Bachelor of Fine Arts, Bachelor of Humanities, Bachelor of Landscape Architecture (five-year program), Bachelor of Music, Bachelor of Musical Arts, and Bachelor of Philosophy.

Not all degrees are offered at every location. Baccalaureate degrees offered at Penn State include both those that are designed to provide an academic (including pre-professional) experience and those that are specifically designed to provide professional preparation.

To ensure excellence, all professionally oriented degree majors provide a strong academic base. The Bachelor of Arts degree (with a given major) is an academic degree; the Bachelor of Science degree (with a given major) and the bachelor’s degree in any subject area (e.g., Bachelor of Architecture) are professional degrees. The Bachelor of Philosophy degree, described in the Intercollege Undergraduate Programs section of this Bulletin, is planned individually and may be designed to serve either academic or professional purposes.

Major
A major is a plan of study in a field of concentration within a type of baccalaureate degree. Colleges and other degree-granting units may have common requirements for all of their majors. Each major may have requirements identified in prescribed, additional, and supporting courses and related areas categories. Elective credits are not considered part of the major.

MORE INFORMATION ABOUT MAJORS (http://senate.psu.edu/curriculum/guide-to-curricular-procedures/baccalaureate-degree-curriculum)

Option
An option is a specialization within a major that should involve at least one-third of the course work credits required for the major, but need not be more than 18 credits. All options within a major must have in common at least one-fourth of the required course work credits in the major. A student can only be enrolled in an option within their own major.

Minor
A minor is defined as an academic program of at least 18 credits that supplements a major. A minor program may consist of course work in a single area or from several disciplines, with at least 6 but ordinarily not more than half of the credits at the 400-course level. Total requirements are to be specified and generally limited to 18 to 21 credits. Entrance to some minors may require the completion of a number of prerequisites, including courses, portfolios, auditions, or other forms of documentation.
that are not included in the total requirements for the minor. All courses for a minor require a grade of C or above.

**Concurrent and Sequential Majors Programs**

At the baccalaureate or associate degree level, students may be approved for admission to more than one major under the Concurrent Majors Program. A Concurrent Majors Program is one in which students take courses to concurrently meet the requirements of at least two majors, with graduation for all majors in the program occurring during the same semester. Concurrent majors must all be at the baccalaureate or associate degree level. Under the Sequential Majors Program, upon graduation from an associate or baccalaureate degree program, a student may apply for re-enrollment in another undergraduate degree program.

**Integrated Undergraduate-Graduate (IUG) Degree Program**

An Integrated Undergraduate-Graduate (IUG) degree program combines a Penn State baccalaureate degree with a master’s degree as a continuous program of study. An IUG program allows qualifying students to:

- create a cohesive plan for baccalaureate and master’s degree studies, with advising informed by requirements for both degree programs;
- complete the combined degree program in less time than it would take to complete each program separately;
- become familiar with the expectations of graduate studies in their programs;
- access the resources of the Graduate School;
- learn from current graduate students who share academic interests.

**Abbreviations, Acronyms, and Codes**

Described below are common codes, abbreviations, acronyms, and other types of academic shorthand used at Penn State, along with a brief explanation of each.

<table>
<thead>
<tr>
<th>Code</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>Audit, attended regularly (grade reporting symbol)</td>
</tr>
<tr>
<td>AUDN</td>
<td>Course requires an audition (course characteristic)</td>
</tr>
<tr>
<td>AUU</td>
<td>Audit, did not attend regularly (grade reporting symbol)</td>
</tr>
<tr>
<td>B</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., CAS 100A, CAS 100B, CAS 100C)</td>
</tr>
<tr>
<td>BA</td>
<td>Business, Smeal College of (college code)</td>
</tr>
<tr>
<td>BC</td>
<td>Behrend (college code)</td>
</tr>
<tr>
<td>BK</td>
<td>Berks (campus code)</td>
</tr>
<tr>
<td>BK</td>
<td>Berks (college code)</td>
</tr>
<tr>
<td>BR</td>
<td>Beaver (campus code)</td>
</tr>
<tr>
<td>BW</td>
<td>Brandywine (campus code)</td>
</tr>
<tr>
<td>C</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., CAS 100A, CAS 100B, CAS 100C)</td>
</tr>
<tr>
<td>CA</td>
<td>Capital (college code)</td>
</tr>
<tr>
<td>CALC</td>
<td>Course requires a calculator (course characteristic)</td>
</tr>
<tr>
<td>CAT</td>
<td>Online catalog, University Libraries</td>
</tr>
<tr>
<td>CC</td>
<td>Commonwealth Campuses</td>
</tr>
<tr>
<td>CCP</td>
<td>College Contact Person</td>
</tr>
<tr>
<td>CCRR</td>
<td>College Contact and Referral Representative</td>
</tr>
<tr>
<td>CCSG</td>
<td>Council of Commonwealth Student Governments</td>
</tr>
<tr>
<td>CE</td>
<td>Continuing Education</td>
</tr>
<tr>
<td>CGPA</td>
<td>Cumulative grade-point average</td>
</tr>
<tr>
<td>CIC</td>
<td>Committee on Institutional Cooperation</td>
</tr>
<tr>
<td>CLEP</td>
<td>College-Level Examination Program</td>
</tr>
<tr>
<td>CM</td>
<td>Communications (college code)</td>
</tr>
<tr>
<td>CNCR</td>
<td>Course is scheduled concurrently with another course (course characteristic)</td>
</tr>
<tr>
<td>CNTRL</td>
<td>Course is controlled (course characteristic)</td>
</tr>
<tr>
<td>COMM</td>
<td>Communications (college abbreviation)</td>
</tr>
<tr>
<td>CORD</td>
<td>Course is coordinated with other course(s) (course characteristic)</td>
</tr>
<tr>
<td>COST</td>
<td>Course requires an additional fee (course characteristic)</td>
</tr>
<tr>
<td>D</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., HIST 297D, HIST 297E)</td>
</tr>
<tr>
<td>DAA</td>
<td>Dean/Director of Academic Affairs</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>DF</td>
<td>Deferred grade (grade reporting symbol)</td>
</tr>
<tr>
<td>DN</td>
<td>Dickinson School of Law (campus code)</td>
</tr>
<tr>
<td>DS</td>
<td>DuBois (campus code)</td>
</tr>
<tr>
<td>DU</td>
<td>Division of Undergraduate Studies (college code)</td>
</tr>
<tr>
<td>DUS</td>
<td>Division of Undergraduate Studies (college abbreviation)</td>
</tr>
<tr>
<td>E</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., HIST 297D, HIST 297E)</td>
</tr>
<tr>
<td>EcoS</td>
<td>Eberly College of Science</td>
</tr>
<tr>
<td>ED</td>
<td>Education (college code)</td>
</tr>
<tr>
<td>EM</td>
<td>Earth and Mineral Sciences (college code)</td>
</tr>
<tr>
<td>EM SC</td>
<td>Earth and Mineral Sciences (college abbreviation)</td>
</tr>
<tr>
<td>EN</td>
<td>Engineering (college code)</td>
</tr>
<tr>
<td>ENGR</td>
<td>Engineering (college abbreviation)</td>
</tr>
<tr>
<td>EOP</td>
<td>Educational Opportunity Program</td>
</tr>
<tr>
<td>EPR</td>
<td>Early Progress Report</td>
</tr>
<tr>
<td>EPS</td>
<td>Educational Planning Survey</td>
</tr>
<tr>
<td>ER</td>
<td>Behrend (campus code)</td>
</tr>
<tr>
<td>ESL</td>
<td>English as a Second Language</td>
</tr>
<tr>
<td>EveX</td>
<td>Course has evening exams (course characteristic)</td>
</tr>
<tr>
<td>F</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., HIST 297F, HIST 297G)</td>
</tr>
<tr>
<td>FE</td>
<td>Fayette (campus code)</td>
</tr>
<tr>
<td>FINL</td>
<td>Course has a final exam (course characteristic)</td>
</tr>
<tr>
<td>FL</td>
<td>Failure under pass/fail option (grade reporting symbol)</td>
</tr>
<tr>
<td>FYS</td>
<td>First-Year Seminar</td>
</tr>
<tr>
<td>G</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., HIST 297F, HIST 297G)</td>
</tr>
<tr>
<td>GA</td>
<td>Arts (General Education code)</td>
</tr>
<tr>
<td>GA</td>
<td>Greater Allegheny (campus code)</td>
</tr>
<tr>
<td>GH</td>
<td>Humanities (General Education code)</td>
</tr>
<tr>
<td>GHW</td>
<td>Health and Wellness (General Education code)</td>
</tr>
<tr>
<td>GN</td>
<td>Graduate non-degree (college code)</td>
</tr>
<tr>
<td>GN</td>
<td>Natural Sciences (General Education code)</td>
</tr>
<tr>
<td>GPA</td>
<td>Grade-point average</td>
</tr>
<tr>
<td>GQ</td>
<td>Quantification (General Education code)</td>
</tr>
<tr>
<td>GR</td>
<td>Graduate (level code)</td>
</tr>
<tr>
<td>GR ND</td>
<td>Graduate non-degree (college code)</td>
</tr>
<tr>
<td>GS</td>
<td>Social and Behavioral Sciences (General Education code)</td>
</tr>
<tr>
<td>GV</td>
<td>Great Valley (campus code)</td>
</tr>
<tr>
<td>GV</td>
<td>Great Valley (college code)</td>
</tr>
<tr>
<td>GWS</td>
<td>Writing/Speaking (General Education code)</td>
</tr>
<tr>
<td>H</td>
<td>Honors course or section (course suffix)</td>
</tr>
<tr>
<td>HB</td>
<td>Harrisburg (campus code)</td>
</tr>
<tr>
<td>HHD</td>
<td>Health and Human Development (college abbreviation)</td>
</tr>
<tr>
<td>HH</td>
<td>Health and Human Development (college code)</td>
</tr>
<tr>
<td>HN</td>
<td>Hazleton (campus code)</td>
</tr>
<tr>
<td>HY</td>
<td>Hershey Medical Center (campus code)</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete (grade reporting symbol)</td>
</tr>
<tr>
<td>I</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., HIST 297I, HIST 297K)</td>
</tr>
<tr>
<td>ICOL</td>
<td>Intercollegiate programs (college code)</td>
</tr>
<tr>
<td>IB</td>
<td>International Baccalaureate Program</td>
</tr>
<tr>
<td>IC</td>
<td>Intercollegiate programs (college code)</td>
</tr>
<tr>
<td>IL</td>
<td>International Cultures (General Education code)</td>
</tr>
<tr>
<td>INC</td>
<td>Incomplete (grade reporting symbol)</td>
</tr>
<tr>
<td>INTG</td>
<td>Course is integrated with other courses (course characteristic)</td>
</tr>
<tr>
<td>IS</td>
<td>Information Sciences and Technology (college code)</td>
</tr>
<tr>
<td>IST</td>
<td>Information Sciences and Technology (college abbreviation)</td>
</tr>
<tr>
<td>ITS</td>
<td>Information Technology Services</td>
</tr>
<tr>
<td>IUG</td>
<td>Integrated undergraduate/graduate degree programs</td>
</tr>
<tr>
<td>IVID</td>
<td>Course uses interactive video (course characteristic)</td>
</tr>
<tr>
<td>J</td>
<td>Individualized instruction (course suffix)</td>
</tr>
<tr>
<td>K</td>
<td>Special topics (course suffix; indicates different versions of the same course, e.g., HIST 297I, HIST 297K)</td>
</tr>
<tr>
<td>L</td>
<td>Lecture section (course suffix)</td>
</tr>
<tr>
<td>LA</td>
<td>Liberal Arts (college code)</td>
</tr>
<tr>
<td>LEAP</td>
<td>Learning Edge Academic Program</td>
</tr>
<tr>
<td>LIAB</td>
<td>Course has liability attendance policy (course characteristic)</td>
</tr>
<tr>
<td>LV</td>
<td>Lehigh Valley (campus code)</td>
</tr>
<tr>
<td>LW</td>
<td>Law (level code)</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>M</td>
<td>Writing Across the Curriculum and Honors (course suffix)</td>
</tr>
<tr>
<td>MA</td>
<td>Mont Alto (campus code)</td>
</tr>
<tr>
<td>MAC</td>
<td>Morgan Academic Center (for Student-Athletes)</td>
</tr>
<tr>
<td>MD</td>
<td>Medical (level code)</td>
</tr>
<tr>
<td>MD</td>
<td>Medicine (college code)</td>
</tr>
<tr>
<td>MED</td>
<td>Medicine (college abbreviation)</td>
</tr>
<tr>
<td>MEP</td>
<td>Multicultural Engineering Program</td>
</tr>
<tr>
<td>MRC</td>
<td>Multicultural Resource Center</td>
</tr>
<tr>
<td>MS</td>
<td>Military Science (ROTC) (course code)</td>
</tr>
<tr>
<td>NACADA</td>
<td>National Academic Advising Association</td>
</tr>
<tr>
<td>NC</td>
<td>Non-credit (level code)</td>
</tr>
<tr>
<td>NDEGR/C/H</td>
<td>Nondegree Regular/Conditional/High School (Classification of Undergraduate Students)</td>
</tr>
<tr>
<td>NG</td>
<td>No grade (grade reporting symbol)</td>
</tr>
<tr>
<td>NK</td>
<td>New Kensington (campus code)</td>
</tr>
<tr>
<td>NR</td>
<td>Nursing (college code)</td>
</tr>
<tr>
<td>NSO</td>
<td>New Student Orientation</td>
</tr>
<tr>
<td>OCLC</td>
<td>Course meets at an off-campus location (course characteristic)</td>
</tr>
<tr>
<td>ODS</td>
<td>Office for Disability Services</td>
</tr>
<tr>
<td>OSA</td>
<td>Office of Student Aid</td>
</tr>
<tr>
<td>OUR</td>
<td>Office of the University Registrar</td>
</tr>
<tr>
<td>P</td>
<td>Pass (noncredit course) (grade reporting symbol)</td>
</tr>
<tr>
<td>P</td>
<td>Practicum (or laboratory) section (course suffix)</td>
</tr>
<tr>
<td>PC</td>
<td>Penn College (Pennsylvania College of Technology; campus code)</td>
</tr>
<tr>
<td>PR</td>
<td>Semester classification (degree-seeking provisional)</td>
</tr>
<tr>
<td>PREQ</td>
<td>Course has prerequisites (course characteristic)</td>
</tr>
<tr>
<td>PROV</td>
<td>Provisional (degree-seeking) student (Classification of Undergraduate Students)</td>
</tr>
<tr>
<td>PS</td>
<td>Pass (pass/fail option) (grade reporting symbol)</td>
</tr>
<tr>
<td>PSU</td>
<td>Pennsylvania State University</td>
</tr>
<tr>
<td>R</td>
<td>Recitation section (course suffix)</td>
</tr>
<tr>
<td>R</td>
<td>Research (grade reporting symbol)</td>
</tr>
<tr>
<td>RAP</td>
<td>Recommended Academic Plan</td>
</tr>
<tr>
<td>RI</td>
<td>Resident Instruction</td>
</tr>
<tr>
<td>ROTC</td>
<td>Reserve Officers’ Training Corps</td>
</tr>
<tr>
<td>S</td>
<td>First-Year Seminar (course suffix)</td>
</tr>
<tr>
<td>SA</td>
<td>Satisfactory achievement (grade reporting symbol)</td>
</tr>
<tr>
<td>SATL</td>
<td>Course is offered at multiple locations via satellite uplink (course characteristic)</td>
</tr>
<tr>
<td>SC</td>
<td>Science, Eberly College of (college code)</td>
</tr>
<tr>
<td>SCIEN</td>
<td>Science, Eberly College of (college abbreviation)</td>
</tr>
<tr>
<td>SEG</td>
<td>Course is segmented (course characteristic)</td>
</tr>
<tr>
<td>SGPA</td>
<td>Semester grade-point average</td>
</tr>
<tr>
<td>SH</td>
<td>Shenango (campus code)</td>
</tr>
<tr>
<td>SI</td>
<td>Supplemental Instruction</td>
</tr>
<tr>
<td>SITE</td>
<td>Schreyer Institute for Teaching Excellence</td>
</tr>
<tr>
<td>SL</td>
<td>Schuylkill (campus code)</td>
</tr>
<tr>
<td>SLO</td>
<td>Special Living Options</td>
</tr>
<tr>
<td>SOTP</td>
<td>Student Orientation and Transition Programs</td>
</tr>
<tr>
<td>SRTE</td>
<td>Student Ratings of Teacher Effectiveness</td>
</tr>
<tr>
<td>SSSP</td>
<td>Student Support Services Program</td>
</tr>
<tr>
<td>T</td>
<td>First-Year Seminar and Honors (course suffix)</td>
</tr>
<tr>
<td>TMDT</td>
<td>Course has additional meeting times/dates (course characteristic)</td>
</tr>
<tr>
<td>U</td>
<td>United States Cultures/International Cultures and Honors (course suffix)</td>
</tr>
<tr>
<td>UAO</td>
<td>Undergraduate Admissions Office</td>
</tr>
<tr>
<td>UC</td>
<td>University College (college code)</td>
</tr>
<tr>
<td>UE</td>
<td>Undergraduate Education</td>
</tr>
<tr>
<td>UFO</td>
<td>University Fellowships Office</td>
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<tr>
<td>UG</td>
<td>Undergraduate (level code)</td>
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<td>UG ND</td>
<td>Undergraduate non-degree (college code)</td>
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<td>UN</td>
<td>Undergraduate non-degree or degree-seeking provisional (college code)</td>
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<tr>
<td>UN</td>
<td>Unsatisfactory achievement (grade reporting symbol)</td>
</tr>
<tr>
<td>UP</td>
<td>University Park (campus code)</td>
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<tr>
<td>UPUA</td>
<td>University Park Undergraduate Association</td>
</tr>
<tr>
<td>US</td>
<td>United States Cultures (General Education code)</td>
</tr>
<tr>
<td>W</td>
<td>Official withdrawal (grade reporting symbol)</td>
</tr>
<tr>
<td>W</td>
<td>Writing Across the Curriculum (course suffix)</td>
</tr>
<tr>
<td>WB</td>
<td>Wilkes-Barre (campus code)</td>
</tr>
<tr>
<td>WC</td>
<td>World Campus</td>
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<td>WEB</td>
<td>Web course; offered entirely through the Internet (course characteristic)</td>
</tr>
<tr>
<td>WEP</td>
<td>Women in Engineering Program</td>
</tr>
<tr>
<td>WF</td>
<td>Withdrew failing (grade reporting symbol)</td>
</tr>
<tr>
<td>WISE</td>
<td>Women in the Sciences and Engineering</td>
</tr>
</tbody>
</table>
Courses Added: Effective Summer 2018

- ENGL 236N: Inequality: Economics, Philosophy, Literature
- GAME 180N: The Art and Science of Virtual Worlds
- GEOG 2N: Apocalyptic Geographies: How can we prevent the end of the world?
- HDFS 254N: Reading Our Lives: Understanding Diversity and Human Development through Memoirs
- HIST 114N: Historical Perspectives on HealthCare Innovations
- HPA 295: Field Experience
- HPA 495: Field Experience
- IT 240Q / CMLIT 240Q / HIST 240Q / WMNST 240Q: Artistic Patronage in Europe
- KINES 419: Disability Sport and Recreation
- PHIL 136N: Art and Philosophy in Ancient Greece
- PHOTO 321N: Flow Visualization: The Art and Physics of Fluid Motion
- PSYCH 175N / COMM 175N: Mental Illness and the Movies
- PT 271W: Pathophysiology I
- RM 214: Applications of Probability Theory to Actuarial Science
- SC 103N: When Data Meets Design
- SRA 268: Visual Analytics
- SUST 150N: The Science of Sustainable Development

Changes to the UG Bulletin

Changes to the Undergraduate Bulletin will be tracked in real-time and listed below. At the end of every semester, these updates will be incorporated into the Bulletin.

New Course Abbreviations

- ATHTR: Athletic Training
- FDSYS: Food Systems
- ISB: Interdisciplinary Science and Business

Courses Added: Effective Fall 2018

- AED 355Q: Show Me Where it Hurts: Healthcare and Creative Inquiry
- ANTH 176: Sex and Gender: A biosocial and comparative perspective
- ASTRO 7N: The Artistic Universe
- ASTRO 141N / COMM 151N: Film and Extraterrestrial Life: Science Fact or Fiction?
- BIOL 60N: Art in the Natural World
- BIOL 161: Human Anatomy and Physiology I – Lecture
- BIOL 162: Human Anatomy and Physiology I – Laboratory
- BIOL 163: Human Anatomy and Physiology II – Lecture
- BIOL 164: Human Anatomy and Physiology II – Laboratory
- BMB 205: Course-Based Research Experience in Biochemistry and Molecular Biology
- BMB 205S: Course-Based Research Experience in Biochemistry and Molecular Biology FYS
- BMB 294: Research Projects
- BMB 400A: Molecular Biology of the Gene
- BMB 482: Research Projects
- CMLIT 112N: Introduction to Global Drama, Theatre, and Performance
- CMLIT 440: War Stories: The Literature of War
- CMPEN 462: Wireless Communications Systems and Security
- CMPSC 447: Software Security
- COMM 222N: Social Justice and the Image
- COMM 328: Effects of Science, Environmental and Health Media
- COMM 361: Entrepreneurial Journalism
- COMM 362: Podcasting
- COMM 364: Data Visualization for Journalists

Common abbreviations for course attributes and suffixes can be found in the University Course Descriptions section.
• CRIMJ 457: American Guns: History, Law & Criminal Justice Challenges
• EARTH 109: The Fundamentals of Shale Energy Development
• ENGL 163N: Defining the Animal
• ENGL 165N / LER 165N: Work and Literature
• ENGL 475: Comics Studies
• ERM 199: Foreign Studies
• ERM 448: Rural Road Ecology and Maintenance
• FRNAR 100: Introduction to Forensic Photography
• HDFS 108N: Art and Science of Human Flourishing
• HDFS 2102: Ethnicity, Health and Aging
• HDFS 448: Death and Bereavement
• HIST 130H: Introduction to the Civil War Era, 1848-1877 Honors
• HIST 164 / AFAM 164: The History of Brazil
• INART 502: The Science of Music
• IT 225N / CRIM 225N: Organized Crime in Film and Society
• LER 202: Understanding Employee Behavior
• LER 304: Labor and Employment Relations Fundamentals
• LER 305: Human Resources Fundamentals
• LER 428: Total Rewards
• LLED 215N: Children's Picture Books as Multimodal Texts
• METEO 51N: Meteorology and Visual Arts: To Know is to See
• MGMT 365: Social Entrepreneurship
• MGMT 427W: Managing an Entrepreneurial Start-up
• MGMT 480: Business Transformation Consulting
• MGMT 485: Entrepreneurial Opportunity Creation
• MGMT 486: Entrepreneurial Investment and Resource Acquisition
• MUSIC 11Z: Under the Hood: How Classical Music Works
• NUTR 175: Healthy Food for All: Factors that Influence What we Eat in the US
• NUTR 211R: Applying Biochemistry to Nutrition
• NUTR 390: Nutritional Biochemistry and Physiology
• PHIL 15: How to Live
• PHIL 242N: Happiness and Well-Being
• PLSC 1H: American Politics: Principles, Processes and Powers
• PLSC 3H: Comparing Politics around the Globe
• PORT 123: Portuguese for Romance-language Speakers
• PSU 97: Special Topics
• PSYCH 109N: The Psychology of Artistic Creativity
• PSYCH 466: The Psychology of Evil
• SOC 20N / COMM 20N: Critical Media Literacy
• SOC 120N / PHIL 120N / PSYCH 120N: Knowing Right from Wrong
• SOC 210Z: Social Determinants of Health
• SOC 211Z: Health Inequality: Understanding the Geographies of Life and Death
• SOILS 299: Foreign Studies
• SRA 311W: Risk Analysis in a Security Context
• SUST 242N: Issues in Sustainability

Courses Added: Effective Spring 2019
• AEE 204N: Science Literacy and Policy in the 21st Century
• AGBM 170Z: Investigating the U.S. Food System: How food moves from field to table
• AGBM 199: Foreign Studies - Agribusiness Management
• AGBM 299: Foreign Studies - Agribusiness Management
• AGBM 399: Foreign Studies - Agribusiness Management
• ART 144Z: Climate Change: Arts, Agency and Activism
• ARTH 120Z: Asian Art and Architecture
• ASIA 100Z: What Is Asia?
• BIOET 401Q: Science, Ethics, Policy, and Law
• BIOET 496: Independent Studies
• BIOET 497: Special Topics
• BIOL 144Z: Climate Change: Biological Impacts – Linked
• BIOL 476: Advanced Human Anatomy - cadaver based
• BIOL 478: COMPARATIVE NEUROANATOMY
• BME 408: Solid Mechanics of Biological Materials
• CAS 170N / IST 170N: What is Information?
• CED 275: Community, Environment and Development Professional Seminar
• CED 329H: Intermediate Environmental & Resource Economics (Honors)
• CED 445: International Development Practice
• CED 470: Participatory Research Methods
• CHE 412: CHE and the Environment
• CHEM 358: Literature, Conduct and Safety in the Chemical Sciences
• CI 285: Active Engagement for Social Justice in Education
• CI 304N: Food, Farms & Justice: What's Education Got To Do With Them?
• CI 385: DC Social Justice in Education: Empowering Communities through Transformative Teaching
• EDSGN 485: Engineering Design Portfolio
• EMCH 302H: Thermodynamics, Heat Conduction, and Principles of Modeling, Honors
• ENGL 142N / SC 142N: Science in Literature
• ENGL 183Z: Adventure Literature
• ENGL 237N: Reading and Writing Documentary Poetry
• ENT 484: Insect Behavior
• ERM 150S: ERM First Year Engagement
• GD 115N: Visualizing Information
• HIST 148: History of Pennsylvania State University
• HM 494H: Senior Honors Thesis
• HUM 297: Special Topics
• ISB 207: Integrating Science and Business
• ISB 475W: Strategic Integration of Science & Business
• ISB 495: Internship
• JST 195 / HIST 195: Genocide in Global perspectives: Twentieth Century and beyond
• KINES 1Z / RPTM 1Z: Introduction to Outdoor Pursuits LINKED
• KINES 458: Introduction to Electrocardiogram Interpretation
• LATAM 499H: Foreign Studies (Honors)
• LLED 422: Teaching the Young Adult Literature Workshop
• ME 492: Dynamics and Vibration Lab
• MGMT 320: Establishing Workforce Diversity and Inclusion
• MKTG 474: Marketing Analytics
• MNG 302: Mine Electrical Systems
• MUSIC 209N: The Music of the Beatles and American Popular Culture
• NURS 480: Preparation for Nursing Licensure Exam
• NUTR 175Z: Healthy Food for All: Factors that Influence What we Eat in the US
• PLANT 200: Introduction to Agricultural Crop Growth, Form, and Function
• PLANT 297: Special Topics
• PLANT 290N: Comparative Violence: Political and Criminological Perspectives
• PORT 473: Luso-Brazilian Cinema
• PPEM 456: From the Tame to the Wild: The Environments and Ecologies of Microbes
• PPEM 494: RESEARCH PROJECT
• PSYCH 100H: Honors Introductory Psychology
• PSYCH 144Z: Climate Change: Individual Behaviors and Group Attitudes
• PSYCH 480: Advanced Mental Health Practicum with Children
• RM 475: Quantitative Analysis for Business
• RPTM 100A: PGA Tournament Golf A
• RPTM 100B: PGA Tournament Golf B
• RPTM 250: PGA Facility Management I
• SCM 301H: Supply Chain Management – Honors
• SOC 208N / COMM 208N: Visual Representations of the Middle East in the US and Middle East
• VBSC 455: One Health
• VBSC 456: Case Studies in Global One Health
• WMNST 120: Sex, Gender, and the Body

Courses Dropped: Effective Summer 2018

• CSA 297: Special Topics
• CSA 397B: Special Topics
• CSA 497H: Special Topics

Courses Dropped: Effective Summer 2019

• EDSGN 10: Introductory Engineering Graphics
• KINES 180: Introduction to Kinesiology
• KINES 48A: Tennis II
• NUTR 370: Professional Issues in Nutrition and Health Careers
• NURS 111: Nursing Roles
• NURS 112: Health Patterns/Nursing Interventions
• NURS 113: Nursing Care During Childbearing Years
• NURS 114: Nursing Care During Childrearing Years
• NURS 116: Clinical Immersion I: Introduction to Concepts of Illness
• NURS 211: Pathophysiology I – Nursing Interventions
• NURS 212: Pathophysiology II – Nursing Interventions
• NURS 213: Pathophysiology III – Nursing Interventions
• NURS 214: Nursing Care of Clients with Psychiatric/Mental Health Disorders
• NURS 216: Clinical Immersion II: Introduction to Concepts of Leadership

Course Changes: Effective Fall 2018

ANTH 2: Introduction to Archaeology (3 Credits) (BA) (GS)

Survey of basic approaches used by archaeologists to interpret basic prehistoric human cultural patterns. ANTH 002 Introduction to Archaeology (3) (GS)(BA) This course meets the Bachelor of Arts degree requirement. Introduction to Archaeology is designed to introduce the basic theories, methods, and data archaeologists use to study ancient peoples, past cultures, and their natural environments. A problem-oriented approach to learning about archaeology combines two one-hour lectures with a one-hour, hands-on lab session each week. The theories and methods introduced in lectures are applied to archaeological data in the computer lab in order to answer questions about life in the past. Hands-on involvement is emphasized through the use of state-of-the-art computers, archaeological software, and (where possible) the handling of archaeological collections. Grades for this course are based on two to three exams and the lab exercises. The course may vary from this standard on other campuses depending upon the availability of computer labs and archaeological collections. However, the weekly lab exercises are available to all campuses from the Department of Anthropology. Students on all campuses will be expected to interact with each other and with the instructor in weekly discussions and exercises. They engage in data gathering, synthesis, and analysis, using exercises that make use of information on the internet as well as data provided by PSU archaeologists. The exercises emphasize human cultural diversity over time and space. There is also an emphasis on the ethics of archaeological research and the ways in which scientific choices and ethical choices interact in professional archaeology. The logical and ethical principles learned are applicable to a broad range of problems that students are likely to encounter in anthropology, in other disciplines, and later in their lives. This course is one of three core courses required of majors in the Anthropology department and it is also required for the minor. ANTH 002 serves as a stepping stone to more advanced and specialized courses in anthropology. This course can be used to fulfill three credits of General Education in the Social/Behavioral Sciences for the Bachelor of Arts requirement.

Changes Effective Fall 2018:

• Number to 2N
• Add General Education Designation GH
• Add General Education Designation Inter-Domain
• Add IL Cultures
• Long Title
• Abbreviated Title
• Description

ANTH 45: Cultural Anthropology (3 Credits) (US) (IL) (BA) (GS)

Old Listing Effective Through Summer 2018:

Beginnings of human culture, economic life, society, government, religion, and art among traditional peoples. ANTH 045 Cultural Anthropology (3)(GS;US;IL)(BA) This course meets the Bachelor of Arts degree requirements. “Cultural Anthropology” is designed to introduce the student to the cultural diversity of our planet. “Culture” can be defined as that set of rules, standards, conventions, and beliefs shared by members of a given human society. These rules are transmitted by social learning. Culture defines what counts as “normal” thought and behavior by the members of a given society. The course will provide the student with an understanding of the basic methods, data and, theories that cultural anthropologists use to study the varieties of human thought, behavior, and social life in their associated physical and social environments. These projects involve individual and group research based upon library and computer-based resources and further foster interactive learning. Teamwork is an essential aspect of both research and presentation. Oral presentations and written papers are stressed. Grades are based on three examinations. This class is one of three core-courses required of
majors and minors in the Department of Anthropology. The course can be used to fulfill three credits of General Education in the Social/Behavioral Sciences for the Bachelor of Arts requirement. Students can expect to acquire a general introduction to the University as an open community of researchers and scholars who attempt to describe accurately, and hence understand, “The Human Condition.” Students in this class will therefore have the opportunity to explore their responsibilities as members of such an intellectual community of free inquiry. In addition, students will develop first-hand knowledge of the learning tools and resources available to them at Penn State including the ever-expanding Web-based Internet. This course offers the student the opportunity to develop intellectual relationships with faculty and fellow classmates who share similar academic interests in cultural anthropology and related fields of inquiry. “Cultural Anthropology” is offered every semester, including the summer session.

Changes Effective Fall 2018:

• Number to 45N
• Add General Education Designation GH
• Add General Education Designation Inter-Domain
• Long Title
• Abbreviated Title
• Description

ANTH 216: Sex and Evolution (3 Credits) (GN) (GS)
Old Listing Effective Through Summer 2018:

Introduction to evolutionary theory and its application to understanding human sexuality and sex differences. ANTH 216 Sex and Evolution (3) (GN;GS) This course introduces students to evolutionary theory and explores its relevance to the anthropological study of human sexuality. After honing their evolutionary skills by investigating non-human reproduction, students will apply evolutionary principles to understanding human sexuality. Why do we prefer certain characteristics in a mate? How do these preferences differ between and within the sexes, and why? How do mating behaviors vary across cultures, and why are some more culturally variable than others? Other topics covered include sexual conflict and rape, and parental care and abuse. In understanding the evolutionary basis for a trait, it is helpful to understand its development. Thus, this course also covers the basics of sexual differentiation and investigates how variation in these processes might lead to variation in sexual orientation and gender identity. Students should take away not only a better understanding of human sexuality but also a way of thinking that helps them understand all living things.

Changes Effective Fall 2018:

• Number to 106N
• Add General Education Designation Inter-Domain
• Description

BIOL 120A: Plants, Places, and People (3 Credits) (GN) (US) (IL) (BA)
Old Listing Effective Through Summer 2018:

Useful and dangerous plants; historical (archaeological), cultural (ethnological), and economic (anthropocentric) aspects, including structural and chemical characteristics of botanical importance. Students who have passed BIOL (PPATH; S T S) 424 may not schedule this course.

Changes Effective Fall 2018:

• Number to 120N
• Description
• Abbreviated Title
• Add General Education Designations GH and Inter-Domain

CAS 222: Foundations: Civic and Community Engagement (3 Credits) (US) (IL) (GS)
Old Listing Effective Through Summer 2018:

Conceptual foundations of public scholarship and orientation to contemporary themes and issues in civic and community engagement.

Cross-Listed Courses: AYFCE 211 CIVCM 211

Changes Effective Fall 2018:

• Number to 222N
• Cross-listings to AYFCE 211N and CIVCM 211N
• Description
• Add General Education Designations GH and Inter-Domain

CHEM 423: Chemical Spectroscopy (4 Credits) (WF)
Old Listing Effective Through Summer 2018:

Modern methods and instruments of spectroscopy and their applications to problems of chemical structure and analysis. CHEM 423W Chemical Spectroscopy (4) This course reviews modern methods and instruments of spectroscopy and their applications to problems of chemical structure and analysis. Topics include electronics, optics, and atomic and molecular spectroscopy (UV-VIS, Fluorescence, FTIR, Raman, liquid- and solid-state NMR). The course thoroughly integrates lecture and laboratory activities. The laboratory component incorporates skill-building exercises with open-ended guided-inquiry laboratory exercises and a semester-long laboratory- and literature-based research project. Students work in small groups (2-3 students) to complete each assignment. Students are required to write research papers during the semester. The reports are linked to the core course topics and the fifth is associated with the semester-long research project. All reports require students to search for and read the relevant published literature. The course is designed to be rigorous and comprehensive in scope. The writing component for this course includes: maintaining a proper laboratory notebook; reports; and an oral poster presentation. All writing elements are reviewed and graded by the instructor and teaching assistants.

Changes Effective Fall 2018:

• Number to 423W
• Prerequisite/Corequisite/Concurrent Courses

CHEM 425: Chromatography and Electrochemistry (4 Credits) (WF)
Old Listing Effective Through Summer 2018:

Gas, liquid, and other forms of chromatography; important techniques of electrochemistry.

Changes Effective Fall 2018:

• Number to 425W

CHEM 431: Organic and Inorganic Preparations (4 Credits) (WF)
Old Listing Effective Through Summer 2018:
Preparation, purification, and characterization of both organic and inorganic compounds by modern methods. CHEM 431W CHEM 431W Organic and Inorganic Preparations (3) CHEM 431W is a one-semester, writing-intensive advanced laboratory course that focuses on the preparation, isolation, purification, and characterization of organic, organometallic, and inorganic compounds. Students are expected to use the techniques learned in the introductory organic chemistry laboratory and will learn more advanced techniques such as the use of air-free and anhydrous reaction conditions, glove bags, vacuum manifolds, vacuum distillations, flash chromatography, solvent stills, and gas-tight syringes. Molecular modeling techniques are also introduced. Students are given hands-on access to instrumentation for the characterization of synthetic products or organic unknowns using standard analysis methods such as IR, NMR, UV/V is spectroscopy, mass spectrometry, polarimetry, HPLC, GC and GC-MS. Students are expected to search the chemical literature using databases and online journals and to write formal lab reports in ACS style. The lab assignments include syntheses, separating an unknown mixture, and a team project, which includes a written proposal, synthetic work, a final report, and a poster presentation.

Changes Effective Fall 2018:

- Number to 431W

CHEM 459: Advanced Experimental Physical Chemistry (4 Credits) (WF)

Old Listing Effective Through Summer 2018:

Laboratory experiments and projects for students interested in advanced study in physical chemistry. CHEM 459W Advanced Experimental Physical Chemistry (4) CHEM 459W Advanced Experimental Physical Chemistry is a project-based course designed as a follow-up to CHEM 457. CHEM 459W provides students with further experience in laboratory techniques used for quantitative experimentation and with the processing and interpretation of quantitative data. Experiments and short research projects are designed to complement the theoretical knowledge acquired in lecture courses so as to enhance students’ competence in problem solving in a research environment. Particular attention will be devoted to written communication of experimental results in an effective and concise manner according to American Chemical Society journal standards.

Changes Effective Fall 2018:

- Number to 459W

CMLIT 191: Introduction to Video Game Culture (3 Credits) (US) (IL) (GH)

Old Listing Effective Through Summer 2018:

A comparative, international look at the nature and history of video games as cultural artifacts, from Pong to online role-playing. CMLIT 191 (GAME 160) Introduction to Video Game Culture (3) This course is a comparative introduction to the nature and history of video games as cultural artifacts, from Pong to online role-playing. It introduces students to academic discussion on and creative work in new digital forms including hypertexts, video games, cell phone novels, machinima, and more. Students will survey major debates over the meaning and value of video games, and study some of the major theoretical terms and perspectives developed to elaborate the cultural and sociological value of video games. The course extends students’ skills in literary interpretation to a variety of new objects, and makes them aware of the role medium plays in aesthetic development and production. Students will leave with a far sharper understanding of how the interpretive tools used in the humanities can be extended to include new media, and with a sense of the historical role video games have played and will continue to play in global cultural production. Because the course is historically focused, it will spend significant time looking at the differential development of video games in three major regions: the United States, Europe, and East Asia (especially Japan).

Cross-Listed Courses: GAME 160

Changes Effective Fall 2018:

- Number to 191N
- Description
- Add GA Designation
- Add Inter-Domain Designation
- Add IL Designation
- Cross-Listed Course Number to 160N

COMM 150: The Art of the Cinema (3 credits) (BA) (GA) (GH)

Old Listing Effective Through Summer 2018:

COMM 150 The Art of the Cinema (3) (GA)(BA) This course meets the Bachelor of Arts degree requirements. Communications 150 is an introduction to cinema studies. The course assumes, as film historian John Belton puts it, that films can reveal, both directly and indirectly, something about cultural identity and memory, and that movies "can be analyzed—even psychoanalyzed—to reveal something about the cultural conditions that produced them and attracted audiences to them.” The course seeks both to familiarize students with works they probably haven’t seen and to “defamiliarize,” through critical and historical analysis, works they very well may have seen. Movies are examined as formal constructs, market commodities, and cultural artifacts—as reflections, however distorted, of life in the twentieth century. Topics include the emergence of the cinema as an institution; the global dominance of classical Hollywood cinema; American film industry organization (production, distribution, exhibition, vertical integration, the studio system, the star system); analysis of film styles (national cinemas, historical movements); analysis of film genres (e.g., silent film melodrama, film noir, comedy, the war film, the western); consideration of film audiences (reception, spectatorship, criticism); introduction to film aesthetics (film art and appreciation); and alternative cinemas (independent, documentary and experimental cinemas). COMM 150 emphasizes media literacy and seeks to help students develop critical thinking, reading and viewing skills. All sections integrate lectures and readings with viewing feature films during the weekly practicum period. Many sections also incorporate slides and film or video clips during the lecture periods to allow students to exercise their critical viewing skills regarding certain teaching points. Students prepare for film screenings by reading, listening to lectures, and analyzing examples of relevant works. Introductory lectures seek to provide a critical and historical context for each week’s screening; follow-up lectures offer critical analysis and examinations reward close viewing. The core purpose of the course, therefore, is to make film viewing a conscious, critical and analytic activity. COMM 150 serves as a prerequisite for most upper-level film studies courses. It is required for Media Studies majors who have chosen the Film/Television option, and is among three courses (along with COMM 100 and COMM 180) from which all Media Studies majors are required to choose. It has no prerequisite and assumes no prior exposure to film studies, and so is directed primarily to students outside the field.

Changes Effective Fall 2018:
Significant natural features of Africa as related to human endeavor; case studies include the Nile, climate change, and natural resources.

EARTH 105 / AFR 105 Environments of Africa: Geology and Climate History (3) (GN,IL)(BA) This course meets the Bachelor of Arts degree requirements. “Environments of Africa: Geology and Climate History” investigates the interrelationships between geology, hydrology, land use and human development in several areas of Africa. We focus primarily on regions north of the equator, although there is a brief segment on South Africa mining. Specific topics include the Nile River (sources of the Nile, agricultural practices, effects of damming the Nile, hydropolitics), the Sahara and Sahel (salt mines, climate change, drought, water resources), and natural resources and their role in politics (gold, diamonds, oil, and gas). The theme of climate change cuts across the entire semester. The quantitative and analytical components of the course involve working through a combination of map exercises and data manipulations (flood stage, groundwater age, rainfall and temperature records). Writing exercises are conducted both individually (essays, analysis of readings) and in collaborative teams (climate change analysis).

Readings for the course come from the popular scientific literature; current refereed research journals, and transcribed oral histories of African people. Faculty lectures will comprise ~30% of the course, and student presentations ~20%, with the remainder of the time devoted to in-class collaborative exercises. There are no pre-requisites for this course. It will be offered annually with a maximum enrollment of 100 students. The goals of the course are to (1) introduce the scientific study of Africa; (2) develop quantitative and scientific reasoning skills; (3) explore the relationship between human society and the natural world. The topics that we explore (e.g., global climate change, allocation of limited water resources) are important political issues that affect people in developed and developing countries throughout the world. It is crucial that the next generation of citizens be informed as to how scientific data is obtained, presented, and interpreted by scientists as well as politicians. Students will work individually and (more commonly) in teams to analyze real data from natural African systems, and will then report their findings to the class both orally and in writing. Examples of the data sets include 100-year records of monthly rainfall and temperature from stations throughout the continent, fossil suites from ancient lake cores in the modern Sahara, and historical writings of Nile flood levels from pre-Biblical times. Through these exercises students will gain an appreciation of the scope of geological time and change, and will be able to incorporate this new long-term perspective into identification and resolution of modern questions.

Cross-Listed Courses: AFR 105

EMSC 240: Energy and Sustainability in Contemporary Culture (3 Credits: Maximum of 3 Credits) (BA)
Old Listing Effective Through Summer 2018:

Critical evaluation of selected media (e.g., books, film) in contemporary culture on topics related to energy and sustainability. Course guides students through an engaging exploration and critical evaluation of selected media (e.g., books, film) in contemporary culture on topics related to energy and sustainability. Three selections are used each term, typically two books and one film. Students consider the subject matter in light of humanistic values, where the science, ideas and history presented in the selected media are critically evaluated relative to the viability of our planet’s ability to support life. Opening lessons cover the foundational science of energy and sustainability, with a global perspective and consideration of the human dimension. The science is presented without technical jargon or advanced mathematics, to promote a genuine and sound understanding of these essential concepts for college-level students of all academic backgrounds. Learning units are devoted to each media selection, with all content, activities and assessments within the unit contributing to this concentrated focus. Activities and assessments engage students in qualitative and quantitative methods, which may include small group discussions, journaling, surveys, interviews, polling, research, presentation of ideas and opinions, and other peer-to-peer interactions. After completing this course, students will – possess the foundational science knowledge necessary to evaluate contemporary topics related to energy and sustainability, from the perspective of universal humanity on a planet of finite resources. – be prepared to develop observations, questions and opinions on topics related to energy and sustainability and to self-express them, in both written and oral presentations, to others with different backgrounds and points of view – be skilled critical readers of energy and sustainability subject matters, knowing how to raise (and answer) questions related to scientific clarity and soundness and how to test assumptions and scope of arguments, especially as related to inclusion of humanistic values and planetary limits – be willing and able to avoid entrenched ideology-based positions on issues related to energy and sustainability and to develop, instead, a personal position based in science and data with a humanistic perspective – know of credible resources and organizations for ongoing research related to energy and sustainability – be prepared to participate in public dialogue on some of the most challenging and complicated issues of our time, including activities such as letters to the editor, online commenting, political engagement, and public advocacy.

Changes Effective Fall 2018:

- Number to 240N
- Description
- Add General Education designation GS
- Add General Education designation GN
- Add General Education designation Inter-Domain

ENGL 225: Sexuality and Modern Visual Culture (3 Credits) (GA) (GH) (INTER-DOMAIN)
Old Listing Effective Through Summer 2018:

An examination of the visual expression of gender and sexual identities in English-speaking cultures since the late nineteenth century. ENGL (ART H/WMNST) 225 Sexuality and Modern Visual Culture (3) (GA;GH) The terms “feminist” and “homosexual” were invented by the Victorians and reflect profound shifts in conceptions of identity. Another invention of the nineteenth century was the idea of the literary and artistic “avant-garde,” a minority contingent with politically and/or aesthetically advanced views.

Changes Effective Fall 2018:

- Change Number to 150N
- Add General Education Designation GH
- Add General Education Designation Inter-Domain
- Description
- Remove Cross-Listed Course
These ideas of minority culture were deeply enmeshed with one another, and have exerted profound influence ever since. This course explores that history with the objective of developing a more sophisticated understanding of how the history of ideas affects our sense of who we are and how we read both texts and images. The course will be relevant to students of American and English studies, art, art history, and women’s and sexuality studies.

Cross-Listed Courses: ARTH 225 WMNST 225

Changes Effective Fall 2018:
- Description
- Abbreviated Title
- Add Inter-Domain Designation
- Change Cross-Listed Course Numbers ARTH 225N WMNST 225N

FR 138: French Culture Through Film (3 Credits) (BA) (GH)
Old Listing Effective Through Summer 2018:

Introduction to French culture through film by French and francophone directors examining gender, ethnicity, and global issues. Taught in English. FR 138 French Culture Through Film (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, taught entirely in English with no assumption of prior knowledge of French, will entail the study and analysis of a number of recent and not-so-recent French films that present, in one way or another, problems or themes characteristic of French history and society. We will not, however, be concerned primarily with watching these films as “illustrations” of various aspects of French culture; on the contrary, we will study them as films. We will be concerned with the filmic devices used, and with the intellectual and ideological orientations of the people who made them. For this reason we will discuss techniques used in the presentation of various events shown in the films, which may or may not involve war, the Occupation, city life, growing up, gender relations, the lives or immigrants, etc. From our study of these films, we will inevitably learn quite a bit about French society and its values, particularly in the period from the Occupation (World War II) to the present. French 138 will satisfy a General Education humanities requirement for students in all majors except French. Students will be evaluated with quizzes (given after the screening of each film ... before class discussion about film) for 20% of final grade; group presentations/participation for 30% and essays (five short papers) for 50%. This course will be offered once a year with a limit of 75.

Changes Effective Fall 2018:
- Number to 138N
- Add GA Designation
- Add Inter-Domain Designation
- Abbreviated Title
- Description

GLIS 101: Globalization (3 Credits) (GS) (IL) (BA)
Old Listing Effective Through Summer 2018:

This course provides a broad introduction to the topic of global studies. GLIS 101 Globalization (3) (GS;IL) (BA) This course meets the Bachelor of Arts degree requirements. This interdisciplinary course explores how people and nations confront the phenomenon of globalization, presenting different perspectives for studying and making sense of the world. Students are exposed to a variety of analytical approaches from the arts, humanities and social sciences to allow them to see how different perspectives portray the world, interpret events, and often shape human actions. The course begins from a humanities perspective, exploring the concept of social identity, in particular understanding how people in different cultures develop a sense of their identity and how this is perpetuated over time through a society’s products, practices, and perspectives (e.g. artifacts, value systems, traditions). The focus then shifts to organizations in society, comparing how they operate with either national or global identities. This leads to an exploration of how information and communication technologies are tools to create both global connectivity, yet can also be a source of division. Globalization is then considered in terms of its impact on the natural environment, populations, and health. Challenges arising in each of these areas are the concern of all global citizens, and are explored in terms of how interdependencies are increasing their impact. The focus of the course progresses to gender, poverty, and human rights, exploring these in tandem with their literary representations, presented in both global and comparative contexts. Economic development models are also used to uncover trends in gender and poverty. The final focus is on global peace and conflict, highlighting how globalization, in bringing people and nations closer together, can also give rise to conflict and division. This course is one of two 100-level courses that are required for the GLIS major. While this course focuses on a general introduction to global studies as a field of study, GLIS 102 complements the topics raised here, exploring many from a range of different perspectives to prepare students for choosing their options through the major.

Changes Effective Fall 2018:
- Number to 101N
- Add General Education Designations GH and Inter-Domain
move or change people? Wealth & Inequality. Why are some nations, and some people, rich, and others poor? What structural factors help explain those differences? How does the distribution of wealth factor into what counts as a good society? Human Rights. What are the most fundamental properties of being human? What kinds of responsibilities have societies imagined that they have to their citizens and non-citizens? Does everyone in a society have the same rights? If rights are everywhere violated and ignored, does that mean they cannot, or should not, exist?

Changes Effective Fall 2018:

- Number to 102N
- Description
- Add General Education Designations GS and Inter-Domain

HDFS 249: Adult Development and Aging (3 Credits) (BA) (GS)
Old Listing Effective Through Summer 2018:

Physiological, psychological, and social development and intervention from young adulthood through old age. HD FS 249 Adult Development and Aging (3) (GS/BA) This course meets the Bachelor of Arts degree requirements. This course will prove an orientation into the multidisciplinary study of aging and development from middle adulthood to old age. Students will be introduced to theories of aging research methods and current information on the psychological, sociological, and biological aspects of aging.

Changes Effective Fall 2018:

- Change Number 249N
- Add General Education Designation GHW
- Add General Education Designation Inter-Domain
- Description

HORT 150: Plants in the Human Context (3 credits) (GN)
Old Listing Effective Through Summer 2018:

An introduction to the many fascinating and vital relationships between plants and human society. HORT 150 Plants and Human Context (3) (GN) The objective of this course is to expose students to the pervasiveness and essentiality of plants in the human experience. Major topics include 1) human civilization as influenced by plants, 2) a history of food from plants, 3) chemicals from plants, 4) non-food plant uses, 5) current issues in plant production, and 6) current botanical issues of global concern. Specific topics range from botanical pharmaceuticals to global warming/use of biofuels, and from culture-specific rotten foods to genetically-modified plants. Students will be exposed to many basic concepts of plant ecology, ecosystem science, emerging technologies, and the criteria used to evaluate sources of scientific information as a natural consequence of studying the range of topics included in the course. Students completing the course will therefore be in an excellent position to intelligently select from the many botanically- and ecologically-oriented majors, minors and options available to them at Penn State. The format of the course consists primarily of lecture/discussions, and includes one team assignment (making a poster) and three individual projects (one page arguments) in addition to a midterm and a final exam. Student evaluations are based on individual exam scores (50%) and on team (20%) and individual (30%) projects

Changes Effective Fall 2018:

- Number to 150N
- Description

- Add General Education designation GS
- Add General Education designation Inter-Domain

HUM 100: Foundations in the Humanities: Understanding the Human Experience (3 Credits) (GH)
Old Listing Effective Through Summer 2018:

Introductory, interdisciplinary study of significant works in the humanities, stressing basic interpretive skills.

Changes Effective Fall 2018:

- Change number to 100N
- Add General Education Designation GA
- Add General Education Designation Inter-Domain
- Description

HUM 150: World Mythologies in the Arts (3 Credits) (IL) (GH)
Old Listing Effective Through Summer 2018:

Interdisciplinary, cross cultural, historical, and contemporary study of world mythologies as represented in the visual arts, literature, and film.

Changes Effective Fall 2018:

- Change Number to 150N
- Add General Education Designation GA
- Add General Education Designation Inter-Domain
- Description

HUM 200: Explorations in the Humanities: The Quest (3 Credits) (GH)
Old Listing Effective Through Summer 2018:

Interdisciplinary study of significant works in the humanities within the broad theme of the quest, stressing students’ interpretive skills.

Changes Effective Fall 2018:

- Change Number to 200N
- Add General Education Designation GA
- Add General Education Designation Inter-Domain
- Description

HUM 311: The Western Tradition I (3 Credits) (IL) (GH)
Old Listing Effective Through Summer 2018:

From prehistory through the Roman world.

Changes Effective Fall 2018:

- Change Number to 311N
- Add General Education Designation GA
- Add General Education Designation GH
- Add General Education Designation Inter-Domain
- Description

HUM 300W: Interpretations in the Humanities (3 Credits) (WF)
Old Listing Effective Through Summer 2018:

A study of selected themes, topics, or periods that introduces students to interdisciplinary approaches to knowledge, interpretation, and creative expression.
Changes Effective Fall 2018:

- Change Number to 300N
- Add GA Designation
- Add GH Designation
- Add Inter-Domain Designation
- Description
- Prerequisite/Corequisite/Concurrent Courses

**HUM 400: Expressions in the Humanities (3 Credits)**

Old Listing Effective Through Summer 2018:

Capstone course for School of Humanities majors: students synthesize and apply approaches to a topic in creative expression and knowledge.

Changes Effective Fall 2018:

- Change number to 400N
- Add GA Designation
- Add GH Designation
- Add Inter-Domain Designation
- Description

**JAPNS 121: Japanese Film and New Media (3 Credits) (GH) (IL) (BA)**

Old Listing Effective Through Summer 2018:

Survey of Japanese film and new media in the twentieth century and beyond, with attention to changing cultural settings. Taught in English. JAPNS 121 Japanese Film and New Media (3) (GH; IL) (BA) This course meets the Bachelor of Arts degree requirements. This course is intended to provide an introduction to modern and cutting-edge forms of cultural production in Japan from the twentieth century to the present day. Prior study of Japan is not required and materials will be available in English. Students will learn about major technologies and forms of media, including film, manga, anime, and various forms of “new media” (cellphone novels, blogs, MMOGs, IM, and Web 2.0 for instance). Readings and screenings will cover several artistic modes including formalism, historiography, documentary, period drama, and experimental works. The course, or individual units within the course, will be structured so that students develop an historical perspective, allowing them to understand the cultural contexts that have inspired the creative works under study. By examining Japanese film and new media with attention to changing cultural settings, students will investigate such topics as the relation between social institutions and the individual, the formation and expression of identity, changing gender roles and family structures, the impact of technological and economic trends on social structure, and changing climates of censorship and freedom of expression. In addition, students will learn to think critically about various media’s techniques and aesthetics of representation, and will become more engaged, critical spectators of film and related media. Class work includes some lecture but emphasizes guided discussions, group work, writing exercises, and some student presentations. This participatory approach is intended to deepen students’ appreciation of the works, to help them understand value systems that may differ from those predominant in western cultures, and to assist students in developing both analytical and expressive abilities. Through critical reading, group discussion and interpretive writing, students will hone skills for evaluating modes of cultural production and consumption in modern Japan. The course is designed to be suitable for all students generally interested in Japan, or interested in various fields of humanistic study, whether or not they have previously studied the culture of Japan. This course is required of the Japanese major. It is designed to count as General Education, as a B.A. “Other Cultures” course, and as an IL “International Cultures” course.

Changes Effective Fall 2018:

- Number to 121N
- Description
- Add General Education Designations GA and Inter-Domain

**MATH 34: The Mathematics of Money (3 Credits) (GQ)**

Old Listing Effective Through Summer 2018:

Simple interest, simple discount, compound interest, annuities, investments, retirement plans, taxes, credit cards, and mortgages. MATH 034 The Mathematics of Money (3) (GQ) This course is intended to be one of several offered by the mathematics department with the goal of helping students from non-technical majors partially satisfy their general education quantification. It is designed to provide a sound introduction to the uses of college level mathematics in personal finance applications. Topics include: simple interest, simple discount, compound interest, annuities, investments, retirement plans, taxes, credit cards, and mortgages.

Prerequisite: one unit of algebra or MATH 004

Changes Effective Fall 2018:

- Description
- Prerequisite/Corequisite/Concurrent Courses

**PLSC 7: Contemporary Political Ideologies (3 Credits) (BA) (GS)**

Old Listing Effective Through Summer 2018:

Critical analysis of contemporary political ideologies such as liberalism, conservatism, socialism, anarchism, fascism, feminism, and environmentalism. PL SC 007 Contemporary Political Ideologies (3) (GS) (BA) This course meets the Bachelor of Arts degree requirements. Liberalism, conservatism, socialism, anarchism, fascism, feminism, and environmentalism are ideologies which have inspired political movements. Understanding their meaning is an essential aspect of the study of contemporary politics. In this course, we examine the basic principles of these ideologies and assess their power to mobilize people for political action. In the process, we also explore the role of ideology in America today, including the responsibility of democratic citizens to understand how ideology shapes their politics. This course serves as a prerequisite for all 400-level political theory courses. This course fulfills one of the lower division requirements for majors in Political Science. It is taken by nearly all Political Science majors. For non-majors this course will be used to fulfill general education social/behavioral science requirement and bachelor of arts social science requirement. Students will take examinations which include short answer and essay questions. They also trace a basic concept, e.g., equality, liberty, democracy, across the political ideologies studied. Their final take-home exam compares contrasting meanings of their chosen concept. Participation and group exercises in discussion sections are also graded. PL SC 117 will be offered twice a year with 90 seats per offering.

Changes Effective Fall 2018:

- Description
- Number to 7N
- Abbreviated Title
PLSC 17: Introduction to Political Theory (3 Credits) (BA) (GS)  
Old Listing Effective Through Summer 2018:

Introduction to basic issues in political theory through analysis of selected major political thinkers. PL SC 017 Introduction to Political Theory (3) (GS)(BA) This course meets the Bachelor of Arts degree requirements. This course examines how the ideas of selected political theorists have been — and continue to be—cruicial for understanding how best to conduct our political lives. Following an introductory exploration of how political theorists think and write about politics, we will read selected theorists from three historical periods: ancient, modern, and contemporary. Our focus will be how these theorists respond to important questions about politics, including how their answers (and even their questions) change over time. Possible questions include: What are the rights of citizens? What are the purposes of states? When is a regime just? How should we organize authority? How should we participate in politics? What counts as political knowledge? How do knowledge and power interact in politics? Most important, what constitutes a good society and a good life? How can we work toward these? So these questions do not remain abstractions we also consider theoretically informed empirical research. By the end of the course, students have a better understanding of selected political theorists and the normative foundations of contemporary politics. This course serves as a prerequisite for all upper level Political Theory courses. This course fulfills one of the lower division requirements for majors in Political Science. Many Political Science majors and minors take it. For non-majors, this course may be used to fulfill general education requirements or the Bachelor of Arts social–behavioral science requirement. Grading is based on analytical papers and—journal assignments, essay exams, occasional quizzes, group presentations, and class participation. PL SC 017 is offered once a year with 60 seats per offering.

Changes Effective Fall 2018:

- Description
- Number to 17N
- Add GH Designation
- Add Inter-Domain Designation
- Add BA Designation

PLSC 17W: Introduction to Political Theory (3 Credits) (WF) (BA) (GS)  
Old Listing Effective Through Summer 2018:

Introduction to basic issues in political theory through analysis of selected major political thinkers.

Changes Effective Fall 2018:

- Description
- Abbreviated Title
- Add GH Designation
- Add Inter-Domain Designation
- Add BA Designation

WMNST 105: Living in a Diverse World (3 Credits) (GH) (GS) (US) (BA)  
Old Listing Effective Through Summer 2018:

This course uses literature, film and scholarly texts to inspire students to explore how conceptions of social difference, such as those linked to categories of gender, race, sexuality, class, ethnicity, and disability, shape society and everyday interactions historically and today. The course takes an intersectional perspective to explore how and why these categories vary over time and space, the effects of such variations for individuals and communities, and the connections between identity and the exercise of power. Geographically, the course emphasizes the relationship between social difference and power in the U.S. history and society, but takes a transnational perspective when possible by making comparisons to contexts beyond the United States. Furthermore, the class examines how individuals and communities most directly marginalized by these processes contest and re-imagine dominant categories and assumptions. Materials and discussions in the class trace broad social and historical trends as well as dive into the facets of everyday life. The class is designed to encourage reflection on the ethical challenges that arise when we become aware of how privilege, power and difference are intertwined in our world and daily lives.

Changes Effective Fall 2018:

- Number to 105N
- Description
- Add B.A. Humanities Designation

WMNST 106U: Representing Women and Gender in Literature, Art and Popular Cultures (3 Credits) (H) (US) (IL) (BA) (GH)  
Old Listing Effective Through Summer 2018:

Interdisciplinary consideration of primary works and scholarship pertaining to women in the humanities and the arts.

Changes Effective Fall 2018:

- Number to 106Q
- Description
- Add General Education Designations GA and Inter-Domain

WMNST 202: Gender Dynamics in Africa (3 Credits) (IL) (BA) (GS)  
Old Listing Effective Through Summer 2018:

Critical analysis of multidisciplinary research on relations between men and women in Africa and critique of Western feminist theories. WMNST (AFR) 202 Gender Dynamics in Africa (3) (GS;IL)(BA) This course meets the Bachelor of Arts degree requirements. In terms of gender studies, western academics have dominated the field. The course will offer a very different, more African-centered, analysis of the gender relations of African. Important African women writers will be read and their works analyzed. The role of African gender dynamics on the African Diaspora (North American, South America, the Caribbean, and the Middle East) will also be studied in this course. Feminism is one of the latest Western theoretical fashions to be applied to African societies. Following the one-size-fits all (or better still the Western-size fits all) approach to intellectual theorizing, it has taken its place in a long series of Western paradigms. African scholars, in particular African women scholars and others, are challenging the very conceptualizations of gender that are used to define, describe or categorize women and men. This class will examine the historical relationships between men and women in Africa and examine the new approaches to the study of gender dynamics in Africa. The course will challenge your perceptions of gender. The ability to critically think and an open mind are requirements for this class. You will also be expected to participate in all class discussions. This course represents a logical sequel to an existing course, AAA S/WMNST 102,
Women in a Cross Cultural perspective; and three courses, AAA S/HIST 191, Early African History, AAA S/HIST 192, Modern African History, and WMNST 4, Global Perspectives on Feminism, which have already been approved by the Senate. This course can be used in both the African and African American Studies major and minors. Grades: map exam 10%, oral history 15%, mid term 30%, and final 45%.

Cross-Listed Courses: AFR 202

Changes Effective Fall 2018:
- Description
- Number to 202N
- Abbreviated Title
- Add GH Designation
- Add Inter-Domain Designation
- Add BA Designation
- Cross-Listed Course AFR 202N

WMNST 301: Sexualities, Gender and Power: Feminist Thought and Politics (3 Credits) (US) (IL) (GH)

Old Listing Effective Through Summer 2018:

An interdisciplinary survey of historical and contemporary feminist theories in both the United States and international contexts. WMNST 301 Sexualities, Gender and Power: Feminist Thought and Politics (3) (GH;US;IL) This course is an undergraduate survey of key theoretical texts shaping feminist theory both yesterday, and today. While attention is given to critical historical moments in feminist thought, the course will stress theoretical trends and debates in feminism today. Course themes will include: (1) feminist epistemology and standpoint theory, epistemic privilege and epistemologies of ignorance; (2) postcolonial critiques of western feminism, and contemporary efforts to define a transnational and anti-racist feminism, (3) gender identity and the very viability of the category “woman”; (4) the concept of freedom, liberation, and of women’s agency in feminist narratives of liberation, (5) theoretical implications for defining productive labor for women that is not exclusively the labor of childbirth, and the subsequent care of children and family, (6) the ongoing search for new paradigms of embodiment and interdependency that counter male-centered constructions.

Changes Effective Fall 2018:
- Description
- Number to 301N
- Abbreviated Title
- Add GS Designation
- Add Inter-Domain Designation

Course Changes: Effective Spring 2019

ASIA 3: Introduction to the Religions of the East (3 Credits) (US) (IL) (GH)

Old Listing Effective Through Fall 2018:

Religious experience, thought, patterns of worship, morals, and institutions in relation to culture in Eastern religions. RL ST (ASIA) 003 Introduction to the Religions of the East (3) (GH;US;IL) This course meets the Bachelor of Arts degree requirements. This course will explore the foundations, development, and diversity of religious traditions in Asia, focusing mostly on Hinduism, Buddhism, Confucianism, Daoism, and Shinto. It is organized according to two sections: Foundations and Developments. The Foundations section provides an introduction to the worldviews and practices of Eastern teachings. We will also discuss the structure of society, the social expectations on individuals based on gender and class, and rituals, which expose us to rich mythologies or intricate ceremonies. The second section, Developments, traces the evolution of religious doctrine and practice through history. Here, we learn to distinguish among large and small-scale movements and schools, and to familiarize ourselves with the geographical scope of each religion in South, Southeast, and East Asia. An abiding emphasis in this course will be on how to read and interpret the varied scriptures and primary texts of these religions.

Cross-Listed Courses: RLST 3

Changes Effective Spring 2019:
- Description
- Remove US Cultures Designation

ASIA 103: Introduction to Hinduism (3 Credits) (GH) (US) (IL) (BA)

Old Listing Effective Through Fall 2018:

Historical development of Hinduism to the present. RL ST (ASIA) 103 Introduction to Hinduism (3) (GH;US;IL) This course meets the Bachelor of Arts degree requirements. This course provides a historical overview of the development of ideas that provide the foundation of the south Asian religious culture. The course begins with a discussion of the Vedic ritual tradition, tracing the emergence of the idea of civic responsibility or Dharma. It then proceeds to analyze how the Vedic ritual tradition may have given rise to the philosophical concepts like that of Karma or (individual action and its underlying motives), Samsara (the cyclical view of life), and the Atman (nature of the individual) during the Upanishadic/Vedic era. The first half of the course concludes with selected readings from the Bhagavadgita, and the Mahabharata. The readings will all be in English. Class discussions focus on how the classical Hindu worldview may have emerged from the philosophical foundation of the Upanishads, and later built the groundwork for the Hindu devotional Bhakti tradition. The second half of the course focuses on the various regional or little traditions from the middle ages analyzing how the local religious cultures (both in the Hindi and non-Hindi speaking areas) may have played out against the great classical Brahmanic tradition. The course concludes with a discussion of how Hinduism has been historically influenced by other religious cultures (both indigenous and foreign) like Buddhism, Jainism, Islam, and Christianity.

Cross-Listed Courses: RLST 103

Changes Effective Spring 2019:
- Description
- Remove US Cultures Designation

ASIA 104: Introduction to Buddhism (3 Credits) (GH) (US) (IL) (BA)

Old Listing Effective Through Fall 2018:

A general survey of the basic doctrine, practice, and historical development of Hinayana and Mahayana Buddhism. RL ST (ASIA) 104 Introduction to Buddhism (3) (GH;US;IL) This course meets the Bachelor of Arts degree requirements. This course is a general survey of the historical development, basic doctrines, and practices of Hinayana, Mahayana, and Vajrayana Buddhism. The course is structured around the "Three Jewels" of Buddhism: Buddha, Dharma, and Sangha. That is to say, we will learn about the Buddha as a historical figure and spirit; we will come to understand the basic elements of his doctrinal teachings; and we will examine the community of followers who have
At issue is the concept of meaning, gradations of meaning, nuances of communication, artificial languages, and computer-related languages. Language differs from other forms of communication, e.g., animal courses examine what constitutes human language and how human reference, time, space) and which are language-culture specific. The regions addressed by the Department of Asian Studies. Students Japanese, Chinese, Persian, Hindi, Punjabi, and Urdu) spanning the communication, and culture. The focus is on Asian languages (Korean, philosophy of Arts degree requirements. The purpose of the course is to introduce the interrelated concepts of language, interaction, communication, and culture. The focus is on Asian languages (Korean, Japanese, Chinese, Persian, Hindi, Punjabi, and Urdu) spanning the regions addressed by the Department of Asian Studies. Students explore which concepts in language and culture are universal (e.g., basic reference, time, space) and which are language-culture specific. The course examines what constitutes human language and how human language differs from other forms of communication, e.g., animal communication, artificial languages, and computer-related languages. At issue is the concept of meaning, gradations of meaning, nuances of meaning, literal meaning, implied and inferred meaning, and so forth. The course provides an overview of the essential branches of linguistics (phonetics, phonology, morphology, semantics, syntax, and pragmatics) initially using English examples to illustrate these areas of linguistic focus. English is also used to illustrate the classical notions of parts of speech. The course provides an overview of the geographic regions in which each of the seven languages are spoken, as well as an overview of writing systems, the notions of standard languages, official languages, government oversight of language purity, and dialects. The course examines pragmatics— including basic theories of politeness. This is a 200-level course and is open to any Asian Studies major or minor interested in learning about the language-culture interface as it applies to languages offered in Asian Studies (plus Persian). Students of any proficiency level of any of the target languages are welcome, from absolute beginners to heritage and/or native speakers.

Changes Effective Spring 2019:

- Description
- Add B.A. Humanities

ASTRO 120: The Big Bang Universe (3 Credits) (BA) (GN)
Old Listing Effective Through Fall 2018:

Exploration of Cosmology, Birth, and Ultimate Fate of the Universe; Origin of Galaxies, Quasars, and Dark Matter. For non-science majors ASTRO 120 The Big Bang Universe (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Astronomical observations made during the last 70 years, combined with mathematical physical theory (Einstein’s General Relativity), has led to a dramatic new view of the history of the Universe. Ten to twenty billion years ago, all the material that is now contained in stars, planets, and galaxies was then compressed into a region, smaller than a pinhead, and so hot that atoms could not survive. This fiery cauldron cooled and expanded, forming hydrogen and helium, and eventually all the materials and structures that we know today. This course will discuss the evidence, theories and controversies of this new scientific cosmology, commonly known as ‘the Big Bang’. This class is designed for the non-science students who, after learning the fundamentals of astronomy in ASTRO 1(GN), ASTRO 5 (GN) or ASTRO 10 (GN), want to pursue further the questions of cosmology. The great success of the Big Bang theory in explaining the expansion of the Universe, the synthesis of the chemical elements, and the relic radiation leftover from the first moments are reviewed. Some of the questions discussed are still debated in the scientific community. For example: Why do some galaxies have stunning spiral structures, while others are relatively featureless ellipticals? What is the “dark matter” that may have emerged from the Big Bang, and seems to make a larger contribution to the mass of the universe than all of the material we are familiar with? What can the most distant and oldest objects we know of, the quasars, tell us about how galaxies formed? In presenting the development of this subject, the empirical and conceptual methods of modern physical science are conveyed. Students are assigned problems that exercise the use of elementary mathematics and physics to address real issues, and will confront discussions of interpretation and meaning in essays. A final project allows them to explore individual interests.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

ASTRO 130: Black Holes in the Universe (3 Credits) (BA) (GN)
Old Listing Effective Through Fall 2018:
The predicted properties of black holes and the astronomical evidence for their existence are investigated in the context of modern ideas about space, time, and gravity. ASTRO 130A/130B Black Holes in the Universe (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Black Holes in the Universe introduces students to the predicted properties of black holes and the astronomical evidence for their existence. Modern ideas about the nature of space, time, and gravity are also covered. The key topics discussed in the course include Newton's and Einstein's theories of gravity, predicted properties of black holes, stars and their fates, how to detect a black hole, gamma-ray bursts, supermassive black holes in galactic nuclei, active galaxies, black hole spin, gravitational waves, Hawking radiation, singularities, and black hole child universes. The course is intended to be an attractive choice for students who are interested in enriching and broadening their understanding of modern physical science. The course is intended for students who have completed and enjoyed the one-semester survey of modern astronomy, ASTRO 001 or 010. It has an interdisciplinary flavor, combining basic physical concepts, astronomical observations, and philosophical ideas to present a complete picture of the current understanding of black holes. Students use mathematics at the level of high school algebra.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

ASTRO 140: Life in the Universe (3 Credits) (BA)
Old Listing Effective Through Fall 2018:

The problem of the existence of life beyond Earth is investigated, drawing from recent research in astronomy and other fields. For non-science majors, ASTRO 140A Life in the Universe (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. The possibility of life beyond Earth is one of the great unsolved puzzles of human thought and has been debated for millenia. An answer would fundamentally change the relationship between the human race to the rest of the Universe. Advances in modern physics and astrophysics have dramatically changed and enriched the understanding of our cosmic surroundings, but have not yet produced an unambiguous evidence concerning the extraterrestrial life. Yet, significant progress has been made on certain aspects of the problem. Recent observations of protoplanetary disks around young stars, planets around solar-type stars and a rapidly spinning pulsar (a Penn State discovery), and pervasive organic molecules throughout the Galaxy give tantalizing albeit indirect hints in favor of the existence of nonterrestrial life. “Life in the Universe” is envisioned to be an attractive choice for students who are interested in enriching and broadening their understanding of modern science. The course is highly interdisciplinary, combining evidence from several fields of science to describe our chances to encounter life beyond Earth and the Solar System. Selecting this course would be a logical choice for students who completed and enjoyed ASTRO 1 (GN), ASTRO 5 (GN), ASTRO 10 (GN). The students are expected to reach the following goals from this course: – learn to appreciate limitations of human experience and a role of the interdisciplinary approach in solving scientific problems – gain understanding of a relationship between the physical Earth, its biosphere, and the rest of the observable Universe – examine in some detail a contemporary problem of scientific investigation: the astrophysical evidence for planets around stars other than the Sun – assess the scientific significance of searches for extraterrestrial life including technological civilizations. The course material is conveyed, analyzed and discussed through lectures, invited talks, reading, essay writing, homework assignments and oral presentations. Lectures systematically cover the topics listed in the course outline at a level appropriate for non-science students, although Science and Engineering majors do take the course and perform at a higher technical level. While general understanding of astronomy from the prerequisite course is expected, the necessary physical and astrophysical concepts are reintroduced to assure a logical and coherent flow of information throughout the course. Videos are used to illustrate a number of topics, such as the search for extraterrestrial intelligence, physical conditions on planets of the Solar System, the detection of planets around a neutron star, and to evaluate the scientific content of science fiction movies. Invited talks by faculty from other departments enrich the course material with in-depth presentations of subjects such as habitable zones around stars, the basics and perspectives of space flight and the foundations of biological evolution. There has been some experimentation with activity and assessment strategies for the course. Some of the work involves quantitative analysis while other work requires qualitative synthesis of classroom experience with readings. Group presentations give students a chance to study selected, often controversial topics and present them to the class in a disciplined, scientific manner.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

ASTRO 401: Fundamentals of Planetary Science and Astronomy (4 Credits)
Old Listing Effective Through Fall 2018:

Overview of the techniques used and results from studies of the Solar System, stars, and galaxies. ASTRO 401 Fundamentals of Planetary Science and Astronomy (3) This course will focus in core content areas in planetary science and astronomy. Students will explore the fundamentals in robotic exploration of the Solar System, how astronomers map and navigate the night sky, our understanding of the nature and evolution of stars, and the nature and evolution of galaxies. Students will engage with real data from Solar System missions as well as ground-based and space-based telescopes. Through the use of many databases and data archives from missions and observatories, the students will become familiar with the census of astronomical objects in various categories. A particular emphasis will be placed on examples of qualitative and quantitative problem solving in these content areas. In addition, students will explore how scientists communicate their results to the public, and they will get hands-on experience, such as planning and executing a planetarium show.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

ASTRO 410: Computational Astrophysics (3 Credits)
Old Listing Effective Through Fall 2018:

Applications of numerical methods and computer programming to astrophysics, including stellar physics and cosmology.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

ASTRO 494H: Honors Thesis (1-6 Credits: Maximum of 6 Credits) (H)
Old Listing Effective Through Fall 2018:

Investigation of an original research problem, including a literature search. Preparation of a formal thesis is optional.
Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BIOL 1: Preparation Skills for Success in Biology and Life Sciences (1 Credit)
Old Listing Effective Through Fall 2018:

Description: A foundation course that emphasizes study skills and reviews basic biological, chemistry and mathematical principles. BIOL 001 Biology of Success (1) This course is designed to facilitate success in the required science courses for allied health majors. Many students are challenged by their lack of basic skills and knowledge in one or more of the following areas: biology, chemistry, mathematics, and study skills. Thus, this course addresses these issues and positions the student for success. During the semester equal time is given to the following topics: study skills, which includes learning styles, goals, test taking strategies and organizational skills; terminology, which includes practice with prefixes, roots, and suffixes; basic math skills, which includes the metric system and practice with work problems; chemistry, which covers atoms, ions, and basic anabolic and catabolic reactions; cell structure and functioning; and body basics, which is an overview of the anatomy and functioning of body systems. Students are given a diversity of assignments and projects relevant to the various topics that will allow them to review and develop a basic level of competency in these areas in preparation for required science courses.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BIOL 3: Peer Learning in Biology (1 Credit)
Old Listing Effective Through Fall 2018:

Group and learning skills to facilitate the understanding of complex biological processes. BIOL 003 BIOL 003 Peer Learning in Biology (1) The study of Biology is complicated by the myriad pathways and processes that must be mastered in a way that interrelationship becomes apparent. A major stumbling block in a student's progress is learning how best to organize one's study so that both the details of these processes can be learned, along with how these processes fit together (i.e. integration). The second hurdle is learning how to use this information in a way that can solve real life problems and to communicate this process to others. This course is designed for students who would like to improve their ability to organize their learning strategies in order to maximize their understanding of the complexities of life's process. The course will be organized using peer learning groups which are posited on the assertion that every student can improve their performance with the proper environment and direction. Group leaders (enrolled in BIOL 251) will play an integral role in the program in that they are the connection between participant and course instructors. The group leaders will learn how to pass their skills on to other students in such a way as to encourage ownership of their education. Through regular meetings, the students enrolled in BIOL 003 will learn about time management and study skills, test taking strategies, exam writing, working with others that have divergent learning styles, and how to be multiculturally competent such that they are able to work with a diverse population.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BIOL 220M: Honors Biology: Populations and Communities (4 Credits) (H) (WF) (BA) (GN)
Old Listing Effective Through Fall 2018:

Honors study of the major physical, chemical, and biological factors constituting environment and their dynamic interaction with organisms forming ecosystems. BIOL 220M Honors Biology. Populations and Communities (4) (GN) (BA) This course meets the Bachelor of Arts degree requirements. BIOL 220M is an introductory course in ecology. It introduces students to the fundamental ecological principles, concepts, patterns, and processes regarding populations, communities, and ecosystems. This course provides students with a foundation of ecological science, as well demonstrating linkages between ecology, population genetics, and evolution. The course objectives are the same as those described in the parent course proposal and are to provide students with a fundamental understanding of: 1) genetic processes within populations of living things; 2) evolutionary processes involved in speciation; 3) dynamic interactions of organisms within and among populations, especially pertaining to energy cycles, various biogeochemical cycles, predator-prey interactions, and the like; and 4) distribution patterns of living organisms and the need to conserve the resources of the earth. Evaluation methods in the lecture part of the course include two to three "mid-term" exams and a comprehensive final exam. Evaluation methods in the lab portion of the course include in-class quizzes, one or more formal lab reports on experiments or data analysis conducted in lab sessions, and short write-ups of existing data sets or relevant ecological issues. Points earned on lecture exams comprise between 65-75% of the total points, whereas points earned in lab comprise about 25-35% of the total points earned in the course. The Honor's version of the course will differ in a number of ways from the parent BIOL 220W course. First, there are more opportunities to discuss current applications of the information. In addition, a unique project (either in lab and/or lecture) will allow students to explore a specific area of the course in more detail (e.g., students can select a species or specific habitat and develop a plan for its restoration). Where appropriate, students will be exposed to current research in specific areas. The evaluation for the course will be modified from that of the parent course in accordance with the changes in assignments.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

- Description
and among populations, especially pertaining to energy cycles, various biogeochemical cycles, predator-prey interactions, and the like, and 4) distribution patterns of living organisms and the need to conserve the resources of the earth. Evaluation methods in the lecture part of the course include two to three “mid-term” exams and a comprehensive final exam. Evaluation methods in the lab portion of the course include in-class quizzes, one or more formal lab reports on experiments or data analysis conducted in lab sessions, and short write-ups of existing data sets or relevant ecological issues. Points earned on lecture exams comprise between 65 – 75% of the total points, whereas points earned in lab comprise about 25 – 35% of the total points earned in the course.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 222: Genetics (3 Credits)
Old Listing Effective Through Fall 2018:
Variation and heredity in bacteria, plants, and animals; relationships of genetic knowledge to evolution and breeding practices. This course is for students in life sciences majors that are not Biology, Genetics and Development and Biochemistry and Molecular Biology. Students should have at least 3 credits of biological sciences before scheduling this course. In this course, we will discuss chromosome structure; mitosis and meiosis, in particular their application of the transmission of DNA; principles of Mendelian inheritance; structure and function of DNA, RNA, and proteins; gene expression; DNA mutations and chromosome changes; genomics; population genetics and the intersection of genetics and society. The course will include multimedia presentations, textbook readings, problem-solving and homework, in-class activities and discussions of science and society.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 230M: Honors Biology: Molecules and Cells (4 Credits) (H) (WF) (BA) (GN)
Old Listing Effective Through Fall 2018:
This four credit course with lecture and laboratory components provides an understanding of the major unifying principles of life as they apply to the study of the molecular mechanisms underpinning the function of living organisms. Through the lab, students are expected to become proficient in the interpretation and presentation of experimental results through written and oral reports. Taken together with the other honors core courses in the biology curriculum (BIOL 110W, BIOL 220W, BIOL 240W), BIOL 230W will help students to integrate concepts ranging from molecular and cellular events through principles governing entire populations and ecosystems. Further, BIOL 230W provides the foundation on which students further their study of molecular genetics – a discipline integral to a number of the biological sciences.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 230W: Biology: Molecules and Cells (4 Credits) (WF) (BA) (GN)
Old Listing Effective Through Fall 2018:
BIOL 230W is a four credit course with lecture and laboratory components. (BIOL 220W, BIOL 230W, and BIOL 240W each carry only 1 credit of “writing”; all three courses must be taken to meet the writing requirement.) The goal of this course is to provide an understanding of the major unifying principles of life as they apply to the study of the molecular mechanisms underpinning the function of living organisms. Through the lab, students are expected to become proficient in the interpretation and presentation of experimental results through written and oral reports. Taken together with the other core courses in the biology curriculum (BIOL 110W, BIOL 220W, BIOL 240W), BIOL 230W will help students to integrate concepts ranging from molecular and cellular events through principles governing entire populations and ecosystems. Further, BIOL 230W provides the foundation on which students further their study of molecular genetics – a discipline integral to a number of the biological sciences.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 240M: Honors Biology: Function and Development of Organisms (4 Credits) (H) (WF) (GN)
Old Listing Effective Through Fall 2018:
Honors study of development and physiological processes at the organismic level. (BIOL 220W, BIOL 230W, and BIOL 240W each carry only 1 credit of “writing”); all three courses must be taken to meet the writing requirement.) BIOL 240M Honors Biology: Function and Development of Organisms (4) (GN) (BA) This course meets the Bachelor of Arts degree requirements. This course provides an understanding of the major unifying principles as they apply to the study of the development and physiological mechanisms utilized by organisms from both animals and plants. In lecture a comparative approach will be taken in the examination of reproduction, development, and physiology primarily at the organismal level. In laboratory, experimental investigations of both animal and plant systems will reinforce the concepts covered in lecture. Through the lab, students are expected to become proficient in the interpretation and presentation of experimental results through written and oral reports. Taken together with the other core courses in the biology curriculum (BIOL 110W, BIOL 220W, BIOL 230W), BIOL 240M will help students to integrate concepts ranging from molecular and cellular events through principles governing entire populations and ecosystems. Further, BIOL 240M provides the foundation on which students further their study of animal physiology and development – two of the largest options in the biology majors curriculum. Through this class, and the other core course, students will develop skills integral to the General Education mission. Evaluation methods in the lecture part of the course include two to three “mid-term” exams and a comprehensive final exam. Evaluation methods
in the lab portion of the course include in-class quizzes, one or more formal lab reports on experiments or data analysis conducted in lab sessions, and short write-ups of existing data sets or relevant ecological issues. Points earned on lecture exams comprise between 65-75% of the total points, whereas points earned in lab comprise about 25-35% of the total points earned in the course. BIOL 240M serves from a number of majors and colleges. The Honor's version of the course will differ in a number of ways from the parent BIOL 240W course. First, there are more opportunities to discuss current applications of the information. In addition, a unique project (either in lab and/or in lecture) will allow students to explore a specific area of the course in more detail (e.g., students choose a topic in the current literature and present a paper along with its significance to the class). Where appropriate, students will be exposed to current research in specific areas. The evaluation for the course will be modified from that of the parent course in accordance with the changes in assignments.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 240W: Function and Development of Organisms (4 Credits) (WF) (BA) (GN)

Old Listing Effective Through Fall 2018:

A study of development and physiological processes at the organismic level. (BIOL 220W, BIOL 230W, and BIOL 240W each carry only 1 credit of "writing"; all three courses must be taken to meet the writing requirement.) BIOL 240W Biology: Function and Development of Organisms (4) (GN) (BA) This course meets the Bachelor of Arts degree requirements. This course provides an understanding of the major unifying principles as they apply to the study of the development and physiological mechanisms utilized by organisms from both animals and plants. In lecture a comparative approach will be taken in the examination of reproduction, development, and physiology primarily at the organismal level. In laboratory, experimental, investigations of both animal and plant systems will reinforce the concepts covered in lecture. Through the lab, students are expected to become proficient in the interpretation and presentation of experimental results through written and oral reports. Taken together with the other core courses in the biology curriculum (BIOL 110, BIOL 220W, BIOL 230W), BIOL 240W will help students to integrate concepts ranging from molecular and cellular events through principles governing entire populations and ecosystems. Further, BIOL 240W provides the foundation on which students further their study of animal physiology and development – two of the largest options in the biology majors curriculum. Through this class, and the other core course, students will develop skills integral to the General Education Program. BIOL 240W serves from a number of majors and colleges and typically enrolls ca. 500 students at University Park and an equal number at campuses throughout the Penn State system. Given the large size of the class, the facilities requirements are substantial. Currently room 100 Thomas is used for lectures, and provides an excellent opportunity to incorporate multimedia presentations in a relatively intimate format. The laboratory portion of the course requires several fully equipped laboratory rooms, as well as classrooms for recitation meetings. For this purpose, two wet lab rooms in Muller Lab (105 and 108) are designated and are shared with another core course offered currently. Finally, a designated preparatory facility (room 107 Mueller) is used exclusively in the core courses.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 251: Peer Leadership in Biology (1 Credit)

Old Listing Effective Through Fall 2018:

Leadership training in guiding others to learn, communicate, and apply biological principles. BIOL 251 BIOL 251 Peer Leadership in Biology (1) The study of Biology is complicated by the myriad pathways and processes that must be mastered in a way that interrelationship become apparent. A major stumbling block in a student's progress is learning how best to organize one's study so that both the details of these processes can be learned, along with how these processes fit together (i.e. integration). The second hurdle is learning how to use this information in a way that can solve real life problems and to communicate this process to others. This course is designed for students who have already mastered basic concepts in biology and who want to learn how to communicate their understanding to others who are learning these first principles. This course is unusual in that it has divergent goals. The students enrolled in this course will be trained to be more effective communicators. In the 21st century, it is critical that we train our students to be better at relating to the general population by using effective communication skills. In addition, the course will train the students to act as effective group leaders in peer learning programs so they become competent, comfortable, and confident in working with students of diverse background, learning styles and skill levels. The philosophy behind peer learning programs is that every student can improve their performance and with the help of a group leader, this goal can be realized. The group leaders play an integral role in the program that in that they are the connection between participant and course instructors. The group leaders will learn how to pass their skills on to other students in such a way as to encourage ownership of their education. Through workshops and biweekly meetings, the group leaders will learn about time management and study skills, test taking strategies, exam writing, working with students with divergent learning styles, and how to be multiculturally competent such that they are able to work with a diverse student population. They will facilitate learning through group activities and practice their leadership skills in a small group setting. Group leaders will be monitored through review of their weekly journals as well as observation of their groups by supervising faculty. The student developed exercises will be implemented and reviewed for effectiveness.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BIOL 402: Biological Experimental Design (3 Credits) (WF)

Old Listing Effective Through Fall 2018:

Discussion of experimental design, analysis and presentation, with a practicum providing for student design, analysis and presentation of biological experiments. Students may not take this course if they have taken BIOBD 350W. BIOL 402W Biological Experimental Design (3) This course emphasizes written and oral communication of scientific ideas. Students discuss papers from the literature, preparing written critiques of two. Critiques are reviewed in writing by the instructor and peers and may be revised twice. Peer reviews are graded in writing and may be revised once. Written proposals for biological research are required. Students must build arguments for methodological rationales, justify statistical approaches, and place their proposed research into a larger societal context. Proposals are reviewed by the instructor and three peer reviewers. Peer reviewers must prepare written critiques and
present proposals to the class during an "NSF"-style panel review. Prior to the presentation, the instructor provides written and oral feedback to the author and the peer reviewer in a meeting at which strategies for presenting the proposal are discussed. Subsequent to the presentation, peer reviewers write summaries of the discussion and provide explicit guidance to authors. Proposals may be revised twice. Peer reviews and summaries are graded in writing and may be revised once. Thus, each student writes 2 critiques, 1 proposal, 2 peer reviews of critiques, 1 peer review of a proposal, and 1 summary of the panel discussion. Each assignment is graded in writing and is subject to revision. Students also are graded on their proposal presentations and on participation in panel discussions. These activities constitute 75% of the final grade. Students must demonstrate competence in the use of SAS, a statistics package. Students must choose and apply appropriate statistical techniques to biological data. In addition to the program and its output, students write interpretations of the results. This activity constitutes 25% of the final grade. Lectures are used to review statistics and “how tos” (e.g., proposal preparation). Case histories are used to address ethics, statistical decision-making, and design. Students are expected to challenge what they learn, and the notion that scientists must acknowledge and guard against bias in their work is emphasized. Intellectual honesty and the ability to give and receive constructive criticism are demanded. This course is required in two of the six options in biology (ecology and general), and it can be taken by students in the other options. The course is required of students who have not fulfilled the WAC requirement at the 200-level (transfer students).

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

BIOL 404: Cellular Mechanisms in Vertebrate Physiology (3 Credits)
Old Listing Effective Through Fall 2018:

This course considers cellular mechanisms governing physiological aspects of vertebrate cell signaling and their adaptation to particular organismal functions.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 405: Molecular Evolution (3 Credits)
Old Listing Effective Through Fall 2018:

This course is designed to introduce the concepts of evolution from a molecular point of view and the basic techniques of analysis of molecular sequence data. The class will include a mixture of lecture-based and student activity-based instruction that addresses various topics in molecular evolution, as well as in-class and extracurricular work on the computer to learn how to use online bioinformatics tools for sequence analysis. As a result of this course, students will be able to analyze DNA and protein data with a purpose of addressing specific scientific questions of interest. The course embraces applications of computing and statistics to the life sciences.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 406: Symbiosis (3 Credits)
Old Listing Effective Through Fall 2018:

Mutualisms (interactions between two species that benefit both of them) occur in every habitat on Earth, and nearly every species on the planet is involved directly or indirectly in one or more of these interactions. The influence of mutualisms transcends levels of biological organization from cells to populations, communities and ecosystems. Mutualistic associations, such as our microbiome and agricultural symbioses, are critical for human health and welfare. Mutualistic symbioses played a fundamental role in the origin of the eukaryotic cells and the evolution of multicellularity. In addition to the key role played by mutualism in the evolution of complex lifeforms on earth, mutualistic association are instrumental to understand how some important ecosystems such coral reefs and hydrothermal vents function. Mutualistic symbioses are critical for nutrient cycling in the environment and the reproduction and dispersal of numerous plant and animal species. This course will focus on unifying concepts that cut across different forms of mutualism. We will explain and tests these concepts analyzing classic examples of mutualisms. We will define and categorize the diverse array of symbiosis occurring in nature. We will explore the evolutionary origins and implications of mutualistic symbiosis, investigate the population, community and ecosystem ecology of mutualisms and we will assess current anthropogenic threats to mutualisms, their potential for resilience and the role of mutualisms in conservation. Finally, we will explore in detail the metabolic linkages using selected nutritional symbiotic mutualisms examples. The course combines in-class and online teaching, as well as a weekly discussion session, in which the students are responsible for selecting one primary scientific article, prepare a brief presentation and lead a critical discussion session in front of the class. The course takes advantage of the technology-rich Bluebox experimental classroom. This learning space has been designed to support active, collaborative learning experiences increasing student engagement.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 407: Plant Developmental Anatomy (3 Credits)
Old Listing Effective Through Fall 2018:

The course will provide students with an understanding of the developmental anatomy of plant organs, tissues and cells throughout the plant life cycle. When appropriate, the course will discuss genes involved in the formation and function of these organs and how organ development is affected by environmental inputs. In laboratory sections, observational skills will be trained and knowledge gained in lectures will be applied to the analysis of plant anatomical structures. Plant developmental adjustments to environmental stresses will be studied using light microscopy and digital image acquisition. Primary scientific literature related to the lecture topics will be assigned as reading material to be discussed in class. Students will learn how to formulate research hypotheses and, in a written assignment, research a global challenge to food security and discuss strategies to improve agricultural productivity by manipulating the biology of plants.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 409: Title: Biology of Aging (3 Credits)
Old Listing Effective Through Fall 2018:
Mechanisms of the aging process, with special reference to man. Unfavorable progressive changes in molecules, cells, systems, and organisms.

**Changes Effective Spring 2019:**
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 412: Ecology of Infectious Diseases (3 Credits)**
Old Listing Effective Through Fall 2018:

This course examines how ecological processes impact upon the epidemiology of infectious diseases. Untitled Document

**Changes Effective Spring 2019:**
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 413: Cell Signaling and Regulation (3 Credits)**
Old Listing Effective Through Fall 2018:

Introduction to the molecular mechanisms by which cells send, receive, regulate, and respond to signals. Through review of primary literature, students will explore the variety of mechanism by which endocrine, paracrine, and juxtacrine signal molecules exert their effects on target cells. Subject matter will include ligand/receptor families, second messenger systems, G-proteins, kinase cascades, and effector proteins that regulate cytoskeleton dynamics, metabolism, and gene expression.

**Changes Effective Spring 2019:**
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 414: Taxonomy of Seed Plants (3 Credits)**
Old Listing Effective Through Fall 2018:

This course provides an introduction to modern plant systematics as exemplified by the wide diversity of living plants growing in central PA. By the end of the course, students will be able to: 1) use the technical vocabulary that describes plant structures necessary for their identification, 2) characterize the major groups and families of flowering plants and gymnosperms, 3) recognize on sight 60 of the most important plant families in our region and be able to describe and contrast their major features, 4) use and write identification keys to identify and study living plants as represented in the local flora, and 5) discuss current concepts of plant systematics and phylogenetics and their applications to plant classification and the study of the evolution of and relationships among families of flowering plants.

**Changes Effective Spring 2019:**
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 415: Ecotoxicology (3 Credits)**
Old Listing Effective Through Fall 2018:

Major concepts and controversies in the interdisciplinary field of ecological toxicology; toxicity analysis, remediation, and case studies of environmental pollution.

**Changes Effective Spring 2019:**
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 416: Biology of Cancer (3 Credits)**
Old Listing Effective Through Fall 2018:

Biology of Cancer introduces basic biological aspects of cancer development with an emphasis on molecular and cellular mechanisms of tumorigenesis. It discusses how molecular genetic approaches can be used to reveal fundamental processes of carcinogenesis.

Through this course, students will learn genetic, cellular and biochemical basis of cancer development and understand how such information can be instrumental in devising strategies for prevention, detection, and
treatment of cancer. As a 400 level class, students are expected to have a background in molecular biology and genetics.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 419: Ecological and Environmental Problem Solving (3 Credits)
Old Listing Effective Through Fall 2018:

Overview of processes involved in solving environmental problems. Provides students with toolkit for understanding ecological and environmental problems. BIOL 419 Ecological and Environmental Problem Solving (3) The course will provide a general overview of the process involved in studying a variety of ecological and environmental problems. It will provide a toolbox of techniques for understanding ecological and environmental problems, and discuss how they can be used to address questions and generate testable predictions. It will examine connections between individuals and populations and communities as well as between theory and data. The focus will be on theoretical and computer modeling approaches, while maintaining a strong link to data and real systems. After an introduction to modeling, students will learn to develop and use simple and stochastic optimization models for individual organisms, as well as applying basic game theory to interactions between individuals. Many of the class meetings will be held in computer laboratories where they will be actively engaged in working on applying these models. They will explore a sequence of population demographic models of increasing complexity, ranging from unlimited, unstructured population growth to density-dependent, structured population growth, in non-spatial and spatial contexts, culminating in individual-based models for population dynamics. The students will then apply these models to interacting species, learning about mutalistic, competitive and host-natural enemy interactions. Finally, we will explore theory for communities of species in space and time. Applied problems will be drawn from all areas of conservation, harvesting, pest control and epidemiology. This course will be one of several ecology courses that are available to students in the ecology and general option in the biology program along with the biology minor.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 421: Comparative Anatomy of Vertebrates (4 Credits)
Old Listing Effective Through Fall 2018:

BIOL 421 / VBSC 421 Comparative Anatomy of Vertebrates Students will study vertebrate anatomy from an evolutionary and developmental perspective. They will become familiar with important structures, terminology and function; a basic requirement of the biomedical sciences. Comparisons between representative vertebrate groups (including fish, amphibians, reptiles, birds and mammals) will be used to illustrate structural adaptations of each organ system from an evolutionary perspective. Specific examples comparing ancestral and descendant species will demonstrate the relationships between the lifestyle of an organism and the morphology of homologous structures. A study of early embryonic development, differentiation of primary germ layers and organ formation will provide a basis for understanding organ structure and function. Laboratory activities will involve work with preserved specimens and will focus heavily on anatomic structure identification and function. Topics include anatomic directional terminology, vertebrate classification systems, early embryonic development and a detailed examination of the various organ systems. Specimens are selected to illustrate the anatomy of ancestral vertebrate species, the evolutionary changes observed in descendant species and the association of morphology with lifestyle. Although students will invest the majority of their time becoming familiar with the anatomy of a representative mammal (the cat), multiple species will be examined, and students will be expected to recognize selected anatomic structures in each species studied.

Cross-Listed Courses: VBSC 421

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 422: Advanced Genetics (3 Credits)
Old Listing Effective Through Fall 2018:

Now is an exciting time for evolutionary, quantitative, and disease genetics. Increasingly sophisticated technologies are making it possible to obtain dense genomic data from large numbers of individuals from a variety of taxa. Such data permits the evaluation of processes that have generated genetic variation, providing a rich resource to make inferences about natural selection and population history that have affected the current distribution of genetic diversity. In addition, when correlated with phenotypic traits, such data enables researchers to identify genomic regions underlying trait variation which is of particular importance for identifying genes involved in disease. By the end of the course, students will be able to understand how the genome is organized, learn how to find and assay genetic variation across the genome, and will know how such variation is inherited. They will learn how pedigree analysis, linkage mapping, and autogyzosity mapping can be used to identify loci underlying Mendelian traits, and will be exposed to a number of examples from human disease. The students will also learn about the neutral and adaptive processes that shape genetic diversity within and across species, and will understand the basics of sequence alignment, phylogenetic reconstruction, and testing for natural selection from within and between species data. Moreover, students will acquire the fundamentals of quantitative genetics, will understand the essentials of polygenic adaptation, and will learn how to use genome-wide association studies to identify loci underlying complex traits. Finally, students will become familiar with recent advances in individual identification from genetic data, and its relationship to privacy.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 424: Seeds of Change: The Uses of Plants (3 Credits)
Old Listing Effective Through Fall 2018:

It is not possible to conceive of civilization, or life on earth for that matter, without plants. Through photosynthesis and oxygen production, plants are the major producers of biomass and constitute the base of the food pyramid. Plants also have evolved astounding diversity of forms, sizes, shapes, colors, smells and chemical compounds. This structural, nutritional and chemical flexibility has been put to innumerable uses by people, from hunter gatherers to the scientists in search of a cure for AIDS. Plants are at the core of our everyday necessities (food, clothing, shelter, medicines, beverages), simple pleasures (flower, fragrances) and pervasive problems (energy supply, drug addition, famine). Plants...
have changed civilization in dramatic ways in the past. Witness, for example, the spectacular alterations in diet and the increased population growth catalyzed by the Columbian Exchange. In the future we expect that plants will continue to affect people through an increasingly complex interplay between new technologies such as genetic engineering, the pressure on natural resources, and the search for new crops, medicines and biomaterials.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 425: Biology of Fungi (4 Credits)
Old Listing Effective Through Fall 2018:

BIOL 425 / PPEM 425 (4 cr.) is a lecture and laboratory survey of the diversity of Fungi, consisting of two 75-minute lecture and two 180-minute laboratory/field activity periods per week. The course moves from branch to branch in the Fungal tree of life, covering aspects of ecology, morphology, physiology and life history, as well as current and historical importance to human affairs in medicine, agriculture and industry. Topics covered as students move through the Fungal tree include: 1) Macrofungi seen in the field; 2) Fungal evolution; 3) Fungal reproduction and dispersal; 4) Fungal growth, development and structure; 5) Fungal genetics and genomics; 6) Fungi as mutualistic symbionts of plants, animals and other organisms; 7) Fungal diseases of plants, animals and humans; 8) Fungi as toxin producers; 9) Fungi as sources of food, pharmaceuticals and enzymes; and 10) Fungi as research organisms used to understand basic biological processes. Some laboratory sessions consist of field trips to local forests to observe and collect Fungi for observation in the laboratory.

Cross-Listed Courses: PPEM 425

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 426: Developmental Neurobiology (3 Credits)
Old Listing Effective Through Fall 2018:

This course will provide a general overview of developmental processes as they apply to the central nervous systems. From initial differentiation of neuronal tissue to the aging of human brain, this course will expose students to many hot topics in the current neuroscience research field, including synaptogenesis, axon guidance, neural stem cells, apoptosis, learning and memory, and Alzheimer's disease. Although one textbook will be assigned as the major reference book, many current research results will be integrated into the lectures so that students can grasp the most recent advancement related to each topic. The course will be divided into four parts. Part I introduces the induction of neural tissue, the polarity and regionalization of the neural tissue, and the generation and function of neural stem cells. Cutting-edge research on neural stem cells will be discussed. Part II deals with various interactions within neuronal system, including neuron-glial interaction, cell adhesion and migration, axon growth and guidance, and target selection. Part III teaches synapse formation and maturation, neurotrophic factors and their distinct functions, and neuronal cell death. Part IV talks about learning and memory from a developmental view, and also neurodegenerative diseases. Current disease research will be discussed. The lectures will be given in PowerPoint presentations. Classical models and front line research will be integrated to stimulate students’ imaginative thinking.

Students will be encouraged to read some current research paper and offer their own view on some particular subject, such as neural stem cells and learning and memory.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 427: Evolution (3 Credits)
Old Listing Effective Through Fall 2018:

This course will study the theory of evolution and the different levels at which biological evolution can be examined ranging from macroevolution and the fossil record to microevolutionary processes at the population level. It will look at how genomes evolve from bacteria to multicellular organisms as well as the evolution of body plans in plants and animals and the molecular underpinnings of these developmental transitions. These concepts will be used to understand human evolution and learn how the genome revolution has shed light on evolutionary medicine.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 428: Population Genetics (3 Credits)
Old Listing Effective Through Fall 2018:

This is an exciting time for population genetics research. Increasingly sophisticated technologies are making it possible to obtain dense genomic data from large numbers of individuals. Further, advances in population genetics theory are improving our ability to make inferences about the evolutionary forces acting on populations. However, to effectively apply these new techniques to data being generated across populations, it is important to understand how evolutionary processes shape patterns of genetic variation. In this course, students will learn about the mathematical models employed in population genetics, and how these models can be used to make inferences from data. Specifically, this course emphasizes modern population genetic theory through the coalescent process, which provides a direct application to the analysis and understanding of empirical data.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 429: Animal Behavior (3 Credits)
Old Listing Effective Through Fall 2018:

Physiological mechanisms, ecological relevance, and adaptive significance of animal behavior.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 431: Reproductive Biology (3 Credits)
Old Listing Effective Through Fall 2018:

Reproductive Biology is an upper-level undergraduate course. The course will discuss topics in reproductive development and physiology, which can include development of gonads and the germline, sex determination,
meiosis, development of gametes, plant reproductive development, effects of environmental factors on reproductive development, cloning and asexual reproduction, infertility and birth defects. In addition to morphological and cellular description of reproductive organs and tissues, there will also be discussion of genetic basis of diseases and molecular analysis of gene functions crucial for reproductive development in human and model organisms. Students will be asked to read original research articles on various aspects of reproductive biology, and work in two-person teams on a powerpoint presentation, which they use to report their understanding of a selected article in class to other students. The lectures and exams focus upon concepts integral to reproductive biology. Exams will be a combination of multiple choice, filling blanks, and true/false questions.

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 432: Developmental Genetics (3 Credits)
Old Listing Effective Through Fall 2018:

An advanced course in developmental biology, focusing on the use of genetics techniques to study fundamental questions of animal development. Topics taught in this course include an introduction of popular model organisms, various mutagenesis approaches, complex signaling mechanisms and cellular reprogramming. The goals for this course are 1. To acquire knowledge in advanced genetic tools commonly used to study animal development. 2. To acquire skills in reading and understanding scientific literature in the field of developmental genetics. 3. To acquire skills in applying knowledge and tools to solve basic problems in developmental genetics. 4. To gain an appreciation for the relevance of developmental genetics research to human health and other global issues.

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 433: Evolution of Vertebrates (3 Credits)
Old Listing Effective Through Fall 2018:

This course focuses on the evolution of vertebrate animals, beginning with an overview of vertebrate classification and a consideration of early vertebrate evolution. Each group of vertebrates (fishes, amphibians, reptiles, birds and mammals) will be explored, with an emphasis on the history of each group, adaptations (physiological, morphological, behavioral) seen within the group, and relationships among members of the group, including insights from molecular data. Consideration of extant (living) vertebrates will be emphasized, specifically convergent adaptations across taxa (including flight, swimming, and specialization for similar environments, such as arctic or desert). The student will develop a perspective on vertebrate evolution, representative groups, vertebrate classification systems, and different vertebrate body plans and special adaptations. Additionally, a course project will reinforce broader skills of scholarly paper writing, oral presentation techniques, and collaboration. There is a single short field trip associated with this course. Over one weekend, the students will be driven to one of several sites, typically a zoo and a natural history museum. This experience provides students with an opportunity to think deeply about how the principles presented in the class shape the diversity of past and current vertebrates. The biology major strives to develop an overall perspective on evolution for our undergraduates, and this course uses an important group, the vertebrates, to fully exemplify and develop that goal. Students in other majors outside our college, including Geology/Paleontology and Wildlife Science may also find interest in this course offering, and could graduate students.

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 434: Pathobiology of Emerging Infectious Disease (3 Credits)
Old Listing Effective Through Fall 2018:

This course examines the biology of emerging and reemerging infectious diseases. The course includes viral, bacterial, and eukaryotic pathogens causing serious mortality and morbidity. Major course topics include a historical perspective on diseases; microbiology and immunology of each class of pathogen; processes of evolutionary change in pathogens; public health efforts to detect, monitor, respond to, and/or eliminate diseases from local to international scales; zoonotic disease and host jumps; and the One Health integration of human, animal and environmental health. Students will complete quizzes, discussions, and a research project based in primary literature reporting on a current or classical infectious disease. Case studies will include, but are not limited to, influenza, HIV/AIDS, smallpox, West Nile virus, polio, dengue, tuberculosis, and malaria. Depending on class size, students may complete additional research projects or scenarios. Students with interests in disease and health from majors in many colleges may wish to take this course.

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 437: Histology (4 Credits)
Old Listing Effective Through Fall 2018:

Description: This course develops a visual, conceptual, and functional understanding of histology, the microanatomy of body cells, tissues, and organs. The lecture portion of this course will use diagrams, digital images, and didactic explanations to build a conceptual understanding of histology, stressing form, function, and clinical applications. The laboratory portion of the course emphasizes form, identification, and naming of cells, tissues, and organs at a microscopic level. As such, the lab will use microscopes and digital images to investigate actual histology slides of body tissue, with the goal of visual identification, classification, and naming of body tissues.

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses
• Description

BIOL 438: Theoretical Population Ecology (3 Credits)
Old Listing Effective Through Fall 2018:

This course a highly quantitative second ecology course. It emphasizes mathematical and theoretical approaches to ecological questions. The course builds on concepts from introductory ecology and requires students to use tools acquired in biostatistics and calculus to solve ecological problems. It can act as an introduction to or as an extension of experimental design. Although it is not a writing-intensive course, students are required to use standard technical writing and public speaking skills throughout the course. The course covers topics that are
BIOL 441: Plant Physiology (3 Credits)
Old Listing Effective Through Fall 2018:
Classical and current concepts in plant constituents, mineral nutrition, water relations, respiration, photosynthesis, photoperiodism, plant growth regulators, growth and development, and responses to the environment. Using these concepts, students will be able to explain how specific processes in a plant integrate with other relevant processes to determine the overall response of the plant to a particular set of conditions; describe how multiple plant biochemical pathways intersect and influence each other; describe how energy affects processes at all levels of biological organization from the molecule and cell to organisms and ecosystems; and be able to explain how plants perceive and respond to their environment, including signal transduction, intercellular communication, and information processing. As part of their work in this course, students will demonstrate an ability to read and discuss the scientific literature on plants and critically analyze current issues in plant physiology including impacts on human health, agricultural biotechnology, and bioenergy.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 443: Evo-devo: Evolution of Developmental Mechanisms (3 Credits)
Old Listing Effective Through Fall 2018:
Evolutionary Developmental Biology (Evo-Devo) is an interdisciplinary field that combines developmental biology, comparative genetics, and evolution to understand how organisms have attained their diversity in form. While the field of developmental biology aims to understand how a given organism develops, Evo-Devo focuses on how form evolves through alteration of these developmental mechanisms. Course instruction involves lectures, discussion, and student presentations/projects and features case studies from the scientific literature across the diversity of life, towards developing a predictive framework for the evolution of form.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 446: Physiological Ecology (3 Credits)
Old Listing Effective Through Fall 2018:
This course introduces students to the study of interactions between physiological capabilities of organisms, their ecology and, more broadly, their environment. This course looks at how organisms work and what it is about their environment that has led them to work that way. Both abiotic and biotic components of the environment are considered as sources of important variation to which organisms must adapt. Plants and microbes are covered to some extent, but the primary focus will be on animals (both vertebrates and invertebrates). The primary goal is to gain an appreciation for the flexibility of physiological systems and the powers of evolutionary processes to shape the physiology of an organism in response to its environment.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 448: Ecology of Plant Reproduction (3 Credits)
Old Listing Effective Through Fall 2018:
Analysis of the ecology, evolution, and natural history of plant reproduction. We focus on angiosperms (flowering plants) but also touch on the broader reproductive diversity in plants. Our topics include pollination, fruit-set, dispersal, and relevant plant-animal interactions. This course is highly integrative and draws on basic concepts in ecology, evolutionary biology, and genetics. We also pay especial attention to the implications of global environmental change on plant reproduction and plant diversity.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOL 450W: Experimental Field Biology (3-5 Credits) (WF)
Old Listing Effective Through Fall 2018:
This is a practical introduction to modern design of field studies and experiments in terrestrial and fresh water habitats. This is an outdoor course almost as much as a classroom one. Be prepared to go outside, develop the power of observation, and discover. Emphasis is given to learning scientific skills via active-learning methods. Students will learn to formulate research questions, and develop adequate hypotheses and study designs and experiments to test hypothesis using statistics. Students will be guided step-by-step to perform basic and advanced data analyses: from data tables and frames, to parametric, non-parametric, and multivariate statistical methods used in everyday biology and ecology research driven hypothesis-testing approaches. Each week the class meets in the classroom (Tuesdays) for discussion-format lectures, and on lab day (Thursdays) the class goes out into the field to collect data and perform experiments. Primary scientific literature will be read and discussed in the context of the lectures and field exercises.

Specific Learning activities include the ecology of natural communities including terrestrial and aquatic, seed dispersal and seed ecology, predation, foraging ecology, pollination, fruit-eating mutualisms, and population census methods. Student evaluations are based on participation, engagement, oral presentations, and written reports (no exams given in this class). At least one field trip involves staying overnight in a natural area. Specific topics covered in this class are: asking questions in science, designs of studies and experiments,
ecological data collection techniques, data storing methods, statistical analyses (univariate to multivariate), graphical representation of results, oral presentation skills, research ethics, and writing and publication skills and techniques.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 451: Biology of RNA (3 Credits)**
Old Listing Effective Through Fall 2018:

Survey of the roles of RNA in biology, emphasizing evolutionary relationships and relevance to human health.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 460: Human Genetics (3 Credits)**
Old Listing Effective Through Fall 2018:

The human genome, its variation, origins, and relation to disease and other traits. ANTH 460 / BIOL 460 Human Genetics (3) The course considers many examples derived from the study of the genetics of human disease, and includes most general areas of interest, including simple Mendelian disorders, and complex chronic diseases such as cancer and cardiovascular disease, and variable special topics including immunogenetics and the genetics of imprinting or other processes. The course usually also touches briefly on the nature of forensic genetics and the problem of making inferences from individual genotypes. Finally, the course considers the bioethical and societal issues involving contemporary human genetics. The study of disease genetics is important for students preparing for graduate work in medicine and other health professions as well as for graduate studies in molecular and evolutionary genetics and related areas, including biological anthropology and bioethics. This course is relevant to requirements or appropriate electives for life science majors and graduate students (check with your academic advisor). Over the years, it has proven to be excellent preparation for subsequent graduate and professional work in these areas. The course is offered most years, in the fall semester. Depending on enrollment and other factors, the course may include graded homework or other components, but evaluation is predominantly based on exams during the semester and a comprehensive final. This course is cross listed as ANTH 460 and BIOL 460, but there is only one course, at the same time and place, for all students no matter how they register. In some years, ANTH 460H / BIOL 460H, a 4-credit Honors version is offered that is identical to 460 but with an additional class period each week involving additional written and presentational assignments and term projects, along with the regular 460 exams, that combine to determine the final grade. Total enrollment is capped at about 100 students.

Cross-Listed Courses: ANTH 460

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 460H: Human Genetics (4 Credits) (H)**
Old Listing Effective Through Fall 2018:

Gene mapping in humans; molecular basis of genetic disease; genomic structure; immunogenetics; and genetic evidence for human evolutionary history. ANTH 460H / BIOL 460H Human Genetics (4) Students will explore interesting normal or pathological variation to understand first its biological nature, then its epidemiological distribution, genes and genetic mechanisms associated with the trait, phylogenetic origins or comparison, and the nature of relevant genotype-phenotype relationships. Alternatively, students may explore methods for identifying and characterizing gene action or structure, or historical subjects related to human variation and evolution.

Ethical and societal aspects of these issues will be considered as well. Time will be taken for faculty or students to read and present current important papers appearing in the literature, relevant to the current course topics. As an Honors course, we will have the time, and the students the dedication, to pursue the chosen topic(s) in much greater and more rigorous detail than is possible in the usual lecture or even seminar course format of ANTH 460 / BIOL 460 which, while presenting material at a sophisticated level, will not have time to explore the more subtle, problematic, or challenging aspects. The students who enroll for this course will be given a description of the approach and the intended general topic, on a course web page or by email when the instructor learns they have registered. The nature of the course will be described including semester-specific themes or focus that will apply (if any). Requisite background reading will be identified so students will know what will be expected of them. Some prior reading will be assigned, so that we can begin the semester with a common basis in background. Students will be evaluated on the quality of their project work, including writing ability, presentation ability, and depth of thought. Several written assignments will be given and graded for content and expression quality.

Although students will take regular ANTH 460 / BIOL 460 lectures, they may be given separate exams (corresponding to those given in the regular course) that will allow more freedom of expression than multiple-choice exams or homework assignments. Depending on the workload in any semester, there may be a separate written take home synthetic essay final exam. The Honors session each week will be highly interactive rather than passive, and students will be graded on attendance, participation and whether they have done assigned work in advance of the class. Students will be expected to have the stipulated background knowledge of biological anthropology, evolutionary biology, statistics and genetics. This course should count as 4 credits toward additional courses in biological anthropology required for the Anthropology major.

Cross-Listed Courses: ANTH 460H

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 461: Contemporary Issues in Science and Medicine (3 Credits)**
Old Listing Effective Through Fall 2018:

Current/classical issues relating to health, research, agriculture, environment, and biotechnology. Active exploration of the impact of science on society. BIOL 461 Contemporary Issues in Science and Medicine (3) The aim of this course is to provide students of the biological and biomedical sciences with a framework to recognize, examine, and resolve conflicts which may affect their professional conduct. Current and classical issues relating to human health, scientific and medical research, agriculture, the environment, and biotechnology will be explored. The history, controversies, and current issues related
to each topic will be presented by the instructor through lecture, guest presentations, and multimedia presentations. Each topic will be explored by students through a variety of activities, including role playing, case studies (real and hypothetical), mock trials, small- and large-group discussions, writing exercises, and student research projects presented in oral and poster format. Some activities and discussions will involve the entire class simultaneously, while other activities will be structured for very small groups (2-3 students), small groups (5-6 students), or large groups (10-15 students). This course is especially relevant to any student majoring in Biology, as it allows and encourages them to relate information they have learned in other Biology courses to their own professional conduct. Although the course was specifically designed to cover issues that are relevant to students majoring in each of the Biology concentration areas (Genetics and Developmental Biology, Ecology, Plant Biology, and Vertebrate Physiology), it is also relevant to students in colleges other than Science, who may be enrolled in majors with some biological content or applications. This course is designed to be rigorous and very interactive.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

**BIOL 464: Sociobiology (3 Credits)**
Old Listing Effective Through Fall 2018:

The study of the adaptive function of social behavior, the comparative analysis of social organization, and the ecology of sociality.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 467: Molecular Basis of Neurological Diseases (3 Credits)**
Old Listing Effective Through Fall 2018:

This course provides up-to-date knowledge of and insight into the molecular/cellular/genetic basis of the neurological diseases. The focus will be on neurodegenerative and cognitive disorders with a relative high prevalence as listed below: Neurodegenerative disorders: Alzheimer’s disease, Parkinson’s disease, Huntington’s disease, Ataxia, ALS Cognitive and emotional disorder: Autism spectrum disorders, Mental Retardation, Depression, Bipolar disorder, Schizophrenia, Addiction, Posttraumatic disorder

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 469: Neurobiology (3 Credits)**
Old Listing Effective Through Fall 2018:

Comprehensive examination of neuroanatomy and physiology designed to integrate the principles of neurochemistry, neuroendocrinology and molecular biology.

Cross-Listed Courses: BBH 469

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 472: Mammalian Physiology (3 Credits)**
Old Listing Effective Through Fall 2018:

Mechanisms concerned with normal animal function, with special emphasis on humans.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 474: Astrobiology (3 Credits)**
Old Listing Effective Through Fall 2018:

Astrobiology is the study of life in the universe. Astrobiology has become a major focus of scientific research in the United States and a topic often discussed in popular science literature. The recent interest in astrobiology has resulted in the formation of an Astrobiology Institute at Penn State University. This advanced undergraduate course in astrobiology will cover many topics in the field including, biochemical evolution, the origin and evolution of life on Earth, microbial diversity, protein evolution, and the distribution of life in the universe. This course is intended to provide students of the natural sciences with the opportunity to prepare for a research career in the rapidly expanding field of astrobiology. The course will also present astrobiology as a cross-disciplinary framework that ties together the diverse courses the students have already taken. The students will learn new concepts while having, to draw on their previous knowledge of chemistry, biology, and the geosciences. In summary, this course has the following objectives: (1) to develop the student’s literacy in astrobiology so that they can critically evaluate claims that they encounter well after the course has ended; (2) to present a scientific question that requires the sum of the student’s previous education to solve; (3) to provide a deep background to some of the astrobiological concepts that are often only briefly mentioned in other classes or in the media; (4) to develop research and communication skills required for a young scientist through a class term paper and short oral presentation; and (5) to prepare the students for graduate research in astrobiology by giving them a broad background of the field and by demonstrating many of the outstanding problems yet to be solved.

Cross-Listed Courses: GEOSC 474

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 482: Coastal Biology (3-4 Credits)**
Old Listing Effective Through Fall 2018:

Marine organisms, their interactions with each other, and their relationships with several coastal habitats.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

**BIOL 492: Senior Seminar in Biology (1 Credit)**
Old Listing Effective Through Fall 2018:

Discussion of selected topics from recent biological literature; reports on current research or internship experiences.

Changes Effective Spring 2019:
Gene expression of transgenic plant traits and the stability of an engineered crop will be discussed. Specific emphasis will be on different modes of inheritance that a transgenic plant can follow after its development and release into the environment. The course also prepares students for understanding the regulatory processes that are required for testing, moving, and environment release of transgenic crops. The laboratory component of the course will introduce students to the common technique of molecular biology that are used to detect expression in transgenic plants. Transgenic maize plants will be grown in a greenhouse and analyzed for expression of introduced genes.

Cross-Listed Courses: AGRO 460

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOTC 479: Methods in Biofermentations (3 Credits)
Old Listing Effective Through Fall 2018:

Bioprocessing principles and development; uses and operation of biofermentors; determination of biomass; problems of scale-up.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BIOTC 489: Animal Cell Culture Methods (3 Credits)
Old Listing Effective Through Fall 2018:

An overview of animal cell culture methodology and its practical application in bioprocess technology.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 211: Elementary Biochemistry (3 Credits)
Old Listing Effective Through Fall 2018:

An overview of biochemistry that includes properties of biomolecules, bioenergetics, metabolism, nutrition, genetics, and molecular biology. B M B 211 B M B 211 Elementary Biochemistry (3) B M B 211 is an overview of biochemistry that includes: basic properties and biosynthesis of proteins and nucleic acids, chemistry, and metabolism of major carbohydrate, lipid, and amino acid classes, energy production pathways including photosynthesis, biological transport, and principles of enzyme action. The course provides the student with a sufficient knowledge of biochemical processes, cellular molecules and their metabolism to serve as a basis for advanced study of nutrition, genetics, biotechnology, agricultural sciences, or related biological areas that depend on a biochemical foundation. Achievement of course objectives is assessed through multiple written examinations designed to evaluate understanding of biochemical concepts and their applications to biological problems. B M B 211 is related to and a prerequisite for the companion laboratory course B M B 212 (1 credit). B M B 211 also serves as the prerequisite for B M B 221, an exploration of the application of biochemical principles to specific problems in medicine, agriculture, and biotechnology. This course requires some proficiency in organic chemistry and general chemistry; thus, CHEM 012, and 034 or 038 are prerequisites. B M B 211 is part of one of the two series of biochemistry courses that students in the Biotechnology major (either General or Clinical Laboratory Science Options) are required to take for the baccalaureate degree. B M B 211 is required by a number of
different majors in the colleges of Agricultural Sciences and Health and Human Development.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 251: Molecular and Cell Biology I (3 Credits)
Old Listing Effective Through Fall 2018:

Biomolecules, genetic mechanisms, organization of cells and their organelles, DNA replication, protein synthesis, membranes, the cell nucleus, energy conversion. B M B 251 Molecular and Cell Biology I (3) This course is an introduction to the fundamental principles of molecular and cellular biology, with a primary focus on eukaryotic cells. Topics covered will include elementary biochemistry; structure and function of biological macromolecules, the cell and its organelles; the role of biological membranes in bioenergetics and sub-cellular compartments. There will be a particular emphasis on the molecular mechanism of heredity; the organization and expression of genetic information; experimental methods used in the analysis of gene expression and the relationship between gene/protein structure and function. A key feature of the Honors section is the use of review papers and peer-reviewed journal articles as integral components of the course. The objectives of this component of the Honors section are to: 1) introduce students to the scientific method (the formulation of hypotheses based on observation and the processes underpinning the rigorous test of such hypotheses); and 2) provide the intellectual framework for a critical evaluation of the literature. Students are expected to engage in classroom discussion and will be evaluated by a combination of classroom presentations, multiple choice and short essay exams. Students are expected to develop a “big picture” view of how the various cellular processes are related to each other and also attain a thorough understanding of the molecular details of the individual processes (e.g. the order and molecular details of events leading from transcription to protein localization within a cell). This course is a prerequisite for B M B 252H.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 252: Molecular and Cell Biology II (3 Credits)
Old Listing Effective Through Fall 2018:

Biomolecules, genetic mechanisms, organization of cells and their organelles, DNA replication, protein synthesis, membranes, the cell nucleus, energy conversion. B M B 251 Molecular and Cell Biology I (3) This course is an introduction to the fundamental principles of molecular and cellular biology, with a primary focus on eukaryotic cells. Topics covered will include elementary biochemistry; structure and function of biological macromolecules, the cell and its organelles; the role of biological membranes in bioenergetics and sub-cellular compartments. There will be a particular emphasis on the molecular mechanism of heredity; the organization and expression of genetic information; experimental methods used in the analysis of gene expression and the relationship between gene/protein structure and function. A key feature of the Honors section is the use of review papers and peer-reviewed journal articles as integral components of the course. The objectives of this component of the Honors section are to: 1) introduce students to the scientific method (the formulation of hypotheses based on observation and the processes underpinning the rigorous test of such hypotheses); and 2) provide the intellectual framework for a critical evaluation of the literature. Students are expected to engage in classroom discussion and will be evaluated by a combination of classroom presentations, multiple choice and short essay exams. Students are expected to develop a “big picture” view of how the various cellular processes are related to each other and also attain a thorough understanding of the molecular details of the individual processes (e.g. the order and molecular details of events leading from transcription to protein localization within a cell). This course is a prerequisite for B M B 252H.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 251H: Molecular and Cell Biology I (3 Credits) (H)
Old Listing Effective Through Fall 2018:

Biomolecules, genetic mechanisms, organization of cells and their organelles, DNA replication, protein synthesis, membranes, the cell nucleus, energy conversion. B M B 251H Molecular and Cell Biology I (3) This course is an introduction to the fundamental principles of molecular and cellular biology, with a primary focus on eukaryotic cells. Topics covered will include elementary biochemistry; structure and function of biological macromolecules, the cell and its organelles; the role of biological membranes in bioenergetics and sub-cellular compartments. There will be a particular emphasis on the molecular mechanism of heredity; the organization and expression of genetic information; experimental methods used in the analysis of gene expression and the relationship between gene/protein structure and function. A key feature of the Honors section is the use of review papers and peer-reviewed journal articles as integral components of the course. The objectives of this component of the Honors section are to: 1) introduce students to the scientific method (the formulation of hypotheses based on observation and the processes underpinning the rigorous test of such hypotheses); and 2) provide the intellectual framework for a critical evaluation of the literature. Students are expected to engage in classroom discussion and will be evaluated by a combination of classroom presentations, multiple choice and short essay exams. Students are expected to develop a “big picture” view of how the various cellular processes are related to each other and also attain a thorough understanding of the molecular details of the individual processes (e.g. the order and molecular details of events leading from transcription to protein localization within a cell). This course is a prerequisite for B M B 252H.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 252H: Molecular and Cell Biology II (3 Credits) (H)
Old Listing Effective Through Fall 2018:

Continuation of B M B 251H; cytoskeleton, cell growth, division, adhesion, signaling, germ cells, differentiation, immune system, nervous system, plant cells. B M B 252H Molecular and Cell Biology II (3) This course is the second part of B M B 251H. This section focuses on the internal organization on eukaryotic cells and their organization in multi-cellular organisms. Topics covered include cell communication, the cytoskeleton, cell cycle, fertilization and development of multi-cellular organisms, genetics of tissues, and the molecular mechanisms of cancer and immunity. A key feature of the Honors section will be the use of review papers and peer-reviewed journal articles as integral components of the course. The objectives of this component of the Honors section are to: 1) introduce students to the scientific method (the formulation of hypotheses based on observation and the processes underpinning the rigorous test of such hypotheses); and 2) provide the intellectual framework for a critical evaluation of the literature. Students are expected to engage in classroom discussion and will be evaluated by a combination of classroom presentations, multiple choice and short essay exams. Cross-Listed Courses: MICRB 252.
such hypotheses); and 2) provide the intellectual framework for a critical evaluation of the literature. Students are expected to engage in classroom discussion and will be evaluated by a combination of classroom presentations, multiple choice and short essay exams.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BMB 400: Molecular Biology of the Gene (2-3 Credits)
Old Listing Effective Through Fall 2018:

Biochemistry of genetic phenomena, including the structure, replication and dynamics of genes and chromosomes, their expression and regulation. B M B 400 Molecular Biology of the Gene (2-3)Molecular Biology of the Gene examines the flow of information in living things at the molecular level. Topics such as the following are included: 1) DNA replication, repair and recombination, 2) RNA transcription and modification, and 3) protein translation, folding and modification. This class is designed as a one-semester course having the objectives of understanding concepts in molecular biology and gene regulation, and exploring research materials and methods used in the laboratory. Course materials are prepared not only from the textbook but also from the primary literature.

Therefore, students who want to take this course should have some familiarity with reading research articles. B M B 400 is for advanced undergraduates who have already taken introductory molecular biology and biochemistry. Knowledge of molecular biology is essential background for pursuit of a career in the life sciences, including academia, medicine, industry, forensic science and science policy.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BMB 401: General Biochemistry (3 Credits)
Old Listing Effective Through Fall 2018:

Principles of the structure and function of biological molecules, including carbohydrates, lipids, membranes, proteins, and enzymes. Students may not receive credit for both CHEM 476 and B M B 401. B M B 401 General Biochemistry (3)B M B 401 is the first course of the honors general biochemistry series, a sequence designed to prepare students for careers and graduate study in the life sciences. Overall, biochemistry describes, in chemical and molecular terms, the structures, mechanisms, and chemical processes at work in all living things, and abstracts organizing principles that underlie life in all its diverse forms. Building upon concepts introduced in molecular and cellular biology and in organic chemistry, students in B M B 401 synthesize and apply this knowledge toward understanding the structure and function of the major classes of cellular constituents: water, and the various macromolecules — amino acids and proteins, sugars, and polysaccharides, nucleotides and nucleic acids, fatty acids and lipids, and membranes and various membrane proteins. These molecules interact to comprise the next level of multi-and mixed molecular structures and organelles that enable a cell to carry out its many metabolic functions. Students also learn about the technologies used to study cellular components and processes, and current advances in biotechnology that have accelerated the pace of discovery in the field. Having gained familiarity with the molecules found in a cell, students are well-equipped to take on more advanced topics in the exciting, rapidly-evolving fields of the life sciences. An overriding theme in biochemistry is that polymers of living systems, though structurally large and functionally complex, are highly ordered chemical entities, with specific sequences of monomeric subunits giving rise to discrete structures and functions. The course begins with an introduction to proteomics, covering the structural basis of protein functions and then moves on to enzyme kinetics and mechanisms. Next, students explore simple and complex carbohydrates and topics in glycobiochemistry that include energy storage, framework skeleton, and specific molecular recognition. Various classes of lipids, including phospholipids, complex lipids, membrane biology and transport systems, are covered next. Following is an analysis of the biochemical basis of signal transduction describing how specific signals regulate biomolecular activity within a cell, and between cells-to keep an organism in homeostasis. Lastly, as a transition to intermediary metabolism in B M B 402H, an introduction to bioenergetic principles is included to provide a framework for understanding pathways of carbon and nitrogen metabolism, using glycolytic reactions as an example.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 401H: General Biochemistry (3 Credits) (H)
Old Listing Effective Through Fall 2018:

Principles of the structure and function of biological molecules, including carbohydrates, lipids, membranes, proteins, and enzymes. Students may not receive credit for both CHEM 476 and B M B 401H. B M B 401H General Biochemistry (3)B M B 401H is the first course of the honors general biochemistry series, a sequence designed to prepare students for careers and graduate study in the life sciences. Overall, biochemistry describes, in chemical and molecular terms, the structures, mechanisms, and chemical processes at work in all living things, and abstracts organizing principles that underlie life in all its diverse forms. Building upon concepts introduced in molecular and cellular biology and in organic chemistry, students in B M B 401H synthesize and apply this knowledge toward understanding the structure and function of the major classes of cellular constituents: water, and the various macromolecules — amino acids and proteins, sugars, and polysaccharides, nucleotides and nucleic acids, fatty acids and lipids, and membranes and various membrane proteins. These molecules interact to comprise the next level of multi-and mixed molecular structures and organelles that enable a cell to carry out its many metabolic functions. Students also learn about the technologies used to study cellular components and processes, and current advances in biotechnology that have accelerated the pace of discovery in the field. Having gained familiarity with the molecules found in a cell, students are well-equipped to take on more advanced topics in the exciting, rapidly-evolving fields of the life sciences. An overriding theme in biochemistry is that polymers of living systems, though structurally large and functionally complex, are highly ordered chemical entities, with specific sequences of monomeric subunits giving rise to discrete structures and functions. The course begins with an introduction to proteomics, covering the structural basis of protein functions and then moves on to enzyme kinetics and mechanisms. Next, students explore simple and complex carbohydrates and topics in glycobiochemistry that include energy storage, framework skeleton, and specific molecular recognition. Various classes of lipids, including phospholipids, complex lipids, membrane biology and transport systems, are covered next. Following is an analysis of the biochemical basis of signal transduction describing how specific signals regulate biomolecular activity within a cell, and between cells-to keep an organism in homeostasis. Lastly, as a transition to intermediary metabolism in B M B 402H, an introduction to bioenergetic principles is included to provide a framework for
understanding pathways of carbon and nitrogen metabolism, using glycolytic reactions as an example.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 402: General Biochemistry (3 Credits)
Old Listing Effective Through Fall 2018:

Comprehensive survey of the pathways and regulation of intermediary metabolism. Most, if not all, of the students taking B M B 402 intend to pursue a Ph.D., M.D. or M.D./Ph.D. degree after graduation. Since biochemistry is an important discipline for advanced studies in life and medical sciences, a major goal of B M B 402 is to prepare students well for their future challenges in graduate or medical school. The textbook used is more advanced than that used in B M B 402, and it is what is typically used in biochemistry courses taught at premier medical schools and graduate schools. The major topics covered include glycolysis, TCA cycle, metabolism of fatty acids, lipids (phospholipids, cholesteral and sphingolipids), amino acids and nucleotides, signal transduction, and human genetic diseases. Since biochemistry is a very rapidly progressing discipline, any new developments not covered by the textbook are introduced in the lectures or via discussion of current scientific papers at an appropriate level. In addition, students must be able to integrate information learned from different but related material. These exams typically take students three hours to complete.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 402H: General Biochemistry (3 Credits) (H)
Old Listing Effective Through Fall 2018:

Comprehensive survey of the pathways and regulation of intermediary metabolism. It has a limited enrollment, B M B 402H provides a more intimate and interactive class environment than does B M B 402. Most, if not all, of the students taking B M B 402H intend to pursue a Ph.D., M.D. or M.D./Ph.D. degree after graduation. Since biochemistry is an important discipline for advanced studies in life and medical sciences, a major goal of B M B 402H is to prepare students well for their future challenges in graduate or medical school. The textbook used is more advanced than that used in B M B 402, and it is what is typically used in biochemistry courses taught at premier medical schools and graduate schools. The class is conducted at a challenging level to provide students with the opportunity to treat topics in greater depth and to explore current development more fully than is possible in B M B 402. The major topics covered include glycolysis, TCA cycle, metabolism of fatty acids, lipids (phospholipids, cholesterol and sphingolipids), amino acids and nucleotides, signal transduction, and human genetic diseases. Since biochemistry is a very rapidly progressing discipline, any new developments not covered by the textbook are introduced in the lectures or via discussion of current scientific papers at an appropriate level. B M B 402H exams consist of entirely essay and problem-solving type questions, whereas B M B 402 exams typically contain all multiple-choice questions. B M B 402H exams require that students understand all aspects of a particular metabolic pathway under study, including the sequential steps of the pathway, chemical structures of all intermediates, the mechanisms of all key reactions, regulation of the pathway, and the relationships with other pathways. In addition, students must be able to integrate information learned from different but related material. These exams typically take students three hours to complete.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 411: Survey of Biochemistry and Molecular Biology Literature (1 Credit)
Old Listing Effective Through Fall 2018:

An introduction to readings and oral presentations in biochemistry and molecular biology.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BMB 428: Physical Chemistry with Biological Applications (3 Credits)
Old Listing Effective Through Fall 2018:

Chemical thermodynamics and kinetics with applications to biological problems.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 430: Developmental Biology (3 Credits)
Old Listing Effective Through Fall 2018:

Molecular and genetic analyses of mechanisms involved in differentiation and determination in biological systems.

Cross-Listed Courses: BIOL 430

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 432: Advanced Immunology: Signaling in the Immune System (3 Credits)
Old Listing Effective Through Fall 2018:

The study of signaling pathways that regulate the immune response. B M B 432 B M B (MICRB/VC SC) 432 Advanced Immunology: Signaling in the Immune System (3) This course will use the immune system as a model in which to study how cells communicate in order to coordinate an immune response. We will focus on signaling mechanisms that regulate such immune responses as T cell activation, Th1/Th2 differentiation, macrophage activation, and migration of immune cells to sites of inflammation. All lectures are based on recent reviews by key investigators in each field, as well as primary articles to present students with the most recent advances, techniques, and approaches used. The goal of the course will be to convey a basis understanding of intracellular signaling mechanisms that will pertain to all areas of biology, an appreciation for current questions and future directions in the field, and an in depth understanding of the signals that govern immune responses. The material presented will build on the basic concepts...
learned in B M B 400 and MICRB 410, and will lay the foundation for more advanced courses at the graduate level.

Cross-Listed Courses: MICRB 432, VBSC 432

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 433: Molecular and Cellular Toxicology (3 Credits)
Old Listing Effective Through Fall 2018:

In-depth coverage of processes by which drugs/chemicals interact with biological systems and the experimental approaches used to study these interactions.

Cross-Listed Courses: VBSC 433

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 435: Viral Pathogenesis (3 Credits)
Old Listing Effective Through Fall 2018:

A study of the molecular and pathological aspects of both human and zoonotic viruses that contribute significantly to human disease.

Viral Pathogenesis provides students with a general knowledge of medically relevant viruses, with a specific focus on important human viral pathogens. The course is meant to help students understand how viruses diseases in humans and animals. Lectures and in class discussions will focus both on the fundamentals of infection and disease mechanisms, and on contemporary virology related topics in the scientific literature. Discussed can be divided into two main areas: (1) general concepts related to viral pathogenesis and the control of viral infections; and (2) specific viruses that cause human disease including HIV, herpes viruses, papillomaviruses, influenza virus, West Nile virus, Ebola virus, and SARS virus. Although prior knowledge virology is not required for taking this course, a working knowledge of molecular biology, cell biology, immunology, and some microbiology is helpful. Thus, MICRB 201 is a prerequisite for this course as well either BIOL 230W or BMB/MICRB 252. Cross-Listed Courses: MICRB 435, VBSC 433

Old Listing Effective Through Fall 2018:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 442: Laboratory in Proteins, Nucleic Acids, and Molecular Cloning (3 Credits)
Old Listing Effective Through Fall 2018:

Laboratory in enzyme purifications and assay techniques; nucleic acid isolation and characterization, including plasmid preparation. B M B (MICRB) 442 Laboratory in Proteins, Nucleic Acids, and Molecular Cloning (3) The DNA portion of B M B/MICRB 442 serves as an introduction to fundamental techniques of recombinant DNA technology and as a reinforcement of principles of Molecular Genetics from lecture courses. The central experiment entails all basic procedures necessary to clone a gene, i.e. to make a recombinant molecule comprised of DNA from two sources. Students use restriction enzymes to cut two distinct DNA molecules into smaller fragments. The fragments are mixed and treated with the enzyme Ligase, which randomly combines small fragments into large recombinant DNA molecules in new combinations different in composition from either original molecule. The recombinant molecules, which include genes that confer drug resistance, are transformed into E. coli cells that initially have no drug resistance. Cells that acquire recombinant DNA molecules are identified by selective plating on growth media containing drugs. From the transformed cells, recombinant DNA is isolated and analyzed by agarose gel electrophoresis, completing the array of basic gene cloning techniques. In addition to this central, multi-session experiment, students also do PCR and an investigation of the lac operon, a classic molecular genetic model system. The proteins portion of B M B/MICRB 442 is designed to introduce students to protein biochemistry topics and laboratory techniques typically encountered in academic and commercial settings. Students will learn about buffers, spectroscopy, enzyme purification and characterization methods. Specifically, the experiments include preparation of buffers and performing kinetic studies to determine Km and Vmax values. Separation of a mixture of phycobiliproteins using ion-exchange column chromatography is a major experiment that the students will perform to learn protein purification methods. In this experiment they will learn how to pour a column, apply sample, elute it with salt gradient and collect fractions using automated fraction collector. Ammonium sulfate precipitation and dialysis will be part of protein purification procedures. Characterization of the separated proteins will be performed by determining the absorption spectra with a Genesys-5 spectrophotometer and by determining the molecular weights of the subunits of the phycobiliproteins by SDS-polyacrylamide gel electrophoresis.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 443W: Laboratory in Protein Purification and Enzymology (3 Credits) (WF)
Old Listing Effective Through Fall 2018:

Laboratory in protein isolation methodology, enzyme kinetics, and physico-chemical properties of proteins.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

BMB 445W: Laboratory in Molecular Genetics I (2 Credits) (WF)
Old Listing Effective Through Fall 2018:

Laboratory in molecular techniques in gene analysis and microbial genetics, emphasizing in vitro methodologies. B M B 445W Laboratory in Molecular Genetics I (2) The objectives of B M B 445W are to provide advanced Biochemistry and Microbiology students with instruction in (1) techniques commonly used in modern research and clinical laboratories in this field, (2) evaluation of the quality of experimental data, including appropriate analysis, and (3) presentation of results of laboratory work in written form. Experiments are focused on key techniques and procedures such as DNA isolation, polymerase chain reaction, Southern hybridization analysis, and DNA sequencing. Students are evaluated via (1) written lab reports organized in the format found in most primary research journals in the field and (2) written examinations that assess the understanding of principles and methodology. B M B 445W is an extension of the nucleic acid section of B M B 342, which is a prerequisite for B M B 445W. The in vitro techniques presented in B M B 445W complement the in vivo techniques in B M B 446, though neither course is prerequisite for the
field of research. We have previously explored the general areas of cell biology, we delve into specific issues, often looking at "classic" papers describing how a specific phenomenon was first investigated. Instead of a general survey of cell biology, we read from journals to explore questions about cell biology and how cell biologists decipher cell functions. Instead of a general survey of cell biology while simultaneously exposing students to the scientific craft of experimental design and analysis. B M B 445W is taught in a standard biochemistry teaching laboratory facility that houses the required equipment necessary for analysis of DNA (electrophoresis units, centrifuges, thermocyclers, cold room, spectrophotometers).

Changes Effective Spring 2019:

- **Prerequisite/Corequisite/Concurrent Courses**
- **Description**

**BMB 448: Model Systems and Approaches in Cell Biology Inquiry (2 Credits)**

Advanced laboratory that uses inquiry-based approaches to the analysis of organelles, genetic mechanisms, and metabolic processes in eukaryotic organisms.

Changes Effective Spring 2019:

- **Prerequisite/Corequisite/Concurrent Courses**
- **Description**

**BMB 450: Microbial/Molecular Genetics (2 Credits)**

Genetic phenomena, with emphasis on molecular mechanisms: gene transfer, recombination, gene conversion, gene fusion, suppression, transposons.

Cross-Listed Courses: MICRB 450

Changes Effective Spring 2019:

- **Prerequisite/Corequisite/Concurrent Courses**
- **Description**

**BMB 460: Cell Growth and Differentiation (3 Credits)**

Mechanisms and regulation of protein trafficking, organelle biosynthesis, cell development, signaling and cell cycle control.

Emphasizes experimental design and analysis. B M B 460 B M B (MICRB) 460 Cell Growth and Differentiation (3) Cell Growth and Differentiation is a unique course that uses the primary literature to teach significant content in advanced cell biology while simultaneously exposing students to the scientific craft of experimental design and analysis. In addition to exploring historical and current cell biology research articles, students will develop two vital scientific skills: critical thinking as applied to experimental data and creative thinking about solving unresolved questions in cell biology. There is no course textbook. As an alternative, we read from journals to explore questions about cell biology and how cell biologists decipher cell functions. Instead of a general survey of cell biology, we delve into specific issues, often looking at "classic" papers describing how a specific phenomenon was first investigated to place current questions in context before progressing to the latest publications exploring how innovative techniques have been applied to deciphering cell function. The course is divided into four units, each of which emphasizes content in a different area. Actual content may vary from year to year as the course is updated to reflect progress in a field of research. We have previously explored the general areas of cell membrane dynamics, intracellular protein trafficking, cell signaling pathways and cancer cell biology.

Finally, the course ends with a unit on stem cells and therapeutic cloning technology. A portion of the final unit is also devoted to discussing the ethical implications of stem cell research with an emphasis on how to make personal decisions about how our society should approach these issues. Reading guides are provided for each assignment to help students find and understand important points in reading assignments. Class periods are devoted to explanations and instructor-led discussions about the readings with an emphasis on understanding the questions, the methods used to approach the questions, the experimental results and the interpretations of the results. Furthermore, periodic class periods are dedicated to experimental approach exercises where students work in groups to practice posing new questions as suggested by our readings and proposing experiments to answer these questions. These skills are vital part of what cell biologists do daily, and these exercises provide practice in thinking like a scientist. Students have previously reported that by taking this course they acquired the ability to read and understand the primary literature and have gained an in-depth understanding about how to use various experimental techniques.

Cross-Listed Courses: MICRB 460

Changes Effective Spring 2019:

- **Prerequisite/Corequisite/Concurrent Courses**
- **Description**

**BMB 464: Molecular Medicine (3 Credits)**

An exploration of the impact of advances in molecular biology on understanding disease mechanisms, medical diagnosis, and therapeutics.

Changes Effective Spring 2019:

- **Prerequisite/Corequisite/Concurrent Courses**
- **Description**

**BMB 480: Tumor Viruses and Oncogenes (3 Credits)**

Oncogenes, DNA and RNA tumor viruses, and relevant experimental techniques with emphasis on molecular basis of carcinogenesis and gene regulation.

Cross-Listed Courses: MICRB 480

Changes Effective Spring 2019:

- **Prerequisite/Corequisite/Concurrent Courses**
- **Description**

**BMB 484: Functional Genomics (3 Credits)**

Biochemical, genetic and evolutionary approaches to comprehensive discovery of functional DNA segments in genomes, including genes and regulatory sequences. B M B 484 Functional Genomics (3) What in your genomic DNA makes you different from chimpanzees, mice or flies? What sequences in your DNA make it more or less likely that you will develop diabetes or cancer? These are questions of widespread interest,
answers to which could play major roles in personalized medicine and
in understanding our place in the biosphere. Modern genomic analysis
uses powerful technologies and generates massive amounts of data,
which are yielding exciting insights into answering these questions. One
hallmark of genomic research is that data are released rapidly along
with tools for browsing and analyzing it. Thus not only can you learn the
major results by reading papers, but you can examine the underlying
data and do your own analyses. Discovery is no longer the exclusive
domain of the data producers? you can join in! This course will introduce
students to ongoing research aimed at identifying functional regions in
genomes and encourage them to use web-based bioinformatics tools
for exploring the genomic and epigenetic data. Students will develop
creative projects that address issues in functional genomics of high
interest to them. The course has two phases, the first on the basics of
genomics (sequencing, alignment, assembly, resources), and the
second on the search for functional elements in genomes. The course will
explore ways to find: - Protein-coding genes within genomes - Transcribed
regions: How much of the genome is transcribed? Which transcribed
regions do not code for proteins? What roles do they play in the cell
(regulatory and enzymatic)? - Evolutionary signatures of function: How
can you use genome comparisons between species to estimate the
amount of functional sequence? and to identify it? - Non-genic functional
sequences: How do you map epigenetic features associated with gene
regulation, such as histone modifications, DNase hypersensitive sites,
and transcription factor occupancy? - Function by phenotype: Given the
ability of genetic association to find loci that contribute to complex traits,
such as disease susceptibility, how does functional genomics aid in
finding basis of these traits?

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

BMB 488: Communities of Practice in Biochemistry and Molecular Biology (2 Credits: Maximum of 16 Credits)
Old Listing Effective Through Fall 2018:

The course combines laboratory research in a community of practice and
a seminar on topics in science, ethics, and society

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

CAMS 25: Greek Civilization (3 Credits) (GH) (IL) (BA)
Old Listing Effective Through Fall 2018:

The origin and development of the ancient Greek people; their political
and social institutions, public and private life. CAMS 025/CAMS 025 Greek
Civilization (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree
requirements. Greek Civilization, CAMS 025 Greek Civilization, is an interdisciplinary
and multimedia introduction to the major features of Greek civilization and its importance to the Western heritage. It shows how the ideals,
achievements, but also the failures of ancient Greeks have shaped the
values of Western civilization. The course begins with an overview of the
territory of the areas around the Mediterranean Sea that were inhabited
by Greeks in antiquity, the reasons for the location of major settlements,
and an introduction to the precursors of the Hellenic peoples, such as
the Minoans, whose cultural achievements preceded and influenced the
earliest Greeks. The course then follows the 1,500-year long development
of Greek history, literature, philosophy, art and archaeology from its
early stages in the second millennium B.C.E. through the Hellenistic
period. The course presents the political, social, religious, and economic
structures of ancient Greece and issues of gender, slavery, foreigners,
colonization, and imperial ambition that reward modern re-evaluation.
The course particularly emphasizes the development of the Greek
city-state, the polis, the unique political system of democracy, and the
tension between the individual and the state through the sixth and fifth
centuries B.C.E. that saw its greatest successes and the failures that
led to the death of Socrates in 399 B.C.E. In this course students may
gain an appreciation for the greatest achievements of Greek culture in
the fields of literature and philosophy, in the work of poets from
Homer and Hesiod to Aeschylus, Sophocles, and Euripides and from
the great Ionian thinkers such as Thales to philosophers such as Plato
and Aristotle. Because classical culture constitutes a major influence
on modern western civilization, such study enables us to see where
various aspects of our own society come from and so better understand
ourselves. This course, then, emphasizes the similarities between the
ancient Greeks and the modern world, thereby establishing the relevance
of this study, while at the same time pointing out the differences between
these two cultures, thereby providing the critical distance necessary for
reflecting on ourselves. In this course students prepare group projects
and oral presentations and write essays that involve the use of library
and Web-based tools such as Perseus, an extensive electronic resource
for all aspects of ancient Greek culture. In this course students will read
(English translations of) original Greek texts, will view many examples
of Greek art, architecture, and artifacts, and will hear examples of music
based on literary or mythological themes that originated with the Greeks.
Through the readings, lectures, and discussions, students may learn
methods for interpreting the historiographical, literary, and material
evidence upon which we base our understanding of the ancient Greeks.

Changes Effective Spring 2019:

- Description

CAS 271: Intercultural Communication (3 Credits) (US) (IL)
Old Listing Effective Through Fall 2018:

Introduction to intercultural communication. Focus on topics such as
language, identity, prejudice, and intergroup relations on a domestic/
international level. CAS 271 Intercultural Communication (3) (US;IL)
This is an introductory course that also fulfills an intercultural and
international competence (GI) requirement. CAS 271 is designed to
give undergraduate students an introduction to the various issues,
trends, and historical perspectives pertaining to communication within
U.S. domestic and international cultures. Students will be graded on
the following required assignments: (1) exams, (2) book reviews, (3)
opinion-editorial position papers, (4) a class-organized campus tour
designed to accent the achievements and contributions of people of
color who are or have been affiliated with Penn State University, (5)
journal of personal reflections concerning racial, ethnic, cultural and
international communication issues, (6) six abstracts of journal articles
that when synthesized will comprise a six-article literature review, (7) final
presentation on cultural relationship building through communication.
CAS 271 is an introductory survey course that is highly recommended to
students as a course preceding several other 300 and 400-level courses
on interpersonal, group and intercultural communication, relationships,
and processes.

Changes Effective Spring 2019:

- Number to 271N
- Description
- Add GH Designation
CHEM 110: Chemical Principles I (3 Credits) (GN) (BA)
Old Listing Effective Through Fall 2018:

Description: Basic concepts and quantitative relations. Students may take only one course for General Education credit from CHEM 110 or CHEM 101. CHEM 110 Chemical Principles I (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. CHEM 110 is the first semester of a two-semester, comprehensive general chemistry course that introduces the students to the basic principles of chemistry with an emphasis on the relationships between the microscopic structure and macroscopic properties of matter. Principles are illustrated with a wide variety of examples from the sciences, engineering and technology, and from everyday life. The course covers the following topics: matter and measurement, molecules and molecular compounds, ions and ionic compounds, chemical reaction types, atomic and molecular weights, the mole, quantitative calculations with chemical reactions, the periodic table, nomenclature, aqueous reactions and solution stoichiometry, thermochromy, electronic structure of atoms, periodic properties of the elements, chemical bonding, molecular geometry, the gaseous, liquid, and solid states of matter, properties of solutions, some basic aspects of chemical equilibrium, and applications to the real world including environmental chemistry. GN credit for CHEM 110 requires that CHEM 111 also be completed.

Prerequisite: satisfactory performance on the Math placement test -- i.e., placement beyond the level of MATH 022; or CHEM 101 and MATH 022 or MATH 041

Changes Effective Spring 2019:

• Description

CHEM 110H: Chemical Principles I – Honors (3 Credits) (H) (GN)
Old Listing Effective Through Fall 2018:

Basic concepts and quantitative relations of chemistry at a level appropriate for students with advanced backgrounds and talents. Students may take only one course for General Education credit from CHEM 110 or CHEM 101. GN to receive Natural Sciences General Education (GN) credit for certain chemistry courses requires both lecture and laboratory courses be taken. These courses are: (CHEM 106 or CHEM 110 or CHEM 110H) and CHEM 111; (CHEM 112 or CHEM 112H) and (CHEM 113 or CHEM 113B).

Prerequisite: satisfactory performance on the Math placement test -- i.e., placement beyond the level of MATH 022; or CHEM 101 and MATH 022 or MATH 041

Changes Effective Spring 2019:

• Description

• Prerequisite/Corequisite/Concurrent Courses

CHEM 112: Chemical Principles II (3 Credits) (GN) (BA)
Old Listing Effective Through Fall 2018:

Continuation of CHEM 110, including an introduction to the chemistry of the elements. CHEM 112 Chemical Principles II (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. CHEM 112 is the second semester of a comprehensive, two-semester general chemistry sequence following CHEM 110. It uses the same text as CHEM 110 and builds upon the subject matter of that course. The course covers the following topics: reaction rates and chemical kinetics, catalysis, acid-base equilibria, the pH scale, common-ion effect, acid-base titrations, factors that affect solubility, buffers, chemical thermodynamics, entropy, free energy, electrochemistry, oxidation-reduction reactions, oxidation numbers, voltaic cells, batteries, corrosion, electrolysis, chemistry of the nonmetals such as hydrogen, oxygen, nitrogen, halogens, noble gases, transition metals, modern materials, alloys and metallurgy, nuclear chemistry, radioactivity, fission and fusion. GN credit for CHEM 112 requires that CHEM 113 or CHEM 113B also be completed.

Prerequisite: CHEM 110 or CHEM 106

Changes Effective Spring 2019:

• Description

CHEM 227: Analytical Chemistry (4 Credits)
Old Listing Effective Through Fall 2018:

The purpose of this course is to provide students with a rigorous and comprehensive exposure to the techniques and methods used in biotech, environmental, forensic, and pharmaceutical industrial and research laboratories. The principles, methodology and practical aspects of both traditional and modern chemical analysis will be discussed. Laboratory and lecture are fully integrated, emphasizing the importance of the laboratory component to achieving mastery of overall course content. Concepts will include acid-base, precipitation, chelation, electrochemistry, UV/Vis spectroscopy, and introductory chromatography, as well as some more advanced topics at the instructor’s discretion. Students will be expected to develop both their chemical problem solving and laboratory skills, and will be evaluated on their ability to speak and write clearly, solve context-based chemical problems, maintain a research style laboratory notebook, and carry out reliable chemical analysis individually as well as part of a team. This course is relevant to any student majoring or minoring in Chemistry or Forensic Science.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

CHEM 400: Chemical Literature (1 Credit)
Old Listing Effective Through Fall 2018:

Description: Instruction in use of the library and of the literature of chemistry. CHEM 400 Chemical Literature (1) CHEM 400 covers an orientation to use the library; sources of organic and inorganic synthesis information; use of relevant indexing and abstracting services; spectral data sources; patent literature; sources related to general chemical information, and properties data. Additional topics may be included as time permits.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

CHEM 406: Nuclear and Radiochemistry (3 Credits)
Old Listing Effective Through Fall 2018:

Theory of radioactive decay processes, nuclear properties and structure, nuclear reactions, interactions of radiation with matter, biological effects of radiation. CHEM 406 CHEM 406 Nuclear and Radiochemistry (3) CHEM 406 provides a basic introduction to many of the important
physical phenomena in nuclear and radiochemistry and the theories that describe them. The exposition of both experimental phenomena and theory complements the content of other upper-level courses in physical chemistry such as CHEM 450 and 452. Specifically, the types of radioactive decay are described, and, using this information, the equations that relate the growth and decay, i.e., the kinetics, of radioactive nuclei are derived. In parallel, a variety of types of nuclear reactions, such as neutron capture are introduced and used to develop the equations that govern the kinetics of nuclear reactions, including the concept of cross section. To describe the nature of nuclear matter, the relationships between energy, binding energy, and mass, are developed and augmented with the introduction of related quantities including the nuclear magnetic-dipole moment, total angular momentum of the nucleus, and Fermi-Dirac and Bose-Einstein statistics. A basic introduction to quantum mechanics, including several problems of increasing complexity, namely, the one-dimensional particle-in-a-box, the three-dimensional particle-in-a-cubic-box, and the particle-in-a-spherical box is then provided. The latter problem forms the basis for developing the single-particle shell-model of the nucleus, which is compared to the single-particle shell-model of the atom, namely, the hydrogen-atom problem. The barrier-penetration theory of alpha-decay, Fermi’s phase-space theory of beta-decay, and the selection rules for gamma-ray decay are then presented. Final topics include the interactions of radiation with matter and the biological effects of radiation.

Cross-Listed Courses: NUCE 405

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

CHEM 410: Inorganic Chemistry (3 Credits)
Old Listing Effective Through Fall 2018:

Conceptual and descriptive aspects of nontransition elements, covering structural, thermodynamic, and kinetic features. CHEM 410 CHEM 410 Inorganic Chemistry (3) CHEM 410 covers structure and bonding in inorganic chemistry, including the chemistry of main group elements and selected topics in transition metal chemistry. Theories and models of chemical bonding (valence bond theory, crystal field theory, and molecular orbital theory) are applied to inorganic molecules, coordination compounds, and solids. The course also covers the following topics: periodic trends in the chemistry of the d- and p-block elements, structural solid state chemistry, magnetism of transition metal complexes and inorganic solids, ionic and covalent bonding in solids, electronic properties of metals, alloys, superconductors, and semiconductors, synthesis of inorganic materials, and properties of nanoscale inorganic solids.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

CHEM 412: Transition Metal Chemistry (3 Credits)
Old Listing Effective Through Fall 2018:

Structure and bonding of compounds containing transition metals. CHEM 412 Transition Metal Chemistry (3) CHEM 412 covers the chemistry of the transition metals, and in particular the d-block elements. Major areas of emphasis include coordination chemistry, organometallics, and the role(s) of transition metals in biology. The course covers the following topics: molecular symmetry with applications to bonding and vibrational spectroscopy, coordination chemistry, structural and optical isomers, crystal and ligand field theories, electronic structure and electronic transitions, spectroscopic methods for probing transition metal complexes, kinetics and thermodynamics of ligand substitution reactions, oxidation-reduction reactions, organometallic complexes and their basic reaction types, homogeneous and heterogeneous organometallic catalysts and their reaction cycles, the interactions of metal ions with biological molecules, the function of transition metal ions in metalloproteins, and medically-important transition metal complexes.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

CHEM 423W: Chemical Spectroscopy (4 Credits) (WF)
Old Listing Effective Through Fall 2018:

Modern methods and instruments of spectroscopy and their applications to problems of chemical structure and analysis. CHEM 423W Chemical Spectroscopy (4) This course reviews modern methods and instruments of spectroscopy and their applications to problems of chemical structure and analysis. Topics include electronics, optics, and atomic and molecular spectroscopy (UV-VIS, Fluorescence, FTIR, Raman, liquid- and solid-state NMR). The course thoroughly integrates lecture and laboratory activities. The laboratory component incorporates skill-building exercises with open-ended guided-inquiry laboratory exercises and a semester-long laboratory- and literature-based research project. Students work in small groups (2-3 students) to complete each assignment. Students are required to write research papers during the semester. The reports are linked to the core course topics and the fifth is associated with the semester-long research project. All reports require students to search for and read the relevant published literature. The course is designed to be rigorous and comprehensive in scope. The writing component for this course includes: maintaining a proper laboratory notebook; reports; and an oral poster presentation. All writing elements are reviewed and graded by the instructor and teaching assistants.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

CHEM 452: Physical Chemistry – Quantum Chemistry (3 Credits)
Old Listing Effective Through Fall 2018:

Introduction to physical chemistry with primary emphasis on molecular structure, spectroscopy, and chemical kinetics. (Graduate credit not allowed for students majoring in Biochemistry and Molecular Biology, Chemistry, or Chemical Engineering.) CHEM 452 CHEM 452 Physical Chemistry – Quantum Chemistry (3) CHEM 452 is an introductory physical chemistry course that covers quantum chemistry, atomic and molecular spectroscopy, and chemical kinetics. If time permits, other possible topics include statistical thermodynamics, nuclear magnetic resonance, electron spin resonance, structures of solids, X-ray scattering, and processes at surfaces. Quantum chemistry includes: development of wave mechanics, Schrödinger’s equation, particle in a box, in a ring, on a spherical surface, free particle, barrier penetration, harmonic oscillator, postulates, hydrogen atom, helium atom, electron spin, atomic and molecular structure and symmetry. Spectroscopy includes: atomic spectra, microwave, infrared, and visible spectra of molecules. Chemical kinetics includes: rate laws, mechanisms, chain reactions, polymerization reactions, catalysis, molecular reaction dynamics (collision theory and activated complex theory), and nature of potential energy surfaces for reactions.

Changes Effective Spring 2019:
This course familiarizes students with the critical texts and intellectual cultures of Warring States and early imperial China. ASIA 482 (HIST 482, CHNS 424) Confucius and the Great Books of Early China (3) This course exposes students to the key texts, thinkers, and ideas that form the foundation of the Chinese classics and classical period. As the first part of a two-seminar series of courses (HIST 484), it provides an integral foundation for the study of Chinese history, culture, or literature. While the emphasis is on the texts and their main themes, the course will encourage historical engagement with the texts by placing them into a context of competing cultural, social, political trends. Readings may be grouped around categories of teachings such as Confucianism, Buddhism, and Daoism, or around thinkers such as “(Confucian) ritualists,” “statesmen,” “military strategists,” “rebels,” “recluses,” and “spiritual leaders.” Students will learn how each of these types of teachings and thinkers related to each other, as well as how they responded to the emergent, centralized political order of the day. This will help students better understand many of the recurrent intellectual, political, and religious themes that arise in later Chinese history as well.

Prerequisites: Fifth semester standing

Cross-Listed Courses: ASIA 482 HIST 482

Changes Effective Spring 2019:

- Number to 418
- Cross-listed ASIA 482 to 418
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses
- Add B.A. and IL Cultures Designations

ECON 472: Transition to Market Economies (3 Credits) (BA) Old Listing Effective Through Fall 2018:

Economics of transition to a market economy; problems of former Soviet-type economies; privatization, stabilization, and institutional change. ECON 472 Transition to Market Economies (3) (BA) This course meets the Bachelor of Arts degree requirements. With the demise of communism in Central and Eastern Europe, former socialist economies are in the process of transition from centrally-planned to market economies. Transition is a comprehensive change, involving all aspects of the economy, including labor markets, capital markets, and the organization of industry, especially privatization. The focus of this course is on the experience of economies in transition and the problems encountered. Special emphasis will be given to the experience of Russia and the other countries of the former Soviet Union. In addition to Central Europe and the former Soviet Union, we will also examine the experience of China. The broad objectives of the course are to provide students with economic analyses of the wide range of issues that arise in considering economies in transition, and to assess the record on transition. The course will examine the following topics: the legacy of central planning; how to organize transition; macroeconomic stabilization in transition economies; privatization; restructuring, ownership change, and improvements in performance; and institutional development and transition. In addition, the concluding section of the course will examine the record transition.

As a 400-level course in economics, this course may be used to meet requirements for the major and for the minor in economics. It requires ECON 302 or ECON 304 (intermediate microeconomic theory and intermediate macroeconomic theory, respectively) as a prerequisite. And the course may be used toward completing a module (area of concentration) in economics in the area of International, Development, and Transition Economics.

Prerequisites: ECON 102 AND ECON 104

Changes Effective Spring 2019:

- Number to 472N
- Description
- Title
- Abbreviated Title
- Add GA Designation
- Add GA Designation
- Add IL Designation
- Add Inter-Domain Designation
- Add Cross-Listing HIST 402N

ENGL 300: Honors Course in English (3-12 Credits: Maximum of 12 Credits) (H) (WF) (BA) Old Listing Effective Through Fall 2018:

Reading, group discussions, and oral and written reports on various specific authors and literary works.

Changes Effective Spring 2019:

- Number to 406M
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

ENGL 302: Honors Seminar in English: Literature After 1800 (3-12 Credits: 12 Credits) (H) (WF) (BA) Old Listing Effective Through Fall 2018:

Reading, group discussions, and oral and written reports on various specific authors and literary works.

Prerequisite: ENGL 015 or ENGL 030; approval of the departmental Honors Committee

Changes Effective Spring 2019:

- Number to 408M
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

ENGL 303: Honors Seminar in English: American Literature & Culture (3-12 Credits: Maximum of 12 Credits) (H) (WF) (BA) Old Listing Effective Through Fall 2018:

Reading, group discussions, and oral and written reports on various specific authors and literary works.

Prerequisite: ENGL 015 or ENGL 030; approval of the departmental Honors Committee
Investigation. The necessity of a rigorous scientific approach will be many of the essential principles and techniques of crime scene philosophy, concepts, and procedures.

FRNSC 410: A Scientific Approach to Crime Scene Investigation (2 Credits)
Old Listing Effective Through Fall 2018:

Principles of crime scene investigation with emphasis on scientific philosophy, concepts, and procedures. FRNSC 410 A Scientific Approach to Crime Scene Investigation (2) In this course, students will learn many of the essential principles and techniques of crime scene investigation. The necessity of a rigorous scientific approach will be stressed. This course uses an intensive, problem-solving style to teach scene management and the recognition, evaluation, enhancement, documentation, control, and collection of physical evidence. Students will be introduced to: * Scene management principles * Search techniques * Techniques to recognize, enhance, document, and collect various types of physical evidence * Communication of procedures and results * Scene reconstruction and its role in a scientific investigation The primary aim of the course is to immerse students in the scientific philosophy, integrity, scene investigation procedures, criminalistics, and role of the criminalist as they relate to scene investigation.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

FRNSC 421: Forensic Molecular Biology (4 Credits) (WF)
Old Listing Effective Through Fall 2018:

Application of biochemistry and molecular biology techniques in forensic analysis. The course will start with a history of forensic biology techniques and move quickly to modern day techniques (e.g., STR serology and DNA analysis. The course will concentrate on the techniques to recognize, enhance, document, and collect various types of physical evidence collected at crime scenes. FRNSC 421W Forensic Molecular Biology (4) Classroom discussions will focus on the application of biochemistry and molecular biology techniques in forensic serology and DNA analysis. The course will start with a history of forensic biology techniques and move quickly to modern day techniques (e.g., STR analysis). Laboratory analysis will include population samples and mock evidence samples. Students will expand their knowledge of population genetics and fine tune their practical laboratory skills. Students will learn about laboratory safety, quality assurance and control, and ethics. They will evaluate results from actual forensic DNA cases, and both discuss how evidence is presented in court and have the opportunity to present their data in mock deposition proceedings. Laboratory exercises will result in the preparation of courtroom ready materials (data, documents, and demonstrations). Many of the classroom discussions will be problem solving exercises designed to emphasize specific applications of laboratory analysis. At the end of the course, students will have a strong understanding of forensic screening techniques and STR analysis of biological evidence, and how to convey their findings in written format. In the laboratory, students will have analyzed different sample types, interpreted DNA profiles, prepared laboratory reports and case files, and
presented the evidence in mock testimony proceedings. As a result, students will have the basic skills necessary to work in a forensic biology crime laboratory. The proposed course is relevant to any science student who has taken B M B 342, 400, and 401, and any student in the Forensic Science major who has an interest in obtaining employment in a local, state or federal law enforcement agency and/or crime laboratory facility. This is a 400-level forensics course that will be required for students in the Forensic Science major who elect to complete the biology option.

Prerequisite: CHEM 213, CHEM 227 and FRNSC411 or CHEM 431W

Changes Effective Spring 2019:

• Number to 421W
• Description
• Prerequisite/Corequisite/Concurrent Courses

FRNSC 427: Forensic Chemistry (4 Credits) (WF)

Old Listing Effective Through Fall 2018:

Analytical and instrumental methods used in the forensic sciences with special emphasis on the analysis and characterization of trace evidence. CHEM (FRNSC) 427W Forensic Chemistry (4) The purpose of this course is to provide students with a rigorous and comprehensive exposure to the techniques and methods used in private, state and federal crime labs in the analysis of trace evidence. The course thoroughly integrates lecture and laboratory activities to explore the history, controversies and current issues related to each topic. The laboratory component incorporates skill-building exercises with open-ended guided-inquiry laboratory exercises and a semester-long laboratory- and literature-based research project. Students work in small groups (2-3 students) to complete each assignment. Students are required to write five research papers during the semester. Four of the reports are linked to the core course topics and the fifth is associated with the semester-long research project. All reports require students to search for and read the relevant published literature. The course is relevant to any student majoring in Forensic Sciences or who has an interest in obtaining employment in a crime lab. The course is required for accreditation through the American Association of Forensic Sciences and is recommended by the National Institute of Justice in their published recommendations for undergraduate curricula in the forensic sciences. The proposed course and the course in Forensic Anthropology/Biology constitute the core 400-level science courses required in the Forensic Sciences major. The course is designed to be rigorous and comprehensive in scope. Grades will be based on in-class lecture examinations (20%), problem sets (10%), laboratory notebooks (15%), laboratory write-ups (30%), and a term project (written and oral presentations; 25%). The writing component for this course includes: maintaining a proper laboratory notebook; five approximately 10-page reports; and an oral poster presentation. All writing elements are reviewed and graded by the instructor and teaching assistants. Students are allowed to correct, or rewrite, and resubmit notebook entries for three separate submissions (notebooks are graded a total of eight times throughout the semester) and the written reports excluding the final project report. Students are required to submit a preliminary poster for a non-graded preview prior to the oral presentation. The writing component of the course accounts for 55% of the total course grade.

Prerequisite: CHEM 213, CHEM 227 and FRNSC411 or CHEM 431W

Cross-Listed Courses: CHEM 427

Changes Effective Spring 2019:

• Number to 427W
• Description
• Prerequisite/Corequisite/Concurrent Courses

JAPNS 120: Japanese Literature in Its Cultural Context (3 Credits) (GH) (IL) (BA)

Old Listing Effective Through Fall 2018:

Japanese literature and film from classical through contemporary times, with attention to changing cultural settings. Taught in English. JAPNS 120 Japanese Literature in Its Cultural Context (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. This course is intended to provide an introduction to the literature of Japan from the seventh century to the postmodern era. Prior study of Japan is not required and materials will be available in English. Students will learn about major eras of Japanese literature and culture, such as the age of the Man'yoshu, the age of the Genji monogatari (The Tale of Genji), the age of No and Kyogen, the age of Wit and Learning, the age of Meiji, the age of industrialization, the postwar years, and postmodernity. The readings will include several genres, such as poetry, folklore, short story, and novel, with an emphasis on prose fiction. The course is structured so that students develop a historical/cultural perspective in order to understand the contexts that have inspired the literary works. By examining literature in its cultural contexts, students will investigate such topics as the relation between social institutions and the individual, the traditional patriarchal system, the changing roles of women, westernization, the Emperor system, and postmodern consumer culture, among others. Students will read literature and related materials from different periods, with occasional presentations of films. Class work includes some lecture but emphasizes guided discussions, group discussions, and students’ presentations. This participatory approach is intended to deepen students' appreciation of the texts, to help them understand value systems that may differ from, or else be shared with, those predominant in modern Western cultures, and to assist students in developing both analytical and expressive abilities. Evaluation will be through means such as in-class presentations, two midterms, one analytic paper (3-7 pages), and in-class participation and discussion. The course is designed to be suitable for all students generally interested in Japan, or interested in various fields of humanistic study, whether or not they have previously studied the culture of Japan. This course is required for the Japanese major. It is designed to count as General Education and as a B.A. "Other Cultures" course. It will be taught once a year with an enrollment of 40-50. This course will be taught in the active-learning mode, featuring both lecture and discussion, including oral presentations, which provides students abundant opportunity for expressing their opinions. Web-based activities may also be included, depending on the instructor. Specifically: Writing, speaking, self-expression: Students will write reaction papers and comprehensive essays (e.g. take-home essay exams), which require the analysis and comparison of various literary works. Opportunity for information gathering, synthesis and analysis in solving problems; A wide range of texts—synchronized and diachronic terms of time and space—will be comparatively analyzed. Students will use the library as well as electronic resources to research texts and authors for their oral presentations and essays. Application of intercultural/ international competence: Students will explore a wide range of texts in Japanese literature and cultures. Students will compare/contrast texts based on cultural and social contexts.

Changes Effective Spring 2019:

• Description
KINES 135: Introduction to Athletic Training (3 Credits)
Old Listing Effective Through Fall 2018:

Foundation of injury recognition and prevention; ethical, legal, and professional issues for the athletic trainer. A laboratory based course. KINES 135 Introduction to Athletic Training provides an overview of the field of athletic training exploring the breadth of athletic training terminology, issues, and injuries. After completing the course, the students will be able to describe the roles of the sports medicine team, understand the legal considerations for the athletic trainer as a health care provider, and identify the basics of physical conditioning and nutrition in reference to injury prevention. Students will be able to describe an emergency action plan for injuries, lightning safety, and provide a basic plan for dehydration and fluid replacement. Students will be able to identify basic use of therapeutic modalities and principles of therapeutic exercise programs. Students will gain an understanding of acute vs. chronic injury conditions and be able to describe the related anatomy, etiologies, pathologies, signs and symptoms, and general treatment and management for injuries of the foot, ankle, lower leg, knee, hip/glute, shoulder, elbow, wrist, hand, cervical spine, and head. A weekly taping laboratory is included and students are provided rationale and demonstrations for specific taping techniques for a variety of injuries. Students are also provided an overview of general medical conditions that may occur in the athletic arena. Students are evaluated through three (3) exams, six (6) quizzes, performance in taping lab and practical exam, development of a medical condition fact sheet and class presentation of the medical condition, in-class assignments, class participation, and class attendance. This course is offered every fall and spring semesters with a maximum enrollment of 35.

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Description
- Add Cross-listing ATHTR 135

KINES 202: Functional Human Anatomy (4 Credits)
Old Listing Effective Through Fall 2018:

In-depth examination of the, musculoskeletal, nervous, cardiovascular, and respiratory systems, and their relationship to human movement.

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Description
- Abbreviated Title
- Add Cross-listing ATHTR 202

KINES 231: Athletic Training Clinical Practice I (3 Credits)
Old Listing Effective Through Fall 2018:

Preparation in basic psychomotor skills required in the clinical practice of athletic training. This is a laboratory fee based course. KINES 231 Athletic Training Clinical Practice I (2) This course is designed to introduce students to basic skills required for the clinical practice of athletic training. The course will teach introductory content and skills related to injury and illness prevention and management. Specific topics include preventing environmental injuries and illnesses, taping and wrapping techniques, protective equipment, preparticipation physical examinations, preparing for emergencies in the athletic setting, and concepts of basic athletic injury management. The course will meet for one hour of lecture and two hours of lab each week. Assessments will include written and practical examinations, homework assignments, and demonstration of practical skills specific to the clinical proficiencies required to sit for the NATABOC exam (must be administered by an NATABOC approved clinical instructor per accreditation guidelines).

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 232: Athletic Training Clinical Practice II (3 Credits)
Old Listing Effective Through Fall 2018:

Athletic Training Clinical Practice II provides instruction in supervised practice of the basic skills required in the practice of athletic training. Topics include documentation of medical records, postural screening, assessment and improvement of flexibility, assessment, and improvement of strength, use of functional rehabilitation protocols, use of common therapeutic modalities, and description of the use of medications in sports medicine. Assessments will include written and practical examinations, homework assignments, and demonstration of practical skills specific to the clinical proficiencies required to sit for the NATABOC exam (must be administered by an NATABOC approved clinical instructor per accreditation guidelines). Students will also complete four-10-hour observations with senior athletic training students. This course provides the student with the opportunity to learn and practice clinical athletic training skills before beginning practicum experiences. The course will meet for 2-hours of lecture and 2-hours of lab each week.

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 233: Emergency Care in Athletic Training (3 Credits)
Old Listing Effective Through Fall 2018:

This course prepares students pursuing the athletic training major in the Department of Kinesiology with the knowledge and skills to respond to medical emergencies. Basic skills including rescue breathing, cardiopulmonary resuscitation, and first aid management of injury and illness emergencies are developed. These skills are supplemented with content related to blood borne pathogens and OSHA regulations needed for personal safety and effective management of athletic training services, the causes and prevention of sudden cardiac death in athletics, and training in the use of automated external defibrillators. The second part of the course focuses on the secondary survey and evaluation and management of central nervous system, musculoskeletal injuries, and shock. The final part of the course addresses conditions of the thorax, abdomen, and musculoskeletal system, environmental hazards encountered in athletics, and drug and alcohol overdoses and poisoning. The course will include the opportunity for professional certification in first aid and cardiopulmonary resuscitation. The course will meet for 2-hours of lecture and 2-hours of lab each week. Assessments will include written examinations, CPR certification (written and practical), blood borne pathogens certification (written), and demonstration of practical skills specific to the clinical proficiencies required to sit for the NATABOC exam (must be administered by an NATABOC approved clinical instructor per accreditation guidelines).
skills specific to the clinical proficiencies required to sit for the NATABOC exam (must be administered by an NATABOC approved clinical instructor per accreditation guidelines)

Changes Effective Spring 2019:
- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 334: Mechanisms and Evaluation of Lower Body Athletic Injuries (3 Credits)
Old Listing Effective Through Fall 2018:

This course will focus on: 1) the etiology of athletic injuries to the lower extremity and lumbosacral spine, and 2) evaluation techniques for assessing athletic injuries to the lower extremity and lumbosacral spine. The objectives of this course include: understanding the mechanisms of athletic injuries to the lower body; demonstrating proficiency in the objective and subjective assessment procedures of lower body athletic injuries; recognizing orthopedic, neurovascular, and medical emergencies associated with lower body athletic injuries; recognizing the normal and abnormal mechanics of the lumbosacral spine and lower extremity including the walking and running gait cycles; and integration of injury mechanisms into the treatment and rehabilitation plan of care for the injured athlete.

Changes Effective Spring 2019:
- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 335: Mechanisms and Evaluation of Upper Body Athletic Injuries (3 Credits)
Old Listing Effective Through Fall 2018:

Etiology of athletic injuries with scientific and practical rationales for evaluation of injuries to upper extremity, neck, head, and trunk. KINES 335 Mechanisms and Evaluation of Upper Body Athletic Injuries (3) This course will focus on: 1) the etiology of athletic injuries to the upper extremity, head, cervical spine, thorax, and abdomen, and 2) evaluation techniques for assessing athletic injuries to the upper extremity, head, cervical spine, thorax, and abdomen. The objectives of this course include: understanding the mechanisms of athletic injuries to the upper body; demonstrating proficiency in the objective and subjective assessment procedures of upper body athletic injuries; recognizing orthopedic, neurovascular, and medical emergencies associated with upper body athletic injuries; recognizing the normal and abnormal mechanics of the cervical spine and upper extremity including the overhead throwing motion; and integration of injury mechanisms into the treatment and rehabilitation plan of care for the injured athlete. This course includes lectures as well as hands-on laboratory sessions. Assessment is based on student performance on written examinations, practical examinations, and written assignments. A literature review paper detailing the pathoetiology of a specific athletic injury is required. This course is required for students completing the athletic training option within the Kinesiology major. It is designed to be taken concurrently with either KINES 395F or 395G. The course is offered every fall semester.

Changes Effective Spring 2019:
- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 336: Medical Aspects of Athletic Training (3 Credits)
Old Listing Effective Through Fall 2018:

Pathology, assessment, and treatment (including pharmacology) of general medical conditions commonly seen in physically active populations. KINES 336 Medical Aspects of Athletic Training (3) This course is designed to instruct students in general medicine content and skills related to the clinical practice of athletic training. Specific topics include pathology; pharmacology; physical examination of head, ears, eyes, nose, throat, pulmonary, cardiovascular, gastrointestinal, renal, genitourinary, and dermatological conditions commonly seen in athletes; exertional heat illness; diabetes and exercise; female athlete triad; injuries in athletes with physical disabilities; and psychosocial aspects of patient-provider relationships. Several lectures will be made by physicians who specialize in sports medicine. Lab activities will include the instruction, practice, and assessment of psychomotor skills related to the course content. The course will meet for three hours per week and will include a balance of both lecture and laboratory activities. Student assessment will include written and practical examinations, homework assignments, and demonstration of practical skills specific to the clinical proficiencies required to sit for the NATABOC exam (must be administered by an NATABOC approved clinical instructor per accreditation guidelines).

Changes Effective Spring 2019:
- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 395F: Practicum in Athletic Training (3 Credits: Maximum of 3 Credits)
Old Listing Effective Through Fall 2018:

KINES 395F Practicum in Athletic Training (3) This course is designed to give students practical experiences in a variety of clinical settings in which certified athletic trainers are commonly employed. Students will accumulate approximately 100-150 clinical hours learning under the supervision of certified athletic trainers in a variety of clinical settings. These settings include but are not limited to: intramural sports, club sports, outpatient sports medicine clinics, high schools, and intercollegiate athletic training rooms. In addition to clinical experiences there is also a didactic portion of this course which emphasizes students gaining proficiency in important clinical skills. There are also weekly written assignments. The objectives of this course include demonstrating proficiency in: the evaluation of an unconscious athlete; the recognition of cerebral concussion and closed head injury; the recognition of acute injury to the cervical spine; the recognition of fractures and dislocations; the assessment of neurovascular function; the recognition, treatment,
and prevention of heat illnesses including heat cramps, heat exhaustion, and heat stroke; the use of splints, stretchers and spine boards in the management of injured athletes; the application of taping and wrapping techniques commonly used in the prevention and management of common athletic injuries; and in obtaining a medical history. Assessment is based on student performance on written examinations, practical examinations, written assignments, and performance in students’ clinical rotations. This course is required for students completing the athletic training option within the Kinesiology major. It is a prerequisite for more advanced athletic training practicums (KINES 395G, 395I, 495F) and it should be taken concurrently with KINES 334 or 335. It is designed to be taken the first semester following admittance to the athletic training option. This course is offered every fall and spring semester.

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Number to 395A
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 395I: Practicum in Athletic Training (3 Credits: Maximum of 3 Credits)

Old Listing Effective Through Fall 2018:

KINES 395I Practicum in Athletic Training (3) This course is designed to provide students didactic and practical clinical experiences in a variety of practice settings in which certified athletic trainers are commonly employed. This is the third clinical assignment after a student is admitted to the Athletic Training option within the Kinesiology major. Students will complete a minimum of 250-300 clock hours under the supervision of a certified athletic trainer in a variety of clinical settings. These settings include but are not limited to: outpatient sports medicine clinics, interscholastic athletic settings, and intercollegiate athletic settings. The objectives of this course include demonstrating proficiency in: assisting lower level students in developing athletic training skills and mastering level-appropriate competencies; demonstrate proficiency in evaluation and documentation of common athletic injuries; assist in the development and documentation of a plan of care for common athletic injuries; demonstrate proficiency in the development and documentation of clinical progression through a plan of care; participate in the application of therapeutic modalities and therapeutic exercise under the supervision of a certified athletic trainer.In this practical experience, the student is required to demonstrate an understanding of the classroom experiences completed to date and as required by the program option up to the current semester. This practicum has a prerequisite requirement of KINES 395G and is a prerequisite for the subsequent athletic training practicum, KINES 495F. Assessment is based on student performance written examinations, practical examinations, written assignments, and performance assessments by supervising athletic trainer(s). The course is designed to be taken the third semester following admittance to the athletic training option. It is offered every fall and spring semester with an enrollment of 15-20 students.

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Number to 495B
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 434: Rehabilitation of Injuries to the Lower Extremities (3 Credits)

Old Listing Effective Through Fall 2018:

Theoretical foundation and laboratory experience in manual therapy techniques and therapeutic exercises for the lower extremities. KINES 434 Rehabilitation of Injuries to the Lower Extremities (3) Rehabilitation of Injuries to the Lower Extremities is a 3-credit course offered each fall semester with an enrollment limit of 40 students. The course provides students who have been accepted into the undergraduate athletic training option in the Department of Kinesiology with the theoretical foundation for application of manual therapy techniques and therapeutic exercises in the treatment of musculoskeletal injuries sustained by physically active individuals. Laboratory instruction and guided practice in performing manual therapy techniques and therapeutic exercises will also be provided. At the end of this course students: 1) can identify five components of a comprehensive plan of care for an injured athlete; 2) have a working knowledge of the effects of therapeutic exercise on tissue repair and return to activity; 3) have a working knowledge of the impact of pain on programs and therapeutic exercise; 4) are able to perform selected manual therapy techniques and integrate them into a comprehensive plan of care; 5) understand the psychological response to injury and therapeutic exercise; 6) can develop a plan of rehabilitation utilizing principles of tissue healing, therapeutic exercise and manual therapy; and 7) instruct patients in home programs of therapeutic exercise. This course will focus on the basic principles of therapeutic exercise and rehabilitation of injuries to the lower extremities. This course will be offered every Fall semester with an anticipated enrollment of 25. Evaluation includes quizzes, rehabilitation plan of care, proficiency notebook, mid-term and final practical exams, and written mid-term and final exams.

Changes Effective Spring 2019:

- Abbreviation to ATHTR
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 435: Rehabilitation of Injuries to the Trunk and Upper Extremities (3 Credits)

Old Listing Effective Through Fall 2018:

Theoretical foundation and laboratory experience in manual therapy techniques and therapeutic exercises for the trunk and upper extremities. KINES 435 Rehabilitation of Injuries to the Trunk and Upper Extremities (3) Rehabilitation of Injuries to the Trunk and Upper Extremities is a 3-credit course offered each fall semester with an enrollment limit of 40 students. The course provides students who have been accepted into the undergraduate athletic training option in the Department of Kinesiology with the theoretical foundation for application of manual therapy techniques and therapeutic exercises in the treatment of musculoskeletal injuries sustained by physically active individuals. Laboratory instruction and guided practice in performing manual therapy techniques and therapeutic exercises will also be provided. At the end of this course students: 1) can identify five components of a comprehensive plan of care for an injured athlete; 2) have a working knowledge of the effects of therapeutic exercise on tissue repair and return to activity; 3) have a working knowledge of the impact of pain on programs of therapeutic exercise; 4) are able to perform selected manual therapy
techniques and integrate them into a comprehensive plan of care; 5) understand the psychological response to injury and therapeutic exercise; 6) can develop a plan of rehabilitation utilizing principles of tissue healing, therapeutic exercise and manual therapy; and 7) instruct patients in home programs of therapeutic exercise. This course will focus on review of the basic principles of therapeutic exercise and rehabilitation on injuries to the trunk and upper extremities. This course is offered every spring semester with an anticipated enrollment of 25. Evaluation methods include quizzes, written and practical exams, rehabilitation plan of care and proficiency notebook.

**Changes Effective Spring 2019:**

- Abbreviation to ATHTR
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

**KINES 436: Therapeutic Modalities in Athletic Training (4 Credits)**

Lecture and laboratory course exploring physiological principles and clinical evidence to the use of therapeutic modalities in athletic training. KINES 436 Therapeutic Modalities in Athletic Training (4) Introduction to Therapeutic Modalities is a 4-credit course offered each spring semester with an enrollment limit of 40 students. The course provides students who have been admitted into undergraduate athletic training option in the Department of Kinesiology with the theoretical foundation for the application of contemporary therapeutic modalities in the treatment of musculoskeletal injuries sustained by athletic individuals. At the end of this course students will: 1) have a working knowledge of the inflammatory response to tissue injury, pain perception and the body's analgesic mechanisms; 2) understand the physical principles of thermal, acoustic, electrical, light and mechanical modalities; 3) understand the physiological response to thermal, acoustic, electrical, light and mechanical modalities; 4) be able to search for and appraise clinically relevant trials involving modality application and; 5) apply these understandings and thermal, acoustic, electrical, light and mechanical modalities in the safe and effective manner. Students are evaluated through written examinations, laboratory examinations and submitted written reviews.

**Changes Effective Spring 2019:**

- Abbreviation to ATHTR
- Abbreviated Title
- Long Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

**KINES 495F: Field Practicum in Athletic Training (3 Credits)**

Participation under supervision in a field practicum.

**Changes Effective Spring 2019:**

- Abbreviation to ATHTR
- Number to 495C
- Abbreviated Title
- Long Title

**MATH 36: Insights Into Mathematics (3 Credits) (BA) (GQ)**

Old Listing Effective Through Fall 2018:

Examples of mathematical applications in many areas including voting theory, fair division, apportionment, and Euler and Hamilton circuits. MATH 36 Insights Into Mathematics (3) (GQ) (BA) This course meets the Bachelor of Arts degree requirements. This course is one of several offered by the Mathematics Department with the goal of helping students from non-technical majors partially satisfy their General Education Quantification (GQ) requirement. In this course, we hope to demonstrate to the students that mathematics is very useful in contemporary problems in our society—from voting theory issues to apportionment of the seats in the U.S. House of Representatives to optimizing the route taken by a delivery person and a variety of other issues. We focus on historical issues related to such contemporary problems and also discuss the merits of various problem-solving techniques throughout the course.

**Changes Effective Spring 2019:**

- Prerequisite/Corequisite/Concurrent Courses
- Description

**MATH 201: Problem Solving in Mathematics II (3 Credits) (GQ)**

Old Listing Effective Through Fall 2018:

A continuation of MATH 200, this course studies the foundations of elementary school mathematics with an emphasis on problem solving. MATH 201 Problem Solving in Mathematics II (3) (GQ) Problem Solving in Mathematics II studies the foundations of elementary school mathematics with an emphasis on problem solving. Mathematical ways of thinking are integrated throughout the study of probability, statistics, graphing, geometric shapes, and measurement. This course is designed for prospective teachers not only to gain the ability to explain the mathematics in elementary school courses, but also to help them comprehend the underlying mathematical concepts. Gaining a deeper understanding will enable them to assist their young students in the classroom since effective mathematical teaching requires understanding what students know, what they need to learn, and then helping them to learn it well.

**Changes Effective Spring 2019:**

- Prerequisite/Corequisite/Concurrent Courses
- Description

**MATH 210: Calculus with Engineering Technology Applications (3 Credits) (BA) (GQ)**

Old Listing Effective Through Fall 2018:

Topics in calculus with an emphasis on applications in engineering technology. MATH 210 Calculus with Engineering Technology Applications (3) is a three-credit course to be taken either after the MATH 81, MATH 82, MATH 83 sequence or after a semester of college-level calculus. The content of the course is geared toward the needs of engineering technology majors and places a large emphasis on technology and applications. The course provides mathematical tools required in the upper division engineering technology courses. A primary goal is to have students use technology to solve more realistic problems than the standard simplistic ones that can be solved by "pencil and paper." Student evaluation will be performed through exams, quizzes,
graded assignments, and a cumulative final exam. It is expected that MTHBD 210 will be offered every semester with an enrollment of 44-80 students.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 220: Matrices (2-3 Credits) (BA) (GQ)
Old Listing Effective Through Fall 2018:

Systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations. MATH 220 Matrices (2-3) (GQ) (BA) This course meets the Bachelor of Arts degree requirements. Systems of linear equations appear everywhere in mathematics and its applications. MATH 220 will give students the basic tools necessary to analyze and understand such systems.

The initial portion of the course teaches the fundamentals of solving linear systems. This requires the language and notation of matrices and fundamental techniques for working with matrices such as row and column operations, echelon form, and invertibility. The determinant of a matrix is also introduced; it gives a test for invertibility. In the second part of the course the key ideas of eigenvector and eigenvalue are developed. These allow one to analyze a complicated matrix problem into simpler components and appear in many disguises in physical problems. The course also introduces the concept of a vector space, a crucial element in future linear algebra courses. This course is completed by a wide variety of students across the university, including students majoring in engineering programs, the sciences, and mathematics. (In case of many of these students, MATH 220 is a required course in their degree program.)

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 220H: Honors Matrices (2-3 Credits) (H) (BA) (GQ)
Old Listing Effective Through Fall 2018:

Honors course in systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations.

MATH 220H Honors Matrices (2) (GQ)(BA) This course meets the Bachelor of Arts degree requirements. This course is intended as an introduction to linear algebra with a focus on solving systems for linear equations. Topics include systems of linear equations, row reduction and echelon forms, linear independence, introduction to linear transformations, matrix operations, inverse matrices, dimension and rank, determinants, eigenvalues, eigenvectors, diagonalization, and orthogonality. The typical delivery format for the course is two 50-minute lectures per week, with typical assessment tools including examinations, quizzes, homework, and writing assignments. In contrast to the non-honors version of this course, the honors version is typically more theoretical and will often include more sophisticated problems. Moreover, certain topics are often discussed in more depth and are sometimes expanded to include applications which are not visited in the non-honors version of the course.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 230: Calculus and Vector Analysis (4 Credits) (BA)
Old Listing Effective Through Fall 2018:

Three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus.

Students who have passed either Math 231 or 232 may not schedule Math 230 or 230H for credit.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 230H: Honors Calculus and Vector Analysis (4 Credits) (H) (BA)
Old Listing Effective Through Fall 2018:

Honors course in three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus. Students who have passed either MATH 231 or 232 may not schedule MATH 230 or 230H for credit. MATH 230H Honors Calculus and Vector Analysis (4) This course is the third in a sequence of three calculus courses designed for students in engineering, science, and related fields. Topics include vectors in space, dot products, cross products; vector-valued functions, modeling motion, arc length, curvature; functions of several variables, limits, continuity, partial derivatives, directional derivatives, gradient vectors, Lagrange multipliers; double integrals, triple integrals; line integrals, Green's Theorem, Stokes' Theorem, the Divergence Theorem. The typical delivery format for the course is four 50-minute lectures per week, with typical assessment tools including examinations, quizzes, homework, and writing assignments. In contrast to the non-honors version of this course, the honors version is typically more theoretical and will often include more sophisticated problems. Moreover, certain topics are often discussed in more depth and are sometimes expanded to include applications which are not visited in the non-honors version of the course.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 231: Calculus of Several Variables (2 Credits) (BA)
Old Listing Effective Through Fall 2018:

Analytic geometry in space; partial differentiation and applications. Students who have passed MATH 230 or MATH 230H may not schedule this course.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 231H: Honors Calculus of Several Variables (2 Credits) (H) (BA)
Old Listing Effective Through Fall 2018:

Honors course in analytic geometry in space; partial differentiation and applications. Students who have passed MATH 230 or MATH 230H may not schedule this course. MATH 231H Honors Calculus of Several Variables (2) This course covers a subset of the material found in MATH 230. Topics include vectors in space, dot products, cross products; vector-valued functions, modeling motion, arc length, curvature; functions of several variables, limits, continuity, partial derivatives, directional derivatives, gradient vectors, Lagrange multipliers. The typical delivery format for the course is two 50-minute lectures per week, with typical assessment tools including examinations, quizzes, homework, and writing assignments. In contrast to the non-honors version of this course, the honors version is typically more theoretical and will often
include more sophisticated problems. Moreover, certain topics are often discussed in more depth and are sometimes expanded to include applications which are not visited in the non-honors version of the course.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 232: Integral Vector Calculus (2 Credits) (BA)
Old Listing Effective Through Fall 2018:
Multidimensional analytic geometry, double and triple integrals; potential fields; flux; Green's, divergence and Stokes' theorems.

Students who have passed MATH 230 may not schedule this course for credit.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 250: Ordinary Differential Equations (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
First- and second-order equations; special functions; Laplace transform solutions; higher order equations. Students who have passed MATH 251 may not schedule this course for credit.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 251: Ordinary and Partial Differential Equations (4 Credits) (BA)
Old Listing Effective Through Fall 2018:
First- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 251H: Honors Ordinary and Partial Differential Equations (4 Credits) (H) (BA)
Old Listing Effective Through Fall 2018:
Honors course in first- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations. MATH 251H Honors Ordinary and Partial Differential Equations (4) This course serves as an introduction to ordinary and partial differential equations. Topics include various techniques for solving first and second order ordinary differential equations, an introduction to numerical methods, solving systems of two ordinary differential equations, nonlinear differential equations and stability, Laplace transforms, Fourier series, and partial differential equations. The typical delivery format for the course is four 50-minute lectures per week, with typical assessment tools including examinations, quizzes, homework, and writing assignments. In contrast to the non-honors version of this course, the honors version is typically more theoretical and will often include more sophisticated problems. Moreover, certain topics are often discussed in more depth and are sometimes expanded to include applications which are not visited in the non-honors version of the course.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 310: Elementary Combinatorics (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Fundamental techniques of enumeration and construction of combinatorial structures, permutations, recurrences, inclusion-exclusion, permanents, 0, 1- matrices, Latin squares, combinatorial designs.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 310H: Honors Concepts of Combinatorics (3 Credits) (H) (BA)
Old Listing Effective Through Fall 2018:
Description: Honors version of elementary and enumerative combinatorics.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 311W: Concepts of Discrete Mathematics (3-4 Credits) (WF) (BA)
Old Listing Effective Through Fall 2018:
Introduction to mathematical proofs; elementary number theory and group theory. Students who have passed CMPSC 360 may not schedule this course for credit.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 312: Concepts of Real Analysis (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
An introduction to rigorous analytic proofs involving properties of real numbers, continuity, differentiation, integration, and infinite sequences and series.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 312H: Honors Concepts of Real Analysis (3 Credits) (H) (BA)
Old Listing Effective Through Fall 2018:
Basic methods of mathematical thinking and fundamental structures, primarily in the context of infinite sets, real numbers, and metric spaces.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 405: Advanced Calculus for Engineers and Scientists I (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Vector calculus, linear algebra, ordinary and partial differential equations. Students who have passed MATH 411 or 412 may not take this course for credit.

Changes Effective Spring 2019:
MATH 411: Ordinary Differential Equations (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Linear ordinary differential equations; existence and uniqueness questions; series solutions; special functions; eigenvalue problems; Laplace transforms; additional topics and applications.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses

MATH 412: Fourier Series and Partial Differential Equations (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Orthogonal systems and Fourier series: derivation and classification of partial differential equations; eigenvalue function method and its applications; additional topics. MATH 412 Fourier Series and Partial Differential Equations (3) (BA) This course meets the Bachelor of Arts degree requirements. The purpose of MATH 412 is to introduce students to the origins, theory, and applications of partial differential equations. Several basic physical phenomena are considered – including flows, vibrations, and diffusions – and used to derive the relevant equations. The fundamentals of the mathematical theory of partial differential equations are motivated and developed for the students through the systematic exploration of these classic physical systems and their corresponding equations: the Laplace, wave, and heat equations. In addition to treating the physical origins of the equations, this course focuses on solving evolution equations as initial value problems on unbounded domains (the Cauchy problem), and also on solving partial differential equations on bounded domains (boundary value problems). There is not one but many techniques for solving these equations, and the course presents some aspect of the expansion in orthogonal functions (including Fourier series), eigenvalue theory, functional analysis, and the use of separation of variables, Fourier transforms, and Laplace transforms to solve PDEs by converting them to ordinary differential equations. This course currently serves a cross-section of the usual plane to the projective plane, with “points at infinity,” homogeneous coordinates, and projective transformations. The main part of the course turns to equations of degree 3 and their singularities, flex points, tangents, and degeneracies. Several new ideas, both algebraic and analytic, are brought in to prove the existence of complex flex points on singular cubics and then real flex points on nonsingular real cubics. There is then a classification on complex projective cubics by a single parameter and finally a full classification of all real projective cubics. As time permits, relations to further topics are sketched: addition of points on a nonsingular cubic, Mordell’s theorem, doubly periodic functions, and Fermat’s last theorem. The course is typically taken by mathematics majors.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses

MATH 416: Stochastic Modeling (3 Credits)
Old Listing Effective Through Fall 2018:

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses

MATH 417: Qualitative Theory of Differential Equations (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Linear differential equations, stability of stationary solutions, ordinary bifurcation, exchange of stability, Hopf bifurcation, stability of periodic solutions, applications. MATH 417 Qualitative Theory of Differential Equations (3) (BA) This course meets the Bachelor of Arts degree requirements. The main objective of the course is the qualitative theory of ordinary differential equations such as existence and uniqueness of solutions, dependence on initial data and parameters, and basic stability of solutions for both linear and nonlinear equations. It is designed to introduce students to modern concepts including the bifurcation theory, intermittent (transitional) and chaotic behavior of solutions and dynamical system approach to differential equations. Along the way, a number of applications are discussed and students get familiar with some basic examples illustrating main principles of the theory, such as Lorenz attractor, predator-prey models, etc. The course is completed by students majoring in engineering programs, the sciences, and mathematics.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses

MATH 421: Complex Analysis (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Infinite sequences and series; algebra and geometry of complex numbers; analytic functions; integration; power series; residue calculus; conformal mapping, applications.

Changes Effective Spring 2019:
- Prerequisite/Corequisite/Concurrent Courses

MATH 437: Algebraic Geometry (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Study of curves in the plane defined by polynomial equations p(x,y)= 0. Projective equivalence, singular points, classification of cubics. MATH 437 Algebraic Geometry (3)(BA) This course meets the Bachelor of Arts degree requirements. The geometric study of algebraic equations is one of the oldest and deepest parts of mathematics, and it lies at the heart of modern developments in geometry, algebra, number theory and physics. Students completing MATH 437 will understand many new algebraic and geometric ideas by studying examples of curves defined by equations of degrees 2 and 3 in the plane. First come conics (given by equations of degree 2 in two variables). Rigid motions, similarities, and affine transformations give different classifications of them. New ideas then show how to get a conic through any five points and prove Pascal’s theorem about six points on a conic. Special cases suggest extension of the usual plane to the projective plane, with “points at infinity,” homogeneous coordinates, and projective transformations. The main part of the course turns to equations of degree 3 and their singularities, flex points, tangents, and degeneracies. Several new ideas, both algebraic and analytic, are brought in to prove the existence of complex flex points on singular cubics and then real flex points on nonsingular real cubics. There is then a classification on complex projective cubics by a single parameter and finally a full classification of all real projective cubics. As time permits, relations to further topics are sketched: addition of points on a nonsingular cubic, Mordell’s theorem, doubly periodic functions, and Fermat’s last theorem. The course is typically taken by mathematics majors.
MATH 448: Mathematics of Finance (3 Credits)
Old Listing Effective Through Fall 2018:

The course provides a foundational knowledge of the mathematics and mathematical models of finance, primarily of option pricing, hedging, and portfolio optimization. The topics include the definition of various financial securities and instruments (e.g., bonds, stocks, forward contracts, and options), the theory of interest, the No-Arbitrage Principle, measures of return and volatility, the Markowitz model of portfolio theory, the Capital Asset Pricing Model, the pricing of forward contracts, option trading strategies, the pricing of options via binomial models and the Black-Scholes model, and principles of hedging.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 455: Introduction to Numerical Analysis I (3 Credits) (BA)
Old Listing Effective Through Fall 2018:

Floating point computation, numerical rootfinding, interpolation, numerical quadrature, direct methods for linear systems. Students may take only one course for credit from MATH 451 and MATH 455.

Prerequisite: CMPSC201 , CMPSC202 , or CMPSC121 ; MATH 220 ; MATH 230 or MATH 231
Cross-Listed Courses: CMPSC 455

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 468: Mathematical Coding Theory (3 Credits) (BA)
Old Listing Effective Through Fall 2018:

Shannon's theorem, block codes, linear codes, Hamming codes, Hadamard codes, Golay codes, Reed-Muller codes, bounds on codes, cyclic codes.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MATH 484: Linear Programs and Related Problems (3 Credits) (BA)
Old Listing Effective Through Fall 2018:

Introduction to theory and applications of linear programming; the simplex algorithm and newer methods of solution; duality theory.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MICRB 201: Introductory Microbiology (3 Credits)
Old Listing Effective Through Fall 2018:

Elementary principles of microbial and viral structure, reproduction, genetics and physiology; relationship to food, water, soil, industrial and disease processes. MICRB 201 Introductory Microbiology (3) MICRB 201, Introductory Microbiology, is a survey course that touches on the full range of topics generally considered to fall within the scope of microbiology. After a short overview of the origins of microbiology and the ways in which forms of life too small to be seen with the naked eye can be studied, the course launches into the following basic topics: 1) the tree of life and the position of microbes in the biological world, 2) structure and function of the bacterial cell as compared with plant and animal cells, 3) microbial nutrition and growth, 4) molecular biology and gene regulation in microbes, 5) microbial genetics, 6) an overview of microbial classification and diversity, and 7) the principles of how microbes interact with their environment. Unlike the standard sections of MICRB 201, the honors course then moves on to an integrated description of microbial diversity and ecology in association with topics such as carbon metabolism, energy acquisition and utilization including photosynthesis, and the environmental impacts of microbial utilization of inorganic chemicals. This is followed by a section concerning eukaryotic or non-bacterial microbes, a section concerning the use of microbes in industry, and then a basic overview of viruses and how they work. The last part of the course deals with microbial interactions with other organisms with an emphasis on their interactions with man. This starts with a discussion of how microbial growth can be controlled, and then the
Using this Bulletin

various kinds of relationships that can exist between microbes and other organisms are covered. This is followed by a section on immunology or the mechanisms animals possess to defend themselves against potentially harmful microbes. The final section concerning a broad range of microbially-caused diseases is preceded by a description of microbial analysis in the clinical or medical laboratory as well as a discussion of how disease-causing microbes are spread in animal populations. MICRB 201H is taught so as to emphasize the impact of microbes on our everyday lives. One way this is accomplished is by class presentations made by small groups of students on topics of current interest in the community at large. Students also write a term paper that can involve any aspect of microbiology using an article from the popular press as their starting point. All students are also required to make a short in-class presentation in which they provide an overview of their term paper. While much of the instruction involves the standard lecture format, classroom discussion is encouraged at all times.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MICRB 202: Introductory Microbiology Laboratory (2 Credits)
Old Listing Effective Through Fall 2018:
Qualitative and quantitative techniques with regard to recognition of bacteria and their processes on a microscopic, colonial, and physiological basis.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

MICRB 401: Microbial Physiology and Structure (3 Credits)
Old Listing Effective Through Fall 2018:
Physiology and structure of bacteria important in microbiological research. Designed for science majors.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MICRB 410: Principles of Immunology (3 Credits)
Old Listing Effective Through Fall 2018:
Theories of immunity; focuses on the basis for the acquired immune response at the organ, cell, and molecular levels.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Cross-Listed Course
- Description

MICRB 412: Medical Microbiology (3 Credits)
Old Listing Effective Through Fall 2018:
Characteristics, methods of identification, and pathogenesis of bacteria that cause human disease; principles of disease dynamics and control.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

MICRB 415: General Virology: Bacterial and Animal Viruses (3 Credits)
Old Listing Effective Through Fall 2018:
The interaction of different types of viruses with bacterial and animal cells, including mechanisms of infection and viral synthesis.

MICRB 415 General Virology: Bacterial and Animal Viruses (3) General Virology: Bacterial and Animal Viruses covers the interactions of different types of viruses with animal and bacterial cells, emphasizing molecular and genetic concepts of viral infection and viral replication. Students are expected to apply basic concepts of microbiology as well as molecular and cell biology to understanding selected viral life cycles, particularly at the molecular level. Lectures are augmented by in-class discussion and homework assignments. Typically, students are evaluated by two hourly exams and a final exam that assess their knowledge of virology and their ability to apply basic concepts of gene expression and cell biology to explaining viral life cycles. This course builds on the common requirements of MICRB 201 and B M B (MICRB) 251/252. The instruction expands into the cellular and molecular bases of viral life cycles with regular reference to and comparison with cellular and molecular biology of uninfected cells. The content of this course complements those on the basic mechanisms of gene expression (B M B 400) and prepares the student for understanding the molecular basis of viral pathogenesis covered in B M B/MICRB/V SC 435.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Cross-Listed Course
- Description

MICRB 421W: Laboratory of General and Applied Microbiology (3 Credits) (WF)
Old Listing Effective Through Fall 2018:
Laboratory exercises demonstrating fundamental techniques and principles of experimentation of general and applied microbiology.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

MICRB 422: Medical Microbiology Laboratory (2 Credits)
Old Listing Effective Through Fall 2018:
Laboratory exercises demonstrating properties and classification of medically important microorganisms and techniques used in their identification.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

MICRB 447: Laboratory in Molecular Immunology (1 Credit)
Old Listing Effective Through Fall 2018:
LABORATORY IN MOLECULAR TECHNIQUES TO ASSAY ANTIGENS, ANTIBODIES, AND RECEPTOR SITES.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description
NUTR 495: Advanced Field Experience in Nutrition (1-6 Credits: Maximum of 6 Credits)  
Old Listing Effective Through Fall 2018:

Supervised off-campus, non-group instruction including individual field experiences, practicums or internships. Written and oral critique of activity is required.

Changes Effective Spring 2019:

• Credits
• Description
• Prerequisite/Corequisite/Concurrent Courses

PHYS 211H: General Physics: Mechanics (4 Credits) (H) (BA) (GN)  
Old Listing Effective Through Fall 2018:

Calculus-based study of the basic concepts of mechanics: motion, force, Newton's laws, energy, collisions, rotation, and oscillations. PHYS 211H General Physics: Mechanics (4) (GN)Calculus-based introduction to classical mechanics, including such topics as: measurement, dimensional analysis, motion in one-dimension, vectors, motion in 2 and 3 dimensions, relative and circular motion, force and dynamics, Newton's Laws, friction, kinetic energy, work, potential energy, energy conservation, systems of particles, center of mass and momentum, elastic and inelastic collisions, rotation (moments of inertia), rolling motion, torque, angular momentum, static equilibrium, gravitational force and Kepler's laws, gravitational potential energy, oscillations, waves (transverse and longitudinal, superposition of waves). In contrast to the non-honors version, PHYS 211H typically makes more frequent use of higher level mathematical concepts and involves the solution of more sophisticated problems. A number of topics are considered in more depth, and these often focus on connections of the material to real-life science or engineering applications.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description
• Abbreviated Title

PHYS 212: General Physics: Electricity and Magnetism (4 Credits) (BA) (GN)  
Old Listing Effective Through Fall 2018:

Calculus-based study of the basic concepts of electricity and magnetism. PHYS 212PHYS 212 General Physics: Electricity and Magnetism (4) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Calculus-based introduction to classical electricity and magnetism, including such topics as: electric charge and electric fields, Gauss's law, electric potential, capacitance, current, resistance, and circuits, magnetic fields, and fields due to currents, induction and inductance, magnetism of matter, Maxwell's equations, and electromagnetic oscillations. This course is designed to provide students with a working knowledge of the elementary physics principles mentioned above, as well as their applications, and to enhance their conceptual understanding of physical laws.

Students attend two lectures, one recitation session, and one two-hour lab/activity period per week. Use of a combination of computer-based and traditional lab exercises is expected and collaborative learning exercises will be used in both lab and recitation settings. The introduction of data acquisition and analysis methods (often making use of modern computer tools) will be stressed in the laboratory/activity period. Course evaluation is based on a combination of regular homework sets and/or quizzes, reports from the lab/activity period, midterm and final exams and other evaluative tools. The course is an important prerequisite for later work in many science and engineering disciplines.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description
• Abbreviated Title

PHYS 212H: General Physics: Electricity and Magnetism (4 Credits: Maximum of 4 Credits) (H) (BA) (GN)  
Old Listing Effective Through Fall 2018:

Calculus-based study of the basic concepts of electricity and magnetism.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description
• Abbreviated Title

PHYS 213: General Physics: Fluids and Thermal Physics (2 Credits) (BA) (GN)  
Old Listing Effective Through Fall 2018:

Calculus-based study of the basic concepts of fluids and sound, heat, kinetic theory, and entropy. PHYS 213PHYS 213 General Physics: Fluids and Thermal Physics (2) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Calculus-based introduction to the basic concepts of fluids and sound, heat, kinetic theory, and entropy, including such topics as: fluid mechanics and motion, sound Waves: speed, harmonic waves, intensity, temperature and heat: thermal expansion, heat capacity, conduction and radiation, kinetic theory of gases: First Law of Thermodynamics, internal energy of a gas, heat capacities, adiabatic expansion, entropy and the Second Law: concept of equilibrium and entropy, heat engines, efficiency of heat engines and refrigerators, introduction to statistical mechanics. This course is designed to provide students with a working knowledge of the elementary physics principles mentioned above, as well as their applications, and to enhance their conceptual understanding of physical laws. Students attend one lecture and one two-hour recitation/lab/activity period per week. Use of a combination of computer-based and traditional lab exercises is expected and collaborative learning exercises will be used in both lab and recitation settings. The introduction of data acquisition and analysis methods (often making use of modern computer tools) will be stressed in the laboratory/activity period. Course evaluation is based on a combination of regular homework sets and/or quizzes, reports from the lab/activity period, midterm and final exams and other evaluative tools. The course is an important prerequisite for later work in many science and engineering disciplines.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses
• Description
• Abbreviated Title

PHYS 214: General Physics: Wave Motion and Quantum Physics (2 Credits) (BA) (GN)  
Old Listing Effective Through Fall 2018:


Calculus-based study of the basic concepts of wave motion, geometrical optics, interference phenomena, photons, wave mechanics, and the structure of matter. PHYS 214 PHYS 214 General Physics: Wave Motion and Quantum Physics (2) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Calculus-based introduction to the basic concepts of wave motion, geometrical optics, interference phenomena, photons, wave mechanics, and the structure of matter, including such topics as: electromagnetic waves: Poynting Vector, polarization and reflection, geometrical optics: mirrors, refraction, lenses, optical instruments, interference and diffraction, photons and matter waves, energy quantization, structure of matter: hydrogen atom, conduction of electrons in solids, and nuclear physics and nuclear energy. This course is designed to provide students with a working knowledge of the elementary physics principles mentioned above, as well as their applications, and to enhance their conceptual understanding of physical laws. Students attend one lecture and one two-hour recitation/lab/activity period per week. Use of a combination of computer-based and traditional lab exercises is expected and collaborative learning exercises will be used in both lab and recitation settings. The introduction of data acquisition and analysis methods (often making use of modern computer tools) will be stressed in the laboratory/activity period. Course evaluation is based on a combination of regular homework sets and/or quizzes, reports from the lab/activity period, midterm and final exams and other evaluative tools. The course is an important prerequisite for later work in many science and engineering disciplines.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

PHYS 230: Introduction to Relativity (3 Credits)

Old Listing Effective Through Fall 2018:

Introduction to special and general relativity including space-time diagrams and relativistic kinematics, length contraction, time dilation, equivalence principles, curved space and cosmology. PHYS 230 Introduction to Relativity (3) This course is designed for science or engineering students who have successfully completed calculus-based physics courses through electricity and magnetism (PHYS 212), and differential and integral calculus (MATH 140 and 141). Co-requisites of linear algebra (MATH 220) and vector calculus (MATH 230 or 231) are required. This course should provide the student with a mathematical and physical understanding of relativity theory beyond that which one encounters in semi-popular treatments of the subject. The mathematical skills which this course will develop, e.g. tensors and tensor analysis, should be especially useful to students in a wide range of science and engineering fields from computer science to physics and electrical engineering.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

PHYS 250: Introductory Physics I (4 Credits) (BA) (GN)

Old Listing Effective Through Fall 2018:

Selected topics in mechanics, heat, and sound. PHYS 250 Introductory Physics I (4) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Algebra-based introduction to classical mechanics, including such topics as one- and two-dimensional motion, vectors, relative and circular motion, force and dynamics, Newton’s laws of motion, work and kinetic energy, potential energy and energy conservation, momentum, rotational motion and angular velocity, static equilibrium and properties of materials, static and moving fluids, vibrations, simple harmonic motion, general properties of waves, sound and human hearing, temperature and kinetic theory, heat and calorimetry, and the basic laws of thermodynamics. This course is designed to provide students with a working knowledge of the elementary physics principles mentioned above, as well as their applications to everyday phenomena and to the life sciences, to enhance their conceptual understanding of physical laws, and to increase their problem solving abilities especially as applied to physical systems. The mathematical prerequisites for this course (and the subsequent PHYS 251) are mathematics at the level of algebra and trigonometry, demonstrated by suitable coursework or demonstration of satisfactory performance on the mathematical proficiency exam. Students attend two lectures, one recitation session, and a two-hour lab/activity per week. Students perform laboratory experiments, discuss their results, and write up their conclusions in weekly lab reports. Course evaluation is based on a combination of homework, quizzes, lab reports, midterm and final exams, and other evaluative tools. The course is a prerequisite for the second semester continuation, PHYS 251.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

PHYS 251: Introductory Physics II (4 Credits) (BA) (GN)

Old Listing Effective Through Fall 2018:

Selected topics in light, electricity, and magnetism. PHYS 251 Introductory Physics II (4) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Algebra-based introduction to classical electricity and magnetism, optics, and areas of modern physics, including such topics electric charge and fields, electrical potential and energy, electric currents and resistance, direct current (DC) circuits, magnetism, electromagnetic induction and applications to devices, electromagnetic waves, light and geometrical optics, wave nature of light, basic optical instruments (microscopes, telescopes, etc.), basics of quantum mechanics, applications of quantum theory to atoms, molecules, and solids, nuclear physics and radioactivity, applications of nuclear energy and radiation. This course is designed to provide students with a working knowledge of the elementary physics principles mentioned above, as well as their applications to everyday phenomena and to the life sciences, to enhance their conceptual understanding of physical laws, and to increase their problem solving abilities, especially as applied to physical systems. The mathematical prerequisites for this course (and the prerequisite PHYS 250) are mathematics at the level of algebra and trigonometry, demonstrated by suitable coursework or demonstration of satisfactory performance on the mathematical proficiency exam. Students attend two lectures, one recitation session, and a two-hour lab/activity per week. Students perform laboratory experiments, discuss their results, and write up their conclusions in weekly lab reports. Course evaluation is based on a combination of homework, quizzes, lab reports, midterm and final exams, and other evaluative tools. The course is a continuation of the first-semester course, the newly renumbered PHYS 250.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses
- Description

PHYS 400: Intermediate Electricity and Magnetism (3-4 Credits)

Old Listing Effective Through Fall 2018:
Electrostatics and magnetostatics in vacuum; electrical and magnetic properties of matter; electrodynamics, Maxwell’s equations, conservation laws, electromagnetic waves and radiation. PHYS 400 Intermediate Electricity and Magnetism I (3-4) A second undergraduate course in electricity and magnetism, required of all physics majors who typically take it in their fifth or sixth semester. The course includes a review of vector calculus, and in-depth discussions of electrostatics, magnetostatics, in vacuum and in matter, time-varying electric and magnetic fields and electrodynamics, leading to Maxwell’s equations. Discussions of conservation laws for charge, energy, and momentum, electromagnetic waves (in vacuum and in matter and at boundaries), electromagnetic vector and scalar potentials and fields, and an introduction to radiation are included.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 402: Electronics for Scientists (4 Credits)
Old Listing Effective Through Fall 2018:

Circuit and network theory; active devices; amplifiers; introduction to digital electronics; noise theory. PHYS 402 PHYS 402 Electronics for Scientists (4)A junior-senior theory/laboratory course providing a survey of modern electronics from a data acquisition and analysis point of view. One of several possible lab-based courses taken by physics majors in several options to satisfy a lab requirement, typically taken by physics majors in their senior year. This course is very useful for students interested in experimental research work and includes examples such as digital data acquisition, the lab study of various electronic devices, fast Fourier transform methods and other topics.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 410: Introduction to Quantum Mechanics I (3-4 Credits)
Old Listing Effective Through Fall 2018:

Basic postulates; Schrodinger wave equation; stationary states; variational method; scattering in one dimension; orbital angular momentum; hydrogen atom; numerical methods.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 419: Theoretical Mechanics (3 Credits)
Old Listing Effective Through Fall 2018:

Principles of Newtonian, Lagrangian, and Hamiltonian mechanics of particles with applications to vibrations, rotations, orbital motion, and collisions. PHYS (MATH) 419 Theoretical Mechanics (3) A second course in classical mechanics, required of all physics majors who typically take it in their 5th or 6th semester. The course includes a review of relevant mathematics, detailed discussions of advanced topics in Newtonian mechanics, introductions to Lagrangian and Hamiltonian dynamics, and applications to such forced oscillations, orbital motion, vibrational motion and normal modes, rigid body motion, and collisions. It is a prerequisite for Physics 461, which is a second semester extension. It is also a valuable background for most 400-level physics courses, especially Physics 410.

Cross-Listed Courses: MATH 419

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 420: Thermal Physics (3 Credits)
Old Listing Effective Through Fall 2018:

Basic postulates of statistical mechanics and thermodynamics, microscopic quantum states and macroscopic parameters; partition functions; Maxwell-Boltzmann and quantum statistics.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 430: Introduction to Computational Physics (3 Credits)
Old Listing Effective Through Fall 2018:

This course will cover basic techniques for writing computational simulations of systems of interest to physicists. The course will aim to provide tools and techniques necessary for simulating initial value problems, chaotic systems, particle distributions on a grid or in the continuum, random processes (Monte Carlo), phase transitions, and numerical solution of equations. Numerical techniques which will also be covered include numerical differentiation (ordinary and partial differential equations), numerical integration, Fourier transforms, linear and nonlinear fitting, root finding, plotting and data presentation. Physical systems to study can include chaotic pendulum motion, diffusion driven motion, the Ising spin model, and dilute gas molecular dynamics. Students will learn to simulate multiple physical systems, and analyze their simulated data using multiple numerical techniques in order to compare their results to expected theoretical behavior. Students’ competency in simulation, analysis and presentation of simulated results will be assessed through independently designed programming projects using learned techniques.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 457: Experimental Physics (1-3 Credits: Maximum of 3 Credits)
Old Listing Effective Through Fall 2018:

Selected experiments in various fields of physics. PHYS 457 Experimental Physics (1-3)An intermediate laboratory course, required of all Physics majors and taken by students, typically in their junior/senior years, this course provides an introduction to modern laboratory techniques and instrumentation used in research labs. Typical ‘short’ experiments include X-ray diffraction, Compton scattering, velocity of light determination, high-temperature superconductors, Raman scattering, Hall effect, scanning tunneling microscopy (STM), and many others, as well as long experiments. This three-credit course also serves as the writing intensive course at the 400-level for most physics majors. One- and two-credit versions of 457 (without the writing-intensive component) are taken by science and education students outside of physics.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

PHYS 458: Intermediate Optics (4 Credits)
Old Listing Effective Through Fall 2018:

Geometrical and physical optics: theory of lens systems, aberrations, apertures, interference, diffraction, polarization. PHYS 458 PHYS 458 Intermediate Optics (4) An intermediate optics course which builds on the
wave and optics used in the 200-level introductory course, this course (which includes a lab component) focuses on physical and geometrical optics, propagation of light and its interaction with matter, polarization, interference, and diffraction. Optical components such as lenses, mirrors, prisms, fiber optics, spectrometers, and interferometers are discussed and employed. The laboratory component includes a number of 1-2 period experiments designed to illustrate the principles of applied geometrical and physical optics. Longer (5 period) experiments are also included which utilize modern, computer-controlled multi-channel detection systems and are applied to such systems as thin-film optics and the optics of semi-conductors.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

**PHYS 479: Special and General Relativity (3 Credits) (BA)**

Old Listing Effective Through Fall 2018:

Mathematical description, physical concepts, and experimental tests of special and general relativity. MATH (PHYS) 479 Special and General Relativity (3) This course is intended as an elective course (within the undergraduate Physics program) for Physics majors to be taken in their senior year. Intended to be cross-listed with MATH, it can also be used in support of a Mathematics minor and, in some options, within the Math program as a program elective as well. The course significantly expands upon the introduction to Special Relativity (SR) seen in PHYS 237, including discussions of experimental tests of SR and applications to relativistic mechanics. It then introduces students to the mathematical machinery required to understand General Relativity (GR), starting with the description of curved spacetimes and geodesics. It discusses solutions to the Einstein equations and surveys the classic tests which established the validity of General Relativity. It concludes with applications of GR in such areas as black hole physics, the generation and detection of gravitational waves, other topics (such as cosmology, relativistic astrophysics, etc.).

Cross-Listed Courses: MATH 479

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

**PHYS 495: Internship (1-18 Credits: Maximum of 18 Credits)**

Old Listing Effective Through Fall 2018:

Supervised off-campus, nongroup instruction including field experiences, practica, or internships. Written and oral critique of activity required.

Changes Effective Spring 2019:

- Prerequisite/Corequisite/Concurrent Courses

**PT 270W: Pathophysiology (3-4 Credits) (WF)**

Old Listing Effective Through Fall 2018:

Introduction medical and post-operative conditions and/or disease states most frequently treated by physical therapy interventions. P T 270W Pahtophysiology (3) This course is an introduction to the study of diseases and those conditions most often treated by Physical Therapy methods. Basic signs, symptoms, causes, and processes of disease and conditions will be covered. The course is designed to give the PTA student a working knowledge of the physiology of disease states in order to prepare the student to think and speak intelligently with patients and other health professionals regarding diseases and conditions commonly seen in physical therapy and their diagnoses, progression, and treatments. Areas of study in the course may include, but are not limited to, the history of pathophysiology, diagnostic methods, infection and healing, metaplasia, mental health, genetic and congenital disorders, and disorders of the following systems: cardiovascular, respiratory, musculoskeletal, nervous, integumentary, endocrine, blood and lymphatics. The student’s knowledge of pathophysiology will be assessed in the course using any or all of the following tools: written examination, student presentations, written term papers, special projects and assignments. This course is a prerequisite for P T 250, P T 260, P T 280, P T 280W, and P T 395E. Prerequisites for this course are a grade of C or better in BIOL 141, BIOL 142 and P T 100 and P T 384 courses. The course is offered once per calendar year at each campus. Expected enrollment is 20-45 students. This is a writing intensive course that will include instructor written evaluation and feedback of student’s writing. The student writing will be specific to the Physical Therapy discipline and include multiple and varied assignments. Writing will be a factor in the final grade for this course. Class size, frequency of offering, and evaluation methods will vary by location and instructor. For these details, check the specific course syllabus.

Changes Effective Spring 2019:

- Credits
- Description
- Prerequisite/Corequisite/Concurrent Courses

**PT 280W: Rehabilitation (4-5 Credits) (WF)**

Old Listing Effective Through Fall 2018:

This course provides the theoretical basis and clinical practice skills used in the assessment and intervention for patients with neuromuscular, functional, and cognitive impairments. P T 280W Rehabilitation (4) Students will learn and develop skills in the rehabilitation treatment of patients with diseases or conditions frequently seen in physical therapy. Students are expected to be able to recognize normal and abnormal gait patterns of patients diagnosed with the diseases/conditions studied. In the laboratory sessions, students practice mobility skills as they related to the pathologies studied. Students learn to treat patients in the orthopedic and neurological populations. To achieve these objectives, students will be involved in lectures, laboratory activities, audiovisual material, and utilization of information from professional literature. Attainment of educational objectives will be determined via written exams and laboratory practical exams. Basic principles utilized in this course have been learned in P T 100. The anatomical and neurological foundations have been presented in BIOL 129 and P T 270. Instruction of patients in and the performance of rehabilitation activities are a foundation in physical therapy. This is a writing intensive course that will include instructor written evaluation and feedback of student’s writing. The student writing will be specific to the Physical Therapy discipline and include multiple and varied assignments. Writing will be a factor in the final grade for this course. Prerequisites for this course are a grade of C or better in BIOL 141, BIOL 142, P T 150, P T 160, P T 270, P T 384, and P T 395. This course is a prerequisite for P T 395F and P T 395G. This course is offered once per calendar year and may be offered in two parts over the course of two semesters. Expected enrollment is 20-45 students, with a limit of 15 students in a given lab section. Class size, frequency of offering, and evaluation methods will vary by location and instructor. For these details, check the specific course syllabus.
• Credits
• Description
• Prerequisite/Corequisite/Concurrent Courses

PT 282W: Rehabilitation-2W (3 Credits) (WF)
Old Listing Effective Through Fall 2018:
Examination of techniques and laboratory experiences in rehabilitation techniques for the physically-challenged.

Changes Effective Spring 2019:
• Abbreviated Title
• Description
• Prerequisite/Corequisite/Concurrent Courses

RHS 300: Introduction to Rehabilitation and Human Services (3 Credits)
Old Listing Effective Through Fall 2018:

Description: Disability, public and private rehabilitation agencies, case management; resources for training; observations in rehabilitation settings.

Changes Effective Spring 2019:
• Description
• Prerequisite/Corequisite/Concurrent Courses

SC 401: Basic Science and Disease (1 Credit)
Old Listing Effective Through Fall 2018:
Clinical aspects of various disease and how basic scientific information contributes towards understanding and treating disease. SC 401 Basic Science and Disease (1) The purpose of this course is to provide students with some general background on the symptoms, risk factors, prevention, and treatment of various diseases. Along with the clinical aspects of the diseases, we examine how basic scientific research studies contribute information towards helping to understand the mechanisms underlying disease development and control. This one-credit course is targeted to all students that have a general interest in health and science, and may include students in the following majors: premedicine, science, biology, chemistry, biochemistry and molecular biology, forensic science, biobehavioral health nursing, kinesiology and nutrition. Enrollment priority is given to students with fourth semester or above status. Examples of topics discussed are: Hypertension, Osteoporosis, Infectious Diseases, Asthma, Chronic Obstructive Pulmonary Disease, Cancer, Diabetes, Sickle Cell Anemia/Anemia, Blood Disorders, Hypercoagulability, Coronary Artery Disease, Alcoholism/Alcohol Poisoning, HIV/AIDS, Tuberculosis, Irritable Bowel Syndrome, Hepatitis, Thyroid Disease, Congestive Heart Failure, Parkinson's Disease, and Arthritis This course is structured as a seminar. Most lectures are powerpoint presentations by invited speakers, which usually will be local physicians sometimes paired with Penn State research faculty. The speakers introduce the disease topic by discussing the basic anatomy and physiology of the system or body part most affected by the disease. (e.g. lungs, heart, kidneys, etc). Once the foundation is established the pathophysiology is discussed. Risk factors and prevention are also highlighted. One important goal of each seminar is to indicate to students how advances in basic science research can impact the understanding and treatment of disease. Students are encouraged to ask questions after the lecture. The speaker(s) remain afterwards to allow students to ask more specific questions about the disease topic. On occasion, speaker physicians also talk about their medical school training and/or life as a practicing physician.

The students that enroll in this course receive a letter grade based on attendance (students must attend 9 out of 10 classes), quizzes and a 2-3 page reaction paper on one of the disease topics. Random short-answer quizzes are sometimes administered at the end of a seminar, testing on information presented during the seminar. Also, reading assignments are sometimes given prior to a seminar, or information handout materials are provided during the seminar. If a student needs to miss class due to an evening exam they need to fill out an Excused Absence Form, which can be obtained from the instructor (no other activities are excusable except for athletic competitions for students in varsity sports).

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses

SRA 440: Security and Risk Analysis Capstone Course (3 Credits) (WF)
Old Listing Effective Through Fall 2018:
The Security and Risk Analysis Capstone course is designed to provide IST students enrolled in the SRA major to experience a semester-long security and risk problem-solving experience, providing realistic security dilemmas requiring a solution process that is well suited for teamwork and collaboration. SRA 440W Security and Risk Analysis Capstone Course (3) This course is designed to provide IST seniors enrolled in the SRA major to experience a semester-long security and risk analysis scenario or problem-solving exercise by providing realistic analytic dilemmas requiring solutions that incorporate facets of the three SRA Options. The problems selected for the Capstone should lend themselves to team collaboration and group solutions.

Changes Effective Spring 2019:
• Number to 440W
• Abbreviated Title
• Description
• Prerequisite/Corequisite/Concurrent Courses

STAT 319: Applied Statistics in Science (3 Credits) (BA)
Old Listing Effective Through Fall 2018:
Statistical inference: principles and methods, estimation and testing hypotheses, regression and correlation analysis, analysis of variance, computer analysis. Students who have passed MATH(STAT) 415 may not schedule this course for credit.

Cross-Listed Courses: MATH 319

Changes Effective Spring 2019:
• Prerequisite/Corequisite/Concurrent Courses

STAT 380: Data Science Through Statistical Reasoning and Computation (3 Credits)
Old Listing Effective Through Fall 2018:
A case study-based course in the use of computing and statistical reasoning to answer data-intensive questions. STAT 380 Data Science Through Statistical Reasoning and Computation (3) This course addresses the fact that real data are often messy by taking a holistic view of statistical analysis to answer questions of interest. Various case studies will lead students from the computationally intensive process of obtaining and cleaning data, through exploratory techniques, and finally to rudimentary inferential statistics. This process will exploit students’ exposure to introductory statistics as well as the R programming
language—hence the required prerequisites—yet novel computing and analytical techniques will also be introduced throughout the course. For the collection of data, students will learn scripting and database querying skills; for their exploration, they will employ R capabilities for graphical and summary statistics; and for their analysis, they will build upon the basic concepts obtained in their introductory statistics course. The varied case studies will elucidate additional statistical topics such as identifying sources of bias and searching for high-dimensional outliers. A possible textbook for this course is Data Science in R: A Case Studies Approach to Computational Reasoning and Problem Solving (2015) by Deborah Nolan and Duncan Temple Lang.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 414: Introduction to Probability Theory (3 Credits)
Old Listing Effective Through Fall 2018:

STAT 414 / MATH 414 is an introduction to the theory of probability for students in statistics, mathematics, engineering, computer science, and related fields. The course presents students with calculus-based probability concepts and those concepts can be used to describe the uncertainties present in real applications. Topics include probability spaces, discrete and continuous random variables, transformations, expectations, generating functions, conditional distributions, law of large numbers, central limit theorems. Most students are recommended to sequentially take MATH 230 or MATH 231 prior to STAT414 / MATH 414, although the alignment of the topics in each class permit concurrent enrollment. Students may take only one course from STAT 414 / MATH 414 and STAT 418 / MATH 418.

Prerequisite: Prerequisite or Concurrent: MATH 230 OR MATH 231
Cross-Listed Courses: MATH 414

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 415: Introduction to Mathematical Statistics (3 Credits)
Old Listing Effective Through Fall 2018:

A theoretical treatment of statistical inference, including sufficiency, estimation, testing, regression, analysis of variance, and chi-square tests.

Cross-Listed Courses: MATH 415

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 416: Stochastic Modeling (3 Credits)
Old Listing Effective Through Fall 2018:

Description: Review of distribution models, probability generating functions, transforms, convolutions, Markov chains, equilibrium distributions, Poisson process, birth and death processes, estimation.

Cross-Listed Courses: MATH 416

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 440: Computational Statistics (3 Credits)
Old Listing Effective Through Fall 2018:

Topics related to computing in statistics, including numerical linear algebra, optimization, simulation, numerical integration, and bootstrapping. STAT 440 Computational Statistics (3)This course introduces many important ideas in statistical computing. Students are expected to possess knowledge of mathematical statistics at the level of STAT 415 and matrices at the level of MATH 220. Students will learn the statistical computing environment called R and use R to implement many of the theoretical computing topics, which include numerical linear algebra, optimization, numerical and Monte Carlo integration, random number generation and simulation, and bootstrapping. Other statistical and mathematical software may be treated briefly, including symbolic mathematics environments like Mathematics and Maple.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 460: Intermediate Applied Statistics (3 Credits)
Old Listing Effective Through Fall 2018:

Review of hypothesis testing, goodness-of-fit tests, regression, correlation analysis, completely randomized designs, randomized complete block designs, latin squares.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 461: Analysis of Variance (3 Credits)
Old Listing Effective Through Fall 2018:

Description: Analysis of variance for single and multifactor designs; response surface methodology.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 462: Applied Regression Analysis (3 Credits)
Old Listing Effective Through Fall 2018:

Introduction to linear and multiple regression; correlation; choice of models, stepwise regression, nonlinear regression.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 463: Applied Time Series Analysis (3 Credits)
Old Listing Effective Through Fall 2018:

Identification of models for empirical data collected over time; use of models in forecasting. STAT 463 Applied Time Series Analysis (3) This course covers many major topics in time series analysis. Students will learn some theory behind various time series models and apply this theory to multiple examples. An introduction to time series and exploratory data analysis will be followed by a lengthy study of several important models, including autoregressive, moving average, autoregressive moving average (ARMA), autoregressive integrated moving average (ARIMA), and seasonal models. For each model methods for parameter estimation, forecasting, and model diagnostics will be covered. Additional topics will include spectral techniques for periodic time series, including power spectra and the Fourier transform, and one or more miscellaneous topics chosen by the instructor, such as forecasting methods, transfer function models, multivariate time series...
methods, Kalman filtering, and signal extraction and forecasting. The use of statistical software will be a central component of this course, as will the proper interpretation of computer output. Students enrolling for this course are assumed to have taken a semester-long course on regression.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 464: Applied Nonparametric Statistics (3 Credits)
Old Listing Effective Through Fall 2018:

Tests based on nominal and ordinal data for both related and independent samples. Chi-square tests, correlation.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 466: Survey Sampling (3 Credits)
Old Listing Effective Through Fall 2018:

Introduction to design and analysis of sample surveys, including questionnaire design, data collection, sampling methods, and ratio and regression estimation. STAT 466 Survey Sampling (3)This course covers classical sampling design and analysis methods useful for research and management in many fields. Topics include design of questionnaires; methods of data collection, sample-survey designs including simple random sampling, stratified sampling, cluster sampling, and systematic sampling ratio, regression, and difference estimation; two-stage cluster sampling; population size estimation; methods for dealing with nonresponse; and possibly other topics at the discretion of the instructor. Statistical software will be used to apply many of the techniques covered by this course.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

STAT 470: Problem Solving and Communication in Applied Statistics (3 Credits) (WF)
Old Listing Effective Through Fall 2018:

This is a capstone course intended primarily for undergraduate statistics majors in their last semester prior to graduation. The course is designed to reinforce problem solving and communication skills through development of writing ability, interaction with peers and the SCC, statistical consulting center (SCC), and oral presentations. Course objectives are tailored to the needs of each cohort and may include the application of statistical reasoning to real-world problems and case studies, recognition or recommendation of appropriate experimental designs, proficient use of ANOVA & GLMs with understanding of associated modeling assumptions, ability to identify concerns about the use or interpretation of statistical models in context, and both written and verbal communication of statistical findings.

Changes Effective Spring 2019:

• Prerequisite/Corequisite/Concurrent Courses

• Number to 470W

WMNST 100: Introduction to Women's and Gender Studies (3 Credits) (GS) (US) (IL) (BA)
Old Listing Effective Through Fall 2018:

Interdisciplinary consideration of the scholarly theories and research pertaining to women’s experiences and women’s status in contemporary American society.

Changes Effective Spring 2019:

• Abbreviated Title
• Description

WMNST 100H: Introduction to Women's and Gender Studies (3 Credits) (H) (US) (IL) (BA)
Old Listing Effective Through Fall 2018:

Changes Effective Spring 2019:

• Number to 100U, Abbreviated Title, Description

Course Changes: Effective Summer 2019

AAAS 3: Scholarship and Community (1 Credit)
Old Listing Effective Through Spring 2019:

Introduction to college life for new students in a designated residential community to help them optimize their Penn State experience.

Changes Effective Summer 2019:

• Abbreviation to AFAM

AGBM 101: Economic Principles of Agribusiness Decision Making (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

Introduction to economic principles and their application to real world examples of agribusiness management issues.

Changes Effective Summer 2019:

• Abbreviated Title
• Description

AGBM 170: Investigating the U.S. Food System: How food moves from field to table (3 Credits) (US)
Old Listing Effective Through Spring 2019:

Our food system is a product of complex interaction of three systems: the natural ecosystem, the managed agricultural system, and the socioeconomic system. Farming, food processing, food distribution, and consumption decisions are all governed by the interaction of these systems. Consequences of these decisions, along with the interactions themselves, have generated a number of overarching scientific and social “hot-button” topics that affect or are affected by the food system: > genetically modified organisms (GMOs), > organic crops and food, > agricultural and food policy, > bio-based energy and biofuels, > environmental implications from agriculture, > food safety, > the role of agribusiness, > animal welfare rules and regulations, > food labeling, > diet and health, > agricultural trade and international development, and > food insecurity and food access. Students in this course will investigate and discuss all of these topics by reading both popular press accounts and peer-reviewed academic research, and by hearing guest speakers from a variety of fields and academic disciplines. However, to provide additional relevance, the course will use specific foods or crops to provide a more concrete examination of these topics. For each of these specific foods, the class will explore and answer seven important where, how, and why questions: (i) Where is the crop grown and why? (ii) How is it grown, and why is it grown the way it is? (iii) What policies affect production
and/or consumption? (iv) How does this food get to consumers? (v) What role do agribusinesses such as food processors and food retailers play? (vi) What role do consumers and consumer groups play? (vii) Are alternative production or marketing systems available? In general, most of these questions will be answered in a social science framework that includes business, economics, and sociology. However, exploring these simple questions will lead to new questions, and the class will have the freedom to explore these questions as deeply as possible. Individual foods or crops examined will include tomatoes, bananas, spinach/lettuce, corn, apples, oranges, poultry/eggs, beef, and pork. These foods or crops represent both fresh and processed foods, as well as both domestically and internationally grown foods. While these foods and crops will be discussed individually, a thorough understanding of the food system will require comparing the answers to the seven questions for multiple foods. Therefore, at least twice during the semester, as understanding builds, the class will pause, and try to evaluate the food system. Finally, when attempting to answer the seven main questions for each of the individual foods and crops, the class will explore the context of current U.S. cultural attitudes and beliefs, and when possible, a cultural history.

Changes Effective Summer 2019:
- Abbreviated Title
- Description
- Add General Education Designation GS

**AGECO 121: Plant Stress: It's Not Easy Being Green (3 Credits) (BA)** (GN)
Old Listing Effective Through Spring 2019:

The many hazards faced by plants and the dynamic ways that plants respond to these problems are examined.

Changes Effective Summer 2019:
- Description

**AMST 103: American Masculinities (3 Credits) (US) (GH)**
Old Listing Effective Through Spring 2019:

Introduction to aspects of masculinities and manhood in America. AMST 103 American Masculinities (3) (GH;US)This course examines aspects of masculinities and manhood in America from a variety of perspectives. It views American manhood through the lens of gender, and presents ideas on the ways that issues of masculinity and sexuality enter, or have entered, discourses of politics, literature, and medicine, among others. It takes up discussion of the varieties of masculinities in American experience across regions, ethnicities, and religions. Students will view these forms of masculinities in different media, including folklore, media, advertising, art, and literature.

Changes Effective Summer 2019:
- Abbreviated Title
- Description

**AMTH 8: Aztecs, Mayas, and Incas (3 Credits) (IL) (BA) (GS)**
Old Listing Effective Through Spring 2019:

Comparative survey of the development of the pre-Columbian Latin American civilizations. AMTH 8 Aztecs, Mayas, and Incas (3) (GS;IL) (BA) This course meets the Bachelor of Arts degree requirements. AMTH 8 is a general survey of three great New World civilizations the Aztecs and the Maya of Mesoamerica (southern Mexico and northern Central America), and the Inkas of the Central Andes of South America. Both the Aztec and the Inka empires were thriving in the 16th century when Europeans arrived, and are known in almost ethnographic detail from oral and written records. Maya civilization matured much earlier — between AD 250-900, and is known primarily through archaeological research, but also through the lens of the New World’s only sophisticated writing system. Course information emphasizes the nature of these societies, analysis and interpretation of their basic institutions, their religions and world views, and their culture histories. Central to the presentation is the degree to which modern Latin American cultures and populations have deep cultural and biological roots in the PreColumbian past, and many ethnographic models are discussed. Within the context of each segment sociological concepts such as “institution”, “household”, “stratification”, “political economy”, “urbanization”, and a host of others are used as organizing features. Issues of gender, ethnicity, and class structure are also discussed. At the end of each semester, time permitting, issues such as the peopling of the Americas, the origins of agriculture, and some of the spectacular pre-Aztec cultures of Mesoamerica are also reviewed. Specific examples of how archaeologists design and carry out research are included, including several in which members of the Anthropology Department have been involved. In addition to lectures, much visual material will be presented, including telecourse programs recently produced under the direction of Anthropology Department faculty. Evaluation will consist of 3-6 museum or web-based writing assignments worth 15-30% of the grade. There will be two mid-term
examinations and one final examination worth 70-85% of the grade. Although this is a large course, exams are hand-written and graded, and require a mix of objective and subjective responses. Each exam has an essay component. This course serves as a useful precursor to ANTH 422 (Mesopotamian Ethnography and Archaeology), ANTH 424 (Andean Ethnography and Archaeology), ANTH 456 (Cultural Ecology), and has a companion course on the Old World—ANTH 9—and the two are often taken as a linked pair by students. ANTH 008 also prepares students for courses in other departments where broad-based comparisons of ancient civilizations or archaeological methods are of concern. This course can fulfill elective credits for anthropology majors and minors. ANTH 8 also may be used to fulfill three credits of General Education in the Social/Behavioral Sciences for the Bachelor of Arts requirement or three credits of Other Cultures in the Social/Behavioral Sciences for the Bachelor of Arts requirement. It can also serve as three credits toward the university requirement for United States and International Cultures Competence.

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title

ANTH 9: Rise of Civilization in the Old World (3 Credits) (IL) (GS)

Old Listing Effective Through Spring 2019:

Evolution of Old World complex societies, especially the first great civilizations of Mesopotamia, Egypt, China, and the Indus Valley. ANTH 9 Rise of Civilization in the Old World (3) (GS, IL)(BA) This course meets the Bachelor of Arts degree requirements. ANTH 9 is an introductory anthropology course with several major themes and purposes. Most fundamental are the origins and development of the earliest complex human societies—what we conventionally call civilizations—in the Old World, namely those of Mesopotamia, Egypt, the Indus Valley, and China. Course information emphasizes the nature of these societies, analysis and interpretation of basic institutions, their religions and world views, and their culture histories. Within the context of each segment sociological concepts such as “institution”, “household”, “stratification”, “political economy”, “urbanization”, and a host of others are used as organizing features. Issues of gender, ethnicity, and class structure are also discussed, and much information is presented in weeks 2 and 3 that is pertinent to an understanding of human biological variation and our cultural attitudes toward it, with obvious implications for issues of race. The course is much broader, however, in that it attempts to place the emergence of these ancient civilizations into the overall perspective of the larger evolutionary career of the human species in the Old World, including human biological and cultural evolution during the later stages of the Paleolithic, the origins and spread of early agriculture, etc. During the first part of the course there is also a series of introductory lectures designed to inform students about what archaeology is and how prehistoric archaeologists carry out scientific research to reconstruct and explain what happened in the past. A great deal of emphasis is placed on ideas, concepts, and theories used by anthropological archaeologists to design and interpret their research and to explore not only what happened in the past, but to develop ideas about why things happened as well. Also included are lectures about archaeological finds or issues that have been particularly well publicized and about which students often express considerable curiosity. The main objectives are a) to expose students to a series of historically significant non-modern, non-Western societies and cultures using overtly evolutionary, behavioral, and sociological perspectives; b) to enlighten students concerning the kinds of extant information are available for these societies, how research is designed to acquire new data, and how scholar’s interpret these data, and c) to stress the nature of the agrarian human condition out of which modern societies so recently emerged, and under which people in many developing societies still live. Central to the latter are issues of subsistence agriculture and human demography. Central to ANTH 9 are comparisons among several great Old World civilizations, comparisons with other world civilizations and cultures, and comparisons with modern society. Also inherent in the course are extensive discussions of geographic and ecological variation and human adaptation to both. The very deep time depth exposes students to societies very different from our own, including social and cultural forms that have no direct analogs in the modern world. A final intent is to make students understand basic concepts such as biological and cultural evolution, as well as a host of more restricted ones, such as “institution”, “household”, “stratification”, “political economy”, “urbanization”, and a host of others that are all used to organize presentations. Issues of gender, ethnicity, and class structure are also discussed. Evaluation will consist of 3-6 museum or web-based writing assignments worth 15-30% of the grade. There will be two mid-term examinations and one final examination worth 70-85% of the grade. Although this is a large course, exams are hand-written and graded, and require a mix of objective and subjective responses. Each exam has an essay component. This course parallels ANTH 8, its New World counterpart. It serves as a useful precursor to ANTH 456 (Cultural Ecology), and also for courses in other departments where broad-based comparisons of ancient civilizations or archaeological methods are of concern, or where (as in CAMS) more specialized courses in Egyptian archaeology, etc., are offered.

Changes Effective Summer 2019:

- Number to 9N
- Description
- Add B.A. Humanities Designation
- Add General Education Designations GH and Inter-Domain

ANTH 21: Introductory Biological Anthropology (3 Credits) (GN)(BA)

Old Listing Effective Through Spring 2019:

The role of human biology and evolution in culture, society, and behavior. ANTH 21 Introductory Biological Anthropology (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. “Introduction to Biological Anthropology” is designed to present to the student the basic principles and findings of human population biology. To that end, the instructors review data on biological variability among contemporary human populations and among the extensive fossils that document human evolution. Comparison between human and nonhuman animals, particularly, the surviving nonhuman primates, provides an essential “Zoological Perspective” by which we can understand the origins and evolution of humankind on this planet. The single unifying concept in biological anthropology is evolution. In this course, the student will be introduced to the mechanisms underlying evolution and their application to past and present human populations. Evolutionary biology emphasizes the similarity between closely related forms, for example, chimpanzees and humans share more traits in common than do dogs and humans, because they have a more recent common ancestor. It also underscores the diversity among individuals in a population, for example, despite being members of the same species, all humans are biologically unique. The process of evolution accounts for both the similarities and the differences within and between populations. It is therefore the theory
of evolution that will organize the diverse content of this course. There are two lectures per week. In addition, there is a weekly practicum class where the student explores material presented in lectures as well as learns new information. Exercises and hands-on demonstrations help the student understand the principles and findings of biological anthropology. Brief written practicum exercises often based on team projects foster interactive learning. Grades are based on three examinations and practicum exercises. This course is one of three core-courses required of majors and minors in the Department of Anthropology. The course can be used to fulfill three credits of General Education in the Natural Sciences. Students can expect to acquire a general introduction to the University as an open community of researchers and scholars who attempt to describe accurately, and hence understand, “The Human Condition.” Students in this class will therefore have the opportunity to explore their responsibilities as members of an intellectual community of free inquiry. This course offers the student the opportunity to develop intellectual relationships with faculty, graduate students and fellow classmates who share similar academic interests in biological anthropology and related fields of inquiry.

Changes Effective Summer 2019:

- Description

ANTH 22: Humans as Primates (3 Credits) (GN)
Old Listing Effective Through Spring 2019:

The biological basis of human behavior within the context of primate biology, behavior, and evolution. ANTH 22 Humans as Primates (3) (GN)Humans as Primates is intended to introduce the student to the biological bases of human anatomy and behavior by drawing comparisons to the behavior and biology of our closest living relatives, the non-human primates. The principal goal of the course is to critically evaluate arguments concerning what uniquely makes us human and the role of genetics, environment, and evolutionary history on the development of human behavior and anatomy. The course will draw heavily on studies of living non-human primates as well as evolutionary theory, paleoanthropology, and psychology to address issues such as human growth and development, diet, human variation, communication, intelligence, reproduction, aggression, and culture. Humans as Primates is divided into four main thematic units each designed to present a set of related lessons exploring the role of biology in various aspects of human life. The first unit provides the foundation for the course by introducing the place of humans in the natural world. This unit presents a survey of living primates and their relationship to humans as well as an overview of evolutionary processes and human evolution. The other units present topics in human biology, communication, and social behavior focusing specifically on topics of importance to current events and aspects of popular culture and modern life. This course should be of significant interest to students in a diversity of disciplines including the biological and social sciences as well as anyone interested in human behavior. The course will rely on readings from the scientific and popular literature and will present information using a variety of formats including images, movies, and interactive activities. Students will be evaluated with a combination of frequent online quizzes, individual assignments, participation in online discussions. The course can be used to fulfill three credits of General Education in the Natural Sciences. As such this course will help students understand how scientific information from a variety of disciplines can be used to investigate and understand human biology and behavior. The course will introduce the student to methods of data collection and analysis, foster critical thinking skills, and provide a rich background for understanding human diversity, human biology, and behavior. Students will have the opportunity to synthesize information from a broad range of disciplines to develop a fuller understanding of the biological basis of human behavior.

Changes Effective Summer 2019:

- Description

ANTH 45U: Cultural Anthropology (3 Credits) (H) (US) (IL) (GS) (BA)
Old Listing Effective Through Spring 2019:

Beginnings of human culture; economic life, society, government, religion, and art among traditional peoples. ANTH 45U Cultural Anthropology (3) (GS;US;IL) (H) Cultural anthropology is the study of human cultural evolution across time and space. This course will be a survey of basic issues, concepts and methods in cultural anthropology. We will consider specific issues such as: the organization of production and distribution; consumption patterns; age and gender relations, family organization, belief systems, social inequality, and cultural change. Throughout, we will be evaluating different approaches to understanding cultural diversity and we will make cross-cultural comparisons to understand cultural behaviors. We will draw examples from around the world to broaden our understanding of cultural experiences and adaptations in different contexts. This honors course will include external case studies and audio-visual materials to complement the readings. Compared to regular introductory anthropology courses, the size of this honors course will allow more opportunities for the students to engage in classroom discussions.

Changes Effective Summer 2019:

- Number to 45Q
- Abbreviated Title
- Long Title
- Description
- Add B.A. Humanities Designation
- Add General Education Designations GH and Inter-Domain

ANTH 146: North American Indians (3 Credits) (US) (BA) (GS)
Old Listing Effective Through Spring 2019:

An introduction to the cultures of the indigenous peoples of North America, north of Mexico, and the effect of contact. The course will allow more opportunities for the students to engage in classroom discussions.

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title
- Add IL Designation

ARTH 130: Art of Africa, Oceania, and the Americas (3 Credits) (US) (IL) (BA) (GA)
Old Listing Effective Through Spring 2019:

A selective overview of the indigenous art of Africa, Oceania and the Americas. ART H 130ART H 130 African, Oceanic, and Native American Art (3) (GA;US;IL) (BA) This course meets the Bachelor of Arts degree requirements. Art History 130 provides a selective introduction to major developments and issues in African and Oceanic art. The beginning of this course will concentrate upon the art and architecture of selected regions of Africa, during the pre-colonial, colonial, and post-colonial periods. This will be followed by a discussion of the traditional arts of Oceania in Polynesia, Micronesia, Melanesia, and Australia. The course will conclude with an introduction to the Pre-Columbian art and
architecture of the Americas and art from the Eastern Woodlands, Great Plains, the Southwest and Pacific Northwest of North America. Art will be examined within its cultural and social contexts. Special attention will be given to the role that art serves in a culture’s religion, rituals, ceremonies, political structure, gender roles, and ethnic identity. The impact of the West upon the art of these regions, both in colonial and post-colonial contexts, will be a reoccurring issue in this course. The actual time devoted to each topic and the sequence of topics will vary from instructor to instructor. The objective of the course is to introduce students to diversity in art. In so doing, negative stereotypes associated with traditional notions of the “primitive” will be challenged. Also, the course emphasizes visual analysis and critical thinking. The course requirements will consist of exams and a paper. As a general education course, this class provides an introduction to African and Oceanic art for students of any major. The course has no prerequisites, and presumes no prior exposure to art history. On the other hand, students majoring in Art History will learn vocabulary, methodology, and theory that is not only basic to the field, but which will also broaden their knowledge of the discipline as a whole.

Changes Effective Summer 2019:

• Description

ARTH 304: Italian, Spanish, and Spanish Colonial Baroque Art and Architecture (3 Credits) (IL) (BA) (GA)
Old Listing Effective Through Spring 2019:

A survey of painting, sculpture, and architecture in Italy, Spain, and the Spanish Americas from 1600-1750. ARTH 304 Southern Baroque Painting (3)(GA:IL)(BA) This course meets the Bachelor of Arts degree requirements. Art History 304 concentrates on the art of Italy, Spain, and the Spanish Colonial from 1600-1750. Discussion will concentrate on what constitutes the baroque and its interpretation in each geographic area as well as issues such as patronage, primary sources, iconography, and historical context. The class will begin with the indications of the new Baroque in Italy during the 1580’s and proceed to Spain and the Spanish Colonial World. The course is designed to meet two principal goals. The first is to increase students’ powers of visual analysis and help them build a critical vocabulary for discussing an art object’s medium, composition, style, and iconography. The second is to foster an understanding of the deep implication of the visual arts in their social and cultural contexts. The course therefore involves significant material relating to political, economic and religious issues. It investigates problems in patronage, function, reception and censorship. It considers such intra- and cross-cultural issues as representations of religious vision, court politics, and social status. Requirements include exams and at least one paper. As a general education course in the arts, this course provides an introduction to Baroque Art for a student of any major. This course has no prerequisite, and presumes no prior exposure to fine art. Students majoring in Art History will learn in it both the common vocabulary of the field and the outlines of the field that form the foundation for future study.

Changes Effective Summer 2019:

• Number to 204
• Title
• Description

ASIA 120: South Asia: A Literary History (3 Credits) (WF) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

The course traces the cultural history of South Asia by studying its literary tradition from ancient to modern times. ASIA 120Y South Asia: A Literary History (3) (GH:IL)(BA) This course meets the Bachelor of Arts degree requirements. Asian 120Y provides undergraduate students a taste of the inherent pluralism of South Asian culture and the readings emphasizing the broad idea of plurality. The readings and discussions may include, but not necessarily remain confined to a) architectural b) literacy c) musical etc. traditions, depending on the research interests of the individual faculty members teaching the course. Asian Studies undergraduates should be able to recognize both the richness of diversity, as well as the nature of the continuity of the cultural tradition in South Asia that has fascinated outsiders for centuries.

Changes Effective Summer 2019:

• Number to 120Y
• Title
• Description

BA 100: Introduction to Business (3 Credits) (GS)
Old Listing Effective Through Spring 2019:

A comprehensive view of the contemporary environment of business. BA 100 Introduction to Business (3) (GS)This course provides a broad overview of the study of business and its environment, organization, operation, and interrelationships with government and society. Topic areas include; economic systems, forms of business ownership, information, accounting, finance, management, and marketing principles, legal and regulatory environments, business ethics and international business. A student majoring in business will develop a broad basis for further study in a specific area in business, while other majors will become familiar with the American enterprise system and the functions and issues facing business today.

Changes Effective Summer 2019:

• Abbreviated Title
• Description

CAMS 1: Greek and Roman Literature (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Selected readings within a chronological and thematic context of significant and influential masterworks of Greece and Rome. CAMS 001
Greek and Roman Literature (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course provides an introduction to the most important literary genres of Greek and Roman literature, which form the basis for Western literature. Content and emphasis may vary each time the course is offered, depending on whether the syllabus concentrates on Greek literature, Roman literature, or a combination of the two. Typically the course surveys Greek or Roman literature or examines a general topic in greater depth such as “Homer and the Tragic Vision,” “Greek and Roman Drama,” “Greek and Roman Epic,” “Greek and Roman Prose,” or “Love in Roman Literature.” The course’s primary objective is to promote an understanding of major literary themes and rhetorical conventions, especially within ancient Mediterranean contexts (literary, oral, or historical). Students will learn how to read texts critically, by gathering information and developing methods of interpretation. They will become familiar with the different cultural assumptions that underpin ancient Greece and Rome. And they will be asked to demonstrate their newly acquired understanding of Greek and Roman literature through a variety of exercises, which aim to develop their skills in writing and speaking. Evaluation methods may take the form of periodic quizzing or testing, with an emphasis on writing coherent short paragraph answers and longer essays; additionally, students may be evaluated through oral presentations, classroom discussion or participation, the writing of short to medium length papers (1-7 pp.), and group projects that aim at collaborative learning. CAMS 001 is an introductory course that may be credited toward every Classics and Ancient Mediterranean Studies major, option, and minor. CAMS 001 is also a General Education course in the Humanities (GH).

Changes Effective Summer 2019:

• Description

CAMS 45H: Classical Mythology (3 Credits) (H) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Introduction to Greek and Roman divinities, heroes and heroines; survey of the major myths and their influence on Western culture.

CAMS 045 Classical Mythology (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. The aim of CAMS 045 is to introduce students to the stories that have shaped western art and civilization for a longer time and more profoundly than any others: the myths of ancient Greece and Rome. It is a common assumption that the ancients needed myth because they had no science, and that the birth of science was the death of myth. We beg to differ. A recurring theme of this course is that while science has replaced myth to explain how the world works, myth has always played several other roles in human experience, and continues to do so. Even today myth is everywhere: in literature, the performing arts, and the visual arts, in both high and popular culture. Myth reveals truths about our humanity, and it reaches people at a gut level—which is why it is still of vital interest to novelists, theologians, psychologists, politicians, ad agents, poets, and scriptwriters. The course has several objectives. First and foremost, we want students to come to know, appreciate, and enjoy the myths themselves, by reading them directly in English translations of ancient epics, dramas, and other literary works. Second, we hope that students will come to appreciate the pervasiveness of myth, and its power, not just in past cultures, but also in other cultures throughout the world as well as our own. Third, central to the course are the significant differences between classical antiquity and modern Western societies including the contrast between Polytheistic Paganism and Judeo-Christian Monotheism. The differences in values and practices such as the attitudes toward human sexuality, general relations, slavery, and socioeconomic relations are also discussed. This course will provide valuable experience in the fundamental skills requisite for success both in the University and the workplace: reading, writing, and research. Examples of the evaluation methods may include: a five-page paper, which will be critiqued and returned for correction and rewriting before receiving a final grade, carried out collaboratively with three or four other students, and a group project involving library research and the creation of a WWW-based exhibition of a mythological theme.

Changes Effective Summer 2019:

• Description

CAMS 45H: Classical Mythology (3 Credits) (H) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Introduction to Greek and Roman divinities, heroes and heroines; survey of the major myths and their influence on Western culture.

Changes Effective Summer 2019:

• Description

CAMS 102: Canaan and Israel in Antiquity (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Political, social, and intellectual history of the land of Canaan/Israel in the Biblical era: Late Bronze and Iron Ages. CAMS (HIST/J ST/RL ST) 102 Canaan and Israel in Antiquity (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. From the domestication of animals and the dawn of agriculture to the development and socialization of monotheism, the world of the first civilizations led to that of the Bible and ancient Israel. This course, involving a critical view of Biblical texts in light of other ancient sources, archaeology and historical methods, explains the nature and the evolution of society, religion and thought in the Biblical era. Learn how civilization arose, and how the state appropriated religion and applied it for its purposes. How the science of administration developed and deployed ideological tools to further its own ideas of the West developed. This course is deeply subversive, particularly of religious and academic shibboleths. The only authority in this class is that of the most persuasive reader, and doctrines, whether religious or political, will have to be checked at the door. An example of evaluation may be: weekly participation in discussion; mid-term and final essay examinations involving a critical evaluation of ancient text’s claims in combination with archaeological evidence; a research essay, where the class or section size is lower than 30; an ability to read critically, bringing different classes of evidence to bear on issues arising from the texts, and construct coherent and compelling arguments to a particular thesis. The course provides a Near Eastern counterpart to HIST 100, 402 and a Near Eastern aspect to the Jewish Studies major. It complements RL ST 110, by offering historical exploration of the culture under study in that course. Related courses include ANTH 012, HEBR, 010, ENGL 104, RL ST 004, and RL ST 111. The course helps round out the majors in History and Jewish Studies, particularly in ancient history. It also extends the program in Religious Studies (history of religions), and it contributes to the ancient stream of the prospective program in Jewish Studies and History.

Cross-Listed Courses: HIST 102 JST 102 RLST 102

Changes Effective Summer 2019:

• Description

CAMS 120: New Testament (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Related courses include ANTH 012, HEBR, 010, ENGL 104, RL ST 004, and RL ST 111. The course helps round out the majors in History and Jewish Studies, particularly in ancient history. It also extends the program in Religious Studies (history of religions), and it contributes to the ancient stream of the prospective program in Jewish Studies and History.
CAMS 122: Apocalypse and Beyond (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

This course surveys apocalyptic literature and apocalyptic movements from the ancient Near East to the modern world. CAMS (J ST/RL ST) 122 Apocalypse and Beyond (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. This course offers a scholarly survey of apocalyptic literature and apocalyptic imagination about the end of the world, from its beginnings in the ancient Near East and the Bible to some examples from the modern world. The course will cover three areas: 1) the ancient literary genre of apocalypse in the Near East; 2) apocalyptic writings in the Jewish and Christian traditions (especially the books of Daniel and Revelation); and 3) some historical examples and discussion of the sociological underpinnings of apocalyptic groups in the medieval to modern periods. Additional attention will be paid to the impact that apocalyptic worldviews have had on the secular world, especially in the fine arts and cinema.

Cross-Listed Courses: JST 122 RLST 122

Changes Effective Summer 2019:

• Description

CAS 272: Political Communication and Technology (3 Credits) (GH)
Old Listing Effective Through Spring 2019:

This course examines how interactive communication technologies reshape political rhetoric, discursive civic culture, deliberation, and participatory democracy. CAS 272 Political Communication and Technology(3)(GH) This course examines how interactive communication technologies reshape political rhetoric, discursive civic culture, deliberation in the online public sphere, and participatory democracy. It traces the evolution of the public sphere and explores theoretical and empirical issues related to online political discourse (blogs, political discussion fora, viral politics of social networking sites), cyberactivism, smart mobs, networked publics, and peer-to-peer production (You Tube, Wikis). CAS 272 concentrates on online rhetorical and discursive strategies of candidates for public office, and individuals and organizations campaigning on specific issues and causes. It emphasizes civic engagement and includes topical areas such as mechanisms of online public spheres, citizen generated discourse and content, viral politics, connections between social networking sites and political discourse, and behaviors such as networked activism. It examines how various interactive communication options have affected political discourse, campaign communications and public deliberation. It provides students with hands-on experiences in analyzing the rhetorical and persuasive strategies involved in creating video content, writing blogs, creating wikis and twitter messages. It teaches students how they could use these communication options in working for political campaigns, civic action groups and non-profit institutions. The goal of the course is to help students understand the opportunities and constraints involved in using interactive communication technologies for civic and political actions, and facilitate their development as informed citizens. Class activities focus on identification and critique of rhetorical strategies employed when using interactive communication technologies, and learning to create content such as weblogs, wikis, and mashups. Students will be graded on exams, participation in discussion groups, analyzing and connecting course concepts to real world examples, creating content such as mashups, and analysis of rhetorical strategies of political candidates and activist groups. CAS 272
Changes Effective Summer 2019:

- Number to 272N
- Description
- Add General Education Designations GS and Inter-Domain

CAS 311: Methods of Rhetorical Criticism (3 Credits)
Old Listing Effective Through Spring 2019:

Principles for the analysis and evaluation of public discourse.

Changes Effective Summer 2019:

- Abbreviated Title
- Description
- Add General Education Designation GH

CAS 352: Organizational Communication (3 Credits)
Old Listing Effective Through Spring 2019:

This course examines the function and structure of communication in both formal and informal situations.

Changes Effective Summer 2019:

- Description
- Add GH Designation

CHEM 213: Laboratory in Organic Chemistry (2 Credits)
Old Listing Effective Through Spring 2019:

Basic laboratory operations; synthesis and chemical or instrumental analysis. Because of duplication of subject matter, students may not receive credit for both CHEM 203 and CHEM 213. CHEM 213 CHEM 213 Laboratory Organic Chemistry (1-2) A strong foundation in organic laboratory skills is provided by this laboratory course. Laboratory work includes learning the basic techniques and recrystallization/melting point determination, distillation, liquid/liquid extraction, thin-layer chromatography and column chromatography. Mastery of these basic techniques lays the foundation for carrying out a number of organic syntheses or natural product isolations. Students are often provided with hands-on access to instrumentation for the characterization of synthetic products or organic unknowns using standard analysis methods such as IR, NMR, UV/V is spectroscopy, mass spectrometry, polarimetry, HPLC, GC and GC-MS. Chemistry 210 is a prerequisite and CHEM 212 may be a co-requisite for this course, because they provide the theoretical background for the reaction chemistry as well as the spectroscopic characterization of organic molecules.*Note: The number of credits and meeting times vary from location to location. Some locations offer CHEM 213 as two one-credit courses to be taken in sequential semesters, whereas other locations offer CHEM 213 as a single-semester two-credit course. Normally, the latter format involves two 3-hour labs per week in addition to extensive written work outside of the laboratory. The prerequisite / concurrent requirement for CHEM 213 does not apply when CHEM 213 is taken as a 1 credit course.

Prerequisite: CHEM 210. Prerequisite or concurrent: CHEM 212

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

CHEM 213W: Laboratory in Organic Chemistry – Writing Intensive (2 Credits) (WF)
Old Listing Effective Through Spring 2019:

Basic laboratory techniques learned in context via theme-based modules, spectral analysis, multi-step synthesis, and professional scientific writing. Because of similarity of subject matter, students may not receive credit for both CHEM 203 and CHEM 213.

Prerequisite: CHEM 210.

Prerequisite or Concurrent: CHEM 212

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

CHNS 121: Chinese Film and New Media (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Survey of Chinese film and new media in the twentieth century and beyond, with attention to changing cultural settings. Taught in English. CHNS 121 Chinese Film and New Media (3) (GH;IL) (BA) This course meets the Bachelor of Arts degree requirements. This is intended to provide an introduction to modern and cutting-edge forms of cultural production in the Chinese-speaking world from the twentieth century to the present day. Prior study of China is not required and materials will be available in English. Students will learn about major technologies and forms of media, including film, TV, and various forms of new media (cellphone novels, blogs, MMOGs, IM, and Web 2.0 for instance). Readings and screenings will cover several artistic modes including formalism, historiography, documentary, period drama, and experimental works. The course, or individual units within the course, will be structured so that students develop an historical perspective, allowing them to understand the cultural contexts that have inspired the creative works under study. By examining Chinese-language film and new media with attention to changing cultural settings, students will investigate such topics as the relation between social institutions and the individual, the formation and expression of identity, changing gender roles and family structures, the impact of technological and economic trends on social structure, and changing climates of censorship and freedom of expression. In addition, students will learn to think critically about various media’s techniques and aesthetics of representation, and will become more engaged, critical spectators of film and related media. Class work includes some lecture but emphasizes guided discussions, group work, writing exercises, and some student presentations. This participatory approach is intended to deepen students’ appreciation of the works, to help them understand value systems that may differ from those predominant in western cultures, and to assist students in developing both analytical and expressive abilities. Through critical reading, group discussion and interpretive writing, students will hone skills for evaluating modes of cultural production and consumption in the Chinese-speaking world. Evaluation will be through means such as in-class presentations, short writing assignments, midterms or quizzes, one analytic paper (3-7 pages), and in-class/on-line participation and discussion. The course is designed to be suitable for all students generally interested in China, or interested in various fields of humanistic study, whether or not they have previously studied Chinese culture. It is designed to count as General Education and as a B.A.

Changes Effective Summer 2019:

- Number to 121N
- Description
CI 280: Introduction to Teaching English Language Learners (3 Credits) (GH)
Old Listing Effective Through Spring 2019:

Introduction to language, culture, instruction, assessment, and professionalism as they relate to teaching English Language Learners in U.S. schools. CI 280 Introduction to Teaching English Language Learners (3) (GH) CI 280 focuses on the development of foundational knowledge to successfully assist English language learners in U.S. school contexts. The basic premise of the course is that teachers play an important role in creating a positive classroom learning environment and bringing school success for English language learners. This course is designed to develop essential dispositions, skills, and knowledge for teacher education students to fulfill their important role. Course objectives are to understand culture, language, learning contexts, and pedagogy. Culture focuses on a) sociocultural characteristics of English language learners, b) how English language learners’ cultural communication and learning styles affect the learning process, c) how English language learners’ cultural values affect their academic achievement and language development, d) negative effect of cultural bias in instruction, materials and assessments, and e) the importance of developing cross-cultural competence in interactions with colleagues, administrators, school and community specialists, students and their families.

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

CMPEH 472: Microprocessors (4 Credits)
Old Listing Effective Through Spring 2019:

Principles of microprocessors, hardware architecture, assembly language, programming, interfacing, and applications of microprocessors will be studied. CMPEH 472 Microprocessors (4) This course is designed to provide students with strong foundation in microprocessor programming and hardware interfacing both in the classroom and laboratory settings. This course is a required course in the Electrical Engineering BS curriculum and is intended to be taken by students who have completed their digital systems and first electronics course requirements. As such, the course integrates materials from the above undergraduate electrical courses in addition to related math, engineering, and science courses.

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

CMPSC 430: Database Design (3 Credits)
Old Listing Effective Through Spring 2019:

Relational database model, query languages, integrity, reliability, normal forms for design.

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

The main goal of this course is to explore the relational database model, with special emphasis on the design and querying of relational databases. Secondary goals include exploration of the mathematical basis for relational databases and exploration of the relationship of database to the rest of computer science. Study of these topics should improve student skills in programming, modeling the structure of data and using and administering databases. Grades will be based on midterm and final exams totaling 250 points, and 10 - 12 homework assignments totaling approximately 200 points. Grades will be based directly on percentage of the total points received from those listed. This course is an elective for students in the BS COMP program and is required for admission into the MS COMP program. The course builds on concepts learned in earlier programming, data structure and discrete mathematics courses. No special facilities are required for this course. This course will be offered once per year, with an expected enrollment of 60 - 70 students.

PreRequisite: CMPSC462

Changes Effective Summer 2019:

- Description
  - Prerequisite/Corequisite/Concurrent Courses

CMPSC 444: Secure Programming (3 Credits)
Old Listing Effective Through Spring 2019:

Secure software design principles/practice, common threats, applied cryptography, trust management, input validation, OS/programming language-specific issues, software validation. CMPSC 444 Secure Programming (3) This course presents an overview of the principles and practice of secure software design. The course begins with a presentation of overarching principles of secure software development that enable the design, implementation, and testing of secure systems that can withstand attacks. These principles and strategies for realizing them will be illustrated through an analysis of common security issues and pitfalls in the software development process. The course will cover a variety of programming languages including C/C++, Java, and scripting languages; different classes of systems including standalone applications, client/server systems, and peer-to-peer applications; and
analyzing voice qualities. The educational objectives of the course are
and Internet resources and specialized computer instrumentation for
of healthy vocal activities. Learning activities include: mini-lectures,
return. The course is designed to integrate theoretical knowledge,
disorders as a possible major, and students interested in learning
Abuse, Misuse, and Disorders is a 3 credit course intended to be the first
Principles of the voice mechanisms, preventing vocal abuse, and
doing vocal abuses and misuses while improving and enhancing
good vocal habits, and 5) developing an understanding of how vocal
behaviors influence social behaviors, employment, and quality of life.
The course includes an overview of the anatomy and physiology of
the respiratory and vocal mechanisms, physics of voice production,
development of vocal abuses and resulting pathologies, disorders
including vocal growths, paralysis, voice disorders associated with cleft
lip and cleft palate, syndromes, neurodegenerative disorders, aging
and head and neck cancer. Students are required to complete readings
from web-based texts, internet sites (e.g. NIH, National Voice Academy,
American Speech-Language Hearing Association, National Cancer
Institute), multiple choice and true false tests and one written research-
topactice assignment.

Changes Effective Summer 2019:
• Abbreviated Title
• Description

ECON 14: Principles of Economics (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:
Analysis of the American economy, emphasizing the nature and
interrelationships of such groups as consumers, business, governments,
labor, and financial institutions. Students who have passed ECON 002 or
004 or are registered in the College of Business Administration may not
schedule this course.

Changes Effective Summer 2019:
• Abbreviated Title
• Description

ECON 102: Introductory Microeconomic Analysis and Policy (3
Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:
Methods of economic analysis and their use; price determination; theory
of the firm; distribution. ECON 102 Introductory Microeconomic Analysis
and Policy (3)(GS)(BA) This course meets the Bachelor of Arts degree
requirements. Economics is the study of how people satisfy their wants
in the face of limited resources. One way to think about economics
is that it is a consistent set of methods and tools that is valuable in
analyzing certain types of problems related to decision-making, resource
allocation, and the production and distribution of goods and services.
There are two main branches of economics, microeconomics, and
macroeconomics. Microeconomics is concerned with economy-wide
factors such as inflation, unemployment, and overall economic growth.

Microeconomics deals with the behavior of individual households
and firms and how government influences that behavior; it is the
subject of this course. More specifically, ECON 102 is an introduction
to microeconomic analysis and policy. The principal objective of the
course is to enable students to analyze major microeconomic issues
clearly and critically. Students will be introduced to the methods and
tools of economic analysis, and these analytical tools will be applied
to questions of current policy interest. Learning these methods and
tools and applying them to interesting policy questions and issues is
development issues specific to different operating systems. Students
will develop and analyze programs that demonstrate security principles,
strategies, coding techniques, and the use of tools that can help make
code more resistant to attacks.

Concurrent Courses: CMPSC 430, CMPSC 431, CMPSC 421W

Changes Effective Summer 2019:
• Description
• Prerequisite/Corequisite/Concurrent Courses

COMM 271: Principles of Multimedia Journalism (3 Credits)
Old Listing Effective Through Spring 2019:
The course introduces how journalists work with the tools of multimedia
and how multimedia is changing journalism. COMM 271 Principles of
Multimedia Journalism (3) Journalists have never had better tools to
cover the news than they do today. Every news organization can now
tell stories with text, video, sound and images. Reporters can interact
with their audience while covering stories in real time. Audiences have
unprecedented choice in when and where they can access information.
These innovations are allowing the news industry to reinvent itself. But
there are major challenges. What does it take to be competitive in a 24/7
news cycle? What is the best way to work with text, video, still images
and sound? How much do reporters and editors need to know about
these tools? What role do social media have in this mix? Are ethical
standards and being lost in the scramble to gain audience and grow
revenue? This course will introduce multimedia news and be a foundation
for skills courses. It will examine the latest platforms and tools of
the trade, adding value with multimedia, the roots and development of
multimedia, working in a cross-platform environment, multimedia
reporting and editing, data visualization, intellectual property rights,
etical issues, citizen journalism, social media and the news, business
models for multimedia journalism, finding a job, and other subjects.

Changes Effective Summer 2019:
• Description
• Long Title
• Abbreviated Title

CSD 100: Preventing Vocal Abuse, Misuse, and Disorders (3 Credits)
(US) (GHA)
Old Listing Effective Through Spring 2019:
Principles of the voice mechanisms, preventing vocal abuse, and
promoting vocal health across the life span. CSD 100 Preventing Vocal
Abuse, Misuse, and Disorders (3)(GHA;US) CSD 100, Preventing Vocal
Abuse, Misuse, and Disorders is a 3 credit course intended to be the first
course for all University students exploring communication sciences
and disorders as a possible major, and students interested in learning
specifically about vocal hygiene, voice use, vocal abuse and voice
disorders. Principles of the voice mechanisms, preventing vocal abuse,
and promoting vocal health across the life span are core principles of
the course. The focus of this course is on preventing voice disorders
and promoting activities that contribute to healthy vocal habits across
the life span. The course is designed to integrate theoretical knowledge,
practice-based, and measurement-focused activities to assist learners
in understanding, achieving, maintaining, and promoting a lifetime
of healthy vocal activities. Learning activities include: mini-lectures,
power point presentations, information/research gathered via library
and Internet resources and specialized computer instrumentation for
analyzing voice qualities. The educational objectives of the course are
to: 1) develop a basic understanding of the normal and disordered vocal
mechanism; 2) understand the need for maintaining and promoting
lifetime wellness in your vocal activities and habits for any occupational
choice; 3) learn about the prevention of vocal disorders across the
life span from vocal nodules to laryngeal cancer; 4) understand the
subjective and objective measures of vocal qualities to assist in changing
and altering vocal abuses and misuses while improving and enhancing
good vocal habits, and 5) developing an understanding of how vocal
behaviors influence social behaviors, employment, and quality of life.

Changes Effective Summer 2019:
• Abbreviated Title
• Description

ECON 102: Introductory Microeconomic Analysis and Policy (3
Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:
Methods of economic analysis and their use; price determination; theory
of the firm; distribution. ECON 102 Introductory Microeconomic Analysis
and Policy (3)(GS)(BA) This course meets the Bachelor of Arts degree
requirements. Economics is the study of how people satisfy their wants
in the face of limited resources. One way to think about economics
is that it is a consistent set of methods and tools that is valuable in
analyzing certain types of problems related to decision—making, resource
allocation, and the production and distribution of goods and services.
There are two main branches of economics, microeconomics, and
macroeconomics. Microeconomics is concerned with economy—wide
factors such as inflation, unemployment, and overall economic growth.
sometimes called “thinking like an economist.” An important goal of this course is to take each student as far down the road of “thinking like an economist” as possible. A variety of mechanisms are used to assess student performance. These evaluation methods typically include exams, quizzes, homework assignments, and group projects. ECON 102 is an introductory course in economics and as such, serves as a prerequisite for several microeconomics-oriented 300-level courses. It is also a required course for all majors and minors in economics, and meets requirements for a General Education (GS) or Bachelor of Arts social science course.

Changes Effective Summer 2019:

- Abbreviated Title
- Description

ECON 104: Introductory Macroeconomic Analysis and Policy (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

National income measurement; aggregate economic models; money and income; policy problems. ECON 104 Introductory Macroeconomic Analysis and Policy (3)(GS)(BA) This course meets the Bachelor of Arts degree requirements. Economics is the study of how people satisfy their wants in the face of limited resources. One way to think about economics is that it is a consistent set of methods and tools that is valuable in analyzing certain types of problems related to decision-making, resource allocation, and the production and distribution of goods and services. There are two main branches of economics, microeconomics, and macroeconomics. Microeconomics deals with the behavior of individual households and firms and how that behavior is influenced by government.

Macroeconomics is concerned with economy-wide factors such as inflation, unemployment, and overall economic growth; it is the subject of this course. More specifically, ECON 104 is an introduction to macroeconomic analysis and policy. The principal objective of the course is to enable students to analyze major macroeconomic issues clearly and critically. Students will be introduced to the methods and tools of economic analysis, and these analytical tools will be applied to questions of current policy interest. Broadly, the course focuses on the determination of national income, on unemployment, inflation, and economic growth in the context of a global economy, and on how monetary and fiscal policy, in particular, influence the economy. Learning the methods and tools of economics and applying them to interesting policy questions and issues is sometimes called “thinking like an economist.” An important goal of this course is to take each student as far down the road of “thinking like an economist” as possible. A variety of mechanisms is used to assess student performance. These evaluation methods typically include exams, quizzes, homework assignments, and group projects. ECON 104 is an introductory course in economics, and as such, serves as a prerequisite for 300-level courses in intermediate macroeconomic analysis, international economics, and money and banking. It is also a required course for all majors and minors in economics, and meets requirements for a General Education or Bachelor of Arts Social Science (GS) course.

Changes Effective Summer 2019:

- Abbreviated Title
- Description

ECON 302: Intermediate Microeconomic Analysis (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools.

Prerequisites: ECON 102

Changes Effective Summer 2019:

- Abbreviated Title
- Description

ECON 304: Intermediate Macroeconomic Analysis (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

Analysis of forces that determine the level of aggregate economic activity.

Prerequisites: ECON 104

Changes Effective Summer 2019:

- Abbreviated Title
- Description

ECON 315: Labor Economics (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

Economic analysis of employment, earnings, and the labor market; labor relations; related government policies.

Prerequisites: ECON 102

Changes Effective Summer 2019:

- Abbreviated Title
- Description

ECON 323: Public Finance (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

Contemporary fiscal institutions in the United States; public expenditures; public revenues; incidence of major tax types; intergovernmental fiscal relations; public credit.

Prerequisites: ECON 102

Changes Effective Summer 2019:

- Abbreviated Title
- Description

ECON 333: International Economics (3 Credits) (BA) (GS)
Old Listing Effective Through Spring 2019:

Why nations trade, barriers to trade, balance of payments adjustment and exchange rate determination, eurocurrency markets, and trade-related institutions.

Prerequisites: (ECON 102 and ECON 104) or ECON 014

Changes Effective Summer 2019:

- Abbreviated Title
- Description
ECON 342: Industrial Organization (3 Credits) (BA) (GS)  
Old Listing Effective Through Spring 2019:  
Industrial concentration, size, and efficiency of business firms, market structure and performance, competitive behavior, public policy and antitrust issues.

Prerequisites: ECON 102  

Changes Effective Summer 2019:  
• Abbreviated Title  
• Description  

EET 311: Alternating Current Circuits (4 Credits)  
Old Listing Effective Through Spring 2019:  
Circuit analysis including controlled sources, op amps, and ideal transformers, and calculus relationships; one/two port networks; three-phase and industrial loads. EET 311 Alternating Current Circuits (4)EET 311 is intended to provide competency in analysis of circuits and application of basic electrical principles including equivalent circuits and models, power and energy, and signal/energy transfer. The course will introduce ideal amplifier models, ideal op-amps and ideal transformers as circuit elements and one-port networks (Thevenin, Norton, and driving point impedance), and two-port networks (Z, Y, H, G, T, and T-I) as equivalent circuits. Since this is the first required course taken by all upper division electrical engineering technology students, ethics and professionalism will be discussed by and expected of the students. Grades will be based on four or five exams including a final exam (65%), laboratory work (20%), computer projects requiring the use of circuit simulation software, spreadsheets, and math packages (10%), and student professionalism (5%). The IEEE code of ethics and the Penn State policy on academic integrity will be applied in the instructor's judgment of student professionalism. This course requires calculus through integral and differential calculus of transcendental functions. It provides the circuit analysis skills required in almost every other EET course and is a specific prerequisite for analysis of signals and systems (EET 312) and understanding semiconductor models and electronic circuits (EET 330).

Changes Effective Summer 2019:  
• Prerequisite/Corequisite/Concurrent Courses  
• Description  

EET 312: Electric Transients (4 Credits)  
Old Listing Effective Through Spring 2019:  
Applied differential equations; in-depth study of transient electricity using Laplace, Fourier transforms, and state-space methods; Bode plots and application. EET 312 Electric Transients (4) This course is designed to provide students with a strong foundation in transient circuit analysis in addition to introduction to signals and systems. The primary objective of the course is to reinforce continuous-time system fundamentals in order to prepare the students for more advanced work in a broad range of areas including communications, control, signal processing and image processing. The topics covered in this course include: 1. Applied differential equations. 2. Transient analysis of RC, RL, and RLC circuits, using differential equations. 3. Complex frequency. 4. Network functions. 5. Bode plots and frequency response. 6. Filter networks and resonant circuits. 7. Laplace transform pairs, and their applications in circuit analysis. 8. Fourier analysis techniques; Fourier series, transform pairs, and their applications in circuit analysis. 9. State-variable circuit analysis. This course is a required course in the Electrical Engineering Technology BS curriculum and is intended to be taken by students who have completed their first circuits course requirements. As such, the course integrates materials from the above undergraduate course in addition to related math, engineering technology, and science courses.

Changes Effective Summer 2019:  
• Prerequisite/Corequisite/Concurrent Courses  
• Description  

EET 409: Power System Analysis I (4 Credits)  
Old Listing Effective Through Spring 2019:  
Analysis and applications study of power utility electrical equipment such as: synchronous machines, transformers, capacitors and transmission lines.

Changes Effective Summer 2019:  
• Prerequisite/Corequisite/Concurrent Courses  
• Description  

EET 410: Power System Analysis II (4 Credits)  
Old Listing Effective Through Spring 2019:  
Principles of load studies, fault analysis, stability and protection of the public electrical power system.

Changes Effective Summer 2019:  
• Prerequisite/Corequisite/Concurrent Courses  
• Description  

EET 413: Optoelectronics (4 Credits)  
Old Listing Effective Through Spring 2019:  
Principles and applications of optoelectronics including sources, detectors, imagers, transmitters, fiber optics, systems and integrated optics.

Changes Effective Summer 2019:  
• Prerequisite/Corequisite/Concurrent Courses  
• Description  

ENGL 2: The Great Traditions in English Literature (3 Credits) (BA) (GH)  
Old Listing Effective Through Spring 2019:  
Major works of fiction, drama, and poetry from the Middle Ages to the twentieth century expressing enduring issues and values. ENGL 002 The Great Traditions in English Literature (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Students are expected to learn fundamental skills of close textual analysis in the context of established literary texts of English and Irish fiction, drama, and poetry from the Middle Ages to the twentieth century that address large questions of ethical and social value. They are also expected to learn to talk and write clearly about the issues and ideas generated by the texts that they are directed to read. ENGL 002 will fulfill the writing component of the Active Learning Exams by requiring a minimum of three writing assignments. These assignments will be drawn from the following kinds of writing: essay, essay exam, or a semester-long reading journal. ENGL 002 will require all students to confront the major interpretive problems found in their assigned readings and to participate actively in the various forms of critical thinking required to comprehend and resolve those problems.
ENGL 002 will require all students to participate in an assessment of the social behavior and other values, both communal and scholarly, relevant to the texts being read and discussed in the course. This course fulfills a General Education humanities requirement or a Bachelor of Arts humanities requirement. This course will be offered once a year with a limit of 60 seats.

Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

ENGL 50: Introduction to Creative Writing (3 Credits) (BA) (GA)
Old Listing Effective Through Spring 2019:

Practice and criticism in the reading, analysis and composition of fiction, nonfiction and poetry writing. ENGL 050 Introduction to Creative Writing (3) (GA)(BA) This course meets the Bachelor of Arts degree requirements. If you believe that the heart of a poet beats inside you anyway—or if you simply enjoy writing to express yourself creatively—you will be at home in this course. You will also be at home here if you are an avid reader of fiction, poetry, and nonfiction, but have never tried your hand at writing it. In English 050 you will explore the genres of nonfiction, fiction, and poetry by reading published essays, short stories, and poems and by writing personal essays, sketches, scenes, and poems. We’ll discuss the relationship between the genres and also discuss what makes each a distinct art form. You’ll hand in weekly writing assignments in addition to completing longer writing projects. You’ll make copies of some of your creative work to distribute and discuss in class.

Changes Effective Summer 2019:

- Description

ENGL 88: Australian/New Zealand Cultural Perspectives (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Australian and New Zealand cultural and social perspectives, with emphasis on the historical development of intellectual, aesthetic, and humanistic values. ENGL 088 Australian/New Zealand Cultural Perspectives (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Students are expected to learn fundamental skills of close textual analysis in the context of the study of a variety of works by authors from Australia and New Zealand. Studying a range of novels, poems, plays, and works of non-fiction, students will discuss the development of Australian and New Zealander literatures in historical context and gain understanding of the historical development of societal values in nations other than the U.S.A. The course aspires to relate geography and history to emerging social and cultural developments as the state and status of the two countries changed during the nineteenth and twentieth centuries, and to track their increasing separation from the "Mother Country" (i.e. Great Britain) as they developed a sense of themselves as different and separate from European societies. The process was neither comfortable nor easy, nor steadily progressive, but the record of it is an often fascinating story of human endeavor and struggle, very frequently against great odds and disappointments, which in turn affected the development of national character if such a thing can be said to exist. The literatures reflect some of the attitudes and qualities that emerged as the two societies were coming into being and forging their own unique identities.

Changes Effective Summer 2019:

- Description

ENGL 104: The Bible as Literature (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Study of the English Bible as a literary and cultural document. ENGL 104 The Bible as Literature (3) (GH) (BA) This course meets the Bachelor of Arts degree requirements. The purpose of this course is to acquaint students with the literature of the Bible, particularly in the King James translation, the translation that has been most influential in the English-speaking world. Throughout this course, students will examine the language, thought, images, and structures of the book that has arguably proved the central text of Western literature. Students will also actively explore the ways in which the Bible has shaped the literature of English-speaking cultures. Students will read substantial portions of the Old and New Testaments, including the Book of Genesis, the Book of Job, and selections from the histories, the prophets, the Book of Psalms, the Gospel of John, the Gospel of Matthew, and the Book of Revelation. Students will learn to read the Bible critically and interpret the book as they would any other literary text. They will also learn about the historical construction of the Bible and contemplate the competing versions of existing Biblical texts. Students will be asked to complete at least three writing assignments drawn from the following kinds of writing: essay, essay exam, or semester-long reading journal. This course will prepare students for additional college-level literature courses by helping them to develop the analytical skills necessary to analyze complex written texts. This course fulfills a General Education Humanities requirement or a Bachelor of Arts requirement. It will be offered twice a year and is capped at 35 students.

Changes Effective Summer 2019:

- Description

ENGL 129: Shakespeare (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

A selection of the major plays studied to determine the sources of their permanent appeal. Intended for non-majors. ENGL 129 Shakespeare (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. ENGL 129 constitutes a broad introduction to Shakespeare’s dramatic works from a variety of thematic, historical, formal, and/or generic vantages. Approaches taken to the plays will vary from class to class, but may include a chronological introduction to the development of Shakespeare’s plays, a consideration of a principal Shakespearean theme or themes through a number of plays from across Shakespeare’s career, a consideration of Shakespeare’s protagonists through a number of plays from across Shakespeare’s career, or a consideration of a number of Shakespeare’s plays in historical context. Time allotted for the discussion of each play will vary, but students should expect to read, on average, a play a week. This class will prepare students for
advanced courses in early modern literatures as well as other academic courses that engage in the verbal and written analysis of complex written texts. Students will be evaluated by means of essays written in and out of class, essay exams, term-long reading journals, and class participation. Students should expect to complete a minimum of three written assignments in the course of the term. The course is a basic introduction to Shakespeare's works suited for non-majors, but may be used as English major elective credit or as credit toward the English minor. The course will be offered three times a year with 60 seats per offering. The course will be offered once a year as an honors course—ENGL 129H.

Changes Effective Summer 2019:

- Description

ENGL 129H: Shakespeare (3 Credits) (H) (BA) (GH)
Old Listing Effective Through Spring 2019:

A selection of the major plays studied to determine the sources of their permanent appeal. Intended for non-majors. ENGL 129H Shakespeare (3) (GH)In ENGL 129H, students will read a selection of up to ten of Shakespeare's major plays, in four different categories: history plays, comedies, tragedies, and romances. Selections may include Othello, King Lear, The Winter's Tale, The Taming of the Shrew, Much Ado about Nothing, As You Like It, Henry IV Part 1 and Part 2, and Henry V, plus a supplemental text such as The Bedford Companion to Shakespeare

Changes Effective Summer 2019:

- Description

ENGL 133: Modern American Literature to World War II (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Cather, Eliot, Frost, Faulkner, Fitzgerald, Hemingway, Hurston, Wharton, Wright, and other writers representative of the years between the world wars. ENGL 133 Modern American Literature to World War II (3) (GH) (BA) This course meets the Bachelor of Arts degree requirements. English 133 will constitute a wide ranging study of modernist American literature, including novels, short stories, poems, plays, and prose, written roughly between the turn of the 19th century and the end of the Second World War. The class will approach this literature from a variety of thematic, historical, and/or generic vantages. Topics under consideration will vary from class to class, but may include a chronological introduction to the development of modernist American literature, a consideration of a principle theme or themes common to modernist American literature through a number of works from across the period, a consideration of a number of modernist works in the context of historical events central to the period, such as the American participation in the First World War and/or the effect on American literature of the ensuing world-wide depression. Time allotted for the study of the works under consideration will vary. This class will prepare students for advanced courses in modernist literatures as well as other academic courses that engage in the verbal and written analysis of complex written texts. Students will be evaluated by means of essays written in and out of class, essay exams, term-long reading journals, and class participation. Students should expect to complete a minimum of three written assignments in the course of the term. The course may be used as English Major elective credit or as credit towards the English Minor. Non-English majors may use this course to fulfill a general education or Bachelor of Arts/Humanities. English 133 will be offered once a year with 60 seats per offering.
ENGL 180: Literature and the Natural World (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Literary representations of the natural world, focusing on English language traditions.

Changes Effective Summer 2019:

• Description

ENGL 221: British Literature to 1798 (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Introduction to literary history and analysis; Beowulf and writers such as Chaucer, Shakespeare, Donne, Milton, Swift, Pope, and Fielding.
ENGL 221 British Literature to 1798 (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Focusing on major writers and their cultural contexts, English 221 surveys British literature to 1798. A remarkable amount of important work was produced over this period. Students will read major texts like Beowulf, Romeo and Juliet, and Tom Jones; learn about renowned authors such as Chaucer, Shakespeare, and Fielding; and be introduced to influential literary forms, such as the epic, the revenge tragedy, and the picaresque novel. The tradition of British literature evolved over periods of significant upheaval and change. Students will also learn about the shifting historical and ethical orientations that energized this tradition, from the Heroic Ethos to Christian Humanism to Neoclassicism. As an introductory survey of British literature, English 221 welcomes non majors: no previous course in literature is required. By reading and discussing some of the best-known works in British literature, students will sharpen their skills of interpretation while surveying an important literary tradition.

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

ENGL 222: British Literature from 1798 (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Introduction to literary history and analysis; writers such as Austen, Wordsworth, Keats, Browning, Dickens, the Brontes, Yeats, Joyce, and Woolf. ENGL 222 British Literature from 1798 (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Focusing on major writers and their cultural contexts, English 222 surveys British literature from 1798 to the present. A remarkable amount of important literature was produced during this period. Students will read major texts like Pride and Prejudice, Hard Times and Jane Eyre; learn about renowned authors such as William Blake, Charles Dickens, and Virginia Woolf; and be introduced to influential literary forms, such as the dramatic monologue, the gothic novel, the and stream-of-consciousness narrative. The tradition of British literature since 1798 evolved over periods of significant upheaval and change. Students will also learn about the shifting historical and ethical orientations that energized this tradition, from rising industrialization and changing class relations to Romanticism, Modernism, and Postmodernism. As an introductory survey of British literature, English 222 welcomes non majors: no previous course in literature is required. By reading and discussing some of the best-known works in British literature, students will sharpen their skills of interpretation while surveying an important literary tradition.

Changes Effective Summer 2019:

• Description

ENGL 227: Introduction to Culture and Sexuality (3 Credits) (US) (IL) (GH)
Old Listing Effective Through Spring 2019:

A course addressing the relationships between sexuality, literature, and culture. ENGL 227 Introduction to Sexuality Studies (3) (GH;US;IL)This course focuses primarily on queer literature, theory, and culture in the post-Stonewall (1969) decades in the United States and Britain. The course will interrogate sexual norms and their deviations, with a particular focus on the relationships between sexuality, imagination, and ethics in the making of sexual communities and in the fostering of sexual activism. We will focus on how class, race, and gender have been shaped, historically, through the production of sexuality, and the resistances offered to the formation and sedimentation of rigidly sexed bodies. We will examine the relationships of memory, temporality, and spatial location in contemporary queer culture and theory. We will explore the relationships between sexuality and ethics, and how both shape the history of queer activism. Above all, we will study the connections between fantasy, imagination, and sexuality in shaping the literary and visual cultures of the U.S. and Britain. We will focus on the ways marginalization, shame, and criminalization are transformed, in the history, culture, and theory of queer people, into visionary acts of “world-making” that have changed contemporary understandings of bodies, identities, social formations, and literary and cultural forms.

Cross-Listed Courses: WMNST 227

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

ENGL 231: American Literature to 1865 (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Introduction to literary history and analysis; writers such as Bradstreet, Franklin, Emerson, Hawthorne, Douglass, Thoreau, Fuller, Melville, Whitman, and Dickinson. ENGL 231 American Literature to 1865 (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Focusing on major writers and their cultural contexts, English 231
surveys American literature to 1865. A remarkable amount of important literature was produced during this period. Students will read major texts like *The Scarlet Letter*, *Leaves of Grass*, and *Narrative of the Life of Frederick Douglass*; learn about renowned authors such as Benjamin Franklin, Henry David Thoreau, and Emily Dickinson; and be introduced to influential literary forms, from Native American oral forms to the short story and free verse. The tradition of American literature to 1865 evolved over periods of significant upheaval and change. Students will also learn about the shifting historical and ethical orientations that energized this tradition from pre-colonial times to periods of Republicanism and Romanticism. As an introductory survey of American literature, English 231 welcomes non majors: no previous course in literature is required. By reading and discussing some of the most important works in American literature, students will sharpen their skills of interpretation while surveying an important literary tradition.

Prerequisites: ENGL 15; ENGL 30 OR (ENGL 137H, ENGL 138T)

**Changes Effective Summer 2019:**

- Description
- Prerequisite/Corequisite/Concurrent Courses
- Add US Cultures Designation

**ENGL 231W: American Literature to 1865 (3 Credits) (WF) (BA)**

Old Listing Effective Through Spring 2019:

Introduction to literary history and analysis. Writers such as Bradstreet, Franklin, Emerson, Hawthorne, Thoreau, Fuller, Melville, Whitman, and Dickinson.

Prerequisites: ENGL 15; ENGL 30

**Changes Effective Summer 2019:**

- Number to 231Y
- Description
- Prerequisite/Corequisite/Concurrent Courses
- Add US Cultures Designation
- Add General Education Designation GH

**ENGL 233: Chemistry and Literature (3 Credits) (BA) (GN) (GH)**

Old Listing Effective Through Spring 2019:

Exploration of key concepts of chemistry, the reciprocal influence of chemistry and literature through history, and the relationship of science to society, culture, and values. ENGL (CHEM) 233 Chemistry and Literature (3) (GN or GH) ENGL/CHEM 233 is a pedagogically innovative course that will be team taught by an instructor from the English department and one from the Chemistry department. Both instructors will be present in the classroom throughout the semester, providing joint presentations and leading discussions. Students may earn either GH or GN credit for the course, but not both. This course teaches both basic concepts of chemistry and their cultural elaboration in literature. It seeks to provide students with a nuanced understanding of how literature and science inform each other and negotiate cultural, religious, and political tensions. The course seeks to explore ways in which our modern world is defined by and dependent on a variety of sciences and technologies. The impact of scientific and technological discoveries continues to dominate discussions of who we are, where we come from, where we are going, and our place in the universe. Understanding how we, as a society, have acquired knowledge is especially important when the ideas, perspectives, and discoveries are perceived to be in conflict with our religious, cultural, or political beliefs. Understanding the origin and development of these ideas, perspectives, and discoveries is an essential component of science and scientific achievement, but too often our methods of teaching science focus almost exclusively on teaching facts and theories at the expense of the historical discovery and development of those facts and theories. This course teaches both the scientific facts and theories and the contexts of their production in order to sharpen students' abilities at critical evaluation of facts. The literary and scientific focus will vary from class to class, but may include writings by literary authors such as Edward Bulwer-Lytton, Bram Stoker, H. G. Wells, Garrett Serviss, William Butler Yeats, Arthur Machen, D.H. Lawrence, A. E. Waite, Aleister Crowley, Arthur Conan Doyle, and Camille Flammarion, and scientific texts by scientists such as William Crookes, William Ramsay, Frederick Soddy, Ernest Rutherford, Wilhelm Comad Roentgen, Henri Bequerel, J. J. Thomson, Niels Bohr, and Marie Curie. Like many literature courses, ENGL/CHEM 233 interprets history, assesses individual and social behavior, engages philosophical ideas, and expresses ethical and aesthetic values. It is especially useful at exploring cultural and social tensions involving scientific knowledge. For students in science programs, the course will explore the technical and conceptual dimensions of scientific knowledge in historical and cultural context. Political, cultural and personal motivations are integral components of the scientific method and deeply influenced the discovery of many of the fundamental chemical and physical concepts students are expected to master in their science curricula. Students should expect to take two exams consisting of a midterm and a final, to write at least two papers for the course demonstrating their abilities at literary analysis and grappling with the themes of the course, and to make a group presentation to the class. Classroom discussion and general class participation will also be a factor in evaluation. The course can be used as an elective credit toward the English Major and Minor, and can help students in English, Chemistry, or any other major fulfill General Education degree requirements. It will be offered once every other year with 20 seats per offering.

Cross-Listed Courses: CHEM 233

**Changes Effective Summer 2019:**

- Number to 233N
- Description
- B.A. Natural Sciences Designation
- Add General Education Designation Inter-Domain
- Cross-listed Course to CHEM 233N

**ENGL 245: Introduction to Lesbian and Gay Studies (3 Credits) (US) (GH)**

Old Listing Effective Through Spring 2019:

An introduction to the study of homosexual identities across a wide range of disciplines and methodologies. An introduction to the study of homosexual identities across a wide range of disciplines and methodologies, this course explores the history of modern, "western" ideas about sexual identity as manifested in both writing and images. The class examines sexuality not as a "natural" or consistent phenomenon, but as a set of beliefs that have changed over time and manifest themselves differently in different cultural and historical contexts. Starting in the late nineteenth century, scientific and medical authorities began categorizing individuals into sexual types based on their manifestations of gendered characteristics and their erotic attractions and practices. This medical typing corresponded with the development of subcultures associated with deviance from sexual norms; these subcultures produced a rich variety of texts, images, performances,
and social forms, many of which are now considered central to both vernacular and high culture. This course explores this rich archive. It investigates constructions of sexual conformity and how sexual nonconformists positioned themselves as a shared group identity. It examines how sexual distinctions between gendered, raced, and classed bodies were historically produced and culturally contested. It considers what commonalities gay identities may-or may not-share with lesbian identities and how the increasing visibility of bisexuality, transgender, and transsexuality has altered perceptions of sexual identity. The course explores the relationship of the avant-garde to mass-mediated politics of GLBTQ subcultures and the impetus to "normalcy." Comparative study of issues of sexual mobility beyond and between the borders of the United States expands the course's critical scope beyond dominant forms of western culture. This course does not propose definitive answers to the questions of identity it addresses. Instead it negotiates the ways sexualities have enabled individuals to articulate-and disarticulate-themselves within social bodies past and present. This course, therefore, has wide relevance for students interested in how group identities come into being and transform over time in dynamic relation to other historical forces. Exploring a wide variety of texts and images associated with the history of sexual identity as well as a variety of interpretations of that history, this course opens students to an archive with the potential to inform and enrich their understandings of many kinds of challenges to regimes of normativity today.

Cross-Listed Courses: WMNST 245

Changes Effective Summer 2019:
- Description
- Abbreviated Title
- Title

**ENGL 262: Reading Fiction (3 Credits) (BA) (GH)**
Old Listing Effective Through Spring 2019:

Elements of fiction including plot, character, viewpoint, and fictional genres in British, American, and other English-language traditions.

Changes Effective Summer 2019:
- Description
- Prerequisite/Corequisite/Concurrent Courses

**ENGL 265: Reading Nonfiction (3 Credits) (BA) (GH)**
Old Listing Effective Through Spring 2019:

Forms of nonfictional prose such as autobiography, biography, essay, letter, memoir, oration, travelogue in British, American, and other English-language traditions.

Changes Effective Summer 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

**ENGL 268: Reading Drama (3 Credits) (BA) (GH)**
Old Listing Effective Through Spring 2019:

Elements of drama including plot, character, dialogue, staging, and dramatic forms in British, American, and other English-language traditions.

Changes Effective Summer 2019:
- Prerequisite/Corequisite/Concurrent Courses
- Description

**ENGL 468: African American Poetry (3 Credits) (US) (BA)**
Old Listing Effective Through Spring 2019:

African American poetry within the contexts of the black oral tradition and transformed European literary tradition.

Prerequisites: ENGL 15 OR ENGL 30

Changes Effective Summer 2019:
- Abbreviated Title
- Description
- Add Cross-listed Course AFAM 468

**ERM 499: Foreign Studies (1-12 Credits: Maximum of 12 Credits) (IL)**
Old Listing Effective Through Spring 2019:

Supervised student activities on research projects identified on an individual or small-group basis.

Changes Effective Summer 2019:
- Description

**ESL 15: ESL Composition for American Academic Communication II (3 Credits) (GWS)**
Old Listing Effective Through Spring 2019:

For undergraduate students who are intermediate/advanced level non-native speakers of English to develop strategies for reading and writing American academic discourse. ESL 015 ESL/Composition for American Academic Communication II (3) This course is for undergraduate students who are intermediate/advanced level non-native speakers of English. Students will become familiar with the various stages in the process of writing and develop strategies for reading and writing various models of American academic discourse. Overall, students will be able to use what they have learned in this course to participate successfully in academic reading and writing tasks throughout their university experiences in the United States. Students will participate in a variety of reading and writing tasks that will enable them to: (a) define the subject, purpose, audience, and appropriate organizational structure for written compositions; (b) revise and reshape their writing to improve ideas, organization, language use, vocabulary and mechanics; (c) identify and correct structural and grammatical errors within their written texts; (d) select sources, take notes, and acknowledge sources to support ideas, using the library to conduct library research; and, (e) become better writers in preparation for their college careers.

Changes Effective Summer 2019:
- Description

**FDSC 105: Food Facts and Fads (3 Credits) (BA) (GHA)**
Old Listing Effective Through Spring 2019:

Impact on society and the individual of modern food technology, food laws, additives, etc.; historical, current, and futuristic aspects. FD SC (S T S) 105 Food Facts and Fads (3) (GHA)(BA) This course meets the Bachelor of Arts degree requirements. Food Facts and Fads is an introductory food course that broadly surveys various aspects of food, agriculture, nutrition, and health. Students in this course explore the
components of the food system from producer to consumer; examine issues related to modern food technology, food and nutrition policies, and changes in the food industry; and assess the impact on the food system, consumers, and on society as a whole. Students will assess their own food and nutrition behaviors, become more aware of the environment in which they make food decisions, and devise strategies for improving health through better diet and increased physical activity. Students learn through lectures, videos, guest speakers, discussions, individual and group activities, and optional field trips. This course emphasizes active learning and critical thinking. Students are expected to complete electronic quizzes, write two or more short reflective papers, and complete a project on a food topic of the student’s choosing, for which information must be gathered from several sources in a variety of ways.

Cross-Listed Courses: STS 105

Changes Effective Summer 2019:

- Description

GER 189: German Film (3 Credits) (IL) (GH)
Old Listing Effective Through Spring 2019:

A survey of German film from its beginnings to the present, with emphasis on historical, political, and cultural contexts. GER 189 German Film (3) (GH;IL) This course is an introduction to German cinema, broadly defined as any representation of moving images made in Germany, Switzerland, or Austria, or by filmmakers from these countries working in exile. The course will be both an historical survey of the developments in German film, as well as a general introduction to film analysis. Neither prior knowledge of German culture and language nor of film history and terminology is required. All materials will be supplied in English. Students will learn about the technology of film production as well as fundamental concepts for film analysis (shots, angles, sound, lighting, etc.). The course will be structured around different political and cultural contexts, providing students with a concrete historical perspective on Germany from the late nineteenth to the early twenty-first centuries. Screenings will cover several artistic modes, including comedy, melodrama, propaganda film, experimental film, period drama, crime drama, horror film, and documentary. Readings will complement screenings with seminal writings by filmmakers and theorists, as well as texts that provide historical perspective and close analysis. By examining German film with attention to changing cultural settings, students will investigate such topics as the relation of memory and history, the representation of war and genocide, the roles of propaganda and censorship, the formation (and deformation) of national identity, the impact of technological and economic changes on culture, and changing gender roles. In addition, students will learn to think critically about the visual medium of film, becoming more engaged and critical spectators in a world saturated with the moving image. Class work includes some lecture but emphasizes guided discussions, group work, writing exercises, and some student presentations. The course is designed to be suitable for all students generally interested in German, or interested in various fields of humanistic study, whether or not they have previously studied the culture of Germany. This course is designed to count as General Education, as a GH “General Humanities,” and as an IL “International Cultures” course.

Changes Effective Summer 2019:

- Number to 189N
- Description
- Add General Education Designations GA and Inter-Domain

GREEK 101: Introductory Ancient Greek (4 Credits) (BA)
Old Listing Effective Through Spring 2019:

Fundamentals of classical Greek grammar, syntax, and vocabulary. GREEK 101 Introductory Ancient Greek (4) (BA) This course meets the Bachelor of Arts degree requirements. The aim of GREEK 101 is to introduce students to the fundamentals of ancient Greek as quickly and thoroughly as possible. The Attic dialect is the basis of Classical Greek grammar, because this is the language of the tragedies of Aeschylus, Sophocles, and Euripides; the comedies of Aristophanes; the histories of Thucydides and Xenophon; the orations of Demosthenes; and the works of Plato. This course focuses primarily on the morphology and syntax of ancient Greek. Drills on each grammar presentation, as well as translation of sentences both from English to Greek and from Greek to English, and of brief passages from ancient authors are the basis of the student’s homework throughout the semester. By the end of the semester, students will be prepared to read short passages of Greek authors. The course will focus on reading and writing rather than speaking, although students will be expected to read Greek aloud regularly in order to master correct pronunciation. GREEK 101 will prepare students to continue with GREEK 102 and then 400-level Greek courses. The course goals, in addition to providing students with a firm grounding in Greek grammar and morphology, include giving students an improved understanding of English grammar and of English vocabulary and word origins. Moreover, while the primary focus will be on mastering forms and syntax, students will also be introduced to the basic aspects of classical Greek culture so that they are able to place the selections they read within a wider cultural context. Students may select to use GREEK 101 to fulfill either a 3-credit requirement for a course in Greek or Roman language, literature, and civilization, or archaeology or the requirement for 9 credits in courses related to Classics and Ancient Mediterranean Studies within the Common Requirements for the Major. Students desiring to fulfill the B.A. requirement for 12th-credit level foreign language in Greek may do so by successfully completing a 400-level course in Greek. Students’ work in the course will be evaluated on a combination of written work, including frequent tests and quizzes; homework completion; and course attendance and participation. GREEK 101 will be offered once per year with 24 seats per offering.

Changes Effective Summer 2019:

- Description

HIST 1: The Western Heritage I (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

A survey of the Western heritage from the ancient Mediterranean world to the dawn of modern Europe.

Changes Effective Summer 2019:

- Description
- Abbreviated Title

HIST 10: World History I (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Human origins; early civilizations; major political and intellectual developments on all continents; cultural interrelationships to 1500. HIST 010 Non-Western Civilization (3) (GH;IL)(BA) This course meets
the Bachelor of Arts degree requirements. History 010 is an introductory survey of ancient history from the emergence of Homo Sapiens to the onset of European exploration (approximately 1500), examining the evolution of the world's various peoples and cultures. The course will focus on the historical processes that led to human diversity, as expressed in varying patterns and systems of government, economics, arts, ideas, belief systems, and social organizations. The course will also treat the growth of agriculture and pastoral nomadism and explore global interactions and linkages, engendered by human migrations, the spread of commerce and disease, wars, and conquests up to 1500. Although the mode of delivery may vary, depending on the semester or session in which a specific section of the course is offered, its campus location, and the instructor's major research specialization, the course will be taught thematically and conceptually. It will include individuals who have played a significant role in influencing the beliefs and institutions of a particular culture, or humanity in general, such as Moses, Confucius, Gautama (the Buddha), Plato, Alexander, Jesus, Muhammad, St. Francis of Assisi, al-Ghazali, Murasaki Shikibu, and Moctezuma. Students will learn about the interrelationships between dominant and nondominant cultures, such as the concepts of Roman imperialism, the tributary relationship between China and its neighbors, the Islamic concept of conquering lands without forcing conversion, the effects of the Mongol conquests, and the beginnings of Portuguese exploration and colonization. The course will make students more aware of the cultural achievements of the ancient Egyptians, Hebrews, Greeks, Romans, Persians, Indians, Chinese, Arabs, Turks, Mayans, and Japanese. Discussion sections (for high-enrollment classes) and essay examinations will promote student facility in written and oral self-expression, analysis, synthesis, comparison and contrast, and cultural empathy. History 010 instructors will, at their discretion, provide opportunities for gathering information from libraries, computerized indexes, and websites. Students will come to understand themselves and their own culture, as well as the background to many other societies and cultures in today's world, through intellectual confrontation with the peoples and cultures of antiquity. Instructors will address issues related to civility, the individual's role within the larger community, and academic honesty.

Changes Effective Summer 2019:
- Description
- Abbreviated Title
- Long Title

**HIST 11: World History II (3 Credits) (IL) (BA) (GH)**

**Old Listing Effective Through Spring 2019:**

Social, economic, and political evolution of societies and cultures from 1500 to the present. HIST 011HIST 011 World History II (3) (GH;IL)(BA)
This course meets the Bachelor of Arts degree requirements. History 011 is an introductory survey of modern history from approximately 1500 to the present, viewing the world and its various peoples and cultures as a whole. This course will focus on the historical processes that have led to modernization, such as exploration, contacts among peoples and cultures, voluntary and forced migrations, the growth of technology and science, industrialization, urbanization, and other trends that have shaped the world since 1500. It will help students to develop facility in speaking and writing about continuity, change, causation, similarities and differences among cultures, universal and particular values, and conceptualization of modernity, through weekly discussion sections, essay examinations, short writing assignments, and selected readings. Its content is intrinsically international and intercultural, addressing overarching themes of ethnicity, race, religion, gender, and especially global perspectives. Approximately one-half of its content.

**Changes Effective Summer 2019:**
- Description
- Abbreviated Title
- Long Title

**HIST 20: American Civilization to 1877 (3 Credits) (US) (BA) (GH)**

**Old Listing Effective Through Spring 2019:**

An historical survey of the American experience from its colonial beginnings through the Civil War and Reconstruction. HIST 020 American Civilization to 1877 (3) (GH;US)(BA) This course meets the Bachelor of Arts degree requirements. History 020 is designed to introduce students to the main events and themes of American history before 1877. This course is not intended to simply acquaint the student with facts, but to teach them how to analyze those facts so that they can understand why historical events in America unfolded as they did. A larger goal of the course is to teach them how to think “historically” and to perceive the relevance of the past to the present. It is impossible to understand either yourself or your society if you cannot identify the role, which your individual and collective past plays in the construction of your actions and thoughts today. The course provides the student with a basic background in American History prior to 1877. HIST 021 chronologically follows this course by providing the student with a background in American History from 1877 to the present. HIST 020 is a prerequisite for upper-division courses in American History, and is a required course for the History major. The course grade will be determined by an in-class midterm exam, an in-class final exam (each containing essay and short-answer sections), a five-page paper based on the analysis of a primary source, and participation in discussion sections. This course will be offered twice per year with 150 seats per offering.

**Changes Effective Summer 2019:**
- Description

**HIST 21: American Civilization Since 1877 (3 Credits) (US) (BA) (GH)**

**Old Listing Effective Through Spring 2019:**

An historical survey of the American experience from the emergence of urban-industrial society in the late nineteenth century to the present. HIST 021 American Civilization Since 1877 (3) (GH;US)(BA) This course meets the Bachelor of Arts degree requirements. History 021 is designed as the second half of a two-term survey of American history, covering the period from 1877 to the present. (History 20 covers the period from 1607 to 1877.) The course uses a lecture format; larger versions have weekly discussion sections as well, led by graduate assistants. In terms of historical knowledge, History 021 seeks to introduce students to salient events, developments, and themes of American history since 1877. Chief among the topics covered are Reconstruction, Westward expansion and the decline of the Native American, the industrial revolution, urbanization, immigration, Gilded Age culture and politics, the labor movement, the New South, Populism, imperialism, Progressivism, segregation and African-American response, the women's movement, World War I, politics and culture in the “Twenties, the Great Depression and New Deal, World War II, post-war prosperity, the Cold War, the Civil Rights movement, the Vietnam War, the disillusionment of the ‘Seventies’, the Reagan revolution, and America in the post-Cold War era. The social and ideological diversity of the American experience is a prominent theme of History 021. A survey textbook selected by the instructor is used, in conjunction with lectures,
to provide a comprehensive overview. The textbook is supplemented by a blend of specialized historical works and primary readings. Students are evaluated on the basis of their performance on papers, exams, quizzes, and class participation and attendance. While History 021 instructors vary in the content and mix of work they assign (and the relative weight they give papers, exams, quizzes, and participation in the course grade), all versions share certain underlying objectives: to expose students to essential events and trends in American history; to develop their capacity to identify and analyze key themes and issues from the past; to give them some experience in the critical assessment of primary sources; and, to sharpen their skills in marshaling data and concepts from readings and lectures, and discussing them cogently both in section meetings and in writing. Increasingly, instructors are integrating multi-media components into their lectures. History 21 is the second half of a two-course survey of American history. History 020 is the first half; the year 1877 marks the dividing point between these two courses. Like History 020, History 021 provides a foundation (and is in fact a prerequisite) for many of the more advanced courses in American history. History 021 is a requirement for the major. Non-majors may use this course to satisfy a general education humanities selection. This course is offered three times a year with 140 seats per offering.

Changes Effective Summer 2019:

• Description

HIST 103: The History of Madness, Mental Illness, and Psychiatry (3 Credits) (IL) (BA) (GH)

Old Listing Effective Through Spring 2019:

This course will examine the ideas that have shaped European and American perceptions of madness, insanity, and mental illness. HIST 103 The History of Madness, Mental Illness, and Psychiatry (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. This course will be an introduction to the modern history of “madness” in the Western world. In particular, we will examine the ideas that have shaped European and American perceptions of madness, insanity, and mental illness; the changing experiences of those afflicted; the development of those professions designed to look after those deemed mad, insane, and mentally ill; and the social and cultural assumptions behind treatments, policies, and public opinions. Our sources will include clinical case studies, memoirs of those living with mental illness, histories of psychiatric practice, and films. An example of the evaluation methods would be 3-4 written, in class exams, a 10-12 page research paper on a subject of choice, and class participation. The chief objectives of the course will be to confront head-on some of our most persistent assumptions about mental health and those with mental illnesses, evaluate how mental illness was understood and treated over the centuries, and become acquainted with the ways in which human biology, culture, society, and politics have reciprocally shaped one another in history. The course can be effectively linked to several courses offered within the Department of History, including HIST 122 and 123 (History of Science I and II) and HIST 422 (European Thought Since 1870). In addition, it will fulfill requirements for both history majors and minors. The substance of the course emphasizes competence in the interpretive and critical understanding of the values, ideas, and experiences associated with mental disability over history and across cultures also means that it meets requirements for both General Education in the Humanities as well as Intercultural/International Competence. It is hoped that students across the human, social, and natural sciences will enroll in the course.

Changes Effective Summer 2019:

• Description

HIST 110: Nature and History (3 Credits) (IL) (BA) (GH)

Old Listing Effective Through Spring 2019:

A broad introduction to the history of human relationships with nature throughout the world. HIST 110 Nature and History (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. The human relationship with the natural environment—the world of plants, animals, and microbes, of air, water, and land—is an important historical subject. History 110 provides a broad, thematic description and analysis of major global trends and shifts, with an emphasis on contemporary issues and problem solving. The most important goal of the course is to provide students with the historical context necessary to construct a thoughtful appreciation of the environmental dilemmas of our time. History 110 encourages students to break down the barriers that often divide the humanities and the sciences.

This course utilizes environmental science to demonstrate and explain specific human tendencies. Finally, this course-as is any in world history-is structured to at least diminish students’ American-centered view of both the past and environmental concerns.

Particularly in relation to contemporary environmental issues, we hope History 110 will make clear that many environmental problems are local in neither their construction nor impact. Ecology has contributed a great deal to historical understanding in terms of specific examples or case studies; however, it has also begun to reconstruct the overall structure of the history that we teach. History 110 seeks to exploit this new paradigm by following a topical organization that is structured around human modes of interaction with the environment. In Unit 1 the course borrows its structure from geography and the natural sciences. Students will be able to consider a wide range of human activity as well as to better comprehend similarities in ideas, ethics and concepts from around the world and throughout history. In Unit 2 the course steps out of chronological limitations to embrace two topics that span human history. By studying such topics, of course, students may see change over time contextualized by a shared concern or resource. Unit 3 is designed to reinforce the global nature of the course and the concerns that we study within it. We will highlight interdependence by including issues that link students’ local environment with distant others. The lectures and discussions will focus on several critical points, including: How has the non-human world shaped the course of human history? What were the environmental impacts of historic changes in the ways humans produced and consumed resources? What ideas shaped the ways different groups of people defined and used specific resources? What role have science and technology played in changing popular attitudes about the human place in the world?

Changes Effective Summer 2019:

• Long Title
• Abbreviated Title
• Description

HIST 111: American Food System: History, Technology, and Culture (3 Credits) (US) (GH)

Old Listing Effective Through Spring 2019:

A cultural analysis of the evolution of U.S. agricultural production and food consumption patterns, the food industry and food marketing.
Examination of the history, culture, social tensions, and contributions of Jews and Judaism in America. HIST (J ST/RL ST) 115 American Jewish History and Culture (3) (GH; US) Throughout American history, Jewish presence on American soil has compelled Americans to re-think the meaning of religious and ethnic diversity. As one of the earliest non-Christian immigrant populations, American Jews struggled to explain how they could nonetheless fit into American cultural, political and social life. At the same time, many Jews have been concerned with their own survival as a distinctive group, unwilling to cede those practices, behaviors or traits that designate them as a people apart from other Americans. This course is about how these two seemingly contradictory goals—to integrate into America and to remain distinctive from other Americans—shaped the history and experience of Jews in the United States and influenced the way Americans think about diversity and pluralism. The student of American-Jewish history must be attuned to the multiple ways that Jewishness has been defined: as a race, a religion, a nationality, and an ethnicity. In this course, far from choosing just one of these designations, we will explore Jewish life from many different angles. Topics to be considered include religious reform, immigrant experience, political activism, popular culture, and struggles over community authority. Readings focus on a number of primary texts, including memoirs, novels, films and philosophical essays. Secondary books and articles will also help deepen students’ understanding of trends in American-Jewish history and awaken them to diverse interpretations of history. Students will be encouraged to engage actively and critically with the texts by writing short reading responses, longer essays, and participating in classroom discussion and presentations, all of which will serve as the basis for their evaluation. This course complements offerings in Religious Studies, Jewish Studies and History. It provides a foundation for an already existing upper-level seminar in American Judaism (listed in Jewish Studies and Religious Studies). In addition, the course strengthens the History department’s offerings in American history, serving as a basis for students interested in immigration, ethnicity and religious history. Students who are interested in modern Jewish history will also find this course a worthwhile addition to their program of study, since, unlike other courses, it deals primarily with the story of Jewish life in the United States.

Cross-Listed Courses: JST 115, RLST 115

Changes Effective Summer 2019:

• Description

HIST 122: History of Science I (3 Credits) (BA) (GH)

Old Listing Effective Through Spring 2019:

A history of science and culture from pre-history until the Scientific Revolution. HIST 122 History of Science I (3) HIST 122 examines scientific endeavor from pre-history until the Scientific Revolution. Topics include ancient Babylonian and Egyptian conceptions of the universe and and its relationship to human society, early Greek methods of understanding their world, and the development of science in the Western world and in other cultures. The course examines a range of theoretical and applied disciplines, including medicine and engineering. Along with key discoveries, the course emphasizes the role of cultural, political, and social forces in determining what human societies have valued as truth and knowledge and the standards and methods by which humans have offered proof of scientific knowledge.

Changes Effective Summer 2019:

• Abbreviated Title

Changes Effective Summer 2019:

HIST 123: History of Science II (3 Credits) (BA) (GH)

Old Listing Effective Through Spring 2019:

A history of science and culture from the scientific revolution to the present. HIST 123 History of Science II (3) HIST 123 examines the intellectual, social, and cultural history of science from the Scientific Revolution to the present. The course covers a range of theoretical and applied disciplines, including engineering and medicine. In addition to major discoveries and new ideas, methods, and tools, the course examines the effect of social conditions on science as well as the impact science has had on society. Scientific developments in the Western world, broadly defined, constitute the organizing framework of the course, but the course also examines science in non-Western cultures.

Changes Effective Summer 2019:

• Abbreviated Title

Changes Effective Summer 2019:

HIST 130: Introduction to the Civil War Era, 1848 through 1877 (3 Credits) (US) (BA) (GH)

Old Listing Effective Through Spring 2019:

Survey of causes and consequences of American Civil War, end of Mexican War in 1848 through end of Reconstruction, 1877. HIST 130 Introduction to the Civil War Era, 1848 through 1877 (3) (GH; US) BA - This course meets the Bachelor of Arts degree requirements. HIST 130 is a general survey of the American Civil War Era that satisfies the Gen Ed GH requirement. Course content features the cause of the war, the conflict itself, and the consequences for the meaning of freedom in the United States. Chronologically, the course spans from 1848 through 1877, or from the Mexican War through Reconstruction. Students will become familiar with American slavery; northern and southern social, cultural, political, and economic composition; the military progress of the war; problems on the home front; the struggle for emancipation; and the creation of a new nation based on free labor. Lectures are supplemented with discussion days in which students react to readings. Grading stresses the use of analytical and writing skills, as well as the ability to think historically and analyze documents critically.

Changes Effective Summer 2019:

• Description

HIST 141: Medieval and Modern Russia (3 Credits) (IL) (BA) (GH)

Old Listing Effective Through Spring 2019:

Introductory survey, including political, social, economic, and cultural development of Kievan, Muscovite, and Imperial Russia.
## HIST 153: The Indian in North America (3 Credits) (US) (BA) (GH)

**Old Listing Effective Through Spring 2019:**

A survey of the American Indian from prehistory to the present.

### Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

## HIST 159: History of the FBI (3 Credits) (US) (GH)

**Old Listing Effective Through Spring 2019:**

Survey of the FBI's history with special emphasis on civil rights and liberties and bureaucratic development. CRIMJ 159 / HIST 159 History of the FBI (3) (GH;US) The History of the FBI introduces students to the 100-plus years history of the Federal Bureau of Investigation. With such a long history, studying the FBI engages students with each of the various historical time periods from the late 19th century to the present, including Reconstruction, the Gilded Age, Progressive Era, First World War, the New Era, the Great Depression, the Second World War, the Cold War, post-Cold War, Age of Terrorism, and contemporary history. Students will understand the evolution of Federal law enforcement, bureaucracy, the increasing power of the Executive branch, the targeting of various minority groups, civil rights and civil liberties issues, and the growth of a national security role for the federal government over time. In its long history the FBI has intersected with a wide variety of groups and issues, and this reality will further expose students to the histories of African Americans, gays and lesbians, women's groups, Latinos, Native Americans, war protestors, students, various political dissenters, immigrants, targeting of morality, obscenity, and labor organizing. Because the FBI is responsive to both the political and policy interests of presidents and the influences of American society, students will come to appreciate the influences that politics has on bureaucracy and law enforcement, as well as the different social, political, economic, and cultural influences that each historical time period have exerted on the FBI to help shape its priorities and structure.

Cross-Listed Courses: CRIMJ 159

### Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Add BA Designation

## HIST 165: Introduction to Islamic Civilization (3 Credits) (IL) (BA)

**Old Listing Effective Through Spring 2019:**

Islamic history, culture, and religious life c.600-1500 C.E.

Cross-Listed Courses: ARAB 165, RLST 165

### Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title
- Add GH Designation

## HIST 171: Introduction to South Asian History 2: Early Modern to Contemporary (3 Credits) (IL) (BA) (GH)

**Old Listing Effective Through Spring 2019:**

An introduction to South Asian history from early modern to contemporary times. ASIA (HIST) 171 Introduction to South Asian History 2: Early Modern to Contemporary (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. This course will offer students a general introduction to the cultures and societies of the South Asian subcontinent from the early modern to the contemporary, following processes of modernization and social transformation through both colonial and postcolonial periods. It covers the rise of British power, and the various responses to it from collaboration to mutiny; the development of competing nationalisms and anticolonialisms, including secular, socialist, Hindu and Muslim variations; accompanying social reform visions including caste abolition and feminism; the turbulent paths toward partition and independence, resulting in the postcolonial states of India, Pakistan, Bangladesh, Nepal, Sri Lanka, and Afghanistan. It then follows the continuing trajectories of these countries after independence, from the Nehruvian years to the neoliberal shift, with attention to emerging social movements and issues including caste and gender relations; religious and separatist politics; struggles around land and development; urbanization, and labor migration; leading into the 21st century.

Cross-Listed Courses: ASIA 171

### Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title

## HIST 172: Survey of Japanese Civilization (3 Credits) (IL) (BA) (GH)

**Old Listing Effective Through Spring 2019:**

Survey of social, institutional, cultural, and religious developments from ancient times to the present. HIST 172 Survey of Japanese Civilization (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. This course is a survey of Japanese history, from ancient times to roughly the present day. It is not possible to cover every aspect of Japanese history in just fifteen weeks, but this course aims to provide an overview of important developments in Japanese society, religion, culture, and government. The goals of the class are not only to gain an understanding of a time and place far removed from our own, but also to develop the skill of building such an understanding through primary and secondary sources, both written and visual.

Cross-Listed Courses: ASIA 172, JAPNS 172

### Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title

## HIST 173: Vietnam in War and Peace (3 Credits) (IL) (BA) (GH)

**Old Listing Effective Through Spring 2019:**

Rise of nationalism and communism; origins of conflict; United States involvement; impact on postwar regional and international politics; contemporary Vietnam. HIST 173 Vietnam in War and Peace (3) (GH;IL) (BA) This course meets the Bachelor of Arts degree requirements. The small Southeast Asian nation of Vietnam remained an obscure and
exotic land, relatively unknown to the rest of the world until the mid-twentieth century when it became the scene of a military and political struggle with important global implications. History 173 examines two interrelated topics: 1) the long history and unique culture of Vietnam and its peoples, extending from prehistory to the present; and 2) Vietnam’s constant struggle over several millennia to secure its independence in the face of continual military, political, social, and economic pressure from outsiders, especially the Chinese, the French, and the Americans. The course includes special focus on the physical geography of Vietnam; the anthropological origins of its people; the evolution of its unique culture, folklore, and legends; its long-term struggle against Chinese military and cultural aggression; its role as a colony in the French global empire; the rise of nationalism and communism in Vietnam; the origins of global conflict in Vietnam in the post-World War II and Cold War world; the conduct of military, political, diplomatic, and economic affairs of France, the United States, North and South Vietnam, and other nations during the wars of 1945-1975; the response of civilian populations and governments to that military conflict; and post-1975 Vietnam. Evaluation methods include map-based examinations to familiarize students with the geography of the region and to underscore how geography and history intersect. Examinations include both essay and objective questions that require students to integrate information from lecture and from readings drawn from both primary and secondary sources that examine Vietnam’s struggles from different viewpoints. Also required is a research/writing project that explores some specific dimension of the American or Vietnamese homefront experience during 1965-1973, the peak years of the U.S. military effort. This course deepens knowledge about Asian cultures introduced in History 010 and 011 (World History). It supports both the interdisciplinary East Asian studies major and Asian Area Studies minor. This course is accepted for the Military Studies major. History 173 satisfies both General Education and Bachelor of Arts degree requirements for Humanities.

Changes Effective Summer 2019:

- Description

HIST 174: The History of Traditional East Asia (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:
Comparative cultural, institutional, and social history of traditional China and Japan to their contact with the industrialized West.
Cross-Listed Courses: ASIA 174

Changes Effective Summer 2019:
- Description
- Abbreviated Title
- Title

HIST 175: The History of Modern East Asia (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:
Comparative survey of the internal developments and external relations of China and Japan since their contact with the industrialized West.
Cross-Listed Courses: ASIA 175

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title

HIST 177: The Rise of Modern Southeast Asia (3 Credits) (IL) (GH)
Old Listing Effective Through Spring 2019:
Study of Southeast Asia from the rise of early empires to the present.
Cross-Listed Courses: ASIA 177

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Title

HIST 178: Latin-American History Since 1820 (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:
Origin, political growth, international relations, and economic status of the Latin-American republics, with emphasis upon present-day conditions. HIST 179 Latin-American History since 1820 (3) (GH:IL) (BA) This course meets the Bachelor of Arts degree requirements. This course focuses on Latin America (with limited coverage of the Caribbean) from the early 1800’s through the present. For the colonial period (c.1500-c.1820), it is easy to see why Latin America has a “common history,” as most of it was ruled by two quite similar countries, Spain and Portugal. But after the colonial system collapsed, giving rise to over a dozen independent countries by the 1830s, the issue becomes more complicated. What do these dependence upon markets in developed countries for their economic prosperity? How can we explain the continuing similarities between these countries, without losing sight of their diversity? The approach of this course is broadly chronological, but for each period we will focus on one or more countries that illustrate (however imperfectly) the trends of the period. The goal of the course is not to provide an encyclopedic knowledge of Latin America, but rather to provide a framework for understanding how current issues are rooted in past historical processes, and to offer a better sense of how key historical themes are “lived” by ordinary people in Latin American society. A related goal of the course is to acquaint students with the historiography of Latin American: the different approaches that historians have used to understand the region. Students will be evaluated on two sets of essay exams and a paper, as well as participating in classroom discussion. HIST 178 and 179 are both requirements for the Latin American Studies Major and Minor, as well as satisfying general credit requirements for the History Major.

Changes Effective Summer 2019:

- Long Title
- Abbreviated Title
- Description
- Add B.A. Other Cultures Designation

HIST 183: Gender, Family, and Society in East Asia (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:
Investigates the history of gender, family, love, and sex in East Asia.
Cross-Listed Courses: ASIA 183
Changes Effective Summer 2019:

• Description

HIST 184: Society and Culture in the Pacific War (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Examines the role of society and culture in the Pacific War's causes, contexts, realities, and aftermath.
Cross-Listed Courses: ASIA 184

Changes Effective Summer 2019:

• Description

HIST 188: Tibet: People, Places and Spaces (3 Credits) (IL) (GH)
Old Listing Effective Through Spring 2019:

This course examines the historical, cultural, and ethnic dimensions of Tibet from the seventh century to the present.
Cross-Listed Courses: ASIA 188

Changes Effective Summer 2019:

• Description

HIST 192H: Modern African History (3 Credits) (H) (GH)
Old Listing Effective Through Spring 2019:

Impact of the slave trade, expansion of Islam, colonial conquest, social and cultural transformations, resistance, nationalism, independence.

Changes Effective Summer 2019:

• Description

Cross-list Course: AFR 192H

HM 330: Food Production and Service Management (2 Credits)
Old Listing Effective Through Spring 2019:

Food service management laboratory stressing the integration of purchasing, menu planning, and costing in quantity production of quality food. HM 330 Food Production and Service Management (2) This course is designed as the application of foodservice production and service management stressing the integration of management modules with training in employee positions for the quantity production of quality food. The course draws from the students' theoretical background in accounting, management, nutrition, food production and sanitation, and thus integrates these areas into the daily operation of a campus foodservice facility as a living laboratory. Students, working as a management team, coordinate and manage all aspects of the food service laboratory. Students also experience a number of employee work positions in the laboratory. Main topics typically include: critical management decisions in a foodservice operation; evaluation of manager and employee performance, interpersonal and time management skills; procedures to prevent sanitation and safety hazards in a foodservice operation; food production, service, sanitation, and quality assurance techniques typical to foodservice operations; technical responsibilities in the development, production and evaluation of a food service system including sales, recipe production and service, cost control, purchasing, facilities management, personnel management, and financial management; critical thinking and leadership skills; and interaction with guests and accurate evaluation of the guests' dining experience.

This foodservice practicum is the second course in the foods sequence. Students enroll in this course after completing the introductory course in food production and service and a Nutrition course in food preparation. The course is a prerequisite for the advanced food production course.

Changes Effective Summer 2019:

• Abbreviated Title

HM 350: Hospitality Decision Making and Information Systems (3 Credits) (GQ)
Old Listing Effective Through Spring 2019:

Application of decision theory and models to solve qualitative and quantitative problems using Hospitality Information Systems and Computer Applications. HM 350 Hospitality Decision Making and Information Systems (3) This course provides students with the opportunity to apply analytical techniques, Excel-based models, and simulation to the management of operations in the hospitality industry. The overriding goal is to provide students with the skills needed to make effective, data-driven decisions. Key topics include: decision making under certainty and risk, total quality management, process analysis and design, capacity planning, process strategy, project management, principles of revenue management, and forecasting for operations management.

Changes Effective Summer 2019:

• Title

• Abbreviated Title

• Description

• Prerequisite/Corequisite/Concurrent Courses

HM 365: Organizational Behavior in the Hospitality Industry (3 Credits) (IL)
Old Listing Effective Through Spring 2019:

Study of individual satisfaction and performance in hospitality organizations. Topics include cultural diversity, motivation, communication, group behavior, and leadership.

Changes Effective Summer 2019:

• Remove IL Designation

• Abbreviated Title

• Description

• Prerequisite/Corequisite/Concurrent Courses

HPA 57: Consumer Choices in Health Care (3 Credits) (GHA)
Old Listing Effective Through Spring 2019:

Introduction to consumers' role in health-care decisions, including health benefits, physician and hospital choice, and end-of-life choices. H P A 057 Consumer Choices in Health Care (3) (GHA) H P A 057 is designed to provide students with an understanding of the consumer's role in health care decisions. The growth in health care information resources, the expansion of for-profit medical care, the consumer revolution, and increasing cost pressure mean consumers must be aware of the critical issues involved in health care decisions. Consumer knowledge and decision-making affect the cost and quality of health care received. The main goal of this course is to educate students to become knowledgeable health care consumers. H P A 057 (GHA) can be used as
INTAG 100: Introduction to International Agriculture (3 Credits) (IL) (BA) (GS)
Old Listing Effective Through Spring 2019:

Ag in developing countries; contemporary crucial issues in global agriculture; emphasizing hunger and food security. INTAG 100 Introduction to International Agriculture (3) (GS;IL)(BA) This course meets the Bachelor of Arts degree requirements. This class focuses on agriculture in developing countries and frames this focus with a discussion of contemporary crucial issues facing agriculture on a global scale, emphasizing global hunger and food security. The primary goal of the course is to inform students about international agriculture, challenging them to think critically and independently about agricultural issues and development, to generate global citizens who are more aware and conversant on important contemporary challenges in the global food, agriculture, and natural resource systems. The objectives of this course are to acquaint students with: (1) the range of cutting edge issues that play an important role in international agricultural development; (2) information and conceptual frameworks of ongoing multi-faceted debates concerning the global food, agriculture and natural resource systems; (3) the social, cultural and ecological systems that shape human decisions about land use in various areas of the world. This class will primarily focus on agriculture in developing countries and frame this focus within a discussion of contemporary crucial issues facing food, agriculture and natural resources on a global scale. Specific emphasis will be placed on debates concerning global hunger and food security. Several examples from around the world will be included. Class will take a variety of formats, including formal lectures from INTAG 100 staff and guest lecturers, videos, lab and site visits, student presentations and class discussion time. The course is part of the International Agriculture minor, and satisfies two General Education requirements. Evaluation consists of group presentations, short papers and exams. The course is offered once every academic year.

Changes Effective Summer 2019:

• Abbreviated Title
• Description

IT 130: Italian Culture and Civilization (3 Credits) (IL) (BA) (GH)
Old Listing Effective Through Spring 2019:

Italian life from antiquity to the present; literature, film, the arts, and contemporary problems in historical perspective. IT 130 Italian Culture and Civilization (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. The course aims to develop critical and analytical skills of undergraduate students. It is an intercultural/international Competence course dealing thoroughly with ethnicity, religion, and global perspective as it pertains to Italian culture and civilization. The course traces, among other themes, the importance of the Roman Empire, the Catholic Church, the Renaissance, presence and contributions of the Roman Catholic Church, the Italian Renaissance, and Italian immigration, artistic patrimony, and culinary contributions. Historical texts used will emphasize the social history of Italians that portrays the continuous processes of adaptations through the ages. Consideration will be given to the various representative Italians such as Dante, Da Vinci, Machiavelli, St. Francis, St. Clare, Fellini, and Fermi. We will read novels and analyze films that depict aspects of Italian thought and culture from religion to politics.

Changes Effective Summer 2019:

• Abbreviated Title
• Description

IT 131: Italian American Culture and Civilization (3 Credits) (US) (BA) (GH)
Old Listing Effective Through Spring 2019:

Italian-American experience from the late 19th century to present. Sociopolitical issues seen through cinema and through literary and other readings. IT 131 Italian American Culture and Civilization (3) (GH;IL)(BA) This course meets the Bachelor of Arts degree requirements. Between 1870 and 1920 over five million Italians immigrated to the United States. They were mainly men, and they came primarily to strike it rich. Of those who came, about one-third returned to Italy. Those who remained, often joined by their families, left an indelible mark on the American cultural, political, artistic, educational and social landscape. This course investigates the fascinating story of Italian immigration to the United States, a story that many students’ great-grandparents and grandparents actually lived and bequeathed in memory via their personal stories. Our inquiry will be interdisciplinary. We will study historical texts, literature and film, which address the historical and sociological conditions of 19th Century Italy, the odyssey of immigration to and assimilation in the United States, and life in the ethnic neighborhood. We will also explore the Mafia, forms of prejudice, and ways Italians uniquely manifested their social values in labor unions, religion and education. Upon successfully completing this course, students will have a solid grasp of how Italians, in becoming Americans, contributed to the rich fabric of life in the United States. Evaluation will be done through limited class participation, examinations, and quizzes. There will be eight multiple-choice exams, with one essay question, and four quizzes based upon the novel readings. IT 131 will provide an Italian American equivalent to IT 130 (Italian Culture and Civilization). It should fulfill Humanities Breadth and Cultural Diversity requirements. The course will not count toward the minor or
Changes Effective Summer 2019:

- Abbreviated Title
- Description

**JST 114: Modern Judaism (3 Credits) (US) (IL) (BA) (GH)**

Old Listing Effective Through Spring 2019:

Trends in Jewish life and thought since the French revolution; Judaism's responses to the challenge of modernity. J ST (RL ST) 114 Modern Judaism (3) (GH;US;IL)(BA) This course meets the Bachelor of Arts degree requirements. The course explores the opportunities and problems of Jews around the world from the late eighteenth century — the "age of emancipation" — to the present time. Commercial, political, and intellectual revolutions in the 1700s, giving rise to modern capitalism, republicanism, and an emphasis on reason, combined to induce political states to grant Jews unprecedented freedom. Emancipation introduced new elements into Jewish life: religious change, personal choice, and internal disagreements. In practical ways, life improved for Jews, as they became more prosperous and assimilated. But freedom also increased the chances for loss of identity, as liberals discarded some rituals as outdated and many individuals chose to give up traditional practices. In addition, anti-Semitism persisted, although it was now, at times, more difficult to detect. Traditional forms of hostility to Jews, such as heresy trials and political expulsions, were replaced by subtle expressions of political and social discrimination. But hatred of Jews did not disappear, despite widespread acceptance in Western culture of political liberalism. The class explores these trends in Europe, the Americas, and Israel. It begins by looking at the fragile freedom of nineteenth-century Jews. In the twentieth century, Jewish experience has often been characterized by open conflict: in the Holocaust, the formation of Israel, contemporary black-Jewish relations in the United States, and Jewish-Muslim relations in the Middle East. The course concludes with these recent struggles.

Course readings include personal narratives (reminiscences or letters) and works of fiction (a short story, play, and novel). The class is primarily a discussion class, using writing assignments as the principal method of evaluation. The course requires three graded essays and an ungraded proposal. Students are also asked to keep a journal of commentary on course readings. Class attendance and participation are components of the final grade. The course serves as an introduction to modern Judaism as a religion and culture. It prepares undergraduate students for advanced work in European and American Judaism, as well as Israeli history and culture. These advanced courses are found in the Religious Studies and Jewish Studies programs and in the Departments of History and Comparative Literature. It may be used to complete the major or minor requirements in Religious Studies and Jewish Studies. The class fulfills the humanities requirement for non majors. The course is normally offered once every two years, and the enrollment is 40 students.

Cross-Listed Courses: RLST 114

Changes Effective Summer 2019:

- Description

**KINES 029: Golf I (1.0-1.5) (GHA)**

Old Listing Effective Through Spring 2019:

A course designed to give students an understanding of and a proficiency in golf skills, rules, and etiquette. KINES 029 Golf I (1.0-1.5) (GHA) Kinesiology 029 is a course designed to give students the understanding, knowledge and skills to begin an exploration of the game of golf. While the courses main area of emphasis is on golfs’ short game (putting, chipping and pitching) students will be educated about full swing fundamentals and proficiencies will be developed in short and mid-irons.Perhaps the most unique feature of Golf I is the weekly on course practice. Each week during this course, students will get a chance to apply the skills they have learned during the week on an actual golf course. This practice time is in a situation where only the students from the class are on the course. This situation creates an ideal practice area for the student golfer to be come acquainted situational application of golf skills. Students who enroll in Kinesiology 029 will find, in the game of golf, a unique form of self-expression. The daily “movement problems” that students will encounter offers a new type of information gathering process accompanied by unusual opportunities to synthesis that information into a “golfing personality”. The development of motor skills will complement students’ oral and written capabilities. The active lifestyle requires that the participant be able to gather, synthesis and analyze information. Students in Kinesiology 029 will be asked to involve themselves in Web and CD-ROM based assignments to gather, synthesis and analyze valuable information about golf’s rules and etiquette, equipment, and travel planning. Students will be evaluated by a combination of (but not limited to) evaluation techniques. Examples of those techniques are written examinations, skills testing, written papers and subjective evaluation of skill level and game performance. The student, who successfully completes Kinesiology 029-Golf I will possess a command of basic golf rules, golf’s terminology and golf etiquette. These basic fundamentals will ease the transition from golf student to golfer. Students will find that, after completion of Golf I the work done in this course will prepare them for actual participation in the game of golf.

Changes Effective Summer 2019:

- Description

**KINES 44: Racquetball I (1-1.5 Credits: Maximum of 1.5 Credits) (GHA)**

Old Listing Effective Through Spring 2019:

The course promotes health, fitness, and enjoyment of the game of racquetball. KINES 044 Racquetball I (1-1.5) (GHA) Kinesiology 044 is a course designed to give the student a comprehensive involvement in the game of racquetball. The basic fundamentals, rules, and strategies will be taught in a drill/modified game format until the student has developed skills and understanding sufficient to compete successfully. It is through the competition where the socialization, fitness, and enjoyment of the game will be enhanced. Hopefully, the desire to continue racquetball as a lifelong activity will result. Successful completion of Racquetball I will allow the student to choose an advanced level of this course if he/she desires. Students will be evaluated by a combination of written examinations/quizzes, skills testing, tournament performance, and subjective evaluation of skill development and game performance.

Changes Effective Summer 2019:

- Description
- Credits to 1.5 Not Repeatable
Description: A course designed to give students an appreciation of and proficiency in the skills, rules, and regulations of tennis. KINES 048 Tennis I (1.5) (GHA) Kinesiology 048 is a course designed to introduce students to the basic skills of Tennis. The initial focus will be twofold: stroke development and acquiring an understanding of the rules, regulations, and terminology of the game. Subsequent effort will emphasize the development of movement skills and a progression from hitting to rallying. In turn, students will learn to apply the above to live-game situations (both singles and doubles). Students will emerge from this course with beginning-level tennis skills as well as an appreciation for the requirements of higher-level tennis participation. Students will be evaluated by (but not limited to) a combination of techniques: written examinations, skills testing, performance standards, and subjective evaluation of skill level.

Changes Effective Summer 2019:

- Description

KINES 62: Introduction to Cardiovascular Activities (1.5 Credits) (GHA)
Old Listing Effective Through Spring 2019:

A course designed to give students an introduction to various types of cardiovascular training. KINES 062 Introduction to Cardiovascular Activities (1.5) (GHA) Kinesiology 062 has been designed to help students become acquainted with and proficient in many types of cardiovascular activities that can be used as part of a lifelong exercise program. Students should expect to participate in a variety of activities such as, but not limited to, walking/jogging, cycling, aquatics, aerobic dance, and cardiovascular exercise machine use.

Additionally, students will have an opportunity to learn skills necessary to create safe cardiovascular exercise programs while considering safety and injury prevention. Kinesiology 062 is taught in a modular format including three to five separate types of cardiovascular exercise being chosen for the course content for the semester. Students will know which courses have been selected by listings in the semester Directory of Classes. Kinesiology 062 will provide a unique balance of training guidelines that can be applied to the various activities one pursues throughout life. Fundamental guidelines for safe exercise, progression, self-monitoring, etiquette, and injury prevention will be introduced throughout the course. Cardiovascular activities serves as a stepping stone to lifetime physical fitness and disease prevention. Self-and group-paced activity will allow for each individual to maximize the benefits of exercise. Various evaluation techniques will be used to assess progress in Kinesiology 062. These techniques will include, but are not limited to, written examinations, performance assessments, and improvement-based evaluations of cardiovascular endurance and strength.

Changes Effective Summer 2019:

- Abbreviated Title
- Description

KINES 65: Jogging (1.5 Credits) (GHA)
Old Listing Effective Through Spring 2019:

A course designed to give students an understanding of and the ability to establish an exercise program involving jogging. KINES 065 Jogging (1.5) (GHA) Kinesiology 065 introduces students to the performance of jogging as a lifelong activity that helps maintain and enhance physical fitness and overall wellness. This course provides the information that the student needs to understand, organize, plan and implement a physical fitness program that features jogging as a primary activity. The centerpiece of this course is a progression of individually-paced jogs of varying lengths that are conducted over various terrains. Past activities have included 1.5-mile timed runs, 2 through 6 mile runs, interval runs, hill runs, and runs to various locations of interest. Locations include Beaver Stadium, the deer research pens, Sunset Park, and various other landmarks around campus and in the community. These activities are complemented by a series of classroom lectures on such topics as the physiology of exercise, jogging safety; goal-setting for personal health; principles and concept of physical fitness; training methods to address different jogging goals; and nutrition and weight control. Students also participate in team-based projects such as group-designed scavenger hunts, “landmark jogs,” and different team games and events that build group interaction skills. As a final project, each student is asked to define a measurable fitness goal and design a fitness jogging program to realize that goal. As part of this assignment, students assemble data to indicate that they have achieved their goal, and then identify and analyze the factors that contributed to their success. Students also have the opportunity to monitor their performance throughout the course using a variety of personal assessment inventories and instruments, such as logs and heart rate monitors. When a student completes Kinesiology 065, he or she will be able to identify the components of an effective physical fitness program and explain how jogging contributes to the success of this program; develop realistic fitness goals and design a jogging program to meet these goals; perform a variety of fitness jogging techniques; and understand how jogging promotes psychological well-being. Frequency of Enrollment: Ten to twelve sections every fall and spring semesters with a maximum of 30 students per section.

Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

KINES 81: Wellness Theory (3 Credits) (GHA)
Old Listing Effective Through Spring 2019:

Focused on preparing and engaging students in the attitudes and behaviors that enhance quality of life and maximize personal potential.

Changes Effective Summer 2019:

- Description

KINES 83: Exercise for Stress Management (1.5 Credits) (GHA)
Old Listing Effective Through Spring 2019:

A course designed to identify the factors that contribute to student stress and develop strategies that will manage these factors. Students who receive credit for KINES 083 will not receive credit for KINES 082. KINES 083 Exercise for Stress Management (1.5) (GHA) Kinesiology 083 is a course designed to give the Penn State student an introductory understanding of the fundamental principles of stress management. This course will provide pertinent information the student needs to understand, organize, plan, and implement a preliminary stress management program. In this course, the Penn State student will follow a four-part concept of stress management that encourages the student to identify the factors that contribute to their stress and to develop strategies that will allow the student to manage these factors more effectively. In the first part of the course, material is presented that relates to the importance of knowing oneself and then establishing vehicles for placing oneself in relationships, environments, and situations that consistently support that “self.” In the second part of the course,
the student is introduced to the elements of fitness and the research
data available to date that supports the idea of fitness prescriptions to
enhance the relaxation response and/or produce relevant changes in
hormone levels. In conjunction with this knowledge and application of
such knowledge, the students learn nutritional facts that allow them to
understand the chemicals that foods possess that can produce a calming
or increased energy effect. Combining this knowledge, the students
develop a personal program to incorporate these fitness and nutritional
goals into their own lives. In the third part of the course, students are
introduced to Eastern literature that indicates that a mind needs to be
trained in order to provide a calming effect, increased concentration, and
efficiency. Students practice these skills to train their mind and be able to
fully depend on their mind to perform more efficiently in time of stress.
In the final part of the course, the students are introduced to the most
current definitions of spirituality and are able to appreciate how their own
spirituality is demonstrated in their lives. The course is taught through a
variety of teaching methods which include lecture, workbook activities,
and the repeated use of stress techniques demonstrated by the instructor
and practiced by the students in class. This learning is supplemented and
reinforced by listening to stress management audio tapes. The students
reflect on specific stress concepts by writing self-reflection papers that
allow them to reflect on how each concept is “showing up” in their own
lives at the present time.

Changes Effective Summer 2019:

- Description

KINES 90A: Introduction to Team Sports/Indoor - Volleyball (1.5
Credits: Maximum of 99 Credits) (GHA)
Old Listing Effective Through Spring 2019:

A course designed to introduce students to the team sport of volleyball.

Changes Effective Summer 2019:

- Description
- Make Not Repeatable

KINES 90B: Introduction to Team Sports/Indoor - Basketball (1.5
Credits: Maximum of 99 Credits) (GHA)
Old Listing Effective Through Spring 2019:

A course designed to introduce students to the team sport of basketball.

Changes Effective Summer 2019:

- Description
- Make Not Repeatable

KINES 90C: Introduction to Team Sports/Indoor - Team Handball
(1.5 Credits: Maximum of 99 Credits) (GHA)
Old Listing Effective Through Spring 2019:

A course designed to introduce students to the sport of team handball.

Changes Effective Summer 2019:

- Description
- Make Not Repeatable

KINES 200: Muscle Training: Physiology, Programs, Techniques (3
Credits)
Old Listing Effective Through Spring 2019:

Physiological basis of strength training emphasizing mechanisms
of muscle contraction and growth, program and facility design, and
individual exercise technique. KINES 200 KINES 200 Muscle Training:
Physiology, Programs, Techniques (3) This course focuses on the
concepts and applications of strength exercise science including relevant
testing and evaluation of strength protocols. It explores the organization
and administration of resistance training and conditioning facilities
including the development of resistance training programs. The course
also introduces students to exercise techniques. As a result of this
course students will be able to work collaborative with others. They
should be able to evaluate information for authority, relevance, currency
and accuracy. They will understand the biomechanics of strength
training, the physiological adaptations to muscle training and the
mechanisms of change with varying populations. In addition they should
be able to select and organize appropriate muscle testing protocols. They
should be able to teach and demonstrate appropriate strength exercises
to an individual or group as well as be able to identify and correct errors
an individual might make. They should be able to prescribe the proper
exercise and exercise sequence to strengthen a specific muscle or
muscle group. And they should be able to design and organize a strength
training facility. Knowledge and skills will be assessed by written tests, by
laboratory work and by a variety of group projects and term papers. This
course is linked to other courses in that it is the course in which students
gain knowledge and experience in designing and prescribing resistance
training exercises for individuals and groups. As such it contributes core
content to the curriculum. The course requires a resistance training room
with adequate equipment and computers, both available to students at
both locations of the College.

Changes Effective Summer 2019:

- Abbreviated Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

KINES 202: Functional Human Anatomy (4 Credits)
Old Listing Effective Through Spring 2019:

This course is designed to provide students a didactic and laboratory
experience in functional human anatomy. Upon course completion,
students should be able to comprehend and apply standard anatomical
nomenclature pertaining to human movement science; comprehend
structure and function of the musculoskeletal, neurological, respiratory,
cardiovascular, lymphatic, gastrointestinal and endocrine systems
pertaining to human movement science; comprehend the classification,
structure and function of human anatomical articulations (joints)
pertaining to human movement science; and comprehend the
classification, structure, and function of human biological tissues
(epithelium, connective, muscle and nervous) pertaining to human
movement science. In the laboratory potion of the course students
will learn to identify bone and capsuloligamentous tissues as well as
their respective landmarks pertaining to human movement science;
identify origins, insertions, actions and innervations of skeletal muscles
pertaining to human movement science; and identify biomechanical
characteristics and neuromuscular activity of human anatomy during
the execution of active, passive as well as resistive movements. The
laboratory portion of this course will use three-dimensional bone models,
joint models, ligament models and cadaveric models to apply concepts
covered in lecture.

Cross-Listed Courses: ATHTR 202
Changes Effective Summer 2019:

- Abbreviated Title
- Change Credits to 3-4

**KINES 350: Exercise Physiology (3 Credits)**

**Old Listing Effective Through Spring 2019:**

Structure and function of the human body as applied to health, wellness, exercise, and sports. KINES 350 Exercise Physiology (3) Exercise Physiology is a mid-to upper division course that will appeal to students with an interest in human biological adaptation. The course has two primary goals: First, students develop an understanding of the physiological adaptations that occur during and after endurance and resistance exercise. Second, students improve their comprehension of the differences between the acute exercise response and the changes that occur with chronic physical activity (exercise training). A major emphasis is placed on physiological systems as they relate to physical activity, exercise and health, and environmental stress; including, but not limited to, cardiovascular, respiratory, musculoskeletal, renal, neural, and metabolic. These systems are considered singly and in combination with regard to both exercise intensity and exercise duration. The depth of inquiry can range from molecular to organismal (whole-body). In addition, the mechanisms underlying the preventive and protective effects of exercise on human health and performance are discussed. The ability to apply concepts and principles of physiology to situations involving exercise, exercise training and decreased physical activity are highlighted, improving students’ abilities to develop and differentiate between paradigms that utilize exercise to improve athletic performance and those that utilize physical activity to promote health. Special topics of applied study may include aging; development; gender; body composition; disease and environmental extremes such as heat, cold, diving and altitude. Students are required to demonstrate via assessment, knowledge and understanding of the acute physiological response to exercise and physiological adaptations to programs of chronic resistance and endurance exercise. Quantitative and analytical skills are emphasized, especially as they pertain to exercise testing and exercise program evaluation. The ability to interpret scientific data as they pertain to exercise physiology is required. Background knowledge in biology, chemistry, physics, and exercise science represent the knowledge base from which the class is built and contributes to the mastery of concepts presented. This course is required for Athletic Training and Kinesiology majors.

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

**KINES 360: The Neurobiology of Motor Control and Development (3 Credits)**

**Old Listing Effective Through Spring 2019:**

This 3 credit lecture course provides a rigorous presentation of the neuroscientific foundations of human movement control and coordination. This course introduces students to the cellular basis of neurophysiology, while emphasizing the contributions of both sensory and motor systems to motor control, coordination, and development. The course provides an in-depth presentation of systems neuroscience, with a special emphasis on the spinal, brainstem, and cortical contributions to movement. The course introduces the physiology and functional anatomy of the major sensory systems, motor systems, and sensorimotor integration networks, of the spinal cord, brainstem, and hemispheric structures in the central nervous system. These include spinal circuitry underlying reflexes and central pattern generators, basal ganglia organization and functional networks, cerebellar organization and functional networks, primary, secondary, and tertiary cortical areas associated with sensory and motor functions, neural tracts associated with ascending and descending sensory and motor systems, and cortical-subcortical loops. Students are introduced to dysfunction in these systems from both disease and traumatic processes, due to development disabilities such as cerebral palsy, degenerative processes including Parkinson's Disease, vascular disease including stroke, as well as traumatic brain injury. The overall objective of this course is to prepare Kinesiology students with a foundational level preparation in neuroscience, as required for understanding control of human movement, motor coordination, motor development and dysfunctions in these processes. This course forms one of four 300-level core courses that provide the basic science foundations that underlie the study of human movement, including exercise physiology, biomechanics, and the psychology of movement behavior. Neuroscience represents the fourth foundational discipline that contributes to human movement science. This course is presented from a hierarchical perspective, that introduces the cellular basis of neural communication, as well as cortical, brainstem, and spinal systems that underlie sensorimotor functions. It provides a thorough introduction to the central nervous system, focusing on a systems level approach to sensory and motor physiology and its impact on motor control and coordination, as well as both developmental, degenerative, and traumatic disorders in these processes. Considerations of applications of the material to the fields of athletics and rehabilitation medicine are often provided.

Changes Effective Summer 2019:

- Prerequisite/Corequisite/Concurrent Courses

**KINES 367: Games and Sports Instruction Across the Lifespan (1 Credit)**

**Old Listing Effective Through Spring 2019:**

How to understand, perform and deliver individual and team games and sports across the lifespan. This course is designed to provide students with the opportunity to research, experience, and reflect upon the content knowledge necessary to successfully instruct and coach a variety of individual and team games and sports across the lifespan. Students will gain experience in at least one activity from each of the four games classification groups (net and wall, invasion, striking and fielding, and target games). Students will develop the knowledge and skills necessary to instruct and coach various lifetime individual and team games and sports. The games and sports chosen for this course (basketball, soccer, golf, softball, and tennis) have been specifically selected for three reasons related to lifespan development and participation. First, they are consistently included in preschool through 12th grade school physical education curriculums. Second, they are popular extra-curricular activities, which are heavily attended by young people and adolescents. Finally, they represent popular adult recreational (pick-up games) and competitive activities (adult leagues) that are often continued over the lifespan. Emphasis is placed on the student’s competency in being able to effectively instruct and perform across multiple individual and team games and sports. Students will be expected to practically demonstrate a range of psychomotor techniques and skills for each given game and sport to a high level. Students will also need to display competence in a range of cognitive, affective and behavioral domain skills. This includes the ability to make appropriate game play decisions, communicate with teammates, understand and adhere to governing body rules/regulations and creating strategies to promote lifelong participation. Students will be assessed on their ability to instruct and
coach the associated psychomotor skills, principles of play, and the official rules and regulations operated by each game or sport’s governing body in a peer-to-peer instructional setting. Practical activity learning experiences are designed to provide students with a sound knowledge of the concepts associated with skill acquisition including the class/team/ client structure and organization, teaching and coaching techniques, and developmentally appropriate activities. Peer to peer instructing and coaching sessions will be used as an instructional strategy.

Prerequisite Courses: KINES 267

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

KINES 368: Individual Fitness and Wellness (2 Credits)

Old Listing Effective Through Spring 2019:

How to perform and deliver fitness and wellness concepts and exercises to individuals across the lifespan. The purpose of this course is to teach students how to effectively communicate, motivate, and engage individuals in fitness improvement exercises and activities across the lifespan (children, young adults, adults, and older adults). Understanding client management skills, various fitness environments, and specific individual fitness exercises and activities from the foundation of the course. Initially, students will learn appropriate and effective client management skills and will explore different instructional environments. Throughout the course, students will work on acquiring skills for developing progressions of exercises across the lifespan. The students will become familiar with contemporary fitness practices and exposed to a variety of exercises. Students will learn the associated execution cues and how to demonstrate the exercise. Students will apply content knowledge to instructing individuals how to properly engage in fitness exercises and activities that contribute to one’s overall wellness. Students will be able to organize and execute a developmentally appropriate fitness program for a client that targets one or more of the components of fitness including: cardiovascular, muscular strength, agility, power, coordination, and flexibility. The primary objectives of the course are to develop an understanding of how to create an individualized fitness program that is appropriate for the individual and how to interact with the individual to promote engagement in regular exercise and activity and successful achievement of goals. Students will examine how the age and developmental level of the individual relates to ability and individual fitness programming. Students will learn the correct form of exercise execution and progressions of exercises. Content knowledge is integrated with application of skills in fitness exercise and instruction and will be put to use in a learning laboratory setting which students will have the opportunity to engage in hands-on instructional experiences.

Prerequisites: KINES 200, KINES 201

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

KINES 395G: Practicum in Athletic Training (3 Credits: Maximum of 3 Credits)

Old Listing Effective Through Spring 2019:

KINES 395G Practicum in Athletic Training (3) This course is designed to provide students didactic and practical clinical experiences in a variety of practice settings in which certified athletic trainers are commonly employed. This is the second clinical assignment after a student is admitted to the Athletic Training option within the Kinesiology major.

Students will complete a minimum of 200-250 clock hours under the supervision of a certified athletic trainer in a variety of clinical settings. These settings include but are not limited to: outpatient sports medicine clinics, interscholastic athletic settings, and intercollegiate athletic settings. The objectives of this course include demonstrating proficiency in: assisting lower level students in developing athletic training skills and mastering level-appropriate competencies; demonstrate proficiency in evaluation and documentation of common athletic injuries; assist in the development and documentation of a plan of care for common athletic injuries; demonstrate proficiency in the development and documentation of clinical progression through a plan of care; participate in the application of therapeutic modalities and therapeutic exercise under the supervision of a certified athletic trainer. In this practical experience, the student is required to demonstrate an understanding of the classroom experiences completed to date and as required by the program option up to the current semester. This practicum has a prerequisite requirement of KINES 395F and is a prerequisite for the subsequent athletic training practicum, KINES 395I. Assessment is based on student performance written examinations, practical examinations, written assignments, and performance assessments by supervising athletic trainer(s). The course is designed to be taken the second semester following admittance to the athletic training option. It is offered every fall and spring semester with an enrollment of 15-20 students.

Changes Effective Summer 2019:

• Abbreviation to ATHTR
• Number to 495G
• Abbreviated Title
• Long Title
• Description
• Prerequisite/Corequisite/Concurrent Courses

KINES 438: Administration and Issues in Athletic Training (3 Credits) (WF)

Old Listing Effective Through Spring 2019:

Theoretical and practical aspects for management of an Athletic Training professional practice and identifying contemporary issues related to the profession. KINES 438W Administration and Issues in Athletic Training (3) This course is designed to instruct students in the concepts and skills required for successful administration of an athletic training program and to understand and discuss contemporary professional issues attendant to the Athletic Training profession. General topics to be covered include theoretical basis of management, program management, human resource management, financial resource management, facility design and planning, information management, athletic injury insurance, legal aspects of sports medicine, ethical considerations in sports medicine, preparticipation physical and drug-testing, professional preparation issues, professional practice issues, and clinical practice issues.

Experts from the community are brought in to lecture on several of the topics. The course meets for three hours per week and utilizes both lecture and discussion formats. Student assessment includes written examinations, written homework assignments, class participation and debates. This is a writing intensive course. Writing will be used to facilitate critical thinking about course material.

Written assignments are based on the technical writing requirements of an athletic training administrator and are graded on both their content and quality.
Calvert Vaux, the art of design on the land has been practiced since the award-winning design of Central Park by Frederick Law Olmsted and the relationship to the allied arts from early beginnings to present day.

Course of the historical development of designed outdoor space in the context of the built environment as a product of cultural values. Grades are based upon a thorough analysis of the design of outdoor space with special emphasis on American design from 1800 to date. It is hoped that students will gain an increased awareness of landscape architecture as an art, and of their own need to eliminate discrimination results from this course into educational materials (e.g., flyers, pamphlets, screensavers, fitness center displays, social media, etc) for use during "Exercise is Medicine" week.

Reviews the physiological basis of exercise for enhancing health and protecting against chronic diseases. KINES 455 Physiological Basis of Exercise as Medicine (3) This course is designed for students interested in developing a deeper understanding of the physiological mechanisms behind exercise as medicine. Course content will consist of a mixture of selected book chapters as well as contemporary review and primary research articles. This course begins with an overview of the current exercise deficiency problem, including the societal, behavioral, and economic changes of the past century which have contributed to the modern day epidemic of chronic inactivity-related disease. After developing an appreciation for the scope of these problems, students will be introduced to the "tools" needed to critically evaluate the association between exercise and/or inactivity on health and the mechanisms by which these associations may occur, including: basic principles of epidemiology, searching/reviewing scientific literature, and experimental design. The remainder of the course will be focused on how exercise/physical activity modifies molecular/tissue-level and integrative physiological function, and describes the extent to which these modifications confer either preventative or therapeutic benefit. This will be accomplished through a combination of lectures, in-class/take-home assignments, as well as student-led discussions. Students will also use the "tools" that they learned at the beginning of the semester to demonstrate and share knowledge with others; integration of this information may include a thorough analysis of a chronic condition including the pathophysiology, strength of evidence for exercise is medicine, and physiological actions of exercise in prevention or treatment. Students may also be given the opportunity to translate their knowledge from this course into educational materials (e.g., flyers, pamphlets, screensavers, fitness center displays, social media, etc) for use during "Exercise is Medicine" week.

An examination of basic legal principles underlying the employment relationship and their social, political, and economic bases. LER 201 Employment Relationship: Law and Policy (3) (GS) (BA) This course meets the Bachelor of Arts degree requirements. LER 201 provides students with an overview of the employment law relationship in the United States. The course begins with a study of the legal principles which affect the creation, development, and implementation of employment law. Several of the most fundamental employment law principles, such as the Master/Servant relationship and the theory of Agency, are adopted from the English common law. Students review the United States Constitution and the constitutional principles necessary to understand employment laws are examined. Students will study several federal and state statutes, including Worker’s Compensation laws (with an emphasis on the Pennsylvania Worker’s Compensation statutes), the Social Security Act, the Fair Labor Standards Act, the National Labor Relations Act, and Equal Employment Opportunity laws. As appropriate, the history, politics, and policies underlying these statutes are discussed. The necessity of understanding not only the legalities of EEO laws but also the societal need to eliminate discrimination results in a thorough study of Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act, the Civil Rights Act of 1991, and the Americans with Disabilities Act. Successful completion of this course equips students with a competency in employment law, transferable to an entry-level human resources or management position.

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Long Title
- Prerequisite/Corequisite/Concurrent Courses

Old Listing Effective Through Spring 2019:

A survey of the historical development of outdoor space in relationship to allied arts from early beginnings to this century. LARCH 060 History of Landscape Architecture (3) (GA)(BA) This course meets the Bachelor of Arts degree requirements. LARCH 060 is an introductory survey course of the historical development of designed outdoor space in relationship to the allied arts from early beginnings to present day. Although the profession of architecture was not named until 1858, with the award-winning design of Central Park by Frederick Law Olmsted and Calvert Vaux, the art of design on the land has been practiced since the beginning of time. It is the creation of human environments, inevitably expressing the creator’s perception of the relationship between humanity and nature. As with all art, the design of outdoor spaces reveals a culture’s beliefs, values, and aspirations. If one studies design in different cultures and time periods, one can learn a great deal about that society. One can also begin to see history holistically, to detect trends, to relate yesterday to today, and to question the present and future. In the course we explore the outdoor spatial designs of history, with emphasis upon what these designs reveal about cultural attitudes toward nature, humanity and art. While we address middle and far-eastern landscapes, the course focuses upon western civilizations with the second half focusing on American landscapes. The objective of this course is to present a concise analysis of the design of outdoor space with special emphasis on American design from 1800 to date. It is hoped that students will gain an increased awareness of landscape architecture as an art, and of their own built environment as a product of cultural values. Grades are based upon three examinations: two during the course and one during final exam period. Each examination is worth 33 1/3% of your final grade. Each exam will consist mostly of multiple-choice questions some of which may be based on slides; there may also be short answer questions. The specific format will be announced prior to each exam. Both lecture content and reading packet material will be covered on the exams. Computer tutorials are available and designed to aid in your understanding of the reading packet. As well, the lectures are taped and are available for review through the University’s Classroom Recording unit. To further aid you in understanding course content, a study guide will be posted every week at the web address.

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Long Title

LER 201: Employment Relationship: Law and Policy (3 Credits) (BA) (GS)

Old Listing Effective Through Spring 2019:

Changes Effective Summer 2019:

- Description
- Title
- Prerequisite/Corequisite/Concurrent Courses

LARCH 60: History of Design on the Land (3 Credits) (US) (IL) (BA) (GA)

Old Listing Effective Through Spring 2019:

KINES 455: Physiological Basis of Exercise as Medicine (3 Credits)
write reviews of various involving different employment laws, including case law and precedents, evidence and interpretation. The course content naturally lends itself to gathering and analyzing information. Students analyze the application of law to various cases, judging the logical consistency between the principle of the law and the case to which it is applied. Library resources are an essential component; on-line resources increasingly are used. The course deals exclusively with laws regulating employment practices and relations among employees in the U.S. workplace. It concentrates on discrimination, equity, due process, social and civil conduct.

Changes Effective Summer 2019:

- Description

LER 460: Human Resources Ethics (3 Credits) (BA)

Old Listing Effective Through Spring 2019:

Ethics of human resources management. LER 460 LER 460 Human Resource Ethics (3)(BA) This course meets the Bachelor of Arts degree requirements. This course is designed for students who have received an introduction to human resources management and would like to spend some time thinking about the ethics of using various human resources practices. Students will devise their own personal codes of ethics, review the codes of others, and apply them to human resources situations. The course has limited enrollment to ensure participation in class discussions. Course work involves class discussion and presentations, outside reading, written in-class and out-of-class assignments, group and individual projects. All students are required to have completed a human resources or personnel management course, because the course assumes knowledge of this material for the students to be able to evaluate the ethical implications of human resources management decisions.

Changes Effective Summer 2019:

- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

MATH 33: Mathematics for Sustainability (3 Credits) (GQ)

Old Listing Effective Through Spring 2019:

Mathematical analysis of sustainability; measurement, rates of change, risk and probability, networks; examples. MATH 033 Mathematics for Sustainability (3) (GQ) This course is intended to be one of several offered by the mathematics department with the goal of helping students from non-technical majors partially satisfy their general education quantification. It is designed to provide an introduction to various mathematical modeling techniques, with an emphasis on examples related to environmental and economic sustainability. The course may be used to fulfill three credits of the GQ requirement for some majors, but it does not serve as a prerequisite for any mathematics courses and should be treated as a terminal course. The course will provide students with the mathematical background and quantitative reasoning skills necessary to engage as informed citizens in discussions of sustainability related to resources, pollution, recycling, economic change, and similar matters of public interest. These include the four key ideas of “measuring” (representing information by numbers, problems of measurement, units, estimation skills); “changing” (quantities changing with time, rates of change, the distinction between stocks and flows, simple models, interest and discount rates); “risking” (probability, expectation, skew distributions and upside vs downside risks, uses and limitations of cost-benefit analysis, risk v. uncertainty); and “networking” (graphs, social networks, the strength of weak ties, social capital).

Prerequisite: one unit of algebra or MATH 004

Changes Effective Summer 2019:

- Description
- Prerequisite/Corequisite/Concurrent Courses
- Add BA Quantification Designation
- Abbreviated Title

MATSE 201: Introduction to Materials Science (3 Credits)

Old Listing Effective Through Spring 2019:

Concepts of relationships between structure and thermal, optical, magnetic, electrical, and mechanical properties of metals, ceramics, glasses, and polymers.

Prerequisites: MATH 231 or CHEM 112

Changes Effective Summer 2019:

- Description
- Prerequisite/Corequisite/Concurrent Courses

MATSE 400: Crystal Chemistry (3 Credits)

Old Listing Effective Through Spring 2019:

Principles of crystal chemistry applied to structures, structural defects and properties of organic, inorganic, intermetallic, and metallic crystals.

Changes Effective Summer 2019:

- Description
- Prerequisite/Corequisite/Concurrent Courses

MATSE 402: Materials Process Kinetics (3 Credits)

Old Listing Effective Through Spring 2019:

A treatment of process kinetics including chemical reaction kinetics and momentum, energy and mass transport.

Changes Effective Summer 2019:

- Description
- Prerequisite/Corequisite/Concurrent Courses

MATSE 419: Computational Materials Science and Engineering (3 Credits)

Old Listing Effective Through Spring 2019:

Introduction to computational material science and engineering. Overview of the computational methods for materials, from atomistic to the continuum scale. MATSE 419 Computational Materials Science and Engineering (3) Modeling is a critically important tool in the field of materials. This course is designed to inform students about all areas of materials modeling, and to explore the use of modeling in different research areas. This is a hands-on undergraduate level course, mandatory for all MATSE students, covering current methods for modeling soft and hard matter, at the atomistic, meso and continuum scale levels. It consists of an overview of individual techniques of modeling from atomistic molecular dynamics and Monte Carlo, coarse-grained molecular dynamics, and multiscale modeling, to the continuum (e.g. SAFT, CALPHAD). It also includes a computer laboratory component with
hands-on exercises. At the conclusion of the course, students will understand the physical basis and basic procedures of each technique.

Students will be able to understand the general literature in modeling and its connection with experimental work, as well as to communicate with experts in the field. From the laboratory practices, they will learn how the individual modeling techniques contribute to knowledge in each area, and to interconnect them with experimental information.

Prerequisites: CMPSC 200

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

**MATSE 436: Mechanical Properties of Materials (3 Credits)**
Old Listing Effective Through Spring 2019:

Fundamental relationships between structure and mechanical behavior of materials. MATSE 436 Mechanical Properties of Materials (3) The topics covered in this course are essential to students in the Materials Science and Engineering options, and these are also required for materials engineering courses nationally accredited by the professional societies. The course is taught at the 400 level because it requires the fundamental courses in mathematics and physics to be completed. The course also requires completion of an introductory course in materials science. This new course typically fits into the junior or senior year, when students in the major are understanding how the properties of materials can be changed by controlling the structure of materials. The course has also been designed such that students in other engineering majors can take this course as a technical elective. Some of the information in this course is used in laboratory courses for the major. The course is not required as a prerequisite for other courses.

Prerequisites: MATH 231, MATH 250 or MATH 251, MATSE201 or MATSE259, PHYS 211 or E SC 314

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

**MATSE 441: Polymeric Materials I (3 Credits)**
Old Listing Effective Through Spring 2019:

Manufacture of industrially significant polymers together with discussion of their major chemical, physical, and mechanical properties. MATSE 441 Polymeric Materials I (3) This 3-credit course focuses on about 40 commercially most important polymers together with the discussion of synthesis routes, industrial production processes, processing methods, physical and chemical properties, and applications.

Prerequisite: CHEM 210, MATH 231

Changes Effective Summer 2019:

• Description, Prerequisite/Corequisite/Concurrent Courses

**MATSE 468: Ceramic processing and powder characteristics (3 Credits)**
Old Listing Effective Through Spring 2019:

MATSE 468 Ceramics Laboratory III (1) This course will demonstrate to students the experimental techniques by which the key powder characteristics and powder processes are determined, how to analyze the data from the measurements, and to reveal the interaction between properties, processing and structure. The course concentrates on the importance of powder characterization, forming techniques, sintering and microstructure characterization in the processing of ceramics.

PreRequisite: MATSE462

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

**MATSE 471: Metallurgy Laboratory I (1 Credit)**
Old Listing Effective Through Spring 2019:

A laboratory integrating experimental aspects of material contained in MATSE 402, 413, and 410, e.g. phase diagram determination, solidification micro-structures, etc. MATSE 471 Metallurgy Laboratory I (1) This course is largely an introduction to basic laboratory characterization techniques (optical microscopy, scanning electron microscopy, image analysis, hardness testing, thermal analysis). However, it also applies those characterization techniques in the context of Design of Experiments. This laboratory class also contains significant drills in technical writing.

Prerequisites: MATSE 430

Changes Effective Summer 2019:

• Prerequisite/Corequisite/Concurrent Courses

**ME 456: Industrial Robot Applications (3 Credits)**
Old Listing Effective Through Spring 2019:

Introduction to robotics, with emphasis on robot selection, programming, and economic justification for manufacturing applications. I E (M E) 456 Industrial Robot Applications (3) This course is a technical elective, and is normally taken by students in their Senior years. In this course, students learn about present and future status of robot applications, and are required to apply fundamental knowledge of physics and mathematics to develop software to analyze and control robots. The course deals with mechanics and control of robot manipulators and wheeled mobile robots. First, students are taught to analyze 3-D kinematics, statics and dynamics of robot manipulators. Then, control algorithms for robot manipulators are presented. Sensors, actuators and softwares used in industrial robots are discussed. In the end, kinematics and control of wheeled mobile robots are presented. During this course, application of computer, particularly Matlab, is emphasized as much as possible.

Cross-Listed Courses: IE 456

Changes Effective Summer 2019:

• Title
• Abbreviated Title
• Description
• Prerequisite/Corequisite/Concurrent Courses
• Remove Cross-Listed Course

**MKTG 344: Buyer Behavior (3 Credits)**
Old Listing Effective Through Spring 2019:

Application of behavioral science concepts to the understanding of buyer behavior as a basis for strategic decisions in marketing management. MKTG 344 Buyer Behavior (3) This course will acquaint students with the field of consumer behavior and its major concepts, research techniques, and research findings. Consumer behavior is presented as an actionable and strategic discipline. Students will be exposed to individual and
psychological factors, as well as the social and cultural factors, that influence consumer behavior.

Changes Effective Summer 2019:

• Number to 444
• Title
• Description
• Prerequisite/Corequisite/Concurrent Courses

MUSIC 11: Under the Hood: How Classical Music Works (3 Credits) (BA) (GA)
Old Listing Effective Through Spring 2019:

An introductory examination of classical music, drawing together aspects of theory and repertoire to understand how the music works.

Changes Effective Summer 2019:

• Description

NURS 200M: Understanding and Applying Nursing Research – Honors Section (3 Credits) (H) (WF)
Old Listing Effective Through Spring 2019:

Introduction to methods and philosophy of empirical inquiry as applied to research in nursing and application to practice. NURS 200M Understanding and Applying Nursing Research – Honors Section (3) As an introductory research course NURS 200M will offer a broad survey of nursing research using multiple, active learning strategies. Students will be expected to come to class having completed the required readings so that they are ready for deeper intellectual engagement with the topics. Students will work individually and in cooperative learning groups on weekly projects inside and outside of class time, complete reflective journaling to enhance meta-cognition, and be expected to analyze and discuss nursing research from multiple viewpoints with a focus on integrity, global perspectives, and leadership in nursing research. To guide the student towards greater personal responsibility for their learning, NURS 200M will use a blended format of live and web-based course work. During the semester, each Honors student will identify an evidence based practice topic that could potentially lead to an undergraduate thesis to study in depth. For the rest of the semester, every in-class and out-of-class assignment will be tailored to their topic. The students will be taught how to conduct a peer review and then will practice this in formative review sessions on their peer(s) projects. NURS 200M will culminate with the development of evidenced based practice paper which will be delivered to their peers as they would at a scientific meeting. This paper will also serve as the first draft of their thesis proposal.

Changes Effective Summer 2019:

• Long Title
• Abbreviated Title
• Description

NUTR 100: Contemporary Nutrition Concerns (1.5 Credits) (GHW)
Old Listing Effective Through Spring 2019:

Interpretation of nutrition principles in relation to contemporary problems in selecting a diet to promote a healthy lifestyle. Students who have received credit for NUTR 251 may not schedule this course. NUTR 100 Contemporary Nutrition Concerns (GHW) This course will present the basic principles of nutrition so that students may be better prepared to evaluate nutrition related issues in the media and to make informed choices about dietary intakes in order to promote a healthful lifestyle. Information about the several classes of nutrients (proteins, carbohydrates, fat, vitamins, and minerals) and the physiological processes used to digest, absorb, and utilize them is presented and related to such topics as maintenance of ideal body weight, improvement in physical performance, and the role of nutrients in various disease states such as heart disease, cancer, and osteoporosis. Students are instructed in ways to obtain information about food and nutrition through training in reading foods labels and accessing quality information from electronic and print media. In order to provide relevance to the individual, each student will collect information about his or her diet by keeping a diet record and will use a software program to compare intakes with dietary recommendations. Several other assignments will allow students to use this information to compare their diets to recommendations for fiber intake, to plan a program to accomplish weight gain or loss, to estimate their energy expenditure and to consider ways they might modify their diet to accomplish some stated goal (e.g. increase iron status or decrease salt intake). This course is intended for non-nutrition major students and will fulfill 1.5 credits of the GHW requirement of general education.

Changes Effective Summer 2019:

• Description
• Credits to 3
• Title
• Abbreviated Title

NUTR 358: Assessment of Nutritional Status (2 Credits)
Old Listing Effective Through Spring 2019:

Introduction to purpose, methods, and scientific basis for assessment of nutritional status in total health care for individuals and groups.

Changes Effective Summer 2019:

• Description
• Credits to 3
• Prerequisite/Corequisite/Concurrent Courses

NUTR 360: Disseminating Nutrition Information (3 Credits)
Old Listing Effective Through Spring 2019:

Theory and practice of providing nutrition information across the lifespan. Open only to Health and Human Development majors.

Changes Effective Summer 2019:

• Abbreviated Title
• Long Title
• Description
• Prerequisite/Corequisite/Concurrent Courses

NUTR 371: Dietetic Internship Application Development (1 Credit)
Old Listing Effective Through Spring 2019:

Provides Dietetic Option majors with techniques and information to specify and implement post-graduation educational and career plans in dietetics. NUTR 371 Dietetic Internship Application Development (1) This course is designed to assist students with the critical thinking skills required to prepare and implement post-graduate educational plans required to progress in the field of nutrition and dietetics. Students wishing to become dietitians must apply to and be selected for a
professional practice experience also known as a dietetic internship following graduation. The process is competitive, complex and requires self awareness of professional strengths and weaknesses as well as knowledge of the individual characteristics and objectives of specific dietetic internships. Through group lecture and discussion, this course will introduce students to this process and help them with the research skills needed to clarify their goals. Students will then meet individually with faculty to discuss their goals and objectives and the internships they would like to apply to.

Students will complete an internship application for at least one of the internships they plan to apply to. They will develop a professional portfolio to assist them in presenting their skills and expertise to potential employers or internship directors. These portfolios are expected by most internship directors during interviews for internship positions. Students will develop a personal statement or letter of intent appropriate for at least one of the internships the student is planning to apply to. Through individual meetings with faculty the student will clarify the message of professional accomplishments and goals in the statement. The student will be assisted with preparation for the interview process. Students will also become familiar with alternative career options should they not receive a match as anticipated.

Prerequisite: senior standing in Nutritional Sciences or Hotel Restaurant and Institutional Management; Concurrent: NUTR 370

**Changes Effective Summer 2019:**

- Number to 393
- Abbreviated Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

**NUTR 391: Introduction to Professional Nutrition Experience (1 Credit)**

*Old Listing Effective Through Spring 2019:*

Provides dietetics students with an introduction to the skills necessary to obtain and complete an advanced field experience in nutrition. NUTR 391 Introduction to Professional Nutrition Experience (1) This course is designed to assist Nutritional Science students in the dietetics option with the development and procurement of a 400 hour professional experience in the field of nutrition and dietetics. To facilitate this process, students will develop a job specific resume, research various appropriate organizations, and develop a detailed organization research report. Students will write professional cover letters. Students will then conduct an occupational interview with a potential preceptor from the organization to ascertain whether this is an appropriate learning environment for their goals. When a field experience site is identified they will complete all of the required agreement documents needed to begin the experience for NUTR 495 credits the following summer or semester. Students in the dietetics option of Nutritional Sciences must also fulfill specific competencies required by the professional accrediting agency ACEND (the Accreditation Council for Education in Nutrition and Dietetics). In addition to preparing for a field experience, students completing NUTR 391 will fulfill three specific learning outcomes: demonstrate assertiveness, advocacy and negotiation skills appropriate to the situation; locate, understand and apply established guidelines to a professional practice setting; and identify and describe the roles of others with whom the Registered Dietitian (or nutrition professional) collaborates in the delivery of food and nutrition services.

**Changes Effective Summer 2019:**

- Description
- Title
- Abbreviated Title
- Credits to 2

**NUTR 400: Introduction to Nutrition Counseling (1 Credit)**

*Old Listing Effective Through Spring 2019:*

No description.

**Changes Effective Summer 2019:**

- Description
- Abbreviated Title
- Credits to 2
- Prerequisite/Corequisite/Concurrent Courses

**NUTR 425: Global Nutrition Problems: Health, Science, and Ethics (3 Credits) (IL)**

*Old Listing Effective Through Spring 2019:*

Examines causes of malnutrition and health problems in low-income countries; explores international cultures and ethical issues related to hunger.

**Changes Effective Summer 2019:**

- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

**NUTR 445: Nutrient Metabolism I (3 Credits)**

*Old Listing Effective Through Spring 2019:*

Nutrients, their sources, metabolism, interrelationships and requirements with focus on carbohydrates, lipids, and proteins.

**Changes Effective Summer 2019:**

- Description
- Prerequisite/Corequisite/Concurrent Courses

**NUTR 446: Nutrient Metabolism II (3 Credits)**

*Old Listing Effective Through Spring 2019:*

Continuation of NUTR 445; nutrients, their sources, metabolism, interrelationships and requirements with focus on vitamins and minerals.

Prerequisites: NUTR 445

**Changes Effective Summer 2019:**

- Long Title
- Abbreviated Title
- Description
- Prerequisite/Corequisite/Concurrent Courses

**NUTR 451: Nutrition throughout the Life Cycle (3 Credits)**

*Old Listing Effective Through Spring 2019:*

Application of basic principles of nutrition to nutritional and physiological needs throughout the life cycle from prenatal to aging.
Prerequisite: NUTR 358, NUTR 445. Prerequisite or concurrent: NUTR 446

Changes Effective Summer 2019:

• Description
• Prerequisite/Corequisite/Concurrent Courses

NUTR 452: Nutritional Aspects of Disease (3 Credits)
Old Listing Effective Through Spring 2019:

Disturbances in metabolism related to human disease processes; principles of nutrition in therapy.

Prerequisites: NUTR 446

Changes Effective Summer 2019:

• Description
• Prerequisite/Corequisite/Concurrent Courses

NUTR 456: Community Nutrition (3 Credits) (US)
Old Listing Effective Through Spring 2019:

Programs and policies of nutrition-related activities of community agencies; factors pertinent to nutrition education; relationship of cultural and social identity to foods and nutrition. NUTR 456 Community Nutrition (3) (US) Programs and policies of nutrition-related activities of community agencies; factors pertinent to nutrition education; theory and practice of community nutrition within the dietetics, nutritional sciences, and public health nutrition professions; emphasis on differences in United States values, traditions, attitudes, beliefs and customs and United States social identities in relation to one another within a community-based framework. This course provides knowledge in the content area of community nutrition which is tested on the national registration examination for registered dietitians. Students are evaluated based assessments designed to increase personal cultural awareness and sensitivity, literacy level of nutrition education materials, credible resources for nutrition information, community needs assessment and community nutrition intervention programming and assessment. In particular, the assessment of a community's nutritional needs and the design of a nutrition intervention serve to highlight the cultural diversity within the United States and increase the student's ability to locate and evaluate information about nutrition and food practices of diverse groups living in the United States. Students will focus on immigrant groups, ethnically or racially diverse groups, Native American tribes or loosely affiliated groups of people who have common socioeconomic status or food practices or food patterns (e.g., poverty, food insecure with/without hunger, vegans, vegetarians, Kosher). Community nutritional needs assessment and interventions assignments also serve to assess whether the United States cultures objectives of this course are successfully met. In addition, each assignment requires that students consider cultural and socioeconomic factors as determinants of diet, nutritional status and health status.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title
• Prerequisite/Corequisite/Concurrent Courses

NUTR 490: Nutrition Seminar (3 Credits) (WF)
Old Listing Effective Through Spring 2019:

Use of selected materials from the scientific literature to prepare a term paper and an oral report.

Prerequisite NUTR 452

Changes Effective Summer 2019:

• Number to 490W
• Description
• Prerequisite/Corequisite/Concurrent Courses

PHIL 1H: Basic Problems of Philosophy (3 Credits) (GH) (H) (BA)
Old Listing Effective Through Spring 2019:

Introduction to central philosophical themes, including the mind/body problem, the existence of God, ethical problems, the nature of reality.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 8: Philosophy and Feminism (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Explores diverse feminist philosophies of culture and knowledge, and examines gender's role in accounts of reality, truth, morality, and justice. PHIL (WMNST) 008 Philosophy and Feminism (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course familiarizes students with concepts and problems of feminist philosophies. It seeks to examine the feminist critique of theories of knowledge and power, as well as the cultural, political, and linguistic implications of this critique. Students will be expected to evaluate existing epistemological assumptions, social organization, the character of power, and language from the vantage of contemporary feminism and its historical context. Students will be graded on participation, case study analyses, a group presentation and response, and a final paper. WMST/PHIL 008 satisfies the GH requirement and is geared towards non-Philosophy majors. It may be used to fulfill the minor requirement in philosophy. This course is offered once a year with an enrollment of 25-200 students.

Cross-Listed Courses: WMNST 8

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 10: Critical Thinking (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Discussion of the validity, soundness, and fallacies of everyday language use and reasoning; informal logic; and manipulative arguments and propaganda. PHIL 010 Critical Thinking (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course is designed to bring students to a critical awareness of the function of argumentation in the various forms it takes, both in the academic realm of logic, as well as the everyday world of television, newspapers, and other forms of communication. Students will examine how arguments are constructed and the means that are used to make an argument convincing. They
will learn to critically analyze arguments in order to detect careless language use and fallacies. They will also learn various types of arguments. Students will be graded on weekly problem-solving homework assignments and re-writes, collaborative fallacy presentations, a mid-term exam, and a comprehensive final exam. PHIL 010 satisfies the GH requirement and it may be used to fulfill minor requirements in philosophy. This course is offered once a year with an enrollment of 25-50 students.

Changes Effective Summer 2019:
• Description
• Abbreviated Title
• Long Title

PHIL 13: Philosophy, Nature, and the Environment (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Studies competing historical and contemporary conceptions of nature, their philosophical foundations, and their implications for environmental problems and public policy. PHIL 13 Philosophy, Nature, and the Environment (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course familiarizes students with concepts regarding the central and very old philosophical problem of describing and understanding nature and the place of human beings in it. This philosophical discourse has evolved in the past 25 years into a firm sub-discipline of philosophy itself, usually under the title of “Environmental Philosophy” or “Philosophy of nature.” The discipline addresses a complex of crucial problems of contemporary society, politics, and ethics revolving around the relation of human beings and the environment. Students will learn the various and conflicting views on nature and the environment, and they will develop the ability to critically navigate these various positions as well as the assumptions underlying the contemporary environmental debate. Students will be graded on participation, case study analyses, a group presentation and response, and a final paper. PHIL 13 satisfies the GH requirement and is geared towards non-Philosophy majors. It may be used to fulfill minor requirements in philosophy. This course is offered once a year with an enrollment of 50-200 students.

Changes Effective Summer 2019:
• Description
• Title
• Abbreviated Title

PHIL 14H: Philosophy of Love and Sex (3 Credits: Maximum of 3 Credits) (H) (BA) (GH)
Old Listing Effective Through Spring 2019:

Changes Effective Summer 2019:
• Description
• Title
• Abbreviated Title
• Add US Designation
• Make Not Repeatable

PHIL 83: First-Year Seminar in Philosophy (3 Credits) (BA) (FYS) (GH)
Old Listing Effective Through Spring 2019:

Critical introduction to philosophical issues in ethics, social and political theory, religion, art, metaphysics, and epistemology. PHIL 083S First-Year Seminar in Philosophy (3) (GH;FYS)(BA) This course meets the Bachelor of Arts degree requirements. First-Year Seminars in Philosophy provide critical introductions to fundamental philosophical issues and problems. Each first-year seminar develops a broad overview of historical and contemporary thought through readings, discussions, and student writings. In this way, students will gain an understanding of important figures, ideas, problems, and theories that have shaped and have continued to influence thought and practice around the world. Students will examine diverse viewpoints that will allow them to understand a wide range of views and challenge them to defend their own positions. First-year seminars involve active use of writing, speaking, and group projects. They provide opportunities for gathering information, analyzing problems, and synthesizing diverse perspectives. Finally, each first year seminar in philosophy allows students to link theory to their own lives.

Changes Effective Summer 2019:
• Description

PHIL 100: The Meaning of Human Existence (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Explores differing views of the significance of human life, the meaning of freedom, and the way to a meaningful life. PHIL 100 The Meaning of Human Existence (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. The course is primarily for non-Philosophy majors and for students considering a major in Philosophy. It is designed to evoke disciplined reflection on basic philosophical questions which are often raised in an unmethodical and uninformed way. It will attempt to approach philosophical thinking from the perspective of everyday concerns, rather than from the various readings which will be done for the course. The general question of the meaning of human existence will furnish a rubric under which philosophical ideas and evaluations enter into ordinary life. The course will offer the opportunity to look at a variety of ways in which human beings have addressed the issues involved in the question of the meaning of life. The philosophical figures whose works will be examined include de Beauvoir, Freud, Marcel, Marcuse, Jaspers, and Sartre. Students will be graded on participation, comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL100 satisfies the GH requirement and it may be used to fulfill the major and/or minor requirements in philosophy. This course is offered once a year with an enrollment of 35-50 students.

Changes Effective Summer 2019:
• Description
• Title
• Abbreviated Title
• Number to 4

PHIL 101: Pragmatism and American Philosophy (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

An introduction to American thought and its relation to American culture, with a focus on the development of pragmatism. PHIL 101 Pragmatism and American Philosophy (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for philosophy majors. (The analogous course for majors is PHIL 401.) PHIL 101 is designed to
Old Listing Effective Through Spring 2019:

PHIL 103H: Ethics and Social Issues (3 Credits) (H) (GH)

Changes Effective Summer 2019:
- Description
- Title
- Abbreviated Title
- Add BA Designation

PHIL 102: Existentialism and European Philosophy (3 Credits) (BA) (GH)

Old Listing Effective Through Spring 2019:

Introduction to European philosophy and issues of life, death, meaning, and absurdity, with a focus on existentialism and its development. PHIL 102 Existentialism and European Philosophy (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for philosophy majors. (The analogous course for majors is PHIL 402.) PHIL 102 introduces students to European philosophy over the past two hundred years. The course begins with the overview of major philosophical themes and developments, and then examines these developments in existentialism, philosophical literature, and postmodernism. The course will focus on metaphysical, moral, and social issues concerning the nature of reality, the nature of the self, the basis of values, and the relations between individuality and community. Students will critically consider these issues in required comparison/contrast papers, a position paper, a collaborative project, and a comprehensive final exam. This course serves as an introduction to the discipline and prepares students for further study in the history of philosophy. PHIL 102 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in philosophy. It is offered once a year with an enrollment of 35-50 students.

Changes Effective Summer 2019:
- Description
- Title
- Abbreviated Title

PHIL 103W: Introduction to Ethics (3 Credits: Maximum of 3) (WF) (BA) (GH)

Changes Effective Summer 2019:
- Description
- Title
- Abbreviated Title
- Add BA Designation

PHIL 105: Title: Introduction to Philosophy of Law and Legal Ethics (3 Credits) (BA) (GH)

Old Listing Effective Through Spring 2019:

Description: Historical and contemporary philosophies of law; concepts of responsibility, property, rights, and justice; and ethical issues in legal practice. PHIL 105 Introduction to Philosophy of Law and Legal Ethics (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for philosophy majors. (The analogous course for majors is PHIL 405. Philosophy of Law.) PHIL 105 will provide students with a critical overview of central positions and figures in philosophy of law and teach students interpretative and critically evaluative methods for distinguishing and attempting to resolve philosophical problems within these positions. This course will investigate the history of philosophy of law and the diverse views of human nature inherent to central philosophical positions. The course will examine the relations between human values, ethics, and law as well as how these relations affect the organization of broader social, political, and religious institutions. Students will be graded on participation, case study analyses, a group presentation and response, and a final paper. PHIL 105 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in philosophy. This course is offered once a year with an enrollment of 25 to 100 students.

Changes Effective Summer 2019:
- Description
- Title
- Abbreviated Title

PHIL 105H: Introduction to Philosophy of Law and Legal Ethics (3 Credits) (H) (BA) (GH)

Old Listing Effective Through Spring 2019:

Ethical issues such as war, privacy, crime and punishment, racism and sexism, civil liberties, affirmative action, abortion, and euthanasia.

Changes Effective Summer 2019:
- Description
- Title
- Abbreviated Title

PHIL 103: Introduction to Ethics (3 Credits: Maximum of 3) (H) (BA) (GH)

Old Listing Effective Through Spring 2019:

Ethical theory about virtue, duty, autonomy, and life quality applied to moral problems, including character, violence, oppression, abortion, and suicide.

Changes Effective Summer 2019:
- Description
- Title
- Abbreviated Title
- Make Not Repeatable
Historical and contemporary philosophies of law; concepts of responsibility, property, rights, and justice; and ethical issues in legal practice.

Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

**PHIL 107: Introduction to Philosophy of Technology (3 Credits) (BA) (GH)**
**Old Listing Effective Through Spring 2019:**

The character of technology; its relation to human values; philosophical assumptions in its development; and how it transforms the world. PHIL (S T S) 107 Introduction to Philosophy of Technology (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Introduction to the Philosophy of Technology surveys a number of recent thinkers on the meaning of technology, its role in our and other societies, and critiques of its effects. Through readings of classic works on philosophy of technology as well as investigations of contemporary media reports and representations of technology, the course will engage your thought about what technology “means” to you and the values embedded in it. This course meets the broad general education needs of students from the humanities, social sciences, engineering, agriculture, as well as professional tracks such as business and pre-law. As technology is increasingly fundamental to our modern way of life in all its aspects, this course gets students asking question about why we do what we do with technology and how it affects us, others around us, and the environment. Required readings typically include collections of essays ranging in reading level from popular journalism to mass-market fiction to historical analyses of technological change and indepth philosophical investigations of the concept of technology. Classroom time will be organized around lecture, regular classroom discussion, and a number of student-led debates. Evaluation will be based upon short writings, a small research paper, a midterm, and a final. The course meets the requirement for General Education in the Humanities (GH). Crosslisted with both S T S and PHIL it compliments other S T S courses (notably, S T S 101 and 233) and is a pre-requisite for S T S/Phil 407. The course is offered biannually and is capped at 40 students.

Cross-Listed Courses: STS 107

Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

**PHIL 108: Introduction to Social and Political Philosophy (3 Credits) (BA) (GH)**
**Old Listing Effective Through Spring 2019:**

Critical introduction to political authority, rights, justice, community, inequality, power, pluralism, and other contemporary, social, and political issues. PHIL 108 Introduction to Social and Political Philosophy (3) (GH) (BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for philosophy majors. (The analogous course for majors is PHIL 408: Social and Political Philosophy.) PHIL 108 will critically examine central philosophical positions, ideologies, and figures in the history of social and political philosophy, their relation to contemporary society, politics, and culture, and the significance of social and political philosophy for human values. The course will investigate the nature of political and social philosophies and systems of social and political practice towards providing students with a greater critical understanding of the nature of social and political organization, their effects on human values, and the traditional philosophical problem of what constitutes the good society. Students will be graded on participation, comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 108 satisfies the GH requirement and it may be used to fulfill the major and/or minor requirements in Philosophy. This course is offered once a year with an enrollment of 35-50 students.

Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

**PHIL 108W: Introduction to Social and Political Philosophy (3 Credits) (WF) (BA) (GH)**
**Old Listing Effective Through Spring 2019:**

...
Critical introduction to political authority, rights, justice, community, inequality, power, pluralism, and other contemporary, social, and political issues.

**Changes Effective Summer 2019:**
- Description
- Title
- Abbreviated Title

**PHIL 113: Introduction to Philosophy of Literature (3 Credits) (BA) (GH)**

Old Listing Effective Through Spring 2019:

Examines philosophical ideas in literature, literary forms in philosophies, style and genre, and relation of philosophy, literature, writing, and culture. PHIL 113 Introduction to Philosophy of Literature (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for Philosophy majors. (The analogous course for majors is PHIL 413.) PHIL 113 will provide a critical overview of the relation between philosophy and literature, philosophical literature, and literary philosophy, discussing specific historical figures, movements, and theories on the topic. The course will seek to provide students with an understanding of the nature of philosophical aesthetic values in literary expression, as well as ideological expressions within literature. It will investigate the nature of philosophical writing and of literary writing in order to critically interpret and assess their differences and similarities as representative of the nature of the human values and the human condition. Students will be graded on participation, comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 113 satisfies the GH requirement and it may be used to fulfill the major and/or minor requirements. This course will be offered once a year with an enrollment of 35 to 50 students.

**Changes Effective Summer 2019:**
- Description
- Title
- Abbreviated Title

**PHIL 115: Introduction to Philosophy and Education (3 Credits) (BA) (GH)**

Old Listing Effective Through Spring 2019:

Examines the nature and goals of education, the philosophical foundations of educational theories, and their economic, political, and cultural implications. PHIL 115 Introduction to Philosophy and Education (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for Philosophy majors. (The analogous course for majors is PHIL 415. Philosophy of Education.) PHIL 115 provides students with a critical survey of philosophies of education and philosophical conceptions of the relations between knowledge, truth, experience, and human values. The course will consider the historical contexts from which philosophical theories about education have arisen and their ideological political, social, and economic implications. In addition, it will develop a student's critical skills regarding self-education and the development of education in contemporary society towards a greater understanding of the philosophical problems that underlie differing philosophical views of education. Students will be graded on a collaborative annotated bibliography project, a collaborative position paper, evaluations of peer papers, and a comprehensive final exam. PHIL 115 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in Philosophy. This course is offered once a year with an enrollment of 35-50 students.

**Changes Effective Summer 2019:**
- Description
- Title
- Abbreviated Title

**PHIL 124: Introduction to Philosophy of Religion (3 Credits) (BA) (GH)**

Old Listing Effective Through Spring 2019:

Explores the meaning of religious belief and experience, the existence of God, ideas of spirituality, and the question of immortality. PHIL 124 Introduction to Philosophy of Religion (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses. (The analogous course for majors is PHIL 424: Philosophy of Religion.) PHIL 124 is designed to give students a coherent overview of the various dimensions of religion elucidated when religion is examined from a philosophical perspective. Topics explored in class will include religious belief, religious experience and spirituality, arguments for the existence of God, contemporary philosophical problems in their relation to religion, religion and science, as well as religion and the future. The class will also examine the differences between Western, Eastern, and other conceptions of religion and spirituality. Major historical authors and their works will be examined, including Anselm, Aquinas, Confucius, Descartes, Lao Tse, and Peirce. Students will be required to compare and contrast differing perspectives towards religion, as well as to critically evaluate these positions. The class will also be oriented towards making relevant connections between historical and contemporary views and issues. Students will be graded on participation, comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 124 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in Philosophy. This course is offered every other year with an enrollment of 35-50 students.

**Changes Effective Summer 2019:**
- Description
- Title
- Abbreviated Title
Historical and contemporary views on the foundations and conditions of knowledge, belief, justification, and truth, conception, perception, and interpretation. PHIL 125 Introduction to Theories of Knowledge (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as with other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for Philosophy majors. (The analogous course for majors is PHIL 425) PHIL 125 will provide a critical survey of key concepts, problems, and figures in the history of epistemology and in contemporary studies in theory of knowledge. The course will develop the student’s analytical and critical skills through studying the foundations and justifications of knowledge, knowledge claims, and the very nature of knowledge and belief fundamental to all human endeavor. This class develops a broad, coherent overview of fundamental issues of belief, knowledge, truth, justification, and inquiry. It emphasizes the thought of major, influential figures and their works, such as Plato, Aristotle, Descartes, Spinoza, Locke, Kant, Kierkegaard, Wittgenstein, Peirce, and Heidegger. Students will be graded on quizzes, re-writing and expanding quizzes, a collaborative research project and paper, and a comprehensive final exam. PHIL 125 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in Philosophy. This course is offered once a year with an enrollment of 35-50 students.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 125W: Introduction to Theories of Knowledge (3 Credits) (WF) (BA) (GH)
Old Listing Effective Through Spring 2019:

Historical and contemporary views on the foundations and conditions of knowledge, belief, justification, and truth, conception, perception, and interpretation.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 126: Introduction to Metaphysics (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Explores the nature of being and reality, the problem of free will and the mind/body problem, identity, and causality.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 126W: Introduction to Metaphysics (3 Credits) (WF) (BA) (GH)
Old Listing Effective Through Spring 2019:

Explores the nature of being and reality, the problem of free will and the mind/body problem, identity, and causality.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 127: Introduction to Philosophy of Mind (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Problems and concepts of mind and consciousness including mind-brain identification, the nature of subjectivity, identity, and artificial intelligence.

PHIL 127 Introduction to Philosophy of Mind (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. The course will provide a critical survey of key concepts, problems, and figures in the history of philosophy of mind and in contemporary studies in philosophy of mind. The course will develop analytical and critical skills through study of basic principles and logical evaluation of arguments in philosophy of mind. As a general education humanities course, this class develops a broad, coherent overview of the nature of mind, the relation of the mental to the physical, and the relations between scientific and philosophical approaches to the nature of mind; emphasizes the thought of major, influential figures and their works, such as Descartes, Locke, Kant, Hegel, Dewey, Heidegger, Wittgenstein, Ryle, Searle, Armstrong, and Dennett; develops competence in interpretation and critical assessment of human values and their place in human subjectivity, self-identity, and intentional experience, and considers the relation of these values to cognitive experience and structures. Students will be graded on participation, three comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 127 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in Philosophy. This course is offered once a year with an enrollment of 35-50 students.

Changes Effective Summer 2019:

• Description
• Title
• Abbreviated Title

PHIL 129: Introduction to Philosophy of Language (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Studies the nature of meaning in language, how we acquire language, communication, signs, and language as descriptive of reality.
PHIL 129 Introduction to Philosophy of Language (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. This course, as well as other 100-level philosophy department courses, is intended for Liberal Arts majors and others likely to take philosophy courses rather than for Philosophy majors. (The analogous course for majors is PHIL 429.) PHIL 129 will provide a critical survey of key concepts, problems, and figures in the history of philosophy of language and in contemporary studies in linguistic philosophy. The course will develop the student’s analytical and critical skills through study of the philosophical and logical foundations of language systems and the role of language problems in relation to philosophical problems. Students will be encouraged to use the linguistic and logical tools they study in the course in evaluating the content of the arguments presented. As a general education humanities course, this class develops a broad, coherent overview of the nature of language, the philosophical assumptions and methodological commitments involved in theories of language, and the relation of language to reality. The class emphasizes the thought of major, influential figures and their works, such as Plato, Aristotle, Locke, Berkeley, Herder, Cassirer, Peirce, Carnay, Wittgenstein, Austin, Searle, and Rorty. Students will be graded on participation, three comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 129 satisfies the GH requirement and it may be used to fulfill major and/or minor requirements in Philosophy. This course is offered every other year with an enrollment of 35-50 students.

Changes Effective Summer 2019:

- Description
- Title
- Abbreviated Title

PHIL 200: Ancient Philosophy (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Examines the thought and influence of major Western thinkers from the pre-Socratics to the neo-Platonists, emphasizing Plato and Aristotle. PHIL (CAMS) 200 Ancient Philosophy (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. PHIL (CAMS) 200 satisfies the GH requirement. As part of the history of philosophy sequence required of undergraduate philosophy majors, this course is designed to present students with a survey of ancient Western Philosophy beginning with the pre-Socratics, continuing with Plato (Socrates), Aristotle, and the post-Aristotelians, and concluding with neo-Platonists and early Christians. Emphasis will be placed on Plato and Aristotle. The class will examine the historical and cultural foundations from which ancient Western philosophy grew, and will explore issues which were focal points of ancient philosophy, such as the nature of reality, change, permanence, truth, form, and matter. Students will critically consider these issues in required comparison/contrast papers, a position paper, a collaborative project, and a comprehensive final exam. Students will also be evaluated on class participation. The course is prerequisite to Philosophy 400-level courses and it will be offered once a year with an enrollment of 35 students. For students studying ancient languages, particularly Greek, this course will offer an important exposure to the interpretation of philosophical text. For Classical and Ancient Mediterranean Studies majors, PHIL/CAMS fulfills the requirement under Supporting Courses for three credits in Greek or Roman literature and language, civilization, or archaeology; and it also fulfills the requirement for six credits for study at any level from an approved list in the general field of Classics and Ancient Mediterranean Studies.

Cross-Listed Courses: CAMS 200

Changes Effective Summer 2019:

- Description
- Title

PHIL 202: Modern Philosophy (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Examines the thought and influence of major Western thinkers from Descartes to Kant, emphasizing rationalism and empiricism, and critical philosophy. PHIL 202 Modern Philosophy (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. As part of the history of philosophy sequence required of undergraduate philosophy majors, this course is designed to examine the thought and influence of the major Western thinkers of Modern Philosophy: Hobbes, Descartes, Leibniz, Spinoza, Locke, Hume, and Kant. The historical, philosophical, and political foundations of this philosophical era will be examined, as well as topics that were prominent intellectually during this time, such as causality, the relation between mind and body, how we come to know things and the degree of certainty we can attribute to our knowledge, and whether or not we can prove God's existence. Students will be required to critically analyze the texts of the philosophers studied in class, as well as to compare, contrast, and critically evaluate the ideas of these thinkers. They will be graded on participation, comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 202 satisfies the GH requirement, it may be used to fulfill the minor requirements in Philosophy, and it is a prerequisite to the 400-level courses. This course will be offered once a year with an enrollment of 35 students.

Changes Effective Summer 2019:

- Description
- Title

PHIL 204: Twentieth Century Philosophy (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Examines the thought and influence of major Western thinkers of the century, including pragmatists, phenomenologists, existentialists, critical theorists, and feminists. PHIL 204 20th Century Philosophy (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. As part of the history of philosophy sequence required of undergraduate philosophy majors, this course provides an overview of the central currents of 20th-century philosophy. This course in combination with the others of the sequence allows a consistent approach to history of philosophy. This historical sequence will comprise the core, of all philosophy major options. As a general education humanities course, this class: 1) develops a broad, coherent overview of the historical development of western philosophy in the 20th century, and the philosophical problems, methods, and results of developments; 2) emphasizes the thought of major, influential figures and their works, such as Peirce, James, Dewey, Frege, Moore, Russell, Carney, Wittgenstein, Hussel, Heidegger, Sartre, Merleau-Ponty, debeauvoir, Addams, Stanton, Rich, Chodorow, MacKinnon, irigaray, Horikheimer, Adorno, Habermas; 3) develops competence in interpretation and critical assessment of human values and their place in theory and practice as set forth in philosophically and historically central views that span all areas of philosophical thought; 4) leads the students to appreciate and think critically about the ends of human action and final, non-instrumental, aesthetic values in moral, political, and aesthetic experience (including attention to the metaphysical and epistemological foundations of this experience) as set forth in the work of major philosophers of the 19th century; 5) teaches students how to communicate clearly, think logically,
and evaluate critically by providing them a critical survey of philosophical theories that are both important in the historical development of western thought and important for understanding continuing and contemporary philosophical issues today; and, 6) meets fully all its stated humanities general education objectives by providing students with texts that occupy a central role in the humanities, requiring careful oral and written analysis of these texts, developing abilities to think critically and imaginatively about the issues in these texts, and leading students to integrate course material with other humanities subjects such as literature, foreign languages, history religion, social and political theory, philosophy of science. Students will be graded on participation, three comparison/contrast papers, a position paper, a collaborative project, and a comprehensive final exam. PHIL 204 satisfies the GH requirement, it may be used to fulfill the minor requirements in Philosophy, and it is a prerequisite to the 400-level courses. This course will be offered every year with an enrollment of 35 students.

Changes Effective Summer 2019:

- Description

PHIL 208: Contemporary Philosophy (3 Credits) (BA) (GH)
Old Listing Effective Through Spring 2019:

Recent trends in philosophical thought and culture, hybrid philosophies, and the philosophical landscape of the future. PHIL 208 Contemporary Philosophy (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. As part of the history of philosophy sequence required of undergraduate philosophy majors, this course is designed to examine recent trends in philosophical thought and culture, hybrid philosophies, and the philosophical landscape of the future. The class will be divided according to the following areas of contemporary thought: Postmodernism, Analytic Thought (the realism/anti-realism debate), neo-Pragmatism, Beyond Postmodernism, Feminism and Science. Students will be required to critically analyze the texts of the philosophers studied in class, as well as to compare, contrast, and critically evaluate the ideas of these thinkers. They will be graded on participation, comparison/contrast papers, a position paper, a collaborative presentation, and a comprehensive final exam. PHIL 208 satisfies the GH requirement, it may be used to fulfill the minor requirements in Philosophy, and it is a prerequisite to the 400-level courses. This course will be offered every year with an enrollment of 35 students.

Changes Effective Summer 2019:

- Description

PHIL 208H: Social and Political Philosophy (3 Credits) (H) (BA) (GH)
Old Listing Effective Through Spring 2019:

Critical introduction to political authority, rights, justice, community, inequality, power, pluralism, and other contemporary, social, and political issues.

Changes Effective Summer 2019:

- Number to 108H
- Description
- Title
- Abbreviated Title

PHOTO 101: Culture of Photography (3 Credits)
Old Listing Effective Through Spring 2019:

This is a non-technical introductory photography course where students photographically and intellectually examine the role of photography in modern culture. PHOTO 101 expands students’ depth of appreciation, knowledge, and understanding of the medium by providing them with a creative and intellectual background to realize its broad cultural scope. The course accomplishes this through photographic and written explorations of social, political and ethical issues relevant to photography. Photography yields unprecedented influence as a primary visual medium and students constantly use photography in their personal lives as both a communications tool and as a creative outlet. The ubiquitous smart phones with built in cameras are responsible for much of this explosive popularity with social media providing appealing venues for publicly displaying photography. Over the first decade of the new millennium, social media sites saw the volume of photo uploads increase dramatically, eventually exceeding 10 billion per month. In light of photography being a key medium students use to share and communicate information about themselves to the world at large, the course is designed to help them to think critically and ethically about the photographs they take, share, view and use. The major course teaching topics will address a broad range of contemporary issues relevant to how photography and culture affect one another. Students will become aware of photography as a constantly evolving medium, whose relatively short historical trajectory has culminated in the development of an easily accessible egalitarian art form that bridged the digital divide to interact intimately with personal computing, cell phone communications, the Internet, and social media. In the course, students will take photographs to fulfill photographic assignments, share them with peer audiences, and then engage in critical conversations regarding the aesthetic and communicative meaning and effectiveness of the photos. They will also engage in written assignments where the course presents them with case studies regarding current issues in photography such as, the impact of technological developments in the medium, ethical uses of photography, photography as free speech, and photography as social media. Students will conduct research on the topics and develop informed written position statements, which they will share with their classmates for peer evaluation and feedback. In addition, students will engage with selected readings regarding aspects of photography addressed in the major teaching topics.

Changes Effective Summer 2019:

- Add General Education Designation GA

PHYS 1: The Science of Physics (3 Credits) (BA) (GN)
Old Listing Effective Through Spring 2019:

Historical development and significance of major concepts, with emphasis on the nature of physics and its role in modern life. (For students in non-mathematical fields.) PHYS 001 The Science of Physics (3) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Introduction to the basic concepts of physics at a conceptual level for students in non-technical majors. Provides a broad survey of the history, concepts, and applications of physics including topics such as classical mechanics in one- and two-dimensions, Newton’s laws of motion, work and energy, momentum, rotational motion, vibration, sound, and waves, heat and the laws of thermodynamics, electricity and magnetism, including simple electrical circuits, and topics in 20th century physics, including relativity and quantum mechanics. Course objectives include the development of an understanding of the scientific method, its application to physics problems of historical interest, as well
as to modern applications; providing an appreciation of the historical role played by physics in the development of modern science, its role in important cultural and societal issues, and in understanding the basic laws of nature, as applied to everyday experience, natural phenomena, or applications technologies (old and new); the development of scientific literacy, to help motivate the many connections of physics to other fundamental scientific fields and applications disciplines; providing experience in problem solving and the conceptual understanding of physics, and emphasizing the recurring role of a few important concepts, cutting across many scientific disciplines, such as the fundamental laws of classical mechanics, the basic laws of thermodynamics (including conservation of energy), as well as applications of modern quantum theory.

Changes Effective Summer 2019:

- Description

**PHYS 211: General Physics: Mechanics (4 Credits) (BA) (GN)**

Old Listing Effective Through Spring 2019:

Calculus-based study of the basic concepts of mechanics: motion, force, Newton's laws, energy, collisions, and rotation. PHYS 211PHYS 211 General Physics: Mechanics (4) (GN)(BA) This course meets the Bachelor of Arts degree requirements. Calculus-based introduction to classical mechanics, including such topics as: measurement, dimensional analysis, motion in one-dimension, vectors, motion in 2 and 3 dimensions, relative and circular motion, force and dynamics, Newton's Laws, friction, kinetic energy, work, potential energy, energy conservation, systems of particles, center of mass and momentum, elastic and inelastic collisions, rotation (moments of inertia), rolling motion, torque, angular momentum, static equilibrium, gravitational force and Kepler's laws, gravitational potential energy, oscillations, waves (transverse and longitudinal, superposition of waves). This course is designed to provide students with a working knowledge of the elementary physics principles mentioned above, as well as their applications, and to enhance their conceptual understanding of physical laws. Students attend two lectures, one recitation session, and one two-hour lab/activity period per week. Use of a combination of computer-based and traditional lab exercises is expected and collaborative learning exercises will be used in both lab and recitation settings. The introduction of data acquisition and analysis methods (often making use of modern computer tools) will be stressed in the laboratory/activity period. Course evaluation is based on a combination of regular homework sets and/or quizzes, reports from the lab/activity period, midterm and final exams and other evaluative tools. The course is an important prerequisite for later work in many science and engineering disciplines.

Changes Effective Summer 2019:

- Description

- Prerequisite/Corequisite/Concurrent Courses

**PLANT 220: Gardening for Fun and Profit (3 Credits) (GN)**

Old Listing Effective Through Spring 2019:

Fundamentals of designing, planting and maintaining residential landscapes and edible gardens for students with minimal/intermediate horticulture knowledge. PLANT 220 Gardening for Fun and Profit (3) (GN) The objective of PLANT 220 (GN), Gardening for Fun and Profit is to provide students with science-based fundamentals of establishing and maintaining residential landscapes and edible gardens. The course provides information that is especially useful to those with minimal to intermediate knowledge of horticultural plants. A background in gardening or landscaping is not needed. Class topics are presented by guest speakers who are scientists and experts in the topic area. Major topics include proper plant selection, soil preparation for establishing plantings, the basics of seeding, growing transplants and planting, the basics of planting and maintaining trees and shrubs, avoiding common mistakes in the garden and landscape, gardening resources, storage and processing fruits and vegetables for home use and ideas for making profit from gardening activities. This course includes a weekly laboratory session where students gain practical skills needed for developing and maintaining residential landscapes and edible gardens through hands-on activities and field trips.

Changes Effective Summer 2019:

- Abbreviated Title
- Description

**PLSC 10: Scientific Study of Politics (3 Credits) (GS)**

Old Listing Effective Through Spring 2019:

This course introduces students to both the scientific study of politics and the way that study advances our understanding of political actors, events, processes, and institutions. PL SC 010 Scientific Study of Politics (3) (GS) This course introduces students to both the scientific study of politics, and the way that study advances our understanding of political actors, events, processes, and institutions. It provides information about the elements of scientific reasoning, and introduces systematic approaches to studying politics through the lens of important puzzles and questions about international relations, comparative politics, and American politics. Students learn about relevant data sources, as well as how to interpret data appearing in graphs and tables. The course consists of three parts. The first part of the course offers an overview of the elements of scientific inquiry including causal explanation, empirical verification, theories and hypotheses, and dependent and independent variables. The second part of the course examines dominant approaches to studying politics including experiments, observational methods such as surveys and elite interviewing, formal models, archival research, and computational methods including text analysis. Each approach will be presented using a similar format. Students will be introduced to the approach through a combination of lectures and assigned readings. They will then look at and learn about data sources suited to and consider questions or puzzles that can be addressed by each approach. Careers that make use of the analytic skills associated with each approach also will be discussed. The final part of the course considers the benefits of scientific approaches over less systematic analysis and the challenges inherent in trying to explain complex political behavior, institutions, and events. By the end of the course, students will understand what it means to political science: i.e., to ask questions about political phenomena, form theories related to those questions, collect data, pick an approach to analyze the data, and draw inferences from the analysis.

Changes Effective Summer 2019:

- Description
- Add BA Designation

**PLSC 177: Politics and Government in Washington DC (1-3 Credits) (BA) (GH)**

Old Listing Effective Through Spring 2019:

The course centers on a Spring Break trip to Washington DC, with students meeting on campus before and after the trip. PL SC 177 Politics and Government in Washington DC (1-3) This course centers on a Spring Break trip to Washington DC, where students will meet with
their members of Congress, get briefings at foreign embassies and international organizations, meet with leaders of federal government agencies, participate in seminars led by interest groups and political party officials and consultants, and tour government offices and facilities. The class will meet before the trip to discuss the history, culture, and context of politics and government in the capital city of the United States and will continue to meet after the trip so that students can analyze what they have learned about politics and government in Washington as a result of their experiences during the trip. The course is open to and appropriate for students in all majors.

Changes Effective Summer 2019:

- Number to 177N
- Description
- Add General Education Designations GH and Inter-Domain
- Add B.A. Humanities Designation

PPEM 120: The Fungal Jungle: A Mycological Safari From Truffles to Slime Molds (3 Credits) (GN)

This course introduces the world of fungi and their impact on humans and the environment around us. PPEM 120 The Fungal Jungle: A Mycological Safari From Truffles to Slime Molds (3) Fungi are a fascinating group of organisms that we encounter in everyday life. Apart from the mushrooms on our pizza or mold in our bathtub, fungi are important plant pathogens that severely interfere with agricultural production, cause diseases in humans and insects, and have a major role in ecosystems. The aim of this course is to introduce students to the world of fungi and review the important functions of fungi in human society, to educate students in basic concepts of fungal biology that are scientifically interesting and important to human society, and to train students to understand both basic and current topics in science. Topics to be covered include the structure and classification of fungi, the ways in which fungi interact with other organisms as pathogens or beneficial partners, the contributions fungi make to ecosystem functioning, and the ways in which humans use fungi and products derived from them. We will discuss examples that students are familiar with and encounter in their everyday life. The course also has an informal lab section that includes several class activities and visits. Class activities are designed to be done in small teams and promote team-work learning, problem solving and critical thinking skills. Students will learn how to isolate, grow and identify fungi, among other activities, culminating in a fungal feast. For example, students will keep a journal on fungi, take quizzes, and deliver a presentation of their favorite fungus, among other assignments. This course is intended to be an introductory science course to non-science majors and will provide important general science knowledge as well as specific details about fungal biology.

Changes Effective Summer 2019:

- Description

PPEM 300: Horticultural Crop Diseases (3 Credits) (GN)

Diseases of horticultural crops are examined stressing their cause, diagnosis, management and national and international importance. PPEM 300 Horticultural Crop Diseases (3) Diseases of horticultural crops are examined stressing their cause, diagnosis, management and understanding the roles they play in national and international trade and bio-security concerns. The biology of plant diseases involving a broad range of biotic and abiotic plant pathogens will be discussed. The objectives are that the student completing the course will 1) be able to describe the causes of plant diseases in general and horticultural crop diseases in particular; 2) be able to explain the interactions that occur among the plant, the environment, and biotic and abiotic agents during disease development; 3) have the ability to diagnose and explain the management of key diseases of horticultural crops; and 4) be able to describe the economic and social impact that plant diseases have on horticultural crops, including how the world trade of these crops can result in the global spread of pathogens important to other agricultural crops and native plants in the environment. The course is recommended for majors in horticulture and urban forestry but is appropriate for everyone interested in growing plants for enjoyment or profit or in maintaining the health of horticultural crops. This course provides an introduction to plant pathology in general and can be followed by more in-depth courses in plant-microbe interactions, mycology, nematology, phytopathology, air pollution impacts on terrestrial ecology, or forest pathology.

Changes Effective Summer 2019:

- Description

SOC 3H: Honors Introduction to Social Psychology (3 Credits) (H) (BA)

This is an honors course that enables students to learn, apply, and evaluate basic social psychology concepts, theories, and research. SOC 003H Honors Introduction to Social Psychology (3) Social Psychology is the scientific study of human minds and behaviors. It focuses on human development, social interaction between individuals, group influences on individuals, and interaction between groups. Social Psychology is an interdisciplinary area of study that bridges sociology and psychology. However, sociological contributions to this field will be emphasized. This course is especially appropriate for students in the Schreyer Honors College and Paterno Fellows.

Changes Effective Summer 2019:

- Description

SOC 30: Sociology of the Family (3 Credits) (BA) (GS)

Family structure and interaction; functions of the family as an institution; cross-cultural comparisons. Students may take only one course for General Education credit from SOC 030 or HD FS 129. SOC 030 Sociology of the Family (3) (GS)(BA) This course meets the Bachelor of Arts degree requirements. Family, in all of its forms, is one of the most fundamental and enduring of social institutions. Because almost everyone grows up in a family, we are accustomed to thinking about the ways in which our values, personalities, and goals have been shaped by family experiences. In this course, however, we will examine families and family relationships from a sociological perspective. In particular, we will consider how our private, taken-for-granted family experiences are related to social factors such as gender, race, ethnicity, social class, the economy, and cultural attitudes and values. Through this course, students will (1) gain a better understanding of current U.S. family patterns and trends, based on empirical research, (2) be able to analyze and interpret family patterns and trends using sociological concepts and theories, (3) evaluate family-related information from multiple perspectives, (4) develop a greater appreciation of the diversity and choices in family life today, and (5) clarify their own values with respect to marriage.
and family life. The instructors encourage discussion and questions in all sections. Assessment is based on objective tests taken in class and writing assignments. These assignments may include library and Internet research, original empirical research, or a journal in which students describe their developing ideas about marriage and family life. This course meets a general education requirement in the social and behavioral sciences. Students may take only one course for General Education credit from SOC 030 or HD FS 129.

Changes Effective Summer 2019:

• Description

SPAN 315: Spanish and Spanish-speakers in the U.S. (3 Credits) (US) (GH)

Old Listing Effective Through Spring 2019:

In this course, we investigate various aspects of the language(s) and language behaviors of U.S. Latinos. SPAN (LTNST) 315 Spanish and Spanish-speakers in the U.S. (3) (GH,US) The course is premised on the idea that language is a crucial component in the formation of identity. To understand Latina/o identity formation in the U.S., then, one must analyze what role languages—Spanish and English—have played in identity formation. The course commences with a brief historical assessment of the various U.S. Latino communities, including Mexican-American, Cuban-American, and Puerto Rican communities. Such a historical purview proves significant in the study of the cultural traditions that persist in these communities, chief among these, the Spanish language. In exploring the Spanish language in U.S. Latino communities, we consider several major sets of questions, among them the following: In what ways do the languages of a U.S. Latino communities differ from those of monolingual Spanish- (and English-) speaking communities? What factors contribute to the maintenance and loss of Spanish in these communities? How does language contribute to the creation of individual and societal identity? How is language exploited in the representation of other U.S. Latino cultural traditions? We consider these questions across a variety of genres: poetry, prose (autobiography in particular), film, art, television, and music. These texts reveal how social environments determine language use as well as how artists have used language to reshape social environments, through, for example, the development of new language practices such as Spanish-English code switching. The course also connects these cultural practices to debates on Spanish in public life and policy.

Cross-Listed Courses: LTNST 315

Changes Effective Summer 2019:

• Description

SPAN 412: Translation (3)

Old Listing Effective Through Spring 2019:

Techniques of oral and written translation from Spanish to English and vice versa, particularly for business, literature, and social work.

PREREQUISITE COURSE: SPAN 300

Changes Effective Summer 2019:

• Description

• Prerequisite/Corequisite/Concurrent Courses

TURF 425: Turfgrass Cultural Systems (3 Credits)

Old Listing Effective Through Spring 2019:

A study of turfgrass maintenance practices and how their interrelationships can be utilized to develop management systems. TURF 425 Turfgrass Cultural Systems (3) TURF 425 is offered to students that are in their final year of the turfgrass science major. They are expected to use the information provided in the course and previously learned agronomic principles and concepts, to develop management and problem solving skills. More in depth information pertaining to various management systems are presented which expands upon prerequisite course content Students are expected to be able to integrate different turfgrass maintenance practices into sound management strategies that lead to the production of high quality turfgrass areas. The management compromise between aesthetic quality and functionality is stressed and students are challenged to recognize those cultural practices that influence the balance between the two. There are three 100 point exams during the semester. The majority of the content in each exam will come from the information provided since the previous one. Several unannounced quizzes will be given throughout the semester (usually 12 to 13 with only the 10 best counting toward the grade). A soil testing exercise is also included whereby the student is expected to take an appropriate sample from a site of their choosing submit it to the soil testing lab, interpret the soil test results, and make a written recommendation based upon the results. The course will help the student better understand how the maintenance practices and pest control programs learned in other courses inter-relate in the overall management scheme for a given turfgrass site. It will also prepare them for TURF 436 (Case Studies) where they will be expected to work in teams in problem solving situations. The facilities provided in ASI building, associated greenhouses, and the turfgrass field research plots as well as the campus grounds provide ample support for the effective delivery of the course.

Changes Effective Summer 2019:

• Abbreviated Title

• Description

WMNST 83: First-Year Seminar in Women's Studies (3 Credits) (US) (IL) (BA) (GH)

Old Listing Effective Through Spring 2019:

Critical approaches to the dimensions and directions in Women’s Studies. WMNST 083S First-Year Seminar in Women's Studies (3) (GH,FYS,US,IL,BA) This course meets the Bachelor of Arts degree requirements. Through the reading of texts, discussions (in-class, study groups, listservs), debates, and collaborative research projects, students are introduced: (a) to feminist analysis of literature and/or culture (b) to the humanities and to the nature of research and scholarship (c) to the concepts of interdisciplinary vs. multidisciplinary research and scholarship (d) to cross-cultural issues (international) (e) to scholarly conduct and responsibilities Students develop international competence by cultivating curiosity about and empathy for other cultures; by recognizing that social variables such as gender, age, social class, religion, ethnicity, race, sexual orientation, and place of residence affect the way people view the world, behave, and communicate; and by developing the ability to locate, organize, and evaluate information about the culture (s) from a variety of sources (print, electronic, people, and personal observations). The points of departure for the development of all of these competencies are literary and cultural texts from international women writers and artists. Students will be evaluated through class discussions, writing projects, and collaborative group projects. This course will prepare the students for other courses in the humanities
by giving them the opportunity to gain insights into the study of the humanities through literary and cultural texts. In addition to the academic topic and issues of this course, students can expect to gain a general introduction to the University as an academic community and have the opportunity to explore their responsibilities as members of that community. Students will develop an understanding of the learning tools and resources available to them, including the opportunity to develop relationships with faculty and other students who share their academic interests. This course fulfills the first-year seminar requirement as well as one of the humanities requirements in general education or a Bachelor of Arts humanities requirement.

Changes Effective Summer 2019:

- Description
- Change Number to 83N
- Add GS Designation
- Add Inter-Domain Designation
- Remove IL Designation
- Add BA Social and Behavioral Sciences Designation

Course Changes: Effective Fall 2019

BA 301: Finance (3 Credits)

An overview of finance for non-business majors. Topics include financial markets and institutions, investments, and financial decision making in organizations. B A 301 Finance (3) The goal of BA 301 is to provide insight into the thinking of both the financial manager and the functional manager that is needed to effectively lead and manage not only their business organization but also their personal financial lives. The course will enable the student to learn the key financial concepts, constructs, and models that are used by financial managers every day around the world. Understanding of the mathematics of finance, the use of financial calculators, and development of Excel financial model problem solving will be emphasized. Ethical financial decision-making will be a common theme that is integrated throughout the course. Using a survey overview approach, the first five weeks of the course will cover concepts such as financial statements and analysis, financial ratios and analysis, long-term financial planning and budgeting, time value of money, discounted cash flow analysis, capital budgeting, break-even analysis, and systematic/unsystematic risk. The next five weeks will provide an overview of financial topics that are normally covered in detail in financial markets courses. These topics include financial systems, money markets, the Federal Reserve and monetary policy, derivatives and speculative markets, and legal and operational issues in financial markets. The final five weeks will cover general personal finance topics of interest such as money management strategies, insurance and risk management, consumer credit, tax strategies, investing in stocks, bonds, and Exchange-Traded Funds, and retirement and estate planning. A student may not receive credit toward graduation for both B A 301 and FIN 301.

Prerequisite: ECON 102

Changes Effective Fall 2019:

- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

BA 302: Supply Chains (3 Credits)

An overview of supply chain management for non-business majors focusing on the strategic importance of source, make and deliver processes. B A 302 Supply Chains (3) The purpose of BA 302 is to provide non-business students with an introduction to the issues and decisions routinely faced by supply chain managers and the impact of effective supply chains on today’s business environment. Using the Supply Chain Operations Reference model as a framework, this course considers how successful firms plan, integrate and execute sourcing, manufacturing, customer fulfillment, reverse logistics and sustainment processes across a complex marketplace to provide value to the customer. The course will look at the interplay and coordination of product, financial and information flows through a supply chain resulting in value creation for the customer and competitive advantage for the firm. Students will consider the roles of drivers such as cost, quality, time, flexibility, innovation and information sharing in designing supply chain strategies in support of overarching business strategies. Through detailed exploration of models, case studies and real world events, coupled with the application of operation management tools and techniques, the course provides the opportunity to identify and dissect issues, and develop solutions to supply chain challenges not only faced by today’s business managers, but also impact the customer. The course will examine supply chain organization, implementation and management planning, the evaluation and control of manufacturing processes, and the execution of supplier and customer management activities. Students will use basic information technologies and programs to leverage tools like business process mapping, value indexing, and total cost analysis to aid in the identification and mitigation of supply chain issues in a global business environment. Students will also be exposed to current supply chain issues such as sustainability and the impact of boundary-spanning information technologies as relevant keys to competitive advantage. The course provides the basic supply chain knowledge and skills necessary for the non-business major to be an effective member of a cross functional team in a professional business environment while providing a level of understanding to benefit the student in navigating the complex customer fulfillment issues present as a consumer of goods and services in today’s globally connected marketplace. A student may not receive credit towards graduation for both B A 302 and SCM 301.

Prerequisite: ACCTG211 ; ECON 102 ; 3 credits of 200-level statistics

Changes Effective Fall 2019:

- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

BA 303: Marketing (3 Credits)

An overview of marketing for non-business majors. Topics include customer behavior, service/product development, pricing, and promotion in diverse markets. B A 303 Marketing (3) The goal of BA 303 is to provide broad-based exposure and understanding of marketing and its processes. The course is meant to be a “stand alone” marketing course for those interested in the role of marketing within the business context and will cover a range of topics from the basic (what is marketing) to the processes (market segmentation, marketing strategy, development of product, price, place and promotion) to the broader societal questions (why marketing exists, ethics, the future of marketing). There will also be an opportunity to examine marketing from the perspective of various
industries for non-business students. Exams will test factual knowledge of marketing and the marketing process. Written homework assignments will ask students to work both individually and in teams to apply course concepts. These may include assignments developing one’s skill set in consumer psychology, target market selection, writing a positioning statement, developing a marketing plan, new product development concepts, promotional campaign ideas, and ethical questions to discuss and debate. Students may also be asked to form small groups for discussion and/or make presentations to the class based on set marketing topics specific to one’s area of interest. Students will also be expected to participate in class discussions. A student may not receive credit towards graduation for both B A 304 and MKTG 221 or MKTG 221W. Furthermore, a student may not receive credit towards graduation for both B A 303 and MKTG 301 or MKTG 301W.

Prerequisite: ECON 102

Changes Effective Fall 2019:

- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

BA 304: Management and Organization (3 Credits)
Old Listing Effective Through Summer 2019:

This course provides an overview of management for students not enrolling in a Penn State business program. Topics include differences in organizations, decision making, motivation, team effectiveness, corporate strategy and competitor analysis, and implementation in a global context. B A 304 Management and Organization (3) This course is an introduction to management focusing on concepts that will help students understand the behavior of employees, teams, and organizations, and apply these concepts to their own careers. The course will initially use basic social science principles to examine how managers can motivate and coordinate activities among individuals and teams within an organization, using principles of personality, ability, values, attitudes, motivation, power, persuasion, leadership, team dynamics, and organizational culture and structure. Then, the course will shift to how whole organizations interact with their external environments. Students will learn to assess company, competitor and industry performance and use this analysis to set goals, plan firm strategies, and implement them. B A 304 is an introduction and overview course that a body of knowledge that exists concerning the management of modern organizations. Management is critical to business success no matter the industry, the field or the arena. Seven key functions for any manager will be covered – organizational structure, operations, staffing, recruitment, leadership, culture (including ethics) and planning. One key take away for B A 304 is the difference between leadership and management. What do these words mean to you? In recent years we have focused on leadership as the preferred ability to strive for with management skill losing favor. In general it has been said that leaders focus on "doing the right things" and managers focus on "doing things right". This will be a theme for review and discussion throughout the course as each subject area is covered. A student may not receive credit towards graduation for both B A 304 and MGMT 100 or MGMT 100W. Furthermore, a student may not receive credit towards graduation for both B A 304 and MGMT 301 or MGMT 301W.

Prerequisite: ECON 102

Changes Effective Fall 2019:

- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

BMB 465: Protein Structure and Function (3 Credits)

Old Listing Effective Through Summer 2019:

A study of the relationship between structure and function of proteins; internet analysis to predict structure and function is included.

Prerequisites: Enforced PreRequisite: BIOL 230W

Changes Effective Fall 2019:

- Description
- Prerequisite/Corequisite/Concurrent Courses

BMB 485: Human Genomics and Biomedical Informatics (3 Credits)

Old Listing Effective Through Summer 2019:

This course covers the basics of measuring genomic variation and exploring how variation in DNA is related to common, complex disease.

Prerequisites: Enforced Prerequisite: BIOL 322 and BMB 400 and (STAT 301 or STAT 401)

Changes Effective Fall 2019:

- Description
- Prerequisite/Corequisite/Concurrent Courses
- Add Cross-Listed Course VBSC 485

CHEM 440: Instrumental Analysis (3 Credits)

Old Listing Effective Through Summer 2019:

General instrumental theory and methods used in common atomic and molecular analyses. CHEM 440 CHEM 440 Instrumental Analysis (3) This course presents analytical methods used by the chemistry community in a way that extends and compliments the treatment in CHEM 221. Preliminary discussions will entail sample preparation for organic and inorganic samples, quantitative measurements, sensitivity and limit of detection. Techniques addressed will cover the areas of separation, qualitative and quantitative optical spectroscopic techniques, mass spectrometry, electroanalytical techniques and surface analysis. In separation techniques, methods presented will be capillary electrophoresis, gas, liquid, and ion chromatography. In optical spectroscopy, methods presented will be infrared, Raman, nuclear magnetic resonance, ultraviolet and visible molecular absorption, chemiluminescence, inductively coupled plasma emission, atomic fluorescence, atomic absorption and emission spectrometry. Mass spectrometry methods presented will include time of flight, magnetic sector and electric sector mass spectrometry as well as interfacing with gas chromatography, liquid chromatography and capillary electrophoresis. Electroanalytical methods include amperometric, voltammetric and potentiometric techniques. Surface analysis methods discussed will be atomic force microscopy, scanning tunneling microscopy, Auger electron spectroscopy, X-ray photoelectron spectroscopy and secondary ion mass spectrometry.

Prerequisites: Enforced Prerequisite: CHEM 450 and CHEM 221

Changes Effective Fall 2019:
The concepts and tools covered in this class allow the student to gain a fundamental understanding of how the finance function works within the business environment. Finance 301 promotes critical thinking and will enable the student to better integrate the individual functions of a business in order to make good business decisions.

Prerequisite: ENGL 015 or ENGL 030; ACCTG211; ECON 102 or ECON 104; SCM 200 or STAT

Changes Effective Fall 2019:
- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

FIN 301H: Corporation Finance (Honors) (3 Credits) (H)
Old Listing Effective Through Summer 2019:

Review of corporate finance concepts including financial statements, ratio analysis, financial planning, time value of money, securities valuation, and capital budgeting. FIN 301H Corporation Finance (Honors) (3) The goal of the FIN 301H honors course is to provide insight into real world issues that are needed to effectively run a business. We will utilize the fundamental concepts learned in finance (integrated with accounting, marketing, management, logistics, operations, and business law/ethics) as a foundation for running a business in the classroom. Our "product" in this business will be a comprehensive strategic business plan for a real, live local, state, national, or international business that will serve not only as an articulation of understanding of core course concepts, but also as a supplement to the existing core package of introductory business courses. The honor students in this course will be building their strategic business plan products in electronic format in closely-knit, high performance teams. The strategic plan product development process in this course inherently involves integration across the functional areas of business: marketing, logistics, finance, and management. There is also inclusion and integration of courses in accounting, business law, management information systems, and statistics as applicable. Each student team will allocate product development responsibilities according to areas of expertise and interest. An appropriate balance of students from several majors will be assigned to each group. Class time will involve exchanging information within and across groups and coordinating activities between groups where necessary. Students will periodically meet with individual and team-based corporate mentors who will provide one-on-one advice on an as-needed basis. Students will also receive specialized training in team-based processes, leadership, and technology tools (HTML, CD-ROM, teleconferencing, etc.) required to implement the products under development. Select members of the Penn State faculty and Smeal College alumni will be on hand at times to provide this specialized training and consulting expertise. Company owners and principals will provide periodic (monthly) reviews of honor students' work to assist students in the development of a first-class, professional business plan product.

Prerequisite: ENGL 015 or ENGL 030; ACCTG211; ECON 102 or ECON 104; SCM 200 or STAT

Changes Effective Fall 2019:
- Description
- Prerequisite/Corequisite/Concurrent Courses

FIN 414: Financial Trading and Applications (3 Credits)
Old Listing Effective Through Summer 2019:
This course focuses on financial modeling and analysis of trading strategies. Bloomberg, Reuters, spreadsheets and trading simulations are used extensively. FIN 414 Financial Trading and Applications (3) The focus of this course is the application of financial theory and technology to the practice of financial trading. The first half of the class examines tools for constructing and evaluating trading strategies. After a short review of probability and statistics, attention turns to the analysis of models for valuing options, credit default swaps, and other financial instruments. Emphasis is placed on the assumptions underlying these models and the application of these models in the real-world. This discussion includes approaches for estimating volatility and the use of the models when underlying assumptions do not hold. The first half of the course concludes with a discussion of value-at-risk and tools for evaluating performance. The analysis of these topics highlights commonly used measures of performance and the potential pitfalls using these measures. The second half of the class examines trading strategies commonly used by hedge funds. Strategies discussed include merger arbitrage, relative value, momentum, index arbitrage, and other quantitative based strategies. Students also study accounting based and fundamentally based trading strategies. Application of these strategies in both the equity and fixed income markets is examined. Attention is also paid to the impact of trading on market prices and other aspects of market microstructure. Throughout the second half of the course, students participate in a project in which they form into teams of fund managers who analyze market data with the purpose of constructing and managing a portfolio that applies various trading strategies. The fund is managed using market simulation software that allows students to execute all trades using real-time market prices and allows them to go long or short equity, commodity, fixed income, and foreign exchange instruments, as well as derivative securities. Upon completion of the project, students make a pitch to a group of potential investors (the class) in which they summarize the themes underlying their strategies, provide performance metrics for their fund, and discuss their primary trading strategies if they were to continue as fund managers. The course pedagogy is lectures, case assignments, trading and valuation simulations, and a trading project. The class will make extensive use of Bloomberg, Reuters, trading software, basic programming languages for financial software, and other technology available. Students are evaluated based on their performance on assignments, exams, and the portfolio project.

Prerequisite: FIN 305W, FIN 406 or FIN 301

Changes Effective Fall 2019:
- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

**MGMT 301: Basic Management Concepts (3 Credits)**

Study of fundamental principles and processes available to the understanding of management. Not available to students who have taken B A 304. MGMT 301 Basic Management Concepts (3) MGMT 301, Basic Management Concepts, is a three credit course offered each semester across Penn State. MGMT 301 exposes undergraduate students to the fundamental principles and basic concepts of management, with emphasis on organizational design, management processes, leadership, motivation, and managing teams and individuals in a global business environment. Understanding these principles and concepts is extremely important for students preparing for and entering the business profession. Managers plan, organize, lead, and control. These functions provide a foundation for MGMT 301 and are included in all course topics and modules. Typical modules include: An Overview of Management; Strategy and Structure; Organizational Behavior; and Group/Organizational Dynamics. The overview of management focuses on the manager’s role and function, decision making, ethics, and managerial oversight. Topics covered in a strategy and structure module will include culture, environmental influences, strategy, organizational structure, globalization, and innovation. Organizational Behavior focuses on how decision making is influenced by various stakeholders who have formal and informal authority and control in a business. What motivates individuals and who are leaders in an organization is discussed along with group dynamics. Understanding team processes, conflict, adaptation to change, and various levels of group and one-on-one communication is important and will be covered by reviewing traditional management strategies and structures along with discussions on current and evolving management issues.

Prerequisite: ENGL 015 or ENGL 030; ECON 102 or ECON 104; MATH 021 or higher or satisfactory score on the mathematics placement examination

Changes Effective Fall 2019:
- Description
- Prerequisite/Corequisite/Concurrent Courses

**MGMT 301H: Basic Management Concepts (Honors) (3 Credits) (H)**

Study of fundamental principles and processes available to the understanding of management. MGMT 301H Basic Management Concepts (3) Organizations are ubiquitous. Students will likely spend a major part of their lives working for one or, perhaps, leading one they have started. Although sound technical skills and relevant knowledge are important reasons an organization hires employees, the ability to lead and manage people is critical for future advancement. This course is focused on the social facets of organizations — as opposed to elements such as finance, marketing, operations, etc. A good grasp of how organizations work will help students succeed in their careers. This course provides a forum to critically engage with theories and concepts that attempt to explain organizational practices. It is designed to not only provide students with the basic fundamentals that may be used as tools to become better managers, but also help students question their own assumptions about how people ought to behave and how they actually do behave in organizations. This course, builds on the concepts embedded in a traditional foundation management course by researching the theories these courses are built upon and pointing out the advantages and limitations of these different approaches. The topics covered in this course will provide both the breadth and depth of understanding of various topics including organizational structure, strategy, culture, leadership styles, ethics, and staffing that fall under the domain of Management & Organization. In addition, specific challenges faced by managers in contemporary organizations such as managing teams, globalization, and diversity are also incorporated. These topics are covered using lectures, independent research, case analyses and experiential exercises that will help you develop in-depth domain knowledge as well as managerial skills. In addition, the course will facilitate the development of research and analytic skills through the inclusion of individual presentations of current topics that represent critical issues in organizations. A team project will further enhance knowledge acquisition of specific issues facing organizations and, since
teams are prevalent across most organizational settings, also help develop teamwork skills.

Prerequisite: ENGL 015 , ENGL 030 , ENGL 137H or CAS 137H , ECON 102 ECON 104 ; MATH 021 or higher or satisfactory score on the mathematics placement examination

Changes Effective Fall 2019:

• Description
• Prerequisite/Corequisite/Concurrent Courses

MGTM 301W: Basic Management Concepts (3 Credits) (WF)
Old Listing Effective Through Summer 2019:

Examination of fundamental principles and processes applicable to the study of management. Not available to students who have taken B A 304. MGTM 301W Basic Management Concepts (3) MGTM 301W, Basic Management Concepts, is a three credit course offered each semester across Penn State. MGTM 301W exposes undergraduate students to the fundamental principles and basic concepts of management, with emphasis on organizational design, management processes, leadership, motivation, and managing teams and individuals in a global business environment. Understanding these principles and concepts is extremely important for students preparing for and entering the business profession. Managers plan, organize, lead, and control. These functions provide a foundation for MGTM 301W and are included in all course topics and modules. Typical modules include: An Overview of Management; Strategy and Structure; Organizational Behavior; and Group/Organizational Dynamics. The overview of management focuses on the manager’s role and function, decision making, ethics, and managerial oversight. Topics covered in a strategy and structure module will include culture, environmental influences, strategy, organizational structure, globalization, and innovation. Organizational Behavior focuses on how decision making is influenced by various stakeholders who have formal and informal authority and control in a business. What motivates individuals and who are leaders in an organization is discussed along with group dynamics. Understanding team processes, conflict, adaptation to change, and various levels of group and one-on-one communication is important and will be covered by reviewing traditional management strategies and structures along with discussions on current and evolving management issues.

Prerequisite: ENGL 015 or ENGL 030 ; ECON 102 or ECON 104 ; MATH 021 or higher or satisfactory score on the mathematics placement examination

Changes Effective Fall 2019:

• Description
• Prerequisite/Corequisite/Concurrent Courses

MGTM 301: Principles of Marketing (3 Credits)
Old Listing Effective Through Summer 2019:

Focuses on customer behavior, product, channels of distribution, promotion, and pricing with emphasis on a culturally diverse environment. Not available to students who have taken B A 303. MGTM 301 Principles of Marketing (3) MGTM 301, Principles of Marketing is a three credit course offered each semester across Penn State and covers terminology and important concepts related to marketing in the business environment. Domestic and international environments that impact marketing are included, with particular emphasis on the marketing environment, segmentation, positioning and targeting. MGTM 301 course objectives include providing an overview and introduction to marketing; demonstrating the relationship of marketing to other functions and processes in a business organization on an integrated basis; providing real world examples of challenges and issues related to marketing; and explaining and discussing important concepts and analytical tools in marketing. Major themes embedded in the foundation of MGTM 301 include domestic and global economic factors influencing current marketing environments; how consumer, business and organizational customers are segmented and targeted; how marketing research and information systems are used to create and guide marketing strategies; how products are developed to serve customers, businesses and organizations; how service products are developed and managed to meet customer needs; how customers are reached through various conventional and technological channels and how these sales management processes are managed; how people in the United States and other nations are influenced by marketing in the non-profit sector; how products and services are marketed to other businesses and organizational customers; how marketing communications programs, which include advertising, publicity, sales promotion and web sites, are designed to reach domestic and international customers; how pricing strategies support corporate objectives in various economic climates; and how marketing programs adapt to shifts towards global markets.

Prerequisite: ENGL 015 or ENGL 030 ; ECON 102 or ECON 104 ; MATH 021 or higher or satisfactory score on the mathematics placement examination

Changes Effective Fall 2019:

• Description
• Prerequisite/Corequisite/Concurrent Courses

MGTM 301H: Principles of Marketing (Honors) (3 Credits) (H)
Old Listing Effective Through Summer 2019:

This course emphasizes fundamental marketing concepts (e.g., segmentation, targeting, and positioning) and the use of marketing research to inform managerial decision-making. MGTM 301H Principles of Marketing (Honors) (3) Marketing begins and ends with the customer, from determining wants and needs to providing customer satisfaction. This course will emphasize fundamental marketing concepts, such as segmentation, targeting, and positioning, and the 4 P’s (product, price, place, and promotion). In addition, the course will emphasize the use of marketing research to inform managerial decision-making. The overarching goal of this course is to introduce you to a) the role of marketing within business organizations and society, and b) the concepts and activities in marketing that create and deliver value to customers. At the conclusion of this course, students will be able to: 1) explain the fundamental concepts of marketing and the role of marketing in business; 2) apply marketing concepts and analysis tools to managerial decision-making; and, 3) provide real-world examples of challenges and issues in marketing. Major themes embedded in MGTM 301H include: domestic and global socioeconomic factors that influence marketing environments; the use of marketing research and information systems to create and guide marketing strategies; how consumers, businesses and organizational customers are segmented and targeted; how products are developed to serve customers, businesses and organizations; unique issues in the marketing of services versus goods; how customers are reached through conventional and technological channels; the sales function, including how sales processes are managed; how marketing communications programs (including advertising, publicity, sales promotion and new media) influence customers; how pricing strategies support corporate objectives, and how consumers respond to pricing; the
roles of non-profit and social marketing; corporate social responsibility and sustainability in marketing; and the impact of marketing on society.

Prerequisite: ENGL 015 , ENGL 030 , ENGL 137H or CAS 137H ; ECON 102 or ECON 104 ; MATH 021 or higher or satisfactory score on the mathematics placement examination

Changes Effective Fall 2019:
- Description
- Prerequisite/Corequisite/Concurrent Courses

MKTG 301W: Principles of Marketing (3 Credits) (WF)
Old Listing Effective Through Summer 2019:

Focuses on customer behavior, product, channels of distribution, promotion, and pricing with emphasis on a culturally diverse environment. Not available to students who have taken BA 303. MKTG 301W Principles of Marketing (3) MKTG 301W, Principles of Marketing is a three credit course offered each semester across Penn State and covers terminology and important concepts related to marketing in the business environment. Domestic and international environments that impact marketing are included, with particular emphasis on the marketing environment, segmentation, positioning and targeting. MKTG 301W course objectives include providing an overview and introduction to marketing; demonstrating the relationship of marketing to other functions and processes in a business organization on an integrated basis; providing real world examples of challenges and issues related to marketing; and explaining and discussing important concepts and analytical tools in marketing. Major themes embedded in the foundation of MKTG 301W include domestic and global economic factors influencing current marketing environments; how consumer, business and organizational customers are segmented and targeted; how marketing research and information systems are used to create and guide marketing strategies; how products are developed to serve customers, businesses and organizations; how service products are developed and managed to meet customer needs; how customers are reached through various conventional and technological channels and how these sales management processes are managed; how people in the United States and other nations are influenced by marketing in the non-profit sector; how products and services are marketed to other businesses and organizational customers; how marketing communications programs, which include advertising, publicity, sales promotion and web sites, are designed to reach domestic and international customers; how pricing strategies support corporate objectives in various economic climates; and how marketing programs adapt to shifting global markets.

Prerequisite: ENGL 015 or ENGL 030 ; ECON 102 or ECON 104 ; MATH 021 or higher or satisfactory score on the mathematics placement examination

Changes Effective Fall 2019:
- Description
- Prerequisite/Corequisite/Concurrent Courses

SCM 301: Supply Chain Management (3 Credits)
Old Listing Effective Through Summer 2019:

Supply chain management concepts, principles, and methodologies. SCM 301 Business Logistics Management (3) SCM 301 is an introductory course that provides an overview of key logistics and supply chain management processes, concepts, and methodologies. Emphasis is given to the framework for supply chain management, the analysis of logistics cost, and service trade-offs among inventory, transportation, and warehousing activities, the strategic role of information technology in supply chains, the use of third-party logistics providers, and the methods of measuring the value of logistics performance. Instruction is based on problem-based learning pedagogy.

Prerequisite: ACCTG211 , ECON 102 , SCM 200 or STAT 200 ; limited to students in baccalaureate status

Changes Effective Fall 2019:
- Description
- Abbreviated Title
- Prerequisite/Corequisite/Concurrent Courses

WMNST 400: Debates in Contemporary Feminism (3 Credits) (US) (IL)
Old Listing Effective Through Summer 2019:

Consideration of feminist theories of women's experience in transforming understanding, reconceptualizing old problems, raising new ones, and expanding traditional disciplines. WMNST 400 Feminist Theory (3) (US;IL)This course focuses on theoretical analyses of gender as major components of contemporary thought. It is designed to help students develop knowledge of critical texts to better analyze women's issues and comprehend the realities of women's lives, past and present. The course will relate analyses of gender to analyses of race, class, religion, ethnicity, national origin, and sexual orientation. The course addresses theoretical issues rooted in an analysis of gender, critiques theories that do not attend to such issues, and investigates the premises and implications of feminist theory. The course will continue to have a prerequisite of WMNST 301: Introduction to Feminist Thought. For the Women's Studies major, WMNST 400 will fall under the heading of Additional Courses, where students will have a choice of this course or WMNST 401: Feminist Perspectives on Research and Teaching. These are our two most general courses at the 400-level. It may also be used to fulfill a US/IL requirement.

Changes Effective Fall 2019:
- Description
- Add GH Designation
- Add GS Designation
- Add Inter-Domain Designation
- Add BA Humanities Designation
- Add BA Social and Behavioral Sciences Designation
- Remove IL Designation
- Number to 400N
- Prerequisite/Corequisite/Concurrent Courses

Program Changes
Accounting, B.S. (ACCAL_BS)
Effective Fall 2018:
- Added undergraduate major at Penn State Altoona, The Altoona College.

Advanced Instructor Development for Professionals, Certificate (AIDFP_UCT)
Effective Fall 2018:
- New undergraduate certificate added.
Advertising/Public Relations, B.A. (ADPR_BA)
Effective April 12, 2018:
• Strategic Communications Option Placed on Enrollment Hold: Not Accepting New Students.

Agribusiness Management, B.S. (AGBM_BS)
Effective Summer 2018:
• Moved MIS 204 from Prescribed Courses to Additional Courses.
• Added AGBM 170, IST 110, and SRA 111 to Additional Courses.

Agricultural Communications, Minor (AGCOM_UMNR)
Effective December 14, 2018:
• Program Placed on Enrollment Hold: Not Accepting New Students.

Agricultural and Extension Education, B.S. (AEE_BS)
Effective Fall 2018:
• Remove ASTRO 1, CHEM 202, and PHYS 1 from Prescribed Courses for the Major.
• Remove Additional Courses and Supporting Courses Area for the Major.
• Add Prescribed Courses to the Production Option.

Animal Science, B.S. (ANSC_BS)
Effective Fall 2018:
• Revised program description.
• Changed name of option from Business/Management Option to Business and Animal Management Option.
• Removed STAT 100 from Additional Courses for the Major.
• Added ANSC 322, BIOL 222, MATH 26 and 41 to Additional Courses for the Major.
• Changed credits of ANSC 311 from 4 credits to 3 credits.
• Removed ANSC 322 from Prescribed Courses for the Business and Animal Management Option.
• Removed ANSC 305, 306, 308, 309, 310, 311, 315, 324, 327, 405, 407, 410, MKTG 221 and MGMT 100 from Additional Courses for the Business and Animal Management Option.
• Added BA 303, 304, CHEM 130, MKTG 301, and MGMT 301 to Additional Courses for the Business and Animal Management Option.
• Removed ANSC 305, 306, 308, 309, 310, 311, 315, 322, 324, 327, 405, 407, 410, 413, BIOL 133 and 222 from Additional Courses for the Science Option.

Anthropology, B.A. (ANTH BA)
Effective Fall 2018:
• Revised Additional Courses Area.
• Increased Electives.
• Changed Requirements for the Major to 37 credits.

Archaeological Science, B.S. (ARSCI_BS)
Effective April 12, 2018:
• Program Placed on Enrollment Hold: Not Accepting New Students.

Asian Studies, B.A. (ASIA_BA)
Effective Spring 2019:
• Removed ASIA 100 from Prescribed Courses.
• Added HINDI 110 and KOR 110 to Additional Courses.
• Added ASIA 3, 100, 101N, 102, 103, 104, 105, 106N, 197 to Additional Courses.

Asian Studies, Minor (ASIA_UMNR)
Effective Spring 2019:
• Removed Prescribed Courses.
• Removed HIST 174, 175, 176, and RLST 3 from Additional Courses.
• Added ASIA 3, 100, 101N, 102, 103, 104, 105, 106N, and 197 to Additional Courses.

Athletic Training, B.S. (ATHTR_BS)
Effective Fall 2018:
• Revised Entrance to Major Requirements.
• Removed KINES 141 from Additional Courses.

Biobehavioral Health, B.S. (BBH_BS, BBHUC_BS)
Effective Fall 2018:
• Added Integrated B.S. in Biobehavioral Health and M.P.H. in Public Health.

Biological Anthropology, B.S. (BANTH_BS)
Effective April 12, 2018:
• Program Placed on Enrollment Hold: Not Accepting New Students.

Climate and Environmental Change, Certificate (CLENVC_UCT)
Effective Spring 2019:
• New undergraduate certificate added.

Computer Engineering, B.S. (Engineering) (CMPEN_BS)
Effective Summer 2018:
• Moved CMPSC 121 and CMPSC 122 from Prescribed Courses to Additional Courses.
• Removed EBF 200 from Additional Courses.
• Added CMPSC 131 and 132 to Additional Courses.

Corporate Communication, Minor (CC_UMNR)
Effective Summer 2018:
• New undergraduate minor added.

Corporate Innovation and Entrepreneurship, B.S. (CIENT_BS)
Effective Summer 2018:
• Revisde Entrance-to-Major Requirements.
• Revised Degree Completion Requirements.
• Revised Program Description.
• Removed MGMT 451 from Prescribed Courses.
• Added MGMT 427W to Prescribed Courses.
• Added MGMT 365, MGMT 420, MGMT 480, MGMT 485, and MGMT 486 to Additional Courses.
Using this Bulletin

Criminal Justice, A.S. (CJCA_AS)
Effective Fall 2018:
• Added undergraduate major at Penn State Harrisburg, The Capital College.

Cybersecurity Computational Foundations, Minor (CCF_UMNR)
Effective Fall 2018:
• New undergraduate minor added.

Dance, B.S. (DANCE_BS)
Effective June 12, 2018:
• Program Placed on Enrollment Hold: Not Accepting New Students.

Deafness and Hearing Studies, Minor (DHS_UMNR)
Effective Fall 2018:
• Removed CSD 495B from Supporting Courses and Related Areas.
• Added SPLED 403A and 403B to Supporting Courses and Related Areas.

Education and Public Policy, B.S. (EPP_BS)
Effective Spring 2019:
• Removed PLSC 3 and ECON 104 from Prescribed Courses.
• Removed EDPSY 400 and EDPSY 406 from Additional Courses.
• Added PLSC 2, 10, SOC 1 and RSOC 11 to Additional Courses.

Electro-Mechanical Engineering Technology, B.S. (EMET_BS)
Effective Fall 2018:
• Added Fayette as offering campus.

Engineering Leadership Development, Minor (ELD_UMNR)
Effective Spring 2019:
• Removed ENGR 493 from Prescribed Courses.
• Moved ENGR 407 from Additional Courses to Prescribed Courses.
• Removed BA 250 from Additional Courses.

Enterprise Resource Planning with SAP, Certificate (SAPBC_UCT)
Effective Fall 2018:
• Revised Program Description.
• Removed SCM 465 and MIS 304 from Required Courses.
• Added MIS 404 to Required Courses.

Fundraising and Advancement, Certificate (FNDADV_UCT)
Effective Fall 2018:
• New undergraduate certificate added.

Japanese Language, Minor (JAPNS_UMNR)
Effective Spring 2019:
• Increased the Requirements for the Minor from 18 to 18-20 credits.
• Removed JAPNS 296, 297, 421, 422, 423, 424, 425, 426, and 450 from Additional Courses.
• Added JAPNS 430, 431, 432, 433, and 434 to Additional Courses.

Information Sciences and Technology, B.S. (ISSUC_BS)
Effective Fall 2018:
• Removed Schuylkill as offering campus.

Information Sciences and Technology/Finance, Minor (ISFIN_UMNR)
Effective Fall 2018:
• Removed FIN 302, 406, 407, 408, 409, 427, 456, 496, and 497 from Additional Courses.

Instructor Development for Professionals, Certificate (IDFP_UCT)
Effective Fall 2018:
• New undergraduate certificate added.

Landscape Architecture, B.L.A. (LARCH_BLA)
Effective Fall 2018:
• Added Integrated B.L.A./M.S. in Landscape Architecture.

Landscape Contracting, B.S. (LSCPE_BS)
Effective Fall 2018:
• Moved BA 250, BLAW 243, and MATH 26 to Additional Courses for the Major.
• Added BA 241, 242, 243, 303, 304, HORT 455, MATH 40, 41, and 140 to Additional Courses for the Major.
• Added SOILS 401 to Prescribed Courses for the Management Option.
• Removed SOILS 402 and SOILS 404 from Additional Courses for the Management Option.

Management, B.S. (Harrisburg) (MNGMT_BS)
Effective Fall 2018:
• Removed MGMT 466 from Prescribed Courses.
• Added MGMT 420 to Prescribed Courses.
• Removed MGMT 450 from Additional Courses.
• Added MGMT 441 to Additional Courses.

Mechanical Engineering Technology, B.S. (Capital) (MET_BS)
Effective Spring 2019:
• Removed IET 321 from Prescribed Courses.
• Added IET 308 to Prescribed Courses.
• Added the W to MET 210 in Additional Courses.

Meeting and Event Management, Certificate (MEMC_UCT)
Effective Fall 2018:
• New undergraduate certificate added.

Operational Excellence for Professionals, Certificate (OEFP_UCT)
Effective Fall 2018:
• New undergraduate certificate added.

Physical Therapist Assistant, A.S. (2PTA_AS)
Effective Spring 2019:
• Revised Entrance to Major Requirements.
• Revised Program Description.
• Increased Requirements for the Major from 68 to 70 Credits.
• Added PT 120 and 285 to Prescribed Courses.
• Add HDFS 129, PSYCH 270, PT 271, 272, 271W, 281 to Additional Courses.
Physics, B.S. (PHYS_BS)
Effective Spring 2019:
• Added CMPSC 131 to Additional Courses for the Major.
• Moved CMPSC 122 from Prescribed Courses to Additional Courses for the Computation Option.
• Added CMPSC 132 to Additional Courses for the Computation Option.
• Added PHYS 430 to Supporting Courses and Related Areas in the Computation Option.
• Added PHYS 414, 430, 443, and 472 to Additional Courses in the General Physics Option.
• Added BIOL 240W to Additional Courses for the Medical Physics Option.

Professional Writing, B.A. (PWRIT_BA)
Effective Spring 2019:
• Removed ENGL 417 from Prescribed Courses.
• Added COMM 234, 270, 271, DIGIT 100, ENGL 214, 420, and 472 to Prescribed Courses.
• Removed CAS 214, COMM 320, 370, ENGL 212, 416, 418, 420, 421, 472, and 473 from Additional Courses.
• Added COMM 1, 2, ENGL 130, 229, 297, 417, 429, 494, 496, GD 100 to Additional Courses.

Public History, Minor (PUBHS_UCT)
Effective Fall 2018:
• New undergraduate minor added.

Recreation, Park, and Tourism Management, B.S. (RPTM_BS)
Effective Spring 2019:
• Revised Program Description.
• Removed Commercial and Community Recreation Management Option.
• Added Commercial Recreation and Tourism Management Option and Community Recreation Management Option.
• Increased the Requirements for the Major from 65-70 to 67-74 Credits.
• Removed RPTM 101, 356 and 460 from Prescribed Courses for the Major.
• Added RPTM 220, 390 and 456 to Prescribed Courses for the Major.
• Removed Additional Courses for the Major.
• Added RPTM 100S, 295A, 360, 395B, 495B, 495C, and 495D to Prescribed Courses for the Professional Golf Management Option.
• Moved HM 336, 466, TURF 100 and BLAW 243 from Prescribed Courses to Additional Courses in the Professional Golf Management Option.
• Removed RPTM 101, 325, and 330 from Prescribed Courses for the Outdoor Recreation Management Option.
• Added CAS 283 and CMPSC 203 to Additional Courses for the Outdoor Recreation Management Option.

Science, B.S. (Altoona) (SCIAL_BS)
Effective May 11, 2018:
• Program Placed on Enrollment Hold: Not Accepting New Students.

Security and Risk Analysis, B.S. (SRA_BS, SRAAL_BS, SRABK_BS, SRACA_BS)
Effective Summer 2018:
• Revised Program Description.
• Moved SRA 311 from Prescribed Courses for the Major to Prescribed Courses for the Information and Cyber Security Option.
• Moved CMPSC 101 from Prescribed Courses to Additional Courses for the Major.
• Added ECON 104, GEOG 128, IST 140, CMPSC 121, MATH 22, 26, 40, 41, 110 and 140 to Additional Courses for the Major.
• Added GEOG 40 from Additional Courses for the Major.
• Removed Supporting Courses Area for the Major.
• Moved IST 440 from Prescribed Courses for the Major to Additional Courses for the Information and Cyber Security Option.
• Added SRA 440W to Additional Courses for the Information and Cyber Security Option.
• Added SRA 268, 311W, IST 452 and SRA 440W to Prescribed Courses for the Intelligence Analysis and Modeling Option.
• Removed ECON 302 from Prescribed Courses for the Intelligence Analysis and Modeling Option.

Effective Fall 2018:
• Added Integrated B.S. in Security and Risk Analysis and M.I.A. in International Affairs.

Effective Spring 2019:
• Revised Entrance to Major Requirements

Supervisory Leadership for Professionals, Certificate (SLFP_UCT)
Effective Fall 2018:
• New undergraduate certificate added.

Teaching English to Speakers of Other Languages, Minor (TESOL_UCT)
Effective Spring 2019:
• Added APLNG 220N and 250 to Additional Courses.

Turfgrass Science, B.S. (TURF_BS)
Effective Spring 2019:
• Added CHEM 130 to Additional Courses.

Turfgrass Science and Management, A.S. (2TSM_AS)
Effective Spring 2019:
• Added CHEM 120 to Additional Courses.
• Added C-requirement to CHEM 202, TURF 295, CHEM 101, and CHEM 110.

FAQs
1. Where can I find a list of General Education courses and information about requirements?
• For information about General Education requirements, please see the General Education (http://bulletins.psu.edu/undergraduate/general-education) section in this Bulletin.

2. The General Education requirements have changed. Do the new requirements apply to me?
• The new General Education requirements apply to students who start at Penn State in Summer 2018 and later. Requirements have not changed for students who began at Penn State before this semester. The older set of requirements can be found in the Archives page. Additional information is available on the Office of General Education website (https://gened.psu.edu).

3. What does the blue keystone symbol mean?
• The keystone indicates that the course is designated as a General Education course. See the degree requirements for your program to identify the General Education courses that are required. Not all courses marked with the keystone count as meeting General Education requirements when required within your program. See the program requirements and speak to an adviser regarding General Education courses that count or do not count toward the General Education requirements.

4. Where can I find bachelor of arts degree requirements?
• Bachelor of arts degree requirements are included in the program requirements section for B.A. programs. You may also see the B.A. requirements in the Academic Information (http://bulletins.psu.edu/undergraduate/general-information/academic-information) section.

5. Where can I find a list of courses and course descriptions?
• You may find courses and descriptions several different ways within the Bulletin. You may navigate to the full listing of courses and descriptions from the Courses (http://bulletins.psu.edu/university-course-descriptions) link in the top navigation menu. You may also scroll over any course number within the Bulletin to see the course description in a course bubble. Search for specific courses through the search option on the homepage or in the search functions throughout the Bulletin.

6. What does a red box around a credit number mean?
• Updates to courses and programs may become effective at various times throughout the year. A red box indicates that a change to the course may have occurred and/or a program update is in progress. You must speak with your adviser regarding the amendments to learn how this affects your academic plan.

7. Which Undergraduate Bulletin should I use?
• Your official record of General Education (http://bulletins.psu.edu/undergraduate/general-education) requirements are found in the Bulletin year that matches the semester in which you enrolled at Penn State. The program requirements are found in the Bulletin year for the semester in which you were admitted into the major program. See the Archive (http://bulletins.psu.edu/undergraduate/archive) page to find past Bulletins.

8. Where can I find past Bulletins?
• Past Bulletins can be found on the Archive (http://bulletins.psu.edu/undergraduate/general-education) page, which can be accessed from any page in the Bulletin's top navigation menu.

9. When will the Undergraduate Bulletin be updated?
• The Bulletin will be updated at the beginning of each semester (fall, spring, and summer). Changes that occur between updates are identified on the Changes (p. 6) page.

10. Why are there are some courses listed in the Bulletin that I can’t schedule?
• The Bulletin Course Description section displays all courses that are currently active at Penn State. Not all of these courses are taught every academic semester or year. To view courses that are available for enrollment by semester, please view the LionPATH Class Search (https://www.lionpath.psu.edu/psc/CSPRD/EMPLOYEE/HRMS/c/SA_LEARNER_SERVICES.CLASS_SEARCH.GBL?Page=SSR_CLSRCH_ENTRY&Action=U).

11. Where can I find information about minors?
• Minors are a specific type of program and may be found through the search process by filtering by minor (http://bulletins.psu.edu/programs/#filter=filter_24).

12. Where can I find the Graduate Bulletin?
• The Graduate Bulletin is located at https://bulletins.psu.edu/graduate.

Have a question we didn't include? Please let us know by emailing bulletins@psu.edu.