JOHNS HOPKINS UNIVERSITY

2006–2007
FIRST TERM
SCHEDULE
OF
ARTS AND
SCIENCES
AND
ENGINEERING
COURSES

Office of the Registrar
April, 2006
GRADUATION RATES

In compliance with the federal Student Right-to-Know Act of 1990 (Public Law 101-542, Sec.668.46), Johns Hopkins University provides the following information to prospective and currently enrolled undergraduates in the Schools of Arts and Sciences and Engineering:

Entering Freshman Class, September, 1997: 944
% of freshman returning as sophomores: 95%
% graduating within 4 years: 79%
% graduating within 5 years: 86%
% graduating within 6 years: 87%

Questions about this data should be addressed to: The Director of Institutional Research, 205 Garland Hall (410) 516-8094
SCHEDULE INFORMATION

This schedule includes all Arts & Sciences and Engineering courses expected to be offered in the fall term and is based upon information received from the departments through March 2006. Updated information can be found at [http://www.jhu.edu/registrar/schedule.html](http://www.jhu.edu/registrar/schedule.html).

The number preceding the decimal identifies the department offering the course (see below):

### ZANVYL KRIEGER SCHOOL OF ARTS & SCIENCES

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Number</th>
<th>Department/Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>070</td>
<td>Political Science</td>
</tr>
<tr>
<td>Behavioral Biology</td>
<td>290</td>
<td>Psychological &amp; Brain Sciences</td>
</tr>
<tr>
<td>Biology</td>
<td>020</td>
<td>Public Health Studies</td>
</tr>
<tr>
<td>Biophysics</td>
<td>250</td>
<td>Public Policy</td>
</tr>
<tr>
<td>Chemistry</td>
<td>030</td>
<td>Romance Languages and</td>
</tr>
<tr>
<td>Classics</td>
<td>040</td>
<td>Literatures</td>
</tr>
<tr>
<td>Cognitive Science</td>
<td>050</td>
<td>Sociology</td>
</tr>
<tr>
<td>Earth &amp; Planetary Science</td>
<td>270</td>
<td>Theatre Arts and Studies</td>
</tr>
<tr>
<td>Economics</td>
<td>180</td>
<td>Writing Seminars</td>
</tr>
<tr>
<td>English</td>
<td>060</td>
<td>Interdepartmental</td>
</tr>
<tr>
<td>Filits and Media Studies</td>
<td>061</td>
<td>Latin American Studies</td>
</tr>
<tr>
<td>German</td>
<td>090</td>
<td>Center for Africana Studies</td>
</tr>
<tr>
<td>History</td>
<td>100</td>
<td>Nondepartmental</td>
</tr>
<tr>
<td>History of Art</td>
<td>010</td>
<td>Art</td>
</tr>
<tr>
<td>History of Science</td>
<td>140</td>
<td>Military Science</td>
</tr>
<tr>
<td>and Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanities Center</td>
<td>300</td>
<td>Program-Museum &amp; Society</td>
</tr>
<tr>
<td>Language Teaching Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arabic</td>
<td>375</td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>373</td>
<td></td>
</tr>
<tr>
<td>E.S.L.</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Hindi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese</td>
<td>378</td>
<td>Applied Math &amp; Statistics</td>
</tr>
<tr>
<td>Kiswahili</td>
<td>379</td>
<td>Biomedical Engineering</td>
</tr>
<tr>
<td>Korean</td>
<td>380</td>
<td>Chemical &amp; Biomolecular Engr.</td>
</tr>
<tr>
<td>Persian</td>
<td>382</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>Russian</td>
<td>377</td>
<td>Computer Science</td>
</tr>
<tr>
<td>Mathematics</td>
<td>110</td>
<td>Entrepreneurship &amp; Mgmt</td>
</tr>
<tr>
<td>Near Eastern Studies</td>
<td>130</td>
<td>Electrical &amp; Computer Engr.</td>
</tr>
<tr>
<td>Neuroscience</td>
<td>080</td>
<td>Geography &amp; Environ. Engr.</td>
</tr>
<tr>
<td>Philosophy</td>
<td>150</td>
<td>Information Security Institute</td>
</tr>
<tr>
<td>Physics &amp; Astronomy</td>
<td>171</td>
<td>Materials Science &amp; Engr.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Professional Communication</td>
</tr>
</tbody>
</table>

The number following the decimal identifies the specific course and has the following significance:

#### Undergraduate Level courses

- **100-299**: Lower division courses
- **300-499**: Upper division courses
- **500-549**: Independent study, Internships or research type courses

#### Graduate Level courses

- **600-799**: Courses normally offered for advanced degree programs. Open to undergraduate students only with permission of the instructor.
- **800-849**: Graduate level independent study, dissertation, and research courses.

2. **The code letter** in parentheses following each 100-549-course number identifies the broad area of study for the fulfillment of undergraduate distribution requirements.

   - **E** -- Engineering Science
   - **H** -- Humanistic Studies
   - **S** -- Social and Behavioral Sciences
   - **N** -- Natural Science
   - **Q** -- Quantitative Studies
   - **W** -- Writing Intensive

3. **The number** in parentheses after each 100-549-course title indicates the undergraduate course credit for the term. Independent Study credits vary and are assigned by the faculty sponsor at the time of grading. Graduate level courses do not carry credits, therefore none are shown for courses ending in 600-849.

4. **The instructor’s name** is indicated in italics following the course title and credits.

5. **Prerequisites** are usually listed in the schedule. It is best however, to check the AS/EN catalog for a more complete statement of any prerequisite requirements.

6. **Meeting times** are indicated whenever they are known. All classes meet for 50 minutes unless otherwise stated. TBA indicates that the time of the course will be announced later. If the time does not appear before the first day of classes, please check with the department.

7. **Classroom assignments** are not made until just before the term begins. Please check the Registrar’s home page at [http://www.jhu.edu/registrar/schedule.html](http://www.jhu.edu/registrar/schedule.html) and click on `Room Schedule` to see a complete listing.
A. COMMON EXAMINATIONS FOR MATH AND LANGUAGE COURSES
Mathematics 105, 106, 107, 108, 109, 201, 202 ------- 9-12 Noon, Friday, December 15
Elementary and Intermediate Language courses ------- 2-5 PM, Tuesday, December 19
Room assignments for the final examinations in these courses will be announced in class in November.

B. Courses with Standard Meeting Time
Classes meeting during the term within the standard meeting times given in the first column will have their examinations at the time and date indicated in the second and third columns. The determining factor will be the first class meeting during the first full week of Fall term classes (Monday, September 11 - Friday, September 15). In the case of lecture style courses, the first lecture meeting will govern, not the section meeting.

<table>
<thead>
<tr>
<th>M(TW)</th>
<th>8 ... 2 - 5 pm</th>
<th>...</th>
<th>Friday, December 22 (except as noted in A above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M(TW)</td>
<td>9 ... 9-12 noon</td>
<td>...</td>
<td>Wednesday, December 20 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>10 ... 9-12 noon</td>
<td>...</td>
<td>Monday, December 18 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>11 ... 9-12 noon</td>
<td>...</td>
<td>Tuesday, December 19 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>12 ... 2-5 pm</td>
<td>...</td>
<td>Wednesday, December 20 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>1 ... 9-12 noon</td>
<td>...</td>
<td>Monday, December 18 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>2 ... 2-5 pm</td>
<td>...</td>
<td>Thursday, December 21 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>3 ... 9-12 noon</td>
<td>...</td>
<td>Saturday, December 16 (except as noted in A above)</td>
</tr>
<tr>
<td>M(TW)</td>
<td>4 ... 2-5 pm</td>
<td>...</td>
<td>Saturday, December 16 (except as noted in A above)</td>
</tr>
<tr>
<td>Th(F)</td>
<td>9 ... 9-12 noon</td>
<td>...</td>
<td>Friday, December 22 (except as noted in A above)</td>
</tr>
<tr>
<td>Th(F)</td>
<td>10:30 ... 2-5 pm</td>
<td>...</td>
<td>Friday, December 15 (except as noted in A above)</td>
</tr>
<tr>
<td>Th(F)</td>
<td>12 ... 2-5 pm</td>
<td>...</td>
<td>Thursday, December 21 (except as noted in A above)</td>
</tr>
<tr>
<td>Th(F)</td>
<td>1 ... 9-12 noon</td>
<td>...</td>
<td>Monday, December 18 (except as noted in A above)</td>
</tr>
<tr>
<td>Th(F)</td>
<td>2 ... 2-5 pm</td>
<td>...</td>
<td>Saturday, December 16 (except as noted in A above)</td>
</tr>
<tr>
<td>Th(F)</td>
<td>3 ... 2-5 pm</td>
<td>...</td>
<td>Sunday, December 17 (except as noted in A above)</td>
</tr>
</tbody>
</table>

Examinations for these courses will be held in the regular term classroom unless the instructor requests an alternate room assignment from the Scheduling Coordinator in the Registrar's Office. In such cases the instructor will announce the new room location in class.

C. Conflicts
For any conflicting examinations, the instructor should contact the Scheduling Desk in Registrar's Office to make alternate arrangements.

The Johns Hopkins University does not discriminate on the basis of race, color, sex, religion, sexual orientation, national or ethnic origin, age, disability or veteran status in any student program or activity administered by the university or with regard to admission or employment. Defense Department discrimination in ROTC programs on the basis of sexual orientation conflicts with this university policy. The university is committed to encouraging a change in the Defense Department policy.

Questions regarding Title VI, Title IX and Section 504 should be referred to Ray Gillian, Office of Equal Opportunity and Affirmative Action, 130 Garfield Hall, (410) 516-8075.
ZANVYL KRIEGER SCHOOL
OF ARTS AND SCIENCES
COURSES

ANTHROPOLOGY

070.103 (H,S) AFRICA AND THE MUSEUM (3) Guyer Limit 20 An introduction to Africa, artistic creativity, collection and exhibition: as African history, as anthro
pology of art and objects, and as public controversy in our national institutions. Works with the Baltimore Museum of Arts. Cross-listed with Africana Studies and the Program in Museums and Society. Sec. 01 MTW 11

070.216 (H,S) THE LOGIC OF ANTHROPOLOGICAL INQUIRY (3) Reynolds Limit 30 A close look at ethnography as a mode of inquiry and as a genre of writing. This will count as a required course for Anthropology majors but open to all undergraduates. Sec. 01 T 12-3

070.221 (H,S) LANGUAGE, CULTURE, AND SOCIETY (3) Haeri Limit 50 Provides a basic understanding of the different ways in which language interacts with culture and society. Contemporary social problems will be examined through the lens of language. This is hands-on course that emphasize skills in textual, narrative and conversation analysis. Sec. 01 ThF 10:30-12

070.318 (H,S) THE WORK OF COMIC ART (3) Carpenter Limit 12 This course will look at comic books in terms of creative acts, identity, intellectual property law, production processes, and social concerns. While comic characters often reflect the views, experiences, and reference material of their creators and publishers, once produced, comic characters take on a life and meaning of their own amongst reading publics. Students can expect to read, theorize, and even make comics as a part of this class. Sec. 01 T 1-4

070.320 (H,S) FILM, FATE AND LAW: COMPARATIVE PERSPECTIVES ON THE OUTLAW IN MEXICAN AND INDIAN FILMS (3) Khan/Poole Limit 35 What fates befall filmic bandits? What do these fates tell us about the ordinary experience of law and time? We explore these questions through Mexican and Indian films about banditry and crime. Cross-listed with Latin American Studies. Sec. 01 W 1-4

070.330 (H,S) ANTHROPOLOGY AND HUMAN RIGHTS (3) Selfy Limit 15 This course examines the central debates on human rights, while emphasizing the contributions anthropology has made to those debates, and to providing innovations within the field of human rights scholarship. Dean's Teaching Fellowship Course Sec. 01 W 12-3

070.370 (H,S) THE ANTHROPOLOGY OF WORK (3) Mulla Limit 25 This course examines the social aspects of work in everyday life, specifically in relation to the religious belief systems and values that work rewards, conflicts with, perpetuates, imports, or absorbs. Dean's Teaching Fellowship Course Sec. 01 ThF 9-10:30

070.381 (H,S) TRANSFORMATIONS IN POST-SOVET SOCIETIES (3) Fournier Limit 25 This course examines the complexities of post-Soviet societies as they undergo radical social change. It focuses on local engagements with Western constructs such as “market”, “democracy”, and “civil society”. Dean's Teaching Fellowship Course Sec. 01 Th 1-4

191.340 (S) EDUCATION POLITICS IN URBAN AMERICA (3) Hayter Limit 15 Cross listed with Political Science, History, Political Science, Sociology, Africana Studies Sec. 01 Th 2-4

300.343 (H) BERGSON AND THE PROBLEM OF NOVELTY IN PHILOSOPHY (3) Marravi Limit 20 Cross-listed with German & Romance Languages, Humanities Center, and Political Science Sec. 01 TBA
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Sections</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>070.503</td>
<td>INDEPENDENT STUDY</td>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.505</td>
<td>DIRECTED RESEARCH</td>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.507</td>
<td>DIRECTED READINGS</td>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.551</td>
<td>INTERNSHIP</td>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.561</td>
<td>SENIOR ESSAY</td>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.616</td>
<td>PROSEMINAR ON ANTHROPOLOGICAL THEORY</td>
<td>Guyer</td>
<td>Sec. 01</td>
<td>M</td>
<td>3-5</td>
</tr>
<tr>
<td>070.617</td>
<td>ANTHROPOLOGICAL RESEARCH METHODS</td>
<td>Poole</td>
<td>Sec. 01</td>
<td>T</td>
<td>1-3</td>
</tr>
<tr>
<td>070.654</td>
<td>ON THE QUESTION OF ETHICS</td>
<td>Das</td>
<td>Sec. 01</td>
<td>M</td>
<td>6-8pm</td>
</tr>
<tr>
<td>070.656</td>
<td>THE ANTHROPOLOGY OF RELIGION</td>
<td>Cannell</td>
<td>Sec. 01</td>
<td>W</td>
<td>1-3</td>
</tr>
<tr>
<td>040.601</td>
<td>MYTHOLOGY OF GREEK GODS: HERMES AND APOLLO</td>
<td>Devries</td>
<td>Sec. 01</td>
<td>W</td>
<td>3-5</td>
</tr>
<tr>
<td>300.623</td>
<td>MIRACLES, EVENTS, EFFECTS</td>
<td>DeVries</td>
<td>Sec. 01</td>
<td>TH</td>
<td>1-4</td>
</tr>
<tr>
<td>300.678</td>
<td>DIFFERENCE AND REPITITION AND ITS SOURCES</td>
<td>Marrati</td>
<td>Sec. 01</td>
<td>W</td>
<td>10-12:30</td>
</tr>
<tr>
<td>070.801</td>
<td>DISSERTATION RESEARCH</td>
<td>Staff</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.871</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Das</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.877</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Northcott</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.879</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Guyer</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.883</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Reynolds</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.885</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Poole</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.889</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Hueter</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.891</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Khan</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.895</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Schneberger</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.897</td>
<td>DIRECTED READING AND RESEARCH</td>
<td>Berry</td>
<td>Sec. 01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ART

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>371.131</td>
<td>STUDIO DRAWING I (2)</td>
<td>Hankin</td>
<td>15</td>
<td></td>
<td>This course focuses on developing fundamental drawing skills for the student with little or no previous studio experience. Basic concepts of form and composition will be taught through exercises based on the book, <em>Drawing on the Right Side of the Brain</em>, and with the aid of still-life setups and live models. ATTENDANCE AT 1ST CLASS IS MANDATORY.</td>
</tr>
<tr>
<td>371.133</td>
<td>PAINTING WORKSHOP I (2)</td>
<td>Hankin</td>
<td>12</td>
<td>371.131 or equivalent</td>
<td>Students who have mastered basic painting skills undertake sustained projects, including portrait and plein air landscape work. Slide lectures and handouts deepen students' appreciation of representational traditions. Advanced techniques, materials, and compositional issues are also investigated.</td>
</tr>
<tr>
<td>371.134</td>
<td>PAINTING WORKSHOP II (2)</td>
<td>Gruber</td>
<td>12</td>
<td>371.133 or equivalent</td>
<td>Students who have mastered basic painting skills undertake sustained projects, including portrait and plein air landscape work. Slide lectures and handouts deepen students' appreciation of representational traditions. Advanced techniques, materials, and compositional issues are also investigated.</td>
</tr>
<tr>
<td>371.145</td>
<td>INTRODUCTORY PHOTOGRAPHY (3)</td>
<td>VanRensselaer/Castro/Berger</td>
<td>15</td>
<td></td>
<td>An introduction to the intensive classroom environment of photography from a fine arts perspective. Students learn basic camera handling through technical exercises and, with the instructor’s guidance, work on projects which expand a personal vision. Darkroom skills not required: students will use a variety of photographic materials specific to their projects. ATTENDANCE AT 1ST CLASS IS MANDATORY.</td>
</tr>
<tr>
<td>371.146</td>
<td>BASIC BLACK &amp; WHITE PHOTOGRAPHY (3)</td>
<td>Berger</td>
<td>7</td>
<td></td>
<td>An introduction to the technical and creative process of producing black and white photographs. Working in the darkroom, students learn the fundamentals of film processing and print development. In-class critiques, discussion, and analysis of historic images develop critical vision. With the instructor’s guidance, students work on a project of their choice and produce a portfolio of 10 mounted prints. ATTENDANCE AT 1ST CLASS IS MANDATORY.</td>
</tr>
<tr>
<td>371.147</td>
<td>WHERE ART MEETS ARCHITECTURE  (3)</td>
<td>Schiffman</td>
<td>15</td>
<td></td>
<td>Students will address two- and three-dimensional problems (usually abstract) in exploiting issues common to architecture and the fine arts, among them space, structure-form relationships, ornament, figure-ground relationships, light and shadow, and perspective. Thinking three-dimensionally will be more important than drawing skill. ATTENDANCE AT 1ST CLASS IS MANDATORY.</td>
</tr>
<tr>
<td>371.149</td>
<td>VISUAL REALITY (3)</td>
<td>Bakker</td>
<td>12</td>
<td>Imagination, Freshmen by permission only</td>
<td>In art, &quot;Realism&quot; is a simulation of visual reality. But art can also simulate alternative realities, those realities or truths which exist only in daydreams or nightmares. In this class, we will learn to explore and create representations of these additional moments of existence. This will require thinking creatively or &quot;outside the box,&quot; a useful skill in any field. Using a variety of media, students are asked to solve problems to which there is no one correct answer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>371.131</td>
<td>T 1-4:30</td>
</tr>
<tr>
<td></td>
<td>2 Th 1-4:30</td>
</tr>
<tr>
<td>371.133</td>
<td>W 1-4:30</td>
</tr>
<tr>
<td>371.134</td>
<td>M 2-5:30</td>
</tr>
<tr>
<td>371.145</td>
<td>Th 2-5</td>
</tr>
<tr>
<td></td>
<td>6-9pm</td>
</tr>
<tr>
<td></td>
<td>W 2-5</td>
</tr>
<tr>
<td>371.146</td>
<td>F 10-1</td>
</tr>
<tr>
<td></td>
<td>F 2-5</td>
</tr>
<tr>
<td>371.147</td>
<td>Th 1-4</td>
</tr>
<tr>
<td>371.149</td>
<td>F 1-4</td>
</tr>
</tbody>
</table>
In this course, students use Photoshop software as a tool to produce images from a fine art perspective, working on projects that demand creative thinking while gaining technical expertise. Run as a companion to traditional photography classes, students will make archival prints, have regular critiques, and attend lectures on the history of the manipulated image and its place in culture. Students will look at art movements which inspire digital artists, including 19th century collage, dada, surrealism, and the zeitgeist of Hollywood films. They will meet with artists who work in this medium as well as visit the IMA to see its growing collection of digital images. Students must have a digital camera. Prior knowledge of Photoshop is not required.
Mycobacterium tuberculosis is an extremely successful intracellular bacterial pathogen able to manipulate phagocytic cells and its own metabolism to survive within a host. The molecular mechanisms of this survival and resistance to antibiotics will be studied.

Plastids are remarkable organelles that are unique to plants. The function of plastids varies and depends on the tissue cells are located. The structure, function and developmental aspects of plastids will be considered.

This course begins with an overview of the biosphere, followed by analysis of ecosystem and exploration of animal behavior in the context of ecosystems and evolution. Next, the cellular and molecular basis of life and the energetics of organisms are presented as unifying themes. The biochemistry of organic molecules, factors controlling gene expression, cellular metabolism, and advances in biotechnology represent topics of concentration. Mechanisms of inheritance and evolution are introduced. This course will also include a series of workshops that will explore current trends in research, experimental design and analysis, and molecular modeling.

This course reinforces the topics covered in 020.151. Laboratory exercises explore subjects ranging from forest ecology to molecular biology to animal behavior. Students participate in a semester-long project, identifying bacteria using DNA sequencing.

The workshop covers applications and current trends in Biology through guest lectures from researchers and hands-on computer programs.

The biology and evolution of humans and their closest living relatives.

The molecules responsible for the life processes of animals, plants, and microbes will be examined. The structures, biosynthesis, degradation, and interconversion of the major cellular constituents including carbohydrates, lipids,
BIOLOGY

proteins, and nucleic acids will illustrate the similarity of the biomolecules and metabolic processes involved in diverse forms of life.

020.311 (N) ENZYMES & PROTEINS (2) Brand
Prereq: 020.305  Limit 15
This course will emphasize the structure and function of enzymes and other proteins. It will build on the fundamentals covered in 020.305 Biochemistry. Some enzymes will be discussed in detail and some of the experimental methods used to understand mechanisms of action will be explored.

020.312 (N) ALL FATS ARE NOT CREATED EQUAL: AN INTRODUCTION TO THE STRUCTURE AND FUNCTION OF BIOLOGICAL MEMBRANES (2) Shaikh
Prereq: 020.305-306  Limit 25
The course will cover the physiochemical properties of model bilayers, the application of model bilayers for nanotechnology, how lipid molecules are synthesized in cells and their role in cellular signaling, lipids in health and disease and potential implications for drug development.

020.315 (N) BIOCHEMISTRY LAB (2) Horner
Coreq: 020.305  Limit 60 per section
First lab section meeting: Sept. 11
This course will reinforce the topics presented in Biochemistry 020.305 through laboratory exercises which use quantitative measurement to study cellular components and processes. Topics include pH, proteins, carbohydrates, lipids, nucleic acids, and enzymes.

020.330 (N) GENETICS (3) Hoyt/Cunningham
Prereq: 020.305  Limit 325
Presentation of the principles of heredity and variation, and their application to evolution and development; physicochemical nature of the gene; problems of recombination, gene action.

020.331 (N) HUMAN GENETICS (2) Hedgecock
Prereq: 020.330  Limit 50
This course will examine the growing impact of human genetics on the biological sciences, on law and medicine, and on our understanding of human origins. Topics include structure and evolution of the human genome, genetic and physical mapping of human chromosomes, molecular genetics of inherited diseases and forensic genetics.

020.336 (N) STEM CELL BIOLOGY IN DEVELOPMENT & DISEASE (3)
Casper/Barrila  Limit 20
Lectures and discussion of primary literature will deepen students' understanding about the biology of various stem cell niches and explore how that knowledge is applied in treatment of disease.

020.340 (N) GENETICS LAB (2) Novis
Prereq: 020.330  Limit 40 per section
This laboratory explores the genetics of living organisms, and students in each section will therefore be required to return to lab on succeeding days to observe and record the results of their experiments.

020.350 (N) TOPICS IN MODERN MEDICINE (1)
Salmon  Limit 25  Perm. Req'd
Post-Bac students only

020.375 (N) HUMAN ANATOMY (3) Teaford
Prereq: 020.305-306  Limit 50
This course is meant to be an introduction to human gross anatomy. It will seek to give students enough background in anatomical knowledge and vocabulary to help them in their initial training in medical school, however, it will not be a substitute for anatomy courses in medical school. It will focus on normal adult anatomy, and will cover each of the main regions of the body.
BIOLOGY

- i.e., thorax, abdomen and pelvis, back and limbs, and head-&-neck. Lectures will cover descriptive and functional anatomy, ultimately leaving students with a better understanding of anatomical terminology and 3D relationships of structures within the human body, and better problem-solving skills as they begin to relate symptoms to causes, again at the gross anatomical level.

020.379 (N) EVOLUTION (3) Norris
Prereq: 020.306, 020.330, or Permission required. Limit 50
This course will explore the principles of natural selection and examine the origin of species from both the geologic record (paleontology) and the genetic record. One goal of the course is to explore the role of DNA as the driving force for evolution.

020.380 (N) MOLECULAR BIOLOGY (3)
Beehner-Cross
Prereq: 020.330
Limit 50
This course will analyze the molecular mechanisms responsible for the control of gene expression in eukaryotic cells. Topics will include the mechanisms governing transcription initiation, elongation and termination; mechanisms of RNA processing and export; role of chromatin structure in transcription; nuclear organization; imprinting and X-chromosome inactivation.

020.401 (N) ADVANCED SEMINAR IN MOLECULAR AND CELLULAR BIOLOGY (3) Staff
BA/MS candidates only. This is a weekly seminar designed for graduate students enrolled in the B.A./M.S. and Ph.D. programs. The seminar involves student presentations of research and discussion of topics of current interest in the field.

020.441 (N) MENTORING IN BIOLOGY (1)
Pearlman/Shingles
Perm. Req'd 020.151/152
To become a mentor, students must have successfully completed 020.151/152, must apply using the form on the Biology Dept. Website, and must be accepted by the instructors. The deadline to apply is 4/11/06. This course provides students who have taken General Biology I & II the opportunity to mentor new students in General Biology I & II. Mentors collaborate with faculty on how to lead effective sessions, help student teams complete team assignments, and generally help students understand difficult concepts and principles in biology. Mentors must have a firm command of the topics covered in biology and must meet with both faculty and students through the course of the semester.

080.304 (N) CELLULAR AND MOLECULAR NEUROSCIENCE (3) Hattar / Zhao
Limit 120
Prereq: 020.151-154, or 020.305-6 and 020.315-6
Cross-listed with Neuroscience.

250.345 (N) CELLULAR AND MOLECULAR PHYSIOLOGY (3) Cone
Limit 60
Prereq: 020.305
Cross-listed with Biophysics and Neuroscience.

250.351 (N) REPRODUCTIVE PHYSIOLOGY (2) Zirkin / Cone
Limit 120
Prereq: 020.305
Cross-listed with Biophysics.

020.501 INTRODUCTION TO INDEPENDENT STUDY
Perm. Req’d.
Freshmen and Sophomores only

020.503 INTRODUCTION TO RESEARCH
Perm. Req’d.
Freshmen and Sophomores only

020.505 INTERNSHIP

020.511 INDIVIDUAL STUDY

020.513 RESEARCH PROBLEMS
### MENTORED RESEARCH PROGRAM

**020.551 BIOLOGY 020.551**

**MENTORED RESEARCH PROGRAM IN MOLECULAR AND CELLULAR BIOLOGY**

**Horner**

**BA/MS candidates only**

**NOTE:** ALL 600 LEVEL COURSES ARE OPEN TO UNDERGRADUATES WITH PERMISSION.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>020.601</td>
<td>CURRENT BIOLOGY RESEARCH</td>
<td>Staff</td>
<td>Limit 50</td>
</tr>
<tr>
<td>020.604</td>
<td>CELLULAR AND MOLECULAR NEUROSCIENCES</td>
<td>Hattar/ Zhao</td>
<td>Taught with 080.304</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prereq: 171.102 or 104 and 020.305, or permission of instructor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This course covers all aspects of cellular neurophysiology, with particular attention to the biophysical and molecular bases of membrane physiology. Topics include the molecular bases of membrane permeability, action potentials, synaptic transmission and neuronal modulation. Readings include a text and original research articles, and computer simulations will be utilized to demonstrate key concepts.</td>
</tr>
<tr>
<td>020.607</td>
<td>SPECIAL TOPICS IN CELLULAR AND MOLECULAR NEUROSCIENCE</td>
<td>Hattar</td>
<td>Perm. Req’d</td>
</tr>
<tr>
<td>020.630</td>
<td>HUMAN GENETICS</td>
<td>Hodgesick</td>
<td>Limit 50</td>
</tr>
<tr>
<td>020.634</td>
<td>CHROMATIN, GENE EXPRESSION, AND EPIGENETICS</td>
<td>Reemon/ Corces/ Mead/ramak</td>
<td>Limit 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>An advanced course in molecular genetics covering various aspects of gene expression, including the structure of the nucleosome, effects of chromatin on transcription of eukaryotic genes, mechanisms of enhancer function, and the role of nuclear organization of gene expression.</td>
</tr>
<tr>
<td>020.668</td>
<td>ADVANCED MOLECULAR BIOLOGY</td>
<td>Schleif</td>
<td>Limit 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>An advanced course in organization and function of eukaryotic and prokaryotic genes, including discussion of techniques to analyze gene structure and transcription.</td>
</tr>
<tr>
<td>020.686</td>
<td>ADVANCED CELL BIOLOGY</td>
<td>Cunningham</td>
<td>Limit 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All aspects of cell biology are reviewed and updated in this intensive course through critical evaluation and discussion of the current scientific literature. Topics include protein trafficking, membrane dynamics, cytoskeleton, signal transduction, cell cycle control, extracellular matrix, and the integration of these processes in cells of the immune system. Open to graduate students and advanced undergraduates by permission of the instructor.</td>
</tr>
<tr>
<td>020.731</td>
<td>SEMINAR: MOLECULAR MORPHOGENESIS</td>
<td>Koshland/ Hill/ Fan</td>
<td>Limit 25</td>
</tr>
<tr>
<td>020.801</td>
<td>RESEARCH ON BIOLOGY PROBLEMS</td>
<td>Staff</td>
<td>Biology Graduate students only</td>
</tr>
<tr>
<td>020.823</td>
<td>INTRO TO BIOLOGY RESEARCH</td>
<td>Staff</td>
<td>First year Biology Graduate students only</td>
</tr>
<tr>
<td>020.824</td>
<td>INTRO TO BIOLOGY RESEARCH</td>
<td>Staff</td>
<td>First year Biology Graduate students only</td>
</tr>
</tbody>
</table>

### BIOLOGY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>250.131 (N)</td>
<td>TOPICS IN BIOPHYSICS RESEARCH</td>
<td>Fleming, K.</td>
<td>Limit 50</td>
</tr>
</tbody>
</table>
BIOPHYSICS

250.332 (N)  X-RAY CRYSTALLOGRAPHY OF BIOLOGICAL MOLECULES (3)
Lattman  Limit 10  Prereq: Elementary Physics and Calculus  Emphasizes crystallography to determine atomic structure of biological macromolecules. Also covers basics such as lattices, space groups, and symmetry. A text will be used.
Sec. 01  ThF 9-10:15

250.345 (N)  CELLULAR AND MOLECULAR PHYSIOLOGY (3)
Cone  Limit 60  Prereq: 020.305  How cells and molecules function as parts of whole organisms. Topics include life cycles of molecules, cells and organisms, cellular and organismic circulatory systems, gas transport, sensory mechanisms, muscle and molecular motors, and virus-host interactions. Cross-listed with Biology and Neuroscience.
Sec. 01  MThW 11

250.351 (N)  REPRODUCTIVE PHYSIOLOGY (2)
Zirkin / Cone  Limit 120  Prereq: 020.305  Focuses on reproductive physiology and biochemical and molecular regulation of the female and male reproductive tracts. Topics include the hypothalamus and pituitary, peptide and steroid hormone action, sex organs, female reproductive tract, menstrual cycle, ovulation and gamete transport, fertilization and fertility. Introductory lectures on each topic followed by research-oriented lectures and readings from current literature. Cross-listed with Biology.
Sec. 01  W 4-5:45pm

250.353 (N)  BIOMOLECULAR DYNAMICS AND ENSEMBLES (3)
Fleming  Limit 15  Recommended Prereq: 020.305; 030.101  Biomolecules exist as ensembles of structures. This structural diversity and conformational flexibility is important to understanding the cellular function of biological macromolecules. Course examines dynamic structure of proteins; explores how dynamic systems are generated and analyzed computationally, and how these dynamics relate to experimental data. No programming experience necessary.
Sec. 01  ThF 1-2:20

250.401 (N)  ADVANCED SEMINAR IN BIOPHYSICS (3)
Garcia-Moreno  Limit 10  Focus on structural and molecular virology. Topics include structural and physical aspects of viruses, replication cycles, evolution and focused discussion on the structural basis of the life cycle of human pathogens such as the influenza virus and HIV. Course shows integration between quantitative and physical biophysical approaches and contemporary biological questions. 020.305 Biochemistry and 250.372 Introduction to Biophysical Chemistry helpful.
Sec. 01  T 3-5:20

250.519  INDEPENDENT STUDY
Sec. 01  Perm. Req'd.

250.521  RESEARCH PROBLEMS

250.531  LABORATORY IN BIOPHYSICS
Permission from Faculty Sponsor  Introduction to independent research in biophysics emphasizing basic laboratory techniques. Individual study arranged with faculty mentor.

250.601  BIOPHYSICS SEMINAR
Cone  Perm. Req.'d.  Graduate students only  Students and invited speakers present current biophysics topics.
Sec. 01  M 4

250.631  LABORATORY RESEARCH IN BIOPHYSICS
Staff  Biophysics research training.
Sec. 01  TBA

250.673  SEMI-ANNUAL THESIS
Fleming, K.  Biophysics Graduate students only  Once each term, advanced graduate students give a 10-minute presentation of
### BIOPHYSICS

Most of their thesis work to the departmental faculty followed by a 30 minute discussion.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>250.683</td>
<td>INTRODUCTION TO UNIX PYTHON</td>
<td>Rose</td>
<td>Limit 35 Two-week course, 9/11/06 - 9/20/06 Required for 250.685 Proteins and Nucleic Acids</td>
</tr>
<tr>
<td>250.685</td>
<td>PROTEINS AND NUCLEIC ACIDS</td>
<td>Rose</td>
<td>Limit 35 Prereq: 250.683 Course begins 9/20/06 Protein as nature’s molecular robots, and DNA/RNA as the genetic material. Experimental and theoretical approaches to macromolecules, including modeling, simulating and visualizing three-dimensional structures.</td>
</tr>
<tr>
<td>250.689</td>
<td>PHYSICAL CHEMISTRY OF BIOLOGICAL MACROMOLECULES</td>
<td>Garcia-Moreno</td>
<td>Limit 35 Introduction to principles, methods, and approaches of protein and nucleic acid energetics. Enthalpy is an understanding relationship between structure, energy dynamics, and biological function. Topics include of classical, chemical, and statistical thermodynamics, kinetics, theory of ligand bonding, and conformational equilibria.</td>
</tr>
<tr>
<td>250.801</td>
<td>DISSERTATION RESEARCH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHEMISTRY

CHEMISTRY (3) Silverstone
Prereq: 030.301-302

030.501 INDEPENDENT RESEARCH IN PHYSICAL CHEMISTRY I
030.503 INDEPENDENT RESEARCH INORGANIC CHEMISTRY I
030.505 INDEPENDENT RESEARCH ORGANIC CHEMISTRY I
030.507 INDEPENDENT RESEARCH IN BIOCHEMISTRY
030.509 INDEPENDENT RESEARCH IN BIOCHEMISTRY II
030.521 INDEPENDENT RESEARCH INORGANIC CHEMISTRY II
030.523 INDEPENDENT RESEARCH ORGANIC CHEMISTRY II
030.527 INDEPENDENT STUDY
030.551 INTERNSHIP IN CHEMISTRY

030.610 CHEMICAL KINETICS Bowen Sec. 01 TBA
030.613 CHEMICAL BIOLOGY INTERFACE PROGRAM FORUM Greenberg Sec. 01 TBA
030.615 SPECIAL TOPICS IN BIOINORGANIC CHEMISTRY Goldberg Sec. 01 TBA
030.617 SPECIAL TOPICS IN INORGANIC CHEMISTRY Karlin Sec. 01 TBA
030.619 CHEMICAL BIOLOGY I Townsend Sec. 01 TBA
030.621 LITERATURE OF ORGANIC CHEMISTRY Staff Sec. 01 W 4-6pm
030.625 ADVANCED MECHANISTIC ORGANIC CHEMISTRY I Tovar Sec. 01 MTW 9

030.635 METHODS IN NUCLEAR MAGNETIC RESONANCE Tolman Sec. 01 TBA
030.666 ORGANIC SYNTHESIS RESEARCH SEMINAR Foner Sec. 01 TBA
030.677 ADVANCED ORGANIC SYNTHESIS I Foner Sec. 01 TBA
030.683 INORGANIC NIGHTS Staff Sec. 01 M 6-8pm
030.801 INDEPENDENT STUDY

CLASSICS

040.105 ELEMENTARY ANCIENT GREEK (4) Staff Limit 20 Year course; must complete 040.106 in order to receive credit. Cannot be taken Satisfactory. Unsatisfactory This course provides a comprehensive and intensive introduction to the study of ancient Greek. During the first semester, focus is on morphology and vocabulary; emphasis in the second semester is on syntax and reading.

040.107 ELEMENTARY LATIN (3.5) Staff Limit 20 per section Year course; must complete 040.108 in order to receive credit. Cannot be taken Satisfactory. Unsatisfactory This course provides a comprehensive and intensive introduction to the study of Latin for new students as well as a systematic review for those students with a background in Latin. Emphasis during the first semester is on morphology and vocabulary; during the second semester, the focus is on syntax and reading.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Cross-listed Courses</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>040.205 (H)</td>
<td>INTERMEDIATE ANCIENT GREEK</td>
<td>Staff</td>
<td>3</td>
<td></td>
<td>Reading ability in classical Greek is developed through a study of various authors, primarily Plato (fall) and Homer (spring).</td>
</tr>
<tr>
<td>040.207 (H)</td>
<td>INTERMEDIATE LATIN</td>
<td>Staff</td>
<td>3</td>
<td></td>
<td>Prerequisites: Limit 20. Although emphasis is still placed on development of rapid comprehension, readings and discussions introduce student to study of Latin literature, principally through texts of Cicero (fall) and Vergil (spring).</td>
</tr>
<tr>
<td>040.213 (H)</td>
<td>FOOD AND DINING IN THE ANCIENT WORLD</td>
<td>Roller</td>
<td>3</td>
<td></td>
<td>Prerequisites: Limit 20. This course examines the diet and dining practices of the Graeco-Roman world. Ancient texts, images, and archaeological remains are the primary objects of study, along with modern scholarship and comparative materials from other cultures.</td>
</tr>
<tr>
<td>040.305 (H)</td>
<td>ADVANCED ANCIENT GREEK</td>
<td>Detienne</td>
<td>3</td>
<td></td>
<td>Limit 8. Reading of prose or verse authors, depending on the needs of students. This semester’s focus will be on Homeric hymns to Hermes and Apollo.</td>
</tr>
<tr>
<td>040.308 (H)</td>
<td>ADVANCED LATIN POETRY</td>
<td>Shapiro</td>
<td>3</td>
<td></td>
<td>Prerequisites: Limit 20. The aim of this course is to increase proficiency and improve comprehension of the Latin language. Intensive reading of Latin texts, with the usual attention to matters of grammar, idiom, translation, etc. Specific offerings vary from year to year. This semester’s focus will be on Vergil’s Eclogues and Georgics.</td>
</tr>
<tr>
<td>040.325 (H)</td>
<td>INTRODUCTION TO ROMAN LAW</td>
<td>Westbrook</td>
<td>3</td>
<td></td>
<td>Limit 25. A historical survey of the legal system of ancient Rome from its beginnings to the great code of Justinian, which is the basis of many modern systems. No knowledge of Latin is required.</td>
</tr>
<tr>
<td>040.356 (H)</td>
<td>ANCIENT GREEK DEMOCRACY: DEFENDERS AND CRITICS</td>
<td>Jones</td>
<td>3</td>
<td></td>
<td>Limit 25. This course surveys the theory, practices, and development of classical Athenian democracy by examining the competing perspectives of its critics and champions in both ancient and modern sources. Dean’s Teaching Fellowship course</td>
</tr>
<tr>
<td>010.390 (H)</td>
<td>ART MUSEUM POLICY AND PRACTICE</td>
<td>Maguire, E</td>
<td>3</td>
<td>Cross-listed with History of Art, Museum Studies, and Near Eastern Studies</td>
<td>Sec. 01 Th 2-5</td>
</tr>
<tr>
<td>212.379 (H)</td>
<td>THE INTELLECTUAL WORLD OF THE ITALIAN RENAISSANCE</td>
<td>Colonna</td>
<td>3</td>
<td>Cross-listed with History, Philosophy, the Humanities Center, and Romance Languages</td>
<td>Sec. 01 W 11-1</td>
</tr>
<tr>
<td>360.133 (H)</td>
<td>GREAT BOOKS: WESTERN TRADITION OR THE HUMANITIES: A TRADITION OF CLASSICS</td>
<td>Biddle, Falla, Vellarderes</td>
<td>3</td>
<td>Cross-listed with Interdepartmental Writing Seminars, Music, and Philosophy</td>
<td>Sec. 01 ThF 10:30-12</td>
</tr>
<tr>
<td>040.501</td>
<td>INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td></td>
<td>Sec. 01 W 3-5pm</td>
</tr>
<tr>
<td>040.519</td>
<td>HONORS RESEARCH</td>
<td></td>
<td></td>
<td></td>
<td>Sec. 01 W 3-5pm</td>
</tr>
</tbody>
</table>
CLASSICS
Anthropology, the Humanities Center, and Philosophy

040.603
CLASSICAL VASE-PAINTING IN THE WALTERS ART MUSEUM
Shapiro  Limit 10  Sec. 01  T 2-4:30
This seminar will focus on recent approaches in the study of Athenian and South Italian red-figure vase-painting ca.480-323 B.C. with special reference to examples in the Walters. Cross-listed with History of Art

040.605
THE ROMANS AND THEIR PAST: "HISTORICISM" VS "EXEMPLARITY" IN ANCIENT HISTORIOGRAPHY
Roller  Limit 10  Sec. 01  Th 2-4
This seminar examines how Roman writers articulate the relationship of present to past, in light of modern debates about "historicism" vs. "exemplarity." Readings: Sallust, Livy, Seneque, Valerius Maximus, Gadamer, Ricoeur, de Certeau, Koselleck, etc.

040.607
SEXUALITY IN ROMAN ART
Valladares  Limit 10  Sec. 01  M 1-3
This seminar will focus on issues regarding the representation of sexuality in Roman art from the late Republic to the late Empire. Attention will be paid to questions of context and patronage. Key Latin texts will also be discussed.

040.704
READING ANCIENT GREEK
Detienne  Limit 10  Sec. 01  W 12-2
This reading seminar is intended to train graduate students in direct and critical work on primary sources. This semester's focus will be on Homeric hymns to Hermes and Apollo.

040.710
READING LATIN POETRY
Shapiro  Limit 10  Sec. 01  TBA
This reading seminar is intended to train graduate students in direct and critical work on primary sources. This semester's focus will be on Vergil's Eclogues and Georgics.

010.660
THE IMAGERY OF THE ROMAN DEAD
Koortbojian  Limit 15  Cross-listed with History of Art

212.761
BOOKS, READERS, AND WRITERS IN PRE-MODERN EUROPE
Celenza/Izbicki  Limit 15  Cross-listed with History, the Humanities Center, and Romance Languages and German

040.801
INDEPENDENT STUDY

040.814
DISSERTATION RESEARCH

COGNITIVE SCIENCE

050.102 (N,S)
LANGUAGE AND MIND (3)  Badecker  Limit 150  Sec. 01  MTW 10
Introductory course dealing with theory, methods, and current research topics in the study of language as a component of the mind. What it is to "know a language": components of linguistic knowledge (phonetics, phonology, morphology, syntax, semantics) and the course of language acquisition.

050.105 (N,S)
INTRODUCTION TO COGNITIVE NEUROPSYCHOLOGY (3)  McCloskey  Limit 125  Sec. 01  ThF 10:30-12
Exploring cognitive deficits caused by brain damage (including language, perceptual, and spatial deficits), and considers how the deficits shed light on normal mental processes. Cross-listed with Neuroscience
MINDS, BRAINS, AND COMPUTERS (3)
Smolensky
Prereq: Calculus I recommended
Limit 40
Mental processes such as language comprehension and visual perception involve complex computations carried out by the brain. But how do brains compute? What exactly do mental processes mean to “compute” anyway? How do the brain and mind relate? These questions will be explored from a range of interdisciplinary perspectives, including recent attempts to develop “neural network” computers which strive to be models of how both the mind and the brain compute.

THE STRUCTURE OF ENGLISH (3)
Burzio
Limit 40
Our knowledge of English has a complex and yet regular structure in all major linguistic domains: word-formation (morphology), sound structure (phonology), and structure of phrases (syntax). This course uncovers the principles that make up our knowledge of English and reflects on the fact that they are largely acquired without specific instruction.

TOPICS IN THE HISTORY OF THE ROMANCE LANGUAGES (3)
Burzio / Legendre
Limit 40
The major romance languages such as French, Spanish, Italian, Portuguese are only a few of the myriad of local languages, all descendants of Latin that the collapse of the Roman Empire gave rise to. This course explores the major changes in sound structure and in general grammatical organization that marked the transition between Latin and the Romance Languages, and their different territorial distributions.

SPECIAL TOPICS IN COGNITIVE DEVELOPMENT (3)
Halberda / Landau
Limit 40
Junior or Senior status for undergrads
Advanced seminar on tools/background for developmental theorist/researchers. Readings cover human cognitive development, other species, computational modeling, and theoretical-philosophical underpinnings. Intense roundtable debate, heavy reading, graduate and advanced undergraduates. Co-listed with Psychological and Brain Sciences

FORMAL METHODS IN COGNITIVE SCIENCE (3)
Frank
Limit 40
This course will be devoted to the study of formal systems that have proven useful in the cognitive science of language. We will discuss a wide range of mathematical structures and techniques and demonstrate their applications in theories of grammatical competence and performance. A major goal of this course is bringing students to a point where they can evaluate the strengths and weaknesses of existing formal theories of cognitive capacities, as well as profitably engage in such formalization, constructing precise and coherent definitions and rigorous proofs.
COGNITIVE SCIENCE

050.656 SPECIAL TOPICS IN COGNITIVE DEVELOPMENT Halberda/Landau
Limit 15 Same as course 050.356
Co-listed with Psychological and Brain Sciences
Sec. 01 W 12-2:30

050.670 FORMAL METHODS IN COGNITIVE SCIENCE Frank
Limit 40 Same as course 050.370
Sec. 01 ThF 12-1:30

050.800 DIRECTED READINGS
Limit 40 per section
Sec. 01 Stuff
Sec. 02 Badecker
Sec. 03 Burzio
Sec. 04 Frank
Sec. 05 Landau
Sec. 06 Legendre
Sec. 07 McCluskey
Sec. 08 Bap
Sec. 09 Smolensky
Sec. 01 TBA

050.802 RESEARCH SEMINAR IN COGNITIVE PROCESSES McCluskey
Limit 20 Current issues and on-going research on human cognition are discussed.
Sec. 01 TBA

050.811 RESEARCH SEMINAR IN LANGUAGE AND COGNITION Landau
Limit 20 A specialized research seminar for individuals researching language acquisition, cognitive development and the interface between language and cognition. Students must actively carry out empirical or theoretical research in these areas.
Sec. 01 TBA

050.822 RESEARCH SEMINAR: SYNTAX Frank / Legendre
Sec. 01 TBA

050.825 SEMINAR IN OPTIMALITY THEORY Smolensky
Limit 20 This seminar will read selected chapters from the book, Smolensky & Legendre (2006), *The Harmonic Mind: From Neural Computation to Optimality Theoretic Grammar*.
Sec. 01 TBA

050.835 SEMINAR IN EXPERIMENTAL AND PROCESSING LINGUISTICS Badecker / Smolensky
Limit 20 Readings and research addressing the application of experimental methods to core questions of grammatical theory and the application of grammatical theory to questions of language processing.
Sec. 01 TBA

050.839 RESEARCH IN COGNITIVE SCIENCE
Sec. 01 Stuff
Sec. 02 Badecker
Sec. 03 Burzio
Sec. 04 Frank
Sec. 05 Landau
Sec. 06 Legendre
Sec. 07 McCluskey
Sec. 08 Bap
Sec. 09 Smolensky
Sec. 01 TBA

050.849 TEACHING PRACTICUM Required course for Teaching Assistants

EARTH & PLANETARY SCIENCES

270.102 (N) FRESHMAN SEMINAR: CONVERSATION WITH THE EARTH Marsh
Limit 110 Freshmen only
Sec. 01: 2 credits (normal participation)
Sec. 02: 3 credits (requires term paper) A discussion of current topics on Earth's origin, evolution, and habitability. Topics will include extinction of life from meteorite impact, global warming, ozone depletion, volcanism, ice ages, and catastrophic floods, among others.
Sec. 01 ThF 11
Sec. 02 ThF 11
## Earth & Planetary Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Requirements</th>
<th>Credits</th>
<th>Units</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>270.103 (N)</td>
<td>Our Changing Planet (3)</td>
<td>Olson/Szlavecz</td>
<td>Limit 110</td>
<td>3</td>
<td></td>
<td>MTW 11</td>
</tr>
<tr>
<td></td>
<td>A broad survey of the Earth as a planet, with emphasis on the processes that control global changes. Topics include: the structure, formation, and evolution of the Earth, the atmosphere, oceans, continents, and biosphere. Special attention is given to present-day issues, such as global climate change, natural hazards, air pollution, resource depletion, human population growth, habitat destruction, and loss of biodiversity. Open to all undergraduates; no prerequisites.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.222 (N)</td>
<td>Earth Materials (4)</td>
<td>Veblen/Ferry/</td>
<td>Limit 30</td>
<td>4</td>
<td></td>
<td>MTW 11</td>
</tr>
<tr>
<td></td>
<td>An introduction to the properties, occurrence, and origin of the basic constituents of the Earth, including minerals, rocks, and soils. Introductory training in the recognition of minerals, rocks, and soils in the laboratory and the field.</td>
<td>ahrens</td>
<td></td>
<td></td>
<td></td>
<td>W 1-4</td>
</tr>
<tr>
<td>270.225 (N)</td>
<td>Earth System History (3)</td>
<td>Hinnov</td>
<td>Coreq: 270.226 Limit 50</td>
<td>3</td>
<td></td>
<td>MW 10</td>
</tr>
<tr>
<td></td>
<td>Geologic histories of Earth and its ecosystems. The evolution and extinction of many forms of life – from bacteria to dinosaurs, flowering plants, and humans – will be reviewed in the context of a changing global environment. Interactions among the upper earth, ocean, atmosphere, and biosphere will be highlighted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.226 (N)</td>
<td>Earth System History Lab (1)</td>
<td>Hinnov</td>
<td>Coreq: 270.225 Limit 30</td>
<td>1</td>
<td></td>
<td>MTW 2</td>
</tr>
<tr>
<td></td>
<td>Laboratory exercises employing fossils, rocks, maps, and stratigraphic cross-sections.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.301 (N)</td>
<td>Geochemical Thermodynamics (3)</td>
<td>Ferry</td>
<td>Prereqs: 270.222 or 270.345</td>
<td>3</td>
<td></td>
<td>MTW 2</td>
</tr>
<tr>
<td>270.303 (N)</td>
<td>Geodynamics (3)</td>
<td>Conrad</td>
<td>Prereqs: 171/101 or 171.105 and 110.202</td>
<td>3</td>
<td></td>
<td>ThF 9:30-10:30</td>
</tr>
<tr>
<td></td>
<td>Study of the basic principles that control deformation of Earth's crust and mantle. Elastic, viscoelastic, and viscous deformation are described using examples from tectonics, uplift, mantle convection, faulting, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.307 (N,Q)</td>
<td>Combining Measurements with Models (4)</td>
<td>Haine</td>
<td>Prereq: Calculus, basic Physics, and Linear Algebra. An introduction to modern ways to interpret observations in the context of a conceptual model. Topics include model building, hypothesis testing, and inverse methods. Practical examples from geophysics, engineering, and medical physics will be featured.</td>
<td>4</td>
<td></td>
<td>MT 9, F 1-3</td>
</tr>
<tr>
<td>270.311 (N)</td>
<td>Geobiology (3)</td>
<td>Jahren</td>
<td>Limit 30</td>
<td>3</td>
<td></td>
<td>ThF 10:30-12</td>
</tr>
<tr>
<td></td>
<td>Study of the interface between the biological and geological earth.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.375 (N)</td>
<td>Groundwater (3)</td>
<td>Garven</td>
<td>Cross listed with Geography and Environmental Engineering</td>
<td>3</td>
<td></td>
<td>MTW 10</td>
</tr>
<tr>
<td>270.377 (N,W)</td>
<td>Climates of the Past (3)</td>
<td>Hinnov</td>
<td>Prereqs: 270.115 or 270.120 or Perm. Req’d</td>
<td>3</td>
<td></td>
<td>ThF 3:30-4:30</td>
</tr>
<tr>
<td></td>
<td>Overview of Earth’s climatic components, global climate regimes, climate variability, the climate-sensitive Earth archives, paleoclimate through geologic time, episodes of extremes, and models of palaeoclimate change. Course is designed for upper level and beginning graduate students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Instructor</td>
<td>Sections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.425 (N)</td>
<td>EARTH AND PLANETARY FLUIDS (3)</td>
<td>Waugh/Olson</td>
<td>01 MTW 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prereq: Basic Physics, calculus, and familiarity with ordinary differential equations. Introductory course on the properties, flow, and transport characteristics of fluids throughout the Earth and planets. Topics covered include: constitutive relationships, fluid rheology, hydrostatics, dimensional analysis, low Reynolds number flow, porous media, waves, stratified and rotating fluids, plus heat, mass, and tracer transport. Illustrative examples and problems are drawn from the atmosphere, ocean, crust, mantle, and core of the Earth and other Planets. Open to graduate and advanced undergraduate students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.495 (N)</td>
<td>SENIOR THESIS</td>
<td>Staff</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preparation of a substantial thesis based upon independent student research, supervised by at least one faculty member in Earth and Planetary Sciences. Open to senior departmental majors only. Required for departmental honors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.501</td>
<td>INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.507</td>
<td>INTERNSHIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.601</td>
<td>FLUIDS SEMINAR</td>
<td>Haine</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.604</td>
<td>SEMINAR IN GEOPHYSICAL PETROLOGY</td>
<td>Marsh</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.605</td>
<td>JOURNAL CLUB</td>
<td>Conrad</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.609</td>
<td>SPECIAL TOPICS IN EARTH AND PLANETARY SCIENCES</td>
<td>Staff/Strobel</td>
<td>02 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.621</td>
<td>TRANSMISSION ELECTRON MICROSCOPY: PRACTICE AND APPLICATIONS</td>
<td>Veblen</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.623</td>
<td>PLANETARY ATMOSPHERES</td>
<td>Strobel</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.642</td>
<td>SURFACE GEOCHEMISTRY</td>
<td>Sverjensky</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.690</td>
<td>IGNEOUS PETROLOGY</td>
<td>Marsh</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.692</td>
<td>IGNEOUS PETROLOGY LAB</td>
<td>Marsh</td>
<td>01 TBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>360.605</td>
<td>SEMINAR: ENVIRONMENT AND APPLIED FLUID MECHANICS</td>
<td>Marsh</td>
<td>F 11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cross-listed with Geography and Environmental Engineering, Interdepartmental and Mechanical Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.807</td>
<td>RESEARCH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ECONOMICS

#### 180.101 (S) ELEMENTS OF MACROECONOMICS
- **Limit 18 per section**
- **Ball**
- **Lec.** Sec. 01: MT 11, Sec. 02: W 11, Sec. 03: W 11, Sec. 04: W 11, Sec. 05: W 11, Sec. 06: W 11, Sec. 07: W 11, Sec. 08: W 11, Sec. 09: W 11, Sec. 10: W 11, Sec. 11: W 11, Sec. 12: W 12, Sec. 13: W 12, Sec. 14: W 12, Sec. 15: W 1, Sec. 16: Th 1, Sec. 17: Th 1, Sec. 18: Th 1, Sec. 19: Th 1, Sec. 20: Th 1, Sec. 21: Th 1, Sec. 22: F 9

#### 180.228 (S) ECONOMIC DEVELOPMENT (3)
- **Limit 25 per section**
- **Gersovitz**
- **Diagnostic test on Elements of Economics is required to be taken in the second week**
- **Lec.** Sec. 01: MT 2

#### 180.241 (S) INTERNATIONAL TRADE (3)
- **Weiss**
- **Prereq: 180.101-102**
- **Sec. 01: T 5:10-6:10pm, T 6:10-7:10pm**

#### 180.266 (S) FINANCIAL MARKETS AND INSTITUTIONS (3)
- **Fohlin**
- **Limit 50**
- **Prereq: 180.101-102**
- **Sec. 01: T 3-5**

#### 180.280 (S) POPULATION ECONOMICS (3)
- **Staff**
- **Cross-listed with Public Health Studies**
- **Sec. 01: TBA**

#### 180.289 (S) ECONOMICS OF HEALTH (3)
- **Rishai**
- **Cross-listed with Public Health Studies**
- **Sec. 01: T 3-5**

#### 180.301 (S) MICROECONOMIC THEORY (4.5)
- **Havriganon**
- **Limit 45 per section**
- **Prereq: 180.101-102, 110.106 or Perm. Req’d**
- **Sec. 01: TBA**

#### 180.310 (S) ECONOMICS OF ANTITRUST (3)
- **Hamilton**
- **Limit 20**
- **Perm. Req’d**
- **Sec. 01: T 1-3**

#### 180.314 (S,Q) MATHEMATICAL ECONOMICS (3)
- **Khan**
- **Limit 40**
- **Prereq: 180.301**
- **Sec. 01: TBA**

#### 180.365 (S) PUBLIC FINANCE (3)
- **Staff**
- **Sec. 01: TBA**

#### 180.392 (S) SENIOR THESIS (5)
- **Fohlin**
- **Prereq: 180.301-302 or Perm. Req’d**
- **Sec. 01: TBA**

#### 570.470 (S) FUTURES MARKET RESEARCH (3)
- **Hanke**
- **Cross-listed with Geography and Environmental Engineering**
- **Sec. 01: TBA**

#### 180.501 INDEPENDENT STUDY
- **Staff**
- **Sec. 01: MT 1-3**

#### 180.603 MACROECONOMIC THEORY
- **Maccini**
- **Limit 50**
- **Prereq: 180.301-302 or Perm. Req’d**
- **Sec. 01: Th 9-11**

#### 180.605 ADVANCED MACROECONOMICS
- **Ball**
- **Limit 20**
- **Prereq: 180.603-604**
- **Sec. 01: M 1-3**
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>180.607</td>
<td>MACROECONOMETRICS</td>
<td>Faust</td>
<td>20</td>
<td>Prereq: 180.633-634</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.611</td>
<td>ECONOMICS OF UNCERTAINTY</td>
<td>Karni</td>
<td>20</td>
<td>Prereq: 180.601 and 180.603 or Perm. Req'd.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.614</td>
<td>MATHEMATICAL ECONOMICS</td>
<td>Khan</td>
<td>20</td>
<td>Prereq: 180.601-602 or Perm. Req'd.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.615</td>
<td>MATHEMATICAL METHODS IN ECONOMICS</td>
<td>Karni</td>
<td>30</td>
<td>Prereq: 180.601-602 or Perm. Req'd.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.619</td>
<td>EVOLUTIONARY ECONOMICS</td>
<td>Young</td>
<td>20</td>
<td>Prereq: Graduate level knowledge of game theory and math methods</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.628</td>
<td>ECONOMIC DEVELOPMENT</td>
<td>Gerosvitz</td>
<td>20</td>
<td>Prereq: 180.601, 180.603</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.636</td>
<td>STATISTICAL INFERENCE</td>
<td>Staff</td>
<td>20</td>
<td>Prereq: Differential Calculus and Linear Algebra. Limited to graduate students in Economics except by permission of the chair</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.637</td>
<td>MICROECONOMETRICS I</td>
<td>Woutersen</td>
<td>20</td>
<td>Prereq: 180.633-634 or equivalent</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.641</td>
<td>INTERNATIONAL TRADE</td>
<td>Krishna</td>
<td>20</td>
<td>Prereq: 180.601, 180.603</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.671</td>
<td>INDUSTRIAL ORGANIZATION</td>
<td>Harrington</td>
<td>20</td>
<td>Prereq: 180.601, 180.603</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.694</td>
<td>APPLIED MICROECONOMETRICS WORKSHOP</td>
<td>Staff</td>
<td>20</td>
<td>Graduate Students only</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.695</td>
<td>MICROECONOMIC THEORY WORKSHOP</td>
<td>Staff</td>
<td>20</td>
<td>Graduate students only</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.696</td>
<td>MACROECONOMICS WORKSHOP</td>
<td>Staff</td>
<td>20</td>
<td>Graduate students only</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.698</td>
<td>RESEARCH/TEACHING PRACTICUMS</td>
<td>Staff</td>
<td>20</td>
<td>Graduate students only</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>180.899</td>
<td>INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ENGLISH**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>060.100</td>
<td>INTRODUCTION TO EXPOSITORY WRITING (3)</td>
<td>Kain / Staff</td>
<td>10</td>
<td>Freshmen Only. This course is designed to help less experienced writers succeed with the demands of college writing. Students learn how to read and summarize texts, how to analyze texts, and how to organize their thinking in clearly written essays. Emphasis is on analysis and the skills that analysis depends upon.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>060.107</td>
<td>INTRODUCTION TO LITERARY STUDY (3)</td>
<td>Ferguson</td>
<td>30</td>
<td>Required course for English majors. We'll consider various literary forms: a selection of early short poems, folk tales, short stories (Edgar Allan Poe and Zora Neale Hurston), and novels.</td>
<td>Sec. 01</td>
</tr>
</tbody>
</table>
EXPOSITORY WRITING (3) Kain / Staff
Limit 15 per section Perm. Req'd for Seniors
This course teaches students the concepts and strategies of academic argument. Students learn to analyze sources, to develop their thinking with evidence, and to use analysis to write clear and persuasive arguments. Each section focuses on its own intellectually stimulating topic or theme, but the central subject in all sections is using analysis to create arguments. To check individual course descriptions, go to the following web site: http://web.jhu.edu/ewp

SHAKESPEARE (THEN AND NOW) (3) Halpern
Limit 20 per section
Shakespeare’s plays remain vital in part because of their engagement with perennially provocative topics: sexuality, politics, social intolerance, the often vexed relations between men and women, parents, and children. In this survey of some of the major comedies, histories and tragedies, we will both place Shakespeare’s plays in their historical context and consider their significance for present-day readers and audiences.

THE RUSSIAN NOVEL (3) Cameron
Limit 18 Freshmen and Sophomores only
Readings include War and Peace, Anna Karenina, The Idiot, and The Brothers Karamazov. A consideration of what makes these works “titanic.”

MARRIAGE PROBLEMS (3) Jarvis, Claire
Limit 18 Prereq: One English course
What is “marriage”? This course reads a variety of historical literary texts to examine why “marriage” is currently such a vexed and contentious term.

MODERNISM AND MODERNITY (3) Attell
Limit 20 per section
A survey of key texts by major figures of literary modernism (1900-1945) in the United States, England, and Ireland. Authors will include: Conrad, Eliot, Faulkner, Hughes, Joyce, Pound, Stein, Stevens, Woolf, and others.

TRAINING, WRITING, CONSULTING (1) McCray
Limit 10 Perm. Req’d

REVENGE TRAGEDY (3) Halpern
Limit 9 Must have taken one English Dept. literature course. Revenge tragedy from Aeschylus to Quentin Tarantino, with emphasis on the form as developed during the English Renaissance by Shakespeare and others.

POETRY AND POETICS (3) Jarvis, Simon
Limit 18 Must have taken one English literature course. This course is particularly concerned with the sensuous or material aspects of poetry (rhythm, metre, “instrumentation”, lineation) and with the possible working-out of an aesthetics adequate to them.
ENGLISH

060.335 (H) (W) SPACES, PLACES, AND BOUNDARIES IN 19TH CENTURY FICTION Armstrong
Limit 18  Must have taken one English literature course. We explore the way 19th-century novelists create living spaces, whether domestic, urban or colonial, from Frankenstein to Conrad. We'll also address theories of social space and cultural geography.

Sec. 01  W 2-4:30

060.384 (H) (W) INTERRACIAL INTIMACY AND THE AMERICAN NOVEL Conn
Limit 18  Must have taken one English literature course. This course examines the novel of interracial intimacy in light of the social, legal, and literary context of intermarriage and interracial sex. Course readings include Faulkner, Baldwin, Kerouac, Himie, and others.

Sec. 01  T 2-4:30

060.388 (H) (W) THE RUSSIAN NOVEL Cameron
Limit 18  Juniors and seniors only. Must have taken two lower level English courses. “If there is no God, how can I be a captain?” We shall examine this and other philosophical, historical, and religious questions in Tolstoy’s and Dostoyevsky’s novels. Readings include War and Peace, Anna Karenina, The Idiot, and The Brothers Karamazov.

Sec. 01  Th 12-2:30

060.501 INDEPENDENT STUDY

060.505 INTERNSHIP - ENGLISH

060.625 REVENGE TRAGEDY Halpern
Limit 9  Must have taken one English Dept. literature course. Revenge tragedy from Aeschylus to Quentin Tarantino, with emphasis on the form as developed during the English Renaissance by Shakespeare and others.

Sec. 01  ThF 1:30-3

060.634 RICHARDSON’S CLARISIA, LITERARY CRITICISM, AND ACCOUNTS OF READING Ferguson
Limit 8  We’ll read Richardson’s very substantial novel Clarissa, analyze how it was anthologized, survey the history of its criticism, and think about the impact of scale in novels. Open to Juniors and Seniors by permission only.

Sec. 01  T 2-5pm

060.644 HEGEL: PHENOMENOLOGY OF SPIRIT Jarvis, Simon
Limit 8  We shall aim to work through the whole of this text (in Miller’s translation). The only required reading each week will be the relevant section of the Phenomenology. The course will also consider some of the Phenomenology’s philosophical and literary “afterlives.”

Sec. 01  F 1-4

060.653 VICTORIAN VISUAL TECHNOLOGIES AND TEXT: OPTICAL CULTURE, SPECTACLE, AND THE LITERARY TEXT Armstrong
Limit 8  A poetics and phenomenology of the lens explored through the technologies both of high science (telescope, microscope) and ludic toys (stereoscope, kaleidoscope), print culture, poetry, and some short fiction.

Sec. 01  Th 1-4

060.657 THE CONDITION OF CULTURE NOVEL IN BRITAIN FROM 1890S TO THE PRESENT Mulhern
Limit 8  Rhetorics of cultural evaluation and formative historical contexts of writing in the novel in Britain: Hardy, Forster, Lawrence, Woolf, Waugh, Spark, Fowles, Naipaul, Rendell, Amis, Kureishi, Smith.

Sec. 01  T 9-12

060.893 INDIVIDUAL WORK

060.895 JOURNAL CLUB TBA
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Requirements</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>061.140 (H)</td>
<td>INTRODUCTION TO THE STUDY OF FILMS (3)</td>
<td>DeLibero</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$40</td>
</tr>
<tr>
<td>061.240 (H)</td>
<td>INTRODUCTION TO FILM PRODUCTION (3)</td>
<td>Mann</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$100, Lab</td>
</tr>
<tr>
<td>061.244 (H)</td>
<td>FILM GENRES (3)</td>
<td>Buckwell</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$40</td>
</tr>
<tr>
<td>061.325 (H)</td>
<td>THE WESTERNS OF FORD, LEONE, AND PECKINPAH (3)</td>
<td>Buckwell</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$40</td>
</tr>
<tr>
<td>061.361 (H)</td>
<td>DOCUMENTARY THEORY (3)</td>
<td>Mann</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$40</td>
</tr>
<tr>
<td>061.384 (H)</td>
<td>HISTORY OF PHOTOJOURNALISM IN THE UNITED STATES (3)</td>
<td>Hijar</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$40</td>
</tr>
<tr>
<td>061.413 (H)</td>
<td>LOST AND FOUND FILM (3)</td>
<td>Mann</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$100</td>
</tr>
<tr>
<td>061.440 (H)</td>
<td>SENIOR PROJECT IN FILM PRODUCTION (3)</td>
<td>Mann</td>
<td>3</td>
<td>Perm Req'd</td>
<td>$100</td>
</tr>
<tr>
<td>061.502</td>
<td>INDEPENDENT STUDY IN FILM AND MEDIA</td>
<td>Staff</td>
<td>Perm Req'd</td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td>061.504</td>
<td>INDEPENDENT STUDY IN FILM PRODUCTION</td>
<td>Mann</td>
<td>Perm Req'd</td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td>061.506</td>
<td>INTERNSHIP IN FILM AND MEDIA</td>
<td>DeLibero</td>
<td>Perm Req'd</td>
<td></td>
<td>$100</td>
</tr>
</tbody>
</table>

- **Laboratory Fee**: $40, $100, or $100 (if production related)
- **Perm Req'd**: Permanent Requirement
- **S/U only**: Can be taken on a S/U (satisfactory/unsatisfactory) basis.
GERMAN

091.101 (H) ELEMENTARY GERMAN (4.5) Mifflin An introduction to the German language and a development of reading, speaking, writing, and listening skills through the use of basic texts. Lab Req’d. Both semesters must be completed with passing grades to receive credit. Cannot be taken Satisfactory/ Unsatisfactory. Limit 18 per section. Students should choose their section based on the MTW schedule. Conflicts arising from the Th/Fri hour will be resolved with instructor.

091.201 (H) INTERMEDIATE GERMAN I (3.5) Wheeler Limit 16 per section. Prereq: 091.101-102 or placement exam. This course is designed to continue the four skills (reading, writing, speaking, and listening) approach to learning German. Reading and discussions are topically based and expanded upon through audio-visual materials. Students will also review and deepen their understanding of the grammatical concepts of German. Taught in German.

091.203 (H) GERMAN FOR PROFESSIONAL COMMUNICATION IN SCIENCE AND ENGINEERING (3) Niebisch Limit 15. Prereq: 091.101-102 or placement exam. This intermediate level course is designed to provide students in engineering and sciences with “real life skills” and cultural background necessary for internship or research trips to Germany. Taught in German.

090.255 (H) FRESHMEN SEMINAR ON NIETZSCHE (3) Pahl Freshmen only. Limit 20. Introduction to the work of Friedrich Nietzsche. Reading and discussion in English.

091.301 (H) ADVANCED GERMAN CONVERSATION AND COMPOSITION (3) Mifflin. Topics covered include reconstruction, (re)development of the party system, the student elections of the 1960s, and developments in West and East Germany. Students analyze literary and journalistic texts, films and print media. Emphasis on style and clarity in both written and oral expression. Review of advanced grammar. Taught in German.

091.303 (H) BUSINESS AND COMMERCIAL GERMAN (3) Wheeler Limit 15. Prereq: 091.201-202 or equivalent. Two-semester intensive introduction into the language and culture of German business, commerce, and industry. Combines the study of foreign language with business skills, including Web publishing through the design and maintenance of a course web page. Students will learn basic economic and business vocabulary, investigate the current status of the German and European economy, and become familiar with economic and political structures as well as specific business practices, customs, and codes of behavior in the business world. Analysis and discussion of German economic and business texts and translation of economic and business materials. Taught in German.
INTRODUCTION TO LITERATURE AND CULTURE: 1900-1945 (3) Costache
Limit 10  Prereq: 091.301-302 or placement exam. This course is designed to introduce students to the analysis of literary and cultural topics. A variety of 20th century texts and visual media will form the basis for discussion of literature and cultural phenomena specific to the time period. Attention is given to improving student writing. Readings, discussion and written assignments in German.

EXPERIMENTAL WRITING (3) Campe
Prereq: 091.303-302. Limit 15
In the early 20th century German authors who also were scientists or doctors engaged in experiments of narrative writing. It is their style and narrative technique which can be called experimental, but experiments are also subject matters in these stories. Readings will include Musil, Schnitzler, and Benn. Reading and Discussion in German

GERMAN JEWISH THOUGHT SINCE THE ENLIGHTENMENT (3) Tobias
Limit 15
Survey trends in German-Jewish thought since Haskala (Enlightenment). Emphasis on debate regarding “Deutschtum” and “Judentum” in 18th and 19th centuries; rationalist interpretations of Judaism; rediscovery of mysticism in 20th century and anti-rationalist tendencies. Readings and discussion in English. Cross-listed with Jewish Studies, History, and the Humanities Center

Proust and Philosophy (3) deVries
Cross-listed with the Humanities Center and Philosophy

BERGSON AND THE PROBLEM OF NOVELTY IN PHILOSOPHY (3) Marratt
Cross-listed with Anthropology, the Humanities Center, and Political Science

INDEPENDENT STUDY

READING AND TRANSLATING GERMAN FOR ACADEMIC PURPOSES 1 Clark
Graduate students only. Limit 15
This course is designed for graduate students in other departments who wish to gain a reading knowledge of the German language. The first semester assumes no knowledge of German and covers the grammatical principles of the language. The second semester assumes a basic knowledge of German grammar and vocabulary and concentrates on reading practice. For certification or credit.

UNDERSTANDING IRONY Tobias
Limit 12
This course will examine some of the classic texts on irony (Schlegel, Novalis, Solger, Hegel) and important 20th century interpretations (Szez, de Man, Lacoue-Labarthe, Nancy). A key concern will be whether there can be a conception of irony without transcendental philosophy.

HEGEL ON ETHICS AND THE THEORY OF TRAGEDY Mothe
Limit 12
Two month intensive course The course will deal with Hegel’s conceptions of art, politics and ethical life (Stimmung), as they are elaborated in his Lectures on Aesthetics and Philosophy of Right. The goal of the course is to unfold these conceptions in their internal coherence and to ask for their contemporary significance. Special consideration will be given to the question of the systematic relation between Hegel’s theories of art, politics and ethical life.
Hegel’s theory of tragedy, especially in the version of his *Phenomenology of the Spirit*, is a good case for addressing this question. Cross-listed with the Humanities Center and Philosophy.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>090.647</td>
<td>MODERNITY, AESTHETIC AND POLITICAL: HOFMANNSTHAL – BRECHT – CUNI</td>
<td>Hebekus</td>
<td>Sec. 01</td>
<td>F</td>
<td>11-1</td>
</tr>
<tr>
<td>090.656</td>
<td>THEORIZING EMOTIONALITY</td>
<td>Pahl</td>
<td>Sec. 01</td>
<td>W</td>
<td>3-5pm</td>
</tr>
<tr>
<td>090.666</td>
<td>GOETHE: ELECTIVE AFFINITIES</td>
<td>Campe</td>
<td>Sec. 01</td>
<td>Th</td>
<td>3-5</td>
</tr>
<tr>
<td>212.761</td>
<td>BOOKS, READERS, AND WRITERS IN PRE-MODERN EUROPE</td>
<td>Celenza / Izbicki</td>
<td>Sec. 01</td>
<td>T</td>
<td>4-6pm</td>
</tr>
<tr>
<td>300.639</td>
<td>PSYCHOANALYSIS AND ART HISTORY</td>
<td>Fried / Leys</td>
<td>Sec. 01</td>
<td>T</td>
<td>1-4</td>
</tr>
<tr>
<td>300.678</td>
<td>DIFFERENCE AND REPEITION AND ITS SOURCES</td>
<td>Marrati</td>
<td>Sec. 01</td>
<td>W</td>
<td>10-12:30</td>
</tr>
<tr>
<td>090.800</td>
<td>INDEPENDENT STUDY</td>
<td>Pahl</td>
<td>Sec. 01</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>090.813</td>
<td>DIRECTED DISSERTATION RESEARCH</td>
<td>Campe</td>
<td>Sec. 01</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>090.815</td>
<td>DIRECTED DISSERTATION RESEARCH</td>
<td>Campe</td>
<td>Sec. 01</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>090.817</td>
<td>DIRECTED DISSERTATION RESEARCH</td>
<td>Tobias</td>
<td>Sec. 01</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Title</td>
<td>Instructor</td>
<td>Credits</td>
<td>Limit</td>
<td>Term(s)</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------</td>
<td>----------------</td>
<td>---------</td>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>100.103 (H,S)</td>
<td>HISTORY OF OCCIDENTAL CIVILIZATION: EUROPE AND THE WIDER WORLD (3) Marshall</td>
<td></td>
<td>3</td>
<td>15</td>
<td>M 1, M 2</td>
</tr>
<tr>
<td>100.120 (H,S)</td>
<td>SLAVERY: FROM AFRICA TO AMERICA (3) Larson</td>
<td></td>
<td>3</td>
<td>25</td>
<td>T 1</td>
</tr>
<tr>
<td>100.121 (H,S)</td>
<td>HISTORY OF AFRICA (3) Hall</td>
<td></td>
<td>3</td>
<td>15</td>
<td>W 1</td>
</tr>
<tr>
<td>100.147 (H,S)</td>
<td>ADAM SMITH AND KARL MARX (3) Jelavich/Shoenberger</td>
<td></td>
<td>3</td>
<td>20</td>
<td>T 1</td>
</tr>
<tr>
<td>100.191 (H,S)</td>
<td>FAMILY HISTORY IN U.S. AND EUROPE (3) Ditz</td>
<td></td>
<td>3</td>
<td>18</td>
<td>W 1</td>
</tr>
<tr>
<td>100.193 (H,S)</td>
<td>UNDERGRADUATE SEMINAR IN HISTORY (3) Johnson</td>
<td></td>
<td>3</td>
<td>20</td>
<td>W 12</td>
</tr>
<tr>
<td>100.247 (H,S)</td>
<td>REMAKING GENDER IN 20TH CENTURY AMERICA (3) Ryan</td>
<td></td>
<td>3</td>
<td>15</td>
<td>W 2</td>
</tr>
<tr>
<td>100.274 (H,S)</td>
<td>SLAVERY AND FREEDOM IN THE AMERICAS (3) Roberts</td>
<td></td>
<td>3</td>
<td>25</td>
<td>Th 2-5</td>
</tr>
</tbody>
</table>
HISTORY

100.275 (H,S) ENTERPRISE AND THE LEGAL SYSTEM: INTRODUCTION TO THE AMERICAN LEGAL SYSTEM (3) Beveridge  Limit 25 This course is designed to introduce the student to the historical development of American law with particular reference to the business corporation and to the fundamentals of legal reasoning. The emphasis will be on the nineteenth century establishment of a distinctly American position on the corporation, the evolution of that position in the twentieth century, and the changes that are currently taking place in the law related to business corporations. 
Dean’s Teaching Fellowship Course
Sec. 01 MW 2-4

100.282(H,S) PRACTICING DIFFERENCE, PRODUCING SIMILARITY: NATIVE AMERICANS AND ENGLISH EXPLORERS IN EARLY AMERICA (3) Stern Spivey  Limit 15 This seminar provides an introduction to the history and historiography of Native American and British American encounters from early exploration to the American Revolution, while introducing interdisciplinary methods of studying cross-cultural encounters.
Dean’s Teaching Fellowship course
Sec. 01 TTh 2-3:30

100.322 (H,S) THE HISTORY OF AFRICAN AMERICANS AT JOHNS HOPKINS (3) Knight  Limit 15 This is an undergraduate research-type seminar in which students working in groups will first become acquainted with historical research methods, the collection of oral tradition, and be taught to use multimedia recording devices. They will then implement their instruction by creating a multi-media biographical and historical essay for the JHU web page dealing with African Americans at the Johns Hopkins Institutions Project. This course involves working together in groups of 2-3 students interviewing any appropriately selected Johns Hopkins figure and then composing an illustrated net-essay following the guidelines of the JHU Afam project.
Sec. 01 W 3-5

100.338 (H,S) CONTEMPORARY AFRICAN POLITICAL ECONOMIES IN HISTORICAL PERSPECTIVES (3) Berry  Limit 25 Examines contemporary economic and political issues and changes against the background of colonial rule and postcolonial history.
Sec. 01 MT 2-3:30

100.346 (H,S) PORTUGAL AND THE WIDER WORLD (3) Russell-Wood  Limit 25 Exploration and Portuguese settlement in Africa, Asia, and America, and integration of these regions into a multi-continental, multi-oceanic system. Political, commercial, military, cultural, and social aspects examined in the context of European/non-European interactions.
Sec. 01 MT 9

100.347 (H) EARLY MODERN CHINA (3) Rowe  Limit 55 The history of China from the 16th to the late 19th centuries.
Sec. 01 ThF 9

100.356 (H,S) THE BUDDHIST EXPERIENCE (3) Lievens  Limit 50 Introduction to Buddhist theory and practice - from India to East Asia.
Sec. 01 ThF 10:30-12

100.358 (H) COMPARING RACIAL FORMATIONS (3) Kramer  Limit 20
Sec. 01 M 2-4

100.375 (H,S) COLLOQUIUM: PROBLEMS IN AMERICAN SOCIAL HISTORY (3) Walters  Limit 20
Sec. 01 TBA
HISTORY

100.397 (H,S) POLITICS AND CULTURE IN MODERN BRITAIN (3)
Walkowitz Limit 15
Some of the themes examined include the history of popular nationalism, industrialization and class conflict, antislavery and reform movements, history of Empire and racial thought, body politics, the urban environment, non-violent and militant politics, gender and war, internationalism and cosmopolitanism.

100.422 (H,S) SOCIETY AND SOCIAL CHANGE IN 18TH CENTURY CHINA (3)
Ronce Limit 12
Prereq: One previous course in Chinese history. Reading knowledge of Chinese recommended but not required.

100.449 (H,S) SOCIAL ETHICS IN AMERICAN THOUGHT (3)
Rosen Limit 6
Perm. Req'd
A study of basic traditions of American thought with a focus on their views of social efficacy, i.e. their ideals of collective human flourishing and the obligations that those ideas entail. Readings and papers on secondary and primary sources.

191.340 (S) EDUCATION POLITICS IN URBAN AMERICA (3)
Hayes Limit 15
This course analyzes the politics of urban public schooling, concentrating on community political dynamics and the struggle for equal educational opportunity and quality education. The course emphasizes the impact of urban transformation, socioeconomic class inequality, and racial and ethnic politics on the changing character of public school reform since the 1954 Supreme Court decision of Brown v. Board of Education. Cross-listed with Anthropology, Political Science, and Sociology, and Africana Studies.

212.379 (H) THE INTELLECTUAL WORLD OF THE ITALIAN RENAISSANCE (3)
Celenza Limit 15
Cross-listed with Classics, the Humanities Center, Philosophy and Romance Languages.

090.386 (H) GERMAN JEWISH THOUGHT SINCE THE ENLIGHTENMENT (3)
Tobias Limit 15
Cross-listed with Jewish Studies, German, and the Humanities Center.

100.507 SENIOR THESIS
Knight
A seminar supervised by the Director of Undergraduate Studies and designed to provide a forum for collective exchange among seniors undertaking the senior thesis. All students undertaking the senior thesis must register and attend.

100.535 INDEPENDENT STUDY
Kramer

100.609 RACE AND MODERN HISTORY
Kramer

100.636 RUSSIAN HISTORY SEMINAR
Brody
This course will explore the chief issues in modern Russian history with an emphasis on culture and politics.

100.659 TOPICS IN GERMAN HISTORY
Johansen
Readings in German social and cultural history, 1815-1914.

100.649 THE AMERICAN SOUTH
Johnson

100.673 RESEARCH SEMINAR IN COLONIAL BRITISH AMERICA AND EARLY UNITED STATES
Greene
Graduate students only

100.677 RESEARCH SEMINAR IN EARLY MODERN BRITISH AMERICA
Greene
Graduate students only
HISTORY

100.699 SOCIAL ETHICS IN AMERICAN THOUGHT Ross Limit 6 Per. Req’d. Taught with 100.449 Sec. 01 M 10-12

100.709 MODERN LATIN AMERICA Knight Reading knowledge of Spanish. Graduate Students only Sec. 01 W 2-4

100.711 TOPICS IN BRAZILIAN HISTORY Russell-Wood Sec. 01 MT 10:30-12

100.721 TOPICS IN AFRICAN HISTORY Berry Topics and debates in historical writings on Africa and interdisciplinary approaches to African history. Will emphasize environmental themes and political economy in fall 2006. Sec. 01 T 10-12

100.726 THE CITY AND THE SEXES Ryan Seminar will explore the interaction between urban history and the history of gender with a focus on 19th and 20th century America. Sec. 01 T 4-6pm

100.735 EARLY MODERN BRITAIN Marshall Sec. 01 TBA

100.746 HISTORY OF SOUTH AFRICA Larson Explores the major historiographical issues in the history of Southern Africa. Sec. 01 T 10-12

100.750 THE REVOLUTIONARY SELF, FRANCE 1750-1830 Reil This course will examine changing concepts of the self and changing forms of “self-presentation” in philosophical texts, memoirs, letters, and literature. Sec. 01 Th 2-4

100.763 SEMINAR: COMPARATIVE WORLD HISTORY Staff Sec. 01 T 4-6pm

100.767 LONDON WORLD CITY, 1880-1960 Walkowitz Limit 12 The following themes are explored: urban cultural theory, print culture and urban identity, the built environment, policing, sexual scandal, popular entertainments and erotic pleasure, consumer culture, cultural imperialism, the experience of war, social democracy, and the emergence of a multi-racial urban society Sec. 01 T 10-12

300.659 PSYCHOANALYSIS AND ART HISTORY Fried / Leys Limit 20 Cross-listed with German & Romance Languages, the Humanities Center, and Philosophy Sec. 01 T 1-4

212.761 BOOKS, READERS, AND WRITERS IN PRE-MODERN EUROPE Celenza / Izbicki Limit 15 Prereq: Basic reading knowledge of Latin or Perm. Req’d. Cross-listed with Classics, German, the Humanities Center, and Romance Languages Sec. 01 T 4-6pm

The following seminars are for Graduate students only

100.781 THE SEMINAR Staff Sec. 01 M 4-6pm

100.783 SEMINAR: MEDIEVAL EUROPE Sec. 01 Th 4-6pm

100.785 SEMINAR: EARLY MODERN EUROPE Sec. 01 Th 4-6pm

100.787 SEMINAR: MODERN EUROPE Sec. 01 Th 4-6pm

100.789 SEMINAR: AMERICAN Sec. 01 W 4-6pm

100.791 SEMINAR: LATIN AMERICAN Sec. 01 T 4-6pm

100.793 SEMINAR: AFRICAN Staff Sec. 01 T 4-6pm

100.801 DISSERTATION RESEARCH

100.803 INDEPENDENT STUDY

HISTORY OF ART

010.101 (H) INTRODUCTION TO THE HISTORY OF EUROPEAN ART- PART I: (H) Maguire Limit 35 per section A survey of painting, sculpture, and architecture from the Renaissance to the present. Sec. 01 T 10:30-12 Lec. ThF

010.102 INTRODUCTION TO THE HISTORY OF EUROPEAN ART- PART II: (H) Maguire Limit 35 per section A survey of painting, sculpture, and architecture from the Renaissance to the present. Sec. 01 M 10:30-12 Lec. ThF

010.103 INTRODUCTION TO THE HISTORY OF EUROPEAN ART- PART III: (H) Maguire Limit 35 per section A survey of painting, sculpture, and architecture from the Renaissance to the present. Sec. 01 W 10:30-12 Lec. ThF
HISTORY OF ART

010.121 (H) 19TH CENTURY EUROPEAN ART
(3) Forgione
Course surveys artistic trends and innovations in 19th-century Europe, including artists associated with movements such as Neoclassicism, Romanticism, Realism, Impressionism, and Post-Impressionism.
Sec. 01 MTW 12

010.170 (H) AMERICAN ART, 1607 - 1860 (3)
Maynard
American painting and sculpture have undergone many transformations from the time of settlement to the present. Reference will be made to outstanding holdings at area museums plus Homewood and Evergreen.
Sec. 01 Th 12-3

010.305 (H) ARCHITECTURE IN AMERICA AND BRITAIN, 1600-1850 (3)
Maynard
Limit 40
As Americans forged their cultural identity, their architecture developed as well, following patterns in Britain, from late-medieval to Georgian, Gothic, and Greek Revival.
Attention will be given to Homewood House.
Sec. 01 Th 4-7pm

010.354 (H) PRINTS AND PRINT CULTURE IN EARLY MODERN EUROPE (3)
Rodini
Limit 25
Printing revolutionized Renaissance visual culture, impacting how images were produced and consumed. Regular visits to the BMA print room will enhance this survey of prints, printmakers, and print technology.
Sec. 01 ThF 10:30-12

010.366 (H) NATIVE AMERICAN ART (3)
Deleonardis
Limit 25
Survey of the principal visual arts of North America (1500 BC - AD 1600). Introduction to interpretive theory and methodology. Collections study in local and regional museums.
Sec. 01 MTW 10

010.379 (H) HELLENISTIC ART (3) Koortbojian
Limit 25
Cross-listed with Classics
Sec. 01 MTW 11

010.390 (H) ART MUSEUM POLICY AND PRACTICE (3) Maguire, E.
Limit 15
Hands-on seminar looks behind the scenes at displays and exhibitions, museum operations and programs, as signs of current thinking about what art, past and present, may be.
Cross-listed with Classics, Museum Studies, and Near Eastern Studies
Sec. 01 Th 2-5

010.411 (H) ART COLLECTING AND THE RISE OF THE MUSEUM (3) Campbell
Limit 15
Case studies ranging from the Renaissance studiolo and kunstkammer, the Uffizi and the Roman College Museum in the 1600s, the formation of state museums in nineteenth century Europe. Can be taken as part of the Program in Museums and Society.
Cross-listed with Museum Studies
Sec. 01 F 12-3

010.501 INDEPENDENT STUDY

010.521 (H) HONORS THESIS Staff
Open to students by arrangement with a faculty advisor in the History of Art Department. Interested students should review the program description available in the department office.

010.599 INTERNSHIPS-HISTORY OF ART Satisfactory/Unsatisfactory only
Cross-listed with Museum Studies

010.618 TOPICS IN 19TH CENTURY ART Armstrong
(3) Armstrong
Topics in 19th-century French art and aesthetics. Still life painting and photography from Chardin to Picasso. This course will consider the genre of painting that was the lowest on the old hierarchy of genres as a site of contemplation of the following themes of modernity and modernism: materiality and
HISTORY OF ART

 commodification, medium-specificity, the gendering of the private sphere, fetishism, fantasy and displacement, subject/object relations, relations between the optical and the tactile, and the transformation of the artist’s studio.

010.649 MANTEGNA AND THE RENAISSANCE COURT ARTIST
Campbell Limit 15 Mantegna’s work will be considered in the context of humanist and antiquarian culture of Padua and Mantua, and the cultural politics of Italian princely states.

Sec. 01 W 4-6pm

010.660 IMAGERY OF THE ROMAN DEAD
Koortbojian Limit 15 Cross-listed with Classics

Sec. 01 M 3-5

010.661 THE TWELFTH-CENTURY COURTS AT CONSTANTINOPLE AND PALERMO Maguire, H. Limit 15 This seminar will study the visual culture of two medieval courts, at Constantinople and Palermo, examining architecture, mosaics, paintings, textiles and ivory carvings in their social and political contexts.

Sec. 01 W 2-4

010.676 PROBLEMS IN ROMANESQUE ART: ASSESSMENT OF INTERPRETATIVE STRATEGIES
Kapler Limit 15 This seminar will consider the varieties of approaches to Romanesque imagery.

Sec. 01 Th 2-4

010.688 PSYCHOANALYSIS AND ART HISTORY Fried / Loy A consideration of major art historical and interpretive texts that make use of psychoanalysis. No prior knowledge of psychoanalysis is required. Authors include: Freud, Laplanche and Pontalis, Melanie Klein, Winnicott, Laplanche, Wollheim, Clark, Steinberg, Bensusan, and Anne Wagner.

Sec. 01 T 1-4

040.603 CLASSICAL VASE-PAINTING IN THE WALTERS ART MUSEUM Shapiro Limit 10 Cross-listed with Classics

Sec. 01 T 2-4:30

010.801 SPECIAL RESEARCH AND PROBLEMS

010.803 INDIVIDUAL WORK

HISTORY OF SCIENCE AND TECHNOLOGY

140.105 (H,S) HISTORY OF MEDICINE
Lec. MT 10

ANTiquITY TO SCIENTIFIC REVOLUTION (3) Staff
Sec. 01 W 10
Sec. 02 W 10
Sec. 03 W 10

Limit 20 per section. Course provides an overview of the medical traditions of six ancient cultures; the development of Greek and Islamic traditions in Europe; and the reform and displacement of the Classical traditions during the Scientific Revolution. Cross-listed with Public Health Studies

140.111 (H,S) FRESHMEN SEMINAR: THE BOMB Leslie Limit 15 Freshmen only We will explore the science and technology behind the atomic bomb, the decision to use it on Japan, and the development of thermonuclear weapons in the postwar era. We will look at the bomb in film and fiction, at nuclear proliferation, and at efforts to harness the bomb for peaceful applications. We will pay particular attention to the parallel histories of the nuclear age in the US and the former USSR, including the rise of atomic cities, atomic testing, and the bomb’s environmental legacy.

Sec. 01 T 2-5
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>140.321 (H,S)</td>
<td>THE SCIENTIFIC REVOLUTION (3)</td>
<td>Lec. MT 11</td>
<td>Sec. 01 W 11</td>
<td>Lec. MT 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Course concerns developments in early modern Europe known as the Scientific</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Revolution. Topics include cosmology, astronomy, mechanics, natural history,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and chemistry and issues involving magic, technology, humanism, and the social</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>content of early modern science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.346 (H,S)</td>
<td>HISTORY OF CHINESE MEDICINE (3)</td>
<td></td>
<td>Sec. 01 MTW 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How did Chinese conceptualize the human body, health and disease over the past 2,000 years? How did these concepts change over time and differ according to region? Why do gender, class, and place matter? Who practiced medicine in China, what did they practice, where, and how do we know what we know about them? These are some of the questions students will engage by discussing the most recent historical, anthropological, and philosophical scholarship on the history of medicine in China and reading a wide range of primary sources on Chinese medicine in English translation. Cross-listed with Public Health Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.350 (H,S)</td>
<td>JAPAN AND THE ENVIRONMENT (3)</td>
<td></td>
<td>Sec. 01 M 2-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examines traditional attitudes to nature, tensions between economic growth and the environment, and the shift from domestic to global environmental concerns.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.361 (H,S)</td>
<td>INTRODUCTION TO MATERIAL CULTURE: THE PET IN EARLY AMERICA (3)</td>
<td></td>
<td>Sec. 01 ThF 10:30-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arthur/ Leslie - Limit 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>What evidence remains of life two hundred years ago? Readings, lecture, and primary research in manuscripts, printed materials, and object study will explore the non-human family members and livestock that were part of the scenery, especially as they relate to Homewood, the 1781 country house of the Carroll family. Directed student research will culminate in an exhibition that opens in early January.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.411 (H,S)</td>
<td>SENIOR RESEARCH SEMINAR (2)</td>
<td></td>
<td>Sec. 01 TBA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leslie</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.443 (H,S)</td>
<td>CONSTRUCTING SCIENTIFIC COMMUNITIES: JAPAN AND AMERICA (3)</td>
<td></td>
<td>Sec. 01 W 2-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kargon/Low - Limit 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>This seminar will explore comparatively the origins of the Japanese and American scientific communities in the period 1860-1920, with special attention to the interactions between them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>280.156 (H,S)</td>
<td>THE INVENTION OF TROPICAL DISEASE (3)</td>
<td></td>
<td>Sec. 01 WF 1-2:30</td>
<td>Freshmen only</td>
<td>Cross-listed with Public Health and Latin American Studies</td>
</tr>
<tr>
<td></td>
<td>Goodyear - Limit 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.501</td>
<td>INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140.601</td>
<td>HISTORY OF SCIENCE, MEDICINE, AND TECHNOLOGY: METHODS, APPROACHES, PERSPECTIVES</td>
<td></td>
<td>Sec. 01 Th 10-12</td>
<td>Kargon/Kingsland</td>
<td>An introductory course at the graduate level to the interpretation of historical evidence and to contemporary methods in the history of science, medicine, and technology.</td>
</tr>
<tr>
<td>140.617</td>
<td>SEMINAR IN THE HISTORY OF BIOLOGICAL SCIENCES</td>
<td></td>
<td>Sec. 01 M 2-4</td>
<td>Kingsland</td>
<td>Key developments in modern life sciences, mid-19th through late-20th century, including laboratory and field sciences. Open to senior undergraduates. Research paper required.</td>
</tr>
<tr>
<td>140.641</td>
<td>DEPARTMENTAL COLLOQUIUM</td>
<td></td>
<td>Sec. 01 Th 3-5</td>
<td>Kingsland/Comfort</td>
<td>Reports by faculty, students, and invited speakers.</td>
</tr>
<tr>
<td>140.643</td>
<td>CONSTRUCTING SCIENTIFIC COMMUNITIES: JAPAN AND AMERICA (3)</td>
<td></td>
<td>Sec. 01 W 2-5</td>
<td>Kargon/Low</td>
<td></td>
</tr>
</tbody>
</table>
This seminar will explore comparatively the origins of the Japanese and American scientific communities in the period 1860-1920, with special attention to the interactions between them.

140.710 SCIENTIFIC REVOLUTION Principe Lecture meets with 140.321. Sec. 01 Lec. MT 11 2-4
140.801 DIRECTED READING AND DISSERTATION Kargon TBA
140.811 DIRECTED READING AND DISSERTATION Kleppeland TBA
140.831 DIRECTED READING AND DISSERTATION Leslie TBA
140.835 DIRECTED READING AND DISSERTATION Principe TBA
140.837 DIRECTED READING AND DISSERTATION Law TBA
140.853 DIRECTED READING AND DISSERTATION Packard TBA
140.871 DIRECTED READING AND DISSERTATION Comfort TBA
140.875 DIRECTED READING AND DISSERTATION Hansson TBA
140.891 DIRECTED READING AND DISSERTATION Inoue TBA
140.893 DIRECTED READING AND DISSERTATION Fissell TBA
140.895 DIRECTED READING AND DISSERTATION Mooney TBA

**HUMANITIES**

300.311 (H) COMPARATIVE SENSIBILITIES: EAST & WEST (3) Rhee Limit 20 This course will examine the concept of literary sensibility through comparative readings of novels and poetry from Western (European, American) and Eastern (Chinese, Korean, Japanese) authors writing in the 19th and 20th centuries. Sec. 01 M 1-3
300.317 (H) INTRODUCTION TO COMPARATIVE DRAMA AND FILM (3) Macksey Limit 15 Sec. 01 WF 2-3:30
300.335 (H) PROUST AND PHILOSOPHY (3) de Vries Limit 20 In addition to the extensive reading of Marcel Proust’s In Search of Lost Time, with special focus on the novel’s use of philosophical tropes, this course will investigate its philosophical reception and significance. Readings will include Bergson, Benjamin, Beckett, Adorno, Jauss, Derrida, Levinas, Girard, deMan, Racineur, Pippin. Cross-listed with German & Romance Languages, and Philosophy Sec. 01 TBA
300.343 (H) BERGSON AND THE PROBLEM OF NOVELTY IN PHILOSOPHY (3) Marran Limit 20 What is the new? This course examines how Bergson has transformed philosophy asking the question of the production of the new. It will focus mainly on his understanding of the evolution of life forms in biology and its consequences for anthropology, politics, and psychology Readings will include: Henri Bergson, Creative Evolution, The Two Sources of Morality and Religion, The Creative Mind, and Stephen Jay Gould, The Structure of Evolutionary Theory. Cross-listed with Anthropology, German & Romance Languages, and Political Science Sec. 01 TBA
309.386 (H) GERMAN JEWISH THOUGHT SINCE THE ENLIGHTENMENT (3) Zohar Limit 15 Cross-listed with German, Jewish Studies, and History Reading hour Sec. 01 W 3-5pm TBA
HUMANITIES

212.379 (H) THE INTELLECTUAL WORLD OF THE ITALIAN RENAISSANCE (3) Celenza Limit 15 Cross-listed with History, Classics, Romance Languages, and Philosophy Sec. 01 W 11-1

300.501 INDEPENDENT STUDY Sec. 01

300.503 INDIVIDUAL HONORS WORK – Open only to Juniors admitted to the Honors Program Macksey/Staff Sec. 01

300.505 INDIVIDUAL HONORS WORK – Open only to Seniors admitted to the Honors Program Macksey/Staff Sec. 01

300.507 (H) (W) HONORS SEMINAR: METHODS IN HUMANISTIC STUDIES (2) Dechand A workshop on Honors projects in progress and their relation to methods in humanistic studies. Open only to students admitted to the Honors Program-Taught at Faculty’s home Sec. 01 Sun 3-5

300.525 (W) EDITORIAL INTERNSHIP (3) Macksey Admission by interview Satisfactory/ Unsatisfactory only Sec. 01 TBA

300.623 MIRACLES, EVENTS, EFFECTS de Vries Limit 20 The seminar will seek to establish a conversation between theologies of the miracle, philosophies of the event, and media theories of special effects. Readings will include St. Paul, St. Thomas Aquinas, Hume, Feuerbach, Benjamin, Wittgenstein, Davidson, Cavell, Badiou, Marion, Manovich, Piron, and others. Cross-listed with Anthropology, Philosophy, and Political Science Sec. 01 Th 1-4

300.639 PSYCHOANALYSIS AND ART HISTORY Fried/Lazy Limit 20 A consideration of major art historical and interpretive texts that make use of psychoanalysis. No prior knowledge of psychoanalysis is required. Authors include: Freud, Laplanche and Pontalis, Melanie Klein, Winnicott, Lacan, Kristeva, Schapiro, Wollheim, Clark, Steinberg, Bensani, and Anne Wagner. (Co-listed as 010.688) Cross-listed with German & Romance Languages, History, and Philosophy Sec. 01 T 1-4

300.640 IRONIC NARRITIVE: THEORIES AND PRACTICES Macksey Limit 20 Romantic, modern, and postmodern concepts of irony: verbal and situational insinuances “perpetual parabasis” and the limits of communication. Course meets at faculty’s home. Sec. 01 M 8-10:30pm

300.678 DIFFERENCE AND REPETITION AND ITS SOURCES Marrati Limit 20 This seminar analyzes Gilles Deleuze’s major book and its philosophical sources: Plato, Bergson, Kant, Leibniz, and others. Cross-listed with Philosophy, Political Science, Anthropology, German & Romance Languages Sec. 01 W 10-12:30


090.641 HEGEL: ON ETHICS AND THE THEORY OF TRAGEDY Monk Limit 12 Two month intensive course Cross-listed with German and Philosophy Sec. 01 M 3-6pm

090.656 THEORIZING EMOTIONALITY Pahl Limit 12 Cross-listed with Study of Women, Gender and Sexuality, German, and Philosophy Sec. 01 W 3-5pm

212.761 BOOKS, READERS, AND WRITERS IN PRE-MODERN EUROPE Celenza / Izbicki Prereq: Basic reading knowledge of Latin or Perm. Sec. 15 Cross-listed with Classics, History, and Romance Languages and German Sec. 01 T 4-6pm
HUMANITIES
300.800 INDEPENDENT STUDY
300.801 INDEPENDENT STUDY-FIELD EXAMS Staff
300.803 DISSERTATION RESEARCH Staff
300.805 LITERARY PEDAGOGY Staff

LANGUAGE TEACHING CENTER

ARABIC

375.115 BEGINNING ARABIC (4.5) Tahrawi/Staff
Sec. 01 MTWHF 9
Sec. 02 MTWHF 10
Sec. 03 MTWHF 11
Limit 18 per section Introductory course in speaking, listening, reading, and writing. Modern Standard Arabic. Presents basic grammatical structures and a basic vocabulary. Through oral-aural drill in classroom, tapes in Language Laboratory, and reading/writing exercises, students attain a basic level of competence on which they can build in subsequent years of study.

375.215 (H) INTERMEDIATE ARABIC (4) Tahrawi/Staff
Sec. 01 MTWHF 12
Sec. 02 MW 2:30-4:30
Limit 18 per section Prereq: 375.115-116 or equivalent
Permit Req'd. Designed to bring students up to competency level required for third/fourth year Arabic. Students will consolidate and expand their mastery of the four basic skills acquired in 375.115-116. More authentic material—written, audio, and visual—will be used, and culture will be further expanded on as a fifth skill.

375.301 (H) ADVANCED ARABIC (3) Tahrawi
Sec. 01 MTW
Limit 15 Prereq: 375.216 or equivalent
Permit Req'd. Designed to enhance students' ability to read, discuss, and write about various topics covered in traditional and contemporary Arabic texts.

375.501 INDEPENDENT STUDY - ARABIC

CHINESE

373.111 ACCELERATED BEGINNING CHINESE (3.5) Hsieh
Sec. 01 MWH 12
Sec. 02 MWH 1
Limit 18 per section Prereq: Existing demonstrable skills in spoken Chinese. Lab Req'd. For students who have significant, previously acquired ability to understand and speak Modern Standard Chinese. Course focuses on reading and writing. Teaching materials are the same as used in 373.115-116; however, both traditional and simplified versions of written Chinese characters are used.

373.115 BEGINNING CHINESE (4.5) Lievens
Sec. 01 MTWHF 10
Sec. 02 MTWHF 11
Sec. 03 MTWHF 12
Limit 15 per section Introductory course in Modern Standard Chinese. Goals: mastery of elements of pronunciation and control of basic vocabulary of 800-900 words and most basic grammatical patterns. Students work first with Pin-Yin system, then with simplified version of written Chinese characters. Note: Student with existing demonstrable skills in spoken Chinese should take 373.111-112.

373.211 (H) ACCELERATED INTERMEDIATE CHINESE (3.5) Staff
Sec. 01 MTW 10
Limit 15 Lab Req'd. For students who possess native-like abilities in comprehension and speaking. The course focuses on reading and writing. Students will work with either simplified or traditional characters.

373.215 (H) INTERMEDIATE CHINESE (4.5) Feng
Sec. 01 MTW 11
Sec. 02 MW 10:30-11:30
Limit 15 per section Consolidation of the foundation that students have laid in their first year of study and continued drill and practice in the spoken language, with continued expansion of reading and writing vocabulary and sentence patterns. Students will work with both simplified and traditional characters. Note: Students who have native-like abilities in comprehension and speaking should take
373.303 (H) CHINESE CALLIGRAPHY (3) Hsieh
Limit 25 This is an introductory course on Chinese brush writing. Knowledge of the Chinese language is useful but not essential. You will hear lectures on history, theory and techniques of brush writing plus aspects of Chinese culture associated with characters used. Remaining time will be used for hands-on practice. Taught in English
Sec. 01 Th 2-4:30

373.311 (H) HEROES AND HEROINES IN CLASSICAL CHINESE NOVELS (3)
Matthews Limit 50 Course examines the portrayal of male and female characters in traditional Chinese novels that are still popular today. Taught in English
Sec. 01 TTh 4-5:15

373.315 (H) UPPER INTERMEDIATE CHINESE (3.5)
Matthews/Hsieh Limit 18 per section
Prereq: 373.216 or equivalent
This two-semester course consolidates and further expands students' knowledge of grammar and vocabulary and further develops reading ability through work with textbook material and selected modern essays and short stories. Class discussions will be in Chinese as far as possible, and written assignments will be given.
Sec. 01 TTh 2-3:15
Sec. 02 MW 2-3:15

373.415 (H) ADVANCED CHINESE (3) Feng
Prereq: 373.315 Limit 15
Readings in modern Chinese prose, including outstanding examples of literature, newspaper articles, etc. Students should understand most of the readings with the aid of a dictionary, so that class discussion need not focus primarily on detailed explanations of grammar. Discussion, to be conducted in Chinese, will concentrate on the cultural significance of the readings' content.
Sec. 01 MW 4:15-5:30

ENGLISH AS A SECOND LANGUAGE
370.600 ORAL SKILLS FOR INTERNATIONAL TEACHING ASSISTANTS Shiffman
Limit 12 Perm. Req'd. No Auditors
Open to Graduate students only
Through a variety of communicative activities, prospective international teaching assistants work to improve fluency, accuracy, and intelligibility in speaking and increase listening comprehension for the classroom.
Sec. 01 MTW 10
Sec. 02 MTW 12

370.601 COMMUNICATION STRATEGIES IN THE AMERICAN CLASSROOM Shiffman
Limit 10 Perm. Req'd. No Auditors
Open to Arts and Science and Engineering Graduate students only
Prospective international teaching assistants work to improve their English language skills while familiarizing themselves with the culture of the American classroom and effective teaching strategies. Students are videotaped practice teaching.
Sec. 01 MTW 1

HINDI
381.101 BEGINNING HINDI (3) Saiwa
Limit 15 per section Lab Req'd.
Course focuses on acquisition of additional vocabulary and grammatical structures in culturally authentic contexts, listening, speaking, reading, and writing comprehension. No Satisfactory/Unsatisfactory
Sec. 01 MW 2-3:15
Sec. 02 MW 3:35-5

381.201 (H) INTERMEDIATE HINDI I (3) Ahluwalia
Limit 18 Prereq: 381.101-102 Course provides refinement of basic language skills in cultural context. Emphasis will be on expansion of vocabulary and grammatical structures and further development of communicative skills.
Sec. 01 TTh 2-3:15
HINDI CONVERSATION (3) Akhovalia
Limit 15 Prereq: 381.201-202. Advanced training in spoken Hindi for students who have completed Intermediate Hindi or have equivalent knowledge and fluency. Communicative activities such as task-oriented acts, role plays, and group discussions will assist in the development of good interactive skills.

INDEPENDENT STUDY - HINDI

SLOW-PACED BEGINNING JAPANESE (3) Nakao
Limit 15. Part one of a four-semester introductory course for students who want to study Beginning Japanese at a slower pace attending three classes rather than five classes per week. Lab required.

BEGINNING JAPANESE (4.5) Zon
Limit 15 per section
(Those who have conflict on Thurs. or Fri. due to lab work may attend a different section)
Goals of the course are mastery of pronunciation, basic grammar and vocabulary. Chinese characters, or Kanji, will be introduced. In addition to written exercises and texts, oral-aural drill in class and work in the language laboratory are important.

BEGINNING JAPANESE (4.5) Katagiri
Limit 15. Prereq: 378.215 or equivalent. Advanced training in spoken and written language, increasing their knowledge of more complex patterns. At completion, students will have a working knowledge of about 250 Kanji.

JAPANESE CONVERSATION (2.5) Katagiri

UPPER INTERMEDIATE JAPANESE (3.5) Zon
Limit 15. Prereq: 378.216. Lab Req’d. Emphasis shifts toward reading, while development of oral-aural skills also continues apace. The course presents graded readings in expository prose and requires students to expand their knowledge of Kanji, grammar, and both spoken and written vocabulary.

ADVANCED JAPANESE (3.5) Nakao
Limit 15. Prereq: 378.316 or equivalent. Lab Req’d. Emphasis shifts toward reading, while development of oral-aural skills also continues apace. The course presents graded readings in expository prose and requires students to expand their knowledge of Kanji, grammar, and both spoken and written vocabulary.

BEGINNING KISWAHILI (3) Maina
Limit 15. This introductory course focuses on vocabulary and presents some of the basic grammatical, phonological, and sociological elements of the Kiswahili language. Students are exposed to different facets of the cultures of eastern Africa (especially Tanzanian and Kenyan).

INTERMEDIATE KISWAHILI I (3) Maina
Limit 15. Prereq: 379.151. Beginning KISWAHILI. Introduces students to conversational and grammatical skills in the Kiswahili language. Lab work focuses on reading, writing, and speaking.

ELEMENTS OF KOREAN I (3) Kang
Limit 15. Focuses on improving speaking fluency to Limited Proficiency so that one can handle simple daily conversations with

KOREAN

LANGUAGE TEACHING CENTER
LANGUAGE TEACHING CENTER

confidence. It provides basic high-frequency structures and covers Korean holidays. No Satisfactory/ Unsatisfactory

380.201 (H) INTERMEDIATE KOREAN READING AND WRITING (3) Kang
Prereq: Existing demonstrable skills in spoken Korean Limit 18 Aims for improving writing skills with correct spelling. Reading materials of Korean people, places, and societies will enhance cultural understanding and awareness, including discussion on family trees.

380.301 (H) ADVANCED KOREAN I (3) Kang Limit 15 Emphasizes reading literacy in classic and modern Korean prose. By reading Korean newspapers and professional articles in one's major, it enables one to be well versed and truly literate.

PERSIAN

382.101 BEGINNING PERSIAN (3) Dehghan Limit 18 The basic modern Persian enables students to learn the Persian alphabet, phonology, morphology, and the basic syntax. Students will also learn reading, writing, and translating basic sentences. Course taught in Persian

RUSSIAN

377.131 ELEMENTS OF RUSSIAN I (4) Samilenko/ Czeczulin Limit 18 (per section) Designed to give students a firm foundation in the language, with special emphasis on the development of vocabulary, basic reading, and conversational skills.

377.208 (H) INTENSIVE INTERMEDIATE RUSSIAN (4) Czeczulin Limit 18 (per section) Prereq. 377.132 Intensive oral work; continued emphasis on grammar and reading comprehension. (Section 02 taught at Goucher College)

377.211 (H) INTRODUCTION TO RUSSIAN LITERATURE I (3) Samilenko Prereq: 377.135 Limit 18 A survey of the important periods of Russian literature from the advent of Christianity to the Russian Revolution. Genres include skazki, byliny, short prose works of the 18th century the poetry of Pushkin, Lermontov, Gogol, Turgenev. All readings are adapted to the intermediate level.

377.269 (H) THE RUSSIAN FAIRY TALE (3) Czeczulin (W) Limit 18 A survey course of Russian oral and subsequent written tradition using multimedia and presented against the background of the Indo-European tradition. Taught in English at Goucher College

377.395 (H) SEMINAR I: RUSSIAN CLASSICS (3) Samilenko Limit 18 Rotating topics in 20th century prose, poetry, drama, or film.

377.501 INDEPENDENT STUDY-RUSSIAN Samilenko

MATHEMATICS

110.105 (Q) INTRODUCTION TO CALCULUS (4) Staff Limit 25 per section This course starts from scratch and provides students with all the background necessary for the study of calculus. It includes a review of algebra, trigonometry, exponential and logarithmic functions, coordinates and graphs. Each of these tools will be introduced in its cultural and historical context. The concept of the rate of change of a function will be introduced. Not open to students who have studied calculus in high school.

110.106 (Q) CALCULUS I (FOR BIOLOGICAL AND SOCIAL SCIENCE) (4) Zhang/Song Limit 25 per section Differential and integral calculus. Includes analytic geometry, functions,

Sec. 01 MTW 11
Sec. 01 MTW 1
Sec. 01 MW 4-5:30
Sec. 01 MTWF 11
Sec. 02 MTWF 9:30-10:20
Sec. 01 MTWF 12
Sec. 02 MTWF 10:30-11:20
Sec. 01 MWF 10
Sec. 01 MWF 1:30-2:20
Sec. 01 T 12-2:30
Sec. 01 T 12-2:30
Sec. 01 MTW 10
Sec. 02 Th 10:30
Sec. 01 Th 9
Sec. 02 Th 10:50
Sec. 03 F 9
Sec. 04 F 12
limits, integrals and derivatives, introduction to differential equations, functions of several variables, linear systems, applications for systems of linear differential equations, probability distributions. Many applications to the biological and social sciences will be discussed.

**110.107 (Q)**  
**CALCULUS II (FOR BIOLOGICAL AND SOCIAL SCIENCE)**  
(4) Blais  
Lec. MTW 10  
Sec. 01 Th 9  
Sec. 02 Th 10:30  
Prereq: C- or better in Calculus I  
Limit 27 per section  
Differential and integral calculus. Includes analytic geometry, functions, limits, integrals and derivatives, introduction to differential equations, functions of several variables, linear systems, and applications for systems of linear differential equations, probability distributions.

**110.108 (Q)**  
**CALCULUS I (FOR PHYSICAL SCIENCES AND ENGINEERING)**  
(4) Gong  
Lec. MTW 10  
Sec. 01 Th 9  
Sec. 02 Th 10:30  
Prereq: C- or better in Calculus I  
Limit 28 per section  
Differential and integral calculus. Includes analytic geometry, functions, limits, integrals and derivatives, polar coordinates, parametric equations, Taylor's theorem and applications, infinite sequences and series. Some applications to the physical sciences and engineering will be discussed. The courses are designed to meet the needs of students in these disciplines.

**110.109 (Q)**  
**CALCULUS II (FOR PHYSICAL SCIENCES AND ENGINEERING)**  
(4) Popovici/ Song  
Lec. MTW 10  
Sec. 01 Th 9  
Sec. 02 Th 10:30  
Prereq: C- or better in Calculus I  
Limit 28 per section  
Differential and integral calculus. Includes analytic geometry, functions, limits, integrals and derivatives, polar coordinates, parametric equations, Taylor's theorem and applications, infinite sequences and series. Some applications to the physical sciences and engineering will be discussed. The courses are designed to meet the needs of students in these disciplines.

**110.113 (Q)**  
**HONORS ONE VARIABLE CALCULUS (4)**  
(4) Staff  
Lec. MTW 3  
Sec. 01 F 12  
Prereq: Calculus I  
Limit 35  
The student is provided with many historical examples of topics each of which serves as an illustration of and provides a background for many years of current research in number theory. This course also provides the student with concrete examples of general abstract concepts studied in 110.401-402. Primes and prime factorization, congruences, Euler's function, quadratic reciprocity, primitive roots, solutions to polynomial congruences (Chevalley's theorem), Diophantine equations including the Pythagorean and Pell equations, Gaussian integers, Dirichlet's theorem on primes.
## MATHEMATICS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.211 (Q)</td>
<td>HONORS MULTIVARIABLE CALCULUS (4)</td>
<td>Wilkin</td>
<td>35</td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.212 (Q)</td>
<td>HONORS LINEAR ALGEBRA (4)</td>
<td>Zucker</td>
<td>30</td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.225 (Q)</td>
<td>PUTNAM PROBLEM SOLVING (3)</td>
<td>Staff</td>
<td>10</td>
<td></td>
<td>Sec. 01</td>
<td>TTh</td>
<td>6:30-7:45pm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.302 (E,Q)</td>
<td>DIFFERENTIAL EQUATIONS WITH APPLICATIONS (4)</td>
<td>Shiffman</td>
<td>35</td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>Th</td>
<td>10:30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.311 (Q)</td>
<td>METHODS OF COMPLEX ANALYSIS (4.5)</td>
<td>Spruck</td>
<td>35</td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.369 (Q,N)</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY (4)</td>
<td>Morava</td>
<td>25</td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit per Section</th>
<th>Section(s)</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.401 (Q)</td>
<td>ADVANCED ALGEBRA I (4.5)</td>
<td>Consani</td>
<td>40</td>
<td></td>
<td>Sec. 01</td>
<td>MTW</td>
<td>11</td>
</tr>
</tbody>
</table>
MATHEMATICS

examples of rings and ideals.
Introduction to field theory. Linear
algebra over a field. Field extensions,
constructible polygons, non-
trisectability.

110.405 (Q)  ANALYSIS I  (4.5)  Mese  Limit 55
Prereq: Calculus III and Linear
Algebra This course is designed to
give a firm grounding in the basic tools
of analysis. It is recommended as
preparation (but may not be a
prerequisite) for other advanced
analysis courses. Real and complex
number systems, topology of metric
spaces, limits, continuity, infinite
sequences and series, differentiation,
Riemann-Stieltjes integration.

110.415 (Q)  HONORS ANALYSIS I  (4.5)  Sogge  Limit 25
Prereq: B+ or higher in
Calculus III and Linear Algebra. This
highly theoretical sequence in
analysis is reserved for the most able
students. The sequence covers the real
number system, metric spaces, basic
functional analysis, the Lebesgue
integral, and other topics.

110.427 (Q)  INTRODUCTION TO THE
CALCULUS OF VARIATIONS  (4)
DeSilva  Limit  25
Prereq: Calculus I, II and III The calculus of variations
is concerned with finding optimal
solutions (shapes, functions, etc.)
where optimality is measured by
minimizing a functional (usually an
integral involving the unknown
functions) possibly with constraints.
This introductory (self-contained)
course will cover one dimensional
problems (often geometric):
brachistochrone, geodesics, minimum
surface area of revolution,
isoperimetric problem, curvature
flows. The course in a seminar style
with active participation required.
Additional material as required (some
differential geometry of curves and
surfaces) holding prerequisites to a
minimum.

110.431 (Q)  INTRODUCTION TO KNOT
THEORY  (4)  Ching  Limit 25
Prereq: Calculus III and Math 401
recommended The theory of knots
and links is a royal road to modern
topology. Course begins with braids
and works up to knots and links. The
fundamental group of a knot or a link
complement will be the central
algebraic focus, and spanning surfaces
will be the main geometric tool.
Together these lead very intuitively to
topology groups (in low dimensions).

110.439 (Q)  INTRODUCTION TO
DIFFERENTIAL GEOMETRY
(4.5)  Spruck  Limit 35
Prereq: Calculus III, Linear Algebra
Theory of curves and surfaces in
Euclidean space: Frenet equations,
fundamental forms, curvatures of a
surface, theorems of Gauss and
Mainardi-Codazzi, curves on a surface;
introduction to tensor analysis and
Riemannian geometry; theorems
egregium, elementary global theorems.

110.443 (Q)  FOURIER ANALYSIS  (4.5)
Goldberg  Limit 25
Prereq: Calculus III, Linear Algebra. Recommend:
110.405. An introduction to the Fourier
transform and the construction of
fundamental solutions of linear partial
differential equations. Homogeneous
distributions on the real line: the Dirac
delta function, the Heaviside step
function. Operations with distributions:
convolution, differentiation, Fourier
transform. Construction of
fundamental solutions of the wave,
heat, Laplace and Schrödinger
equations. Singularities of fundamental
MATHEMATICS

110.480 (Q)  ELLIPTIC CURVES AND CRYPTOGRAPHY (4) Zhang
The topic of elliptic curves plays a central role in modern number theory. It has found a significant application in the most recent development of cryptography. This course covers the elementary theory of elliptical curves and its application to cryptography. Recommended for math majors who are interested in this area of number theory, as well non-math majors who want to have a mathematical understanding of elliptical curve cryptosystems.

110.601  ALGEBRA Ono  Limit 25
110.605  REAL VARIABLES Minicozzi  Limit 25  Prereq: 110.405, 110.413 or equivalent.
110.608  RIEMANN SURFACES Kong  Limit 25
110.615  ALGEBRAIC TOPOLOGY Boardman  Limit 25  Prereq: 110.401, 110.413
110.619  LIE GROUPS & LIE ALGEBRAS Shalika  Limit 25  Prereq: 110.402
110.631  PARTIAL DIFFERENTIAL EQUATIONS Minicozzi  Limit 25  Prereq: 110.605-606
110.635  MICROLOCAL ANALYSIS Zelditch  Limit 25  Prereq: 110.605
110.643  ALGEBRAIC GEOMETRY Consani  Prereq: 110.601-602
110.645  RIEMANNIAN GEOMETRY Mese  Limit 25
110.730  TOPICS IN COMPLEX GEOMETRY Wentworth  Limit 25
110.733  TOPICS IN ALGEBRAIC NUMBER THEORY Ono  Limit 25
110.737  TOPICS IN ALGEBRAIC GEOMETRY Shokurov  Limit 25
110.799  THESIS RESEARCH
110.800  INDEPENDENT STUDY - GRADUATES

MEDICINE TUTORIALS

These School of Medicine courses are open only to selected junior and senior premedical students with the approval of their faculty advisor and Preprofessional Advising, Garland Hall - Third Floor. Interdivisional registration is required.

A separate list of the tutorials to be offered will be available at the Registrar's Office after classes begin. Registration for these courses is accomplished by submitting an approved "add" slip and interdivisional registration form to Preprofessional Advising, as soon as possible after classes begin, and in any event, not later than the fourth week of classes.

Please note: No area code credit is given toward degree for the Medicine tutorials and all tutorials are graded Satisfactory/Unsatisfactory.

MILITARY SCIENCE

374.100  LEADERSHIP LAB (1) Butera  Required for all ROTC cadets  Limit 100
Students practice their leadership skills in a variety of settings to build a better understanding of leadership strengths and weaknesses and to provide a forum for discussion of leader development.
### MILITARY SCIENCE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Section</th>
<th>Credits</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>374.101 (S)</td>
<td>LEADERSHIP AND MANAGEMENT I (2)</td>
<td>01</td>
<td>2</td>
<td>Th</td>
<td>2-4</td>
</tr>
<tr>
<td></td>
<td>Langston</td>
<td>02</td>
<td></td>
<td>F</td>
<td>9-11</td>
</tr>
<tr>
<td></td>
<td>Coreq: 374.100 (non-ROTC students are not required to take the Leadership Lab)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 01 - Limit 20 - for ROTC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 02 - Limit 20 and Perm. Req’d.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Establishes a foundation of basic leadership fundamentals such as: problem solving, communications, effective writing, goal setting, improving speaking and listening skills, and an introduction to counseling.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>374.201 (H,S)</td>
<td>LEADERSHIP AND TEAMWORK I (2)</td>
<td>01</td>
<td>2</td>
<td>Th</td>
<td>12-2</td>
</tr>
<tr>
<td></td>
<td>Shackelford</td>
<td>02</td>
<td></td>
<td>F</td>
<td>11-1</td>
</tr>
<tr>
<td></td>
<td>Coreq: 374.100 (non-ROTC students are not required to take the Leadership Lab)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 01 - Limit 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 02 - Limit 20 and Perm. Req’d.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freshmen &amp; Sophomores only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Class examines how to build effective teams, various methods for influencing action, effective communication in setting and achieving goals, decision-making, creativity in problem solving, and providing feedback.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>374.301 (S)</td>
<td>LEADERSHIP &amp; TACTICAL THEORY I (2)</td>
<td>01</td>
<td>2</td>
<td>Th</td>
<td>2-4</td>
</tr>
<tr>
<td></td>
<td>Ballesteros</td>
<td>02</td>
<td></td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coreq: 374.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 01 - Limit 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 02 - Limit 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examines the role communications, values, and ethics play in effective leadership through application of principles in tactical scenarios. Emphasis is on improving written and oral communications skills and military tactics proficiency.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>374.401 (S)</td>
<td>PROFESSION OF ARMS I (2)</td>
<td>01</td>
<td>2</td>
<td>Th</td>
<td>12-2</td>
</tr>
<tr>
<td></td>
<td>Romaine</td>
<td>02</td>
<td></td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coreq: 374.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 01 - Limit 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sec. 02 - Limit 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study includes practical exercises on establishing an ethical command climate and developing values required of a professional officer. Students apply their leadership skills in the ROTC battalion and prepare for commissioning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>374.501 (W)</td>
<td>INDEPENDENT STUDY IN LEADERSHIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Romaine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coreq: 374.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limit 10 - ROTC students only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students select topics relevant to the study of military leadership and will complete a project based on current military doctrine and the contemporary operating environment of current military operations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>374.511 (W)</td>
<td>MILITARY SCIENCE INTERNSHIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Romaine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limit 10 - Perm. Req’d.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of credits awarded is based on project</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students will apply leadership principles learned to actual situations in the Military Science Department or in other settings in the Baltimore / Washington, DC area and will record observations in a professional journal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MUSIC

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Section</th>
<th>Credits</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>376.111</td>
<td>RUDIMENTS OF MUSIC THEORY AND MUSICHANSHIP I (3)</td>
<td>01</td>
<td>3</td>
<td>MTW</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Staff: Limit 15 per section</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>This course introduces written and aural music fundamentals including notation, scales, intervals, chords, rhythm, meter and sight-singing. Students will compose melodies and short pieces and complete listening projects. There are no prerequisites for this course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>376.211</td>
<td>MUSIC THEORY AND MUSICHANSHIP I (3)</td>
<td>01</td>
<td>3</td>
<td>MTW</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Staff: Prereq: Qualifying examination or 376.111</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Limit 15: Introduction to basic principles of tural music through listening, analysis and music making. Students study melody, harmony, voice leading, figured bass and dissonance treatment, and will also undertake short composition projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>376.212</td>
<td>MUSIC THEORY AND MUSICHANSHIP II (3)</td>
<td>01</td>
<td>3</td>
<td>MTW</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Staff: Prereq: 376.211</td>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Limit 15: This course continues the written and aural work of the previous course but focuses on chromatic harmony while continuing the study of melody, counterpoint and figured bass.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MUSIC THEORY AND MUSICIANSHIP III (3) Staff  Prereq: 376.212  Limit 15  Continuation of written and aural work of the previous two semesters. Projects in four-voice writing from figured bass and counterpoint in two and three voices are completed, using as models a variety of styles and composers. Students study simple binary, rounded binary and ternary forms, and compose a short work in a tonal idiom.

INTRODUCTION TO WESTERN CLASSICAL MUSIC (3) Staff  Limit 20 per section  Students will learn aural strategies to focus their listening, as well as vocabulary, cultural and historical context for music of the Baroque, Classical, Romantic and 20th century periods. Composers studied will include Bach, Handel, Haydn, Mozart, Beethoven, Schubert, Chopin, Brahms, Debussy, Schoenberg, and Stravinsky.

NEAR EASTERN STUDIES

ANCIENT NEAR EASTERN CIVILIZATION (3) Schwartz  Limit 50  Review of important issues in ancient Near Eastern history and culture from the Neolithic era to the Persian period. Included will be an examination of the Neolithic agricultural revolution, the emergence of cities, states and writing, and formation of empires. Cultures such as Sumer and Akkad, Egypt, the Hittites, Israelites, Assyrians, Babylonians, and Persians will be discussed.

ANCIENT EGYPTIAN CIVILIZATION (3) Bryan  Limit 50  Introduction to the monuments and culture of Egypt from 3500 B.C. to 100 A.D. From the pyramids at Giza to Hellenistic Alexandria, this course surveys in slide illustrated lectures the remains of one of the worlds greatest early cultures.

INTRODUCTION TO THE HEBREW BIBLE/Old Testament (3) Lewis  Limit 40  A critical and historical survey of the books of the Hebrew Bible (Old Testament) giving primary attention to the religious ideas they contain and the ancient contexts in which they were composed. Topics include: The Academic Study of Religion, Textual Criticism, Canaanite and Israelite Religion, Patriarchal Religion, The Tribal League, The Ideology of Kingship, Theology, Prophecy, Priestly Sources, Psalms, Wisdom Literature, and Apocalyptic Thought. Cross-listed with Jewish Studies

THE ARCHAEOLOGY OF THE HOLY LAND FROM THE DAWN OF CIVILIZATION TO THE END OF THE IRON AGE (3) Ivan  Limit 50  The course will cover the cultural history of the land of the Bible (Israel / Palestine / Jordan) from ca. 5000 to 587 BC. as revealed through archaeological research and will include the rise of Canaanite civilization, the emergence of the Israelites, and new information on the Philistine phenomenon. Cross-listed with Jewish Studies

HISTORY OF ANCIENT SYRIA-PALESTINE  McCurow  Limit 50  A survey of the history of Ancient Syria and Canaan, including Ancient Israel.

ANCIENT EGYPTIAN ART (3) Bryan  Limit 30  A survey of Egyptian art as seen
NEAR EASTERN STUDIES
in the temples, tombs, funerary, and minor arts of Egypt between 3000 and 100 B.C. Slide lectures will provide a survey of art from the Pyramids to Augustus Caesar and will focus on such topics as the principles of Egyptian art; can the term art apply to early Egypt? How were artisans trained and what techniques and materials were utilized in their work?

130.330(H) SEX AND THE GARDEN (3) Robbins
Limit 10 The history of the interpretation of Genesis 2-3.
Cross-listed with Jewish Studies and Studies of Women, Gender and Sexuality
Sec. 01 ThF 12:30-2

130.400 (H) INTRODUCTION TO MIDDLE EGYPTIAN (Hieroglyphs) (3) Jasnow
Limit 15 Introduction to the grammar and writing system of the classical language of the Egyptian Middle Kingdom (ca. 2055-1650 B.C.). In the second semester, literary texts and royal inscriptions will be read.
Sec. 01 TTh 2-4

130.440 ELEMENTARY BIBLICAL HEBREW (3) Kang
Limit 10 Survey of grammar and reading of simple texts. (Credit given only on completion of both semesters.) May not be taken on a satisfactory/unsatisfactory basis.
Cross-listed with Jewish Studies
Sec. 01 ThF 12-1:30

130.450 ELEMENTARY MODERN HEBREW (3) Braun
Limit 15 Credit given only on completion of both semesters. May not be taken on a Satisfactory/Unsatisfactory basis.
Cross-listed with Jewish Studies
Sec. 01 TTh 11

130.452 (H) INTERMEDIATE MODERN HEBREW (3) Braun
Limit 10 Reading of nonliterary and technical texts. Expository writing.
Cross-listed with Jewish Studies
Sec. 01 TTh 12

130.454 (H) ADVANCED MODERN HEBREW (3) Braun
Limit 10 Reading of nonliterary and technical texts. Expository writing.
Cross-listed with Jewish Studies
Sec. 01 TTh 1

010.390 (H) ART MUSEUM POLICY AND PRACTICE: INFORMATION IN THE ART MUSEUM (3) Maguire, E.
Limit 12
Cross-listed with History of Art and Classics
Sec. 01 T 2-5

130.501 READINGS AND RESEARCH (3) Staff

130.590 INDEPENDENT STUDY

131.622 ARCHAEOLOGY OF IRON AGE PALESTINE (3) Ilan
Limit 15 The course will survey Iron Age material culture, how it changed over time and what those changes represent from a social, political, and economic viewpoint. Our archaeological approach will be informed both by texts (biblical and extra-biblical) and anthropology. Out of the chaos of collapsing Late Bronze Age empires emerged new social and political entities such as Israelites, Philistines, Moabites and Ammonites. How were these similar and how where they different? Can archaeology discern ethnicity? How did the region’s first territorial states develop and what is the archaeological expression of a state society in Palestine? How do military conquests and population transfers appear in the archaeological record? To what degree do archaeology and the biblical text converge and diverge? Which chronology is correct, the traditional one or the new low chronology? Did Kings David and Solomon exist? Cross-listed with Jewish Studies
Sec. 01 F 2-4

131.634 SEMINAR IN NEAR EASTERN ARCHAEOLOGY (3) Schwartz
Topic varies but can include the archaeology of Mesopotamia, Syria, or Palestine, of thematic discussions (e.g., on ideology, state collapse, etc.).
Sec. 01 T 10-12

131.800 READINGS AND RESEARCH Sec. 01 • Staff  Sec. 04 - Schwartz Sec. 02 - McCarter  Sec. 06 - Bryan Sec. 05 - Lewis  Sec. 07 - Cooper  Sec.08 - Westbrook  Sec. 08 – Jasnow
131.848  DISSERTATION RESEARCH
Sec. 01 - Bryan  Sec. 04 - Cooper
Sec. 02 - Schwartz  Sec. 05 - Westbrook
Sec. 03 - McCarter  Sec. 06 - Lewis
Sec. 07 - Jasnow

132.630  LITERARY AND RELIGIOUS TEXTS
Cooper  We will read the Babylonian Epic of Creation, Enuma Elish, in the original cuneiform.

132.680  NEO-BABYLONIAN
Westbrook  Sec. 01  W 4-6pm

132.700  ELEMENTARY SUMERIAN
Kleinerman  Sec. 01  TBA

132.710  ADVANCED SUMERIAN
Cooper  We will read Letter Collection B and related materials in the original cuneiform.

132.800  MESOPOTAMIAN SEMINAR
Cooper/Schwartz/Westbrook  Research and discussion on topics of current interest.

133.600  INTRODUCTION TO MIDDLE EGYPTIAN (Hieroglyphic).
Jasnow  Limit 15  Introduction to the grammar and writing system of the classical language of the Egyptian Middle Kingdom (ca. 2135-2000 B.C.). In the second semester, literary texts and royal inscriptions will be read.

133.610  MIDDLE EGYPTIAN TEXTS
Bryan/Jasnow  Sec. 01  Th 9-12

133.648  INTRODUCTION TO COPTIC
Jasnow  Sec. 01  M 1-3

133.656  ADVANCED DEMOTIC
Jasnow  Sec. 01  M 9-11

134.660  HISTORY OF SYRIA / PALESTINE
McCarter  A survey of the history of Ancient Syria and Canaan, including Ancient Israel.
Cross-listed with Jewish Studies  Sec. 01  MW 2 plus 1 hour TBA

134.700  NORTHWEST SEMITIC EPIGRAPHY
McCarter  Cross-listed with Jewish Studies

NEUROSCIENCE

080.205 (N)  SYSTEMS NEUROSCIENCE (3) Hendry
Limit 130  Prereq: 080.101, 200.118, 080.203 or 200.141  The brain and spinal cord work as integrated units to achieve perception, movement and memory. This course presents a complete survey of sensory and motor systems, each of the memory systems and the control of emotive behavior. Both the structure of the central nervous system of other species will be discussed, however, where they contribute to an understanding of structure and function.
Cross-listed with Behavioral Biology  Sec. 01  TTh 2-3:30

080.250 (N,S)  NEUROSCIENCE LAB: A PRACTICAL APPROACH (CMJST)(CG) (3) Gorman/Fortune
Limit 20 per section Prereq: 080.205  This course will give students the "hands-on" experience of the inter-disciplinary nature of neuroscience. Students will use anatomical and neuro-physiological techniques to understand the basic underlying principles of neuroscience.
Sec. 01  T 9-12
02  T 1-4
03  W 1-4

080.304 (N)  CELLULAR AND MOLECULAR NEUROSCIENCE (3) Hatter/Zhao
Limit 120  Prereqs: 020.151-154, or 020.305-306 and 020.315-316  This course is a survey of the mechanisms through which the nervous system receives sensory signals, transmits signals from neuron to neuron, and drives the activity of target tissues such as glands and muscles. Topics include the molecular basis of the action potential, effect of cell shape and
myelination on conduction of action potentials, mechanisms regulating neurotransmitter release, structure and function of neurotransmitter receptors, modulation of neuronal functions, sensory transduction, and muscle contraction. The molecular basis of genetic disorders involving nerve and muscle function will also be studied. Cross-listed with Biology.

080.330 (N)  BRAIN INJURY AND RECOVERY OF FUNCTION (CM)(ST) (3) Gorman
Prereq: 080.203, 080.205 & 080.304 or Perm. Req'd Limit 30
This course investigates numerous types of brain injuries and explores the responses of the nervous system to these injuries. The course's primary focus is the cellular and molecular mechanisms of brain injury and the recovery of function. Discussions of traumatic brain injury, stroke, spinal cord, and tumors, using historical and recent journal articles, will facilitate students' understanding of the current state of the brain injury field. Cross-listed with Psychological and Brain Sciences and Behavioral Biology.

080.335 (N)  NEUROSCIENCE OF PAIN (ST) (3) Haythornthwaite
Limit 25
Prereq: 080.205 or 200.141
Course will focus on the neurobiological mechanisms and psychological aspects of pain. Experimental (animal & human) and clinical models and methods will be discussed throughout. Cross-listed with Psychological and Brain Sciences.

080.352 (N)  PRIMATE BRAIN FUNCTIONS (3) Hendry
Limit 35
Prereq: 080.205
Neuroscience is approaching the time when it can offer a compelling explanation for how the brain works. This course takes advantage of work done in humans and non-human primates to survey concepts in sensory perception, motor command, and memory mechanisms. Lectures are given by faculty whose research explores these issues. Each subject is explored as a three-lecture sequence: 1) a background lecture that lays out the general principles and overriding questions of the field; 2) an in-depth lecture that covers the most recent scientific literature; and 3) a summary lecture that brings together the major questions and their Resolution. Cross-listed with Psychological and Brain Sciences.

080.411 (N)  ADVANCED SEMINAR IN NEUROSCIENCE I (3) Yoshioka
For students in 4th year of the BA/MS Program Perm. Req'd.

080.412 (N)  ADVANCED SEMINAR IN NEUROSCIENCE I (3) Yoshioka
For students in 4th year of the BA/MS Program Perm. Req'd.

080.413 (N)  ADVANCED SEMINAR IN NEUROSCIENCE I (3) Yoshioka
For students in 4th year of the BA/MS Program Perm. Req'd.

080.414 (N)  ADVANCED SEMINAR IN NEUROSCIENCE I (3) Yoshioka
For students in 4th year of the BA/MS Program Perm. Req'd.

080.419 (N)  ADVANCED SEMINAR IN NEUROSCIENCE I (1) Yoshioka
For students in 4th year of the BA/MS Program Perm. Req'd.

080.511  INDEPENDENT STUDY

080.531  RESEARCH IN NEUROSCIENCE B FRESHMEN

080.541  RESEARCH IN NEUROSCIENCE B SOPHOMORES

080.551  RESEARCH IN NEUROSCIENCE B JUNIORS

080.561  RESEARCH IN NEUROSCIENCE B
INTRODUCTION TO COGNITIVE NEUROPSYCHOLOGY (3) McCloskey
Limit 25 Cross-listed with Cognitive Science
Sec. 01 ThF 10:30-12

GENETICS (CM) (3) Hoyt/ Cunningham
Prereq: 020.305 Limit 325
Cross-listed with Biology
Sec. 01 MTW 10

BEHAVIORAL ENDOCRINOLOGY (CM)(ST) (3) Ball
Prereq: 200.141 or 080.205 or Perm. Req’d.
Cross-listed with Behavioral Biology and Psychological & Brain Sciences
Sec. 01 ThF 10:30-12

CELLULAR AND MOLECULAR PHYSIOLOGY (3) Cone
Prereq: 020.305 Cross-listed with Biology and Biophysics
Sec. 01 MTW 11

MENTORED RESEARCH IN NEUROSCIENCE Yoshioka
For students in the BA/MS Program Perm. Req’d.
Sec. 01 TBA

MENTORED RESEARCH IN NEUROSCIENCE Yoshioka
For students in the BA/MS Program Perm. Req’d
Sec. 01 TBA

MENTORED RESEARCH IN NEUROSCIENCE Yoshioka
For students in the BA/MS Program Perm. Req’d
Sec. 01 TBA

CELLULAR AND MOLECULAR NEUROSCIENCE Hutter/ Zhao
Taught with 080.304 Limit 50
Prereq: 171.102 or 104 and 020.305, or permission of instructor Coreq: 020.306
Cross-listed with Biology
Sec. 01 MW 3:30-5

READINGS IN SYSTEMS NEUROSCIENCE Connor Limit 10
Perm. Req’d This is a graduate-level seminar series on current literature in systems neuroscience. It also serves as a discussion group/journal club for students and faculty at the Krieger Mind/Brain Institute, and is open to the wider systems/cognitive neuroscience community at Homewood and other Hopkins campuses. Each week, a student or faculty member will present a recent article selected in consultation with the course directors. The selected readings will focus on the neural mechanisms of perception, attention, motor behavior, learning and memory.
Sec. 01 W 5pm

PHILOSOPHY

PHILOSOPHIC CLASSICS (3) Williams
Historical introduction to reading and doing philosophy by way of critically examining selected classic texts in the Western philosophical tradition. Philosophers to be examined include Plato, Descartes, Hume, Kant, and Nietzsche.
Sec. 01 M 11
Lec. Sec. 02 M 12
Sec. 03 M 1
Sec. 04 T 11
Sec. 05 T 12
Sec. 06 T 1
Sec. 07 M 1
Sec. 08 T 1

FRESHMEN SEMINAR ON CONSCIOUSNESS (3) Williams (Meredith)
Limit 15 Freshmen Only The key questions concerning consciousness are: Can consciousness be something natural, e.g., a neurophysiological property or a cognitive property of certain complex organisms or a biologically emergent property? How is the consciousness of animals and humans the same or different? What is the relation of consciousness to our sense of self? We shall examine several attempts to answer these questions, including those who think that consciousness is a mystery.
Sec. 01 MTW 9

INTRODUCTION TO GREEK
OLYMPIC (3) Irv Limit 20 per section
A survey of the earlier phase of Greek philosophy. Socrates, Plato, and Aristotle will be discussed, as well as two groups of thinkers who preceded them, usually known as the pre-
### PHILOSOPHY

**150.219 (H)** *PHILOSOPHY OF BIOETHICS*  (3)  Rock  Limit 20 per section  
Introduction to a wide range of moral issues arising in the biomedical fields, e.g., physician-assisted suicide, human cloning, abortion, surrogacy, and human subjects research. 
Cross listed with Public Health Studies

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>M</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>T</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>M</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>T</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>M</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>W</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>M</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>W</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>T</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**150.245 (H)** *PHILOSOPHY OF MIND: SELF-KNOWLEDGE*  (3)  Tumulty  Limit 35  
How is your knowledge of yourself different from your knowledge of other people? This question will organize our approach to key questions about the relation between the mind and the body, between emotion and belief, and about the nature of perception.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MTW</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**150.405 (H)** *HISTORY OF MODERN PHILOSOPHY: RENAISSANCE THROUGH KANT*  (3)  Greenberg  Limit 35  
Prereq: 150.205 or equivalent or Perm Req’d. An examination of selected texts by Descartes, Malebranche, Locke, and Berkeley.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>T</td>
<td>1-4</td>
<td></td>
</tr>
</tbody>
</table>

**150.419 (H)** *KANT’S CRITIQUE OF JUDGEMENT*  (3)  Forster  Limit 35  
A close study of both parts of Kant’s third Critique, Aesthetics and Telology and their significance for post-Kantian philosophy.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>T</td>
<td>9-10</td>
<td></td>
</tr>
</tbody>
</table>

#### Additional Courses

**150.420 (H,Q)** *INTERMEDIATE SYMBOLIC LOGIC*  (4)  Rynasiewicz  
Limit 35 Prereq: Experience in Math Logic  
Includes topics covered in 150.218 but with an introduction to meta-theory

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MTW</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>F</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**150.422 (H,Q)** *AXIOMATIC SET THEORY*  (3)  Rynasiewicz  
Limit 35 Prereq: 150.421 or a sufficient level of mathematical maturity  
Axiomatic development of set theory, including the theory of transfinite ordinals and cardinals. Relative consistency proofs. Independence of the axiom of choice, and of the continuum hypothesis. Implications for the foundations of mathematics.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MTW</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**150.431 (H)** *PHILOSOPHY OF SCIENCE*  (3)  Achinstein  
Limit 35  
An examination of basic concepts underlying thought and practice in the natural and social sciences, such as scientific methods, the verification of hypotheses, explanation, and the role and status of scientific theories. Readings will be from philosophers of science past and present.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>ThF</td>
<td>10:30-12</td>
<td></td>
</tr>
</tbody>
</table>

**150.440 (H)** *PHILOSOPHY OF LANGUAGE, PART I: FROM FREGE TO QUINE*  (3)  Tumulty  
Limit 35  
This course surveys 20th century analytic philosophy of language and focuses on the themes of meaning, understanding, truth, and reference. This course is self-contained but will be followed by 150.441 Philosophy of Language, Part II: From Quine to the Present Day.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MTW</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**150.451 (H)** *ETHICAL THEORIES*  (3)  Jenkins  
Limit 35  
This course features, first, close readings of the classic texts (by Aristotle, Kant, and Mill) behind philosophy’s dominant attempts to systematically order, explain and justify ethical life; and, second, an examination of contemporary attempts to ground theory in considerations of virtue and character.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MTW</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**150.467 (H)** *ABSTRACT PHILOSOPHY AND PRACTICAL LIFE*  (3)  Smith  
Limit 20  
This course examines the ways in which philosophical ideas about knowledge and reality can influence ethics, politics, and everyday life. Readings will be from Plato, Marcus Aurelius, Thmas Hobbes, and William James.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MTW</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**191.420 (S)** *SPEED AND POLITICS*  (3)  Glezos  
Limit 15  
Prereq: Junior or Senior standing or permission of instructor.

<table>
<thead>
<tr>
<th>Section</th>
<th>Days</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>W</td>
<td>2-5</td>
<td></td>
</tr>
</tbody>
</table>

Cross-listed with Political Science
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Limit</th>
<th>Cross-listed Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>300.335 (H)</td>
<td>PROUST AND PHILOSOPHY (3)</td>
<td>deVries</td>
<td></td>
<td>Cross-listed with German &amp; Romance Languages, and Humanities Center</td>
</tr>
<tr>
<td>212.379 (H)</td>
<td>THE INTELLECTUAL WORLD OF THE ITALIAN RENAISSANCE, (3) Celenza</td>
<td></td>
<td></td>
<td>Cross-listed with Classics, History, Humanities, and Romance Languages</td>
</tr>
<tr>
<td>360.133 (H)</td>
<td>GREAT BOOKS: WESTERN TRADITION OR THE HUMANITIES, A TRADITION OF CLASSICS (3)</td>
<td>Bett / Biddle / Talle / Valladares</td>
<td></td>
<td>Cross-listed with Classics, Interdepartmental, Music, and Writing Seminars.</td>
</tr>
<tr>
<td></td>
<td>Chosen topics. Some cross-list.</td>
<td></td>
<td>20</td>
<td>Limit 20 per section.</td>
</tr>
<tr>
<td></td>
<td>Limits vary by section.</td>
<td></td>
<td></td>
<td>Open to all Undergraduates</td>
</tr>
<tr>
<td></td>
<td>Sec. 01 TBA</td>
<td></td>
<td></td>
<td>Sec. 02 TBA 10:30-12</td>
</tr>
<tr>
<td></td>
<td>Sec. 03 TBA 10:30-12</td>
<td></td>
<td></td>
<td>Sec. 04 TBA 10:30-12</td>
</tr>
<tr>
<td>150.511</td>
<td>DIRECTED STUDY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150.551</td>
<td>HONORS PROJECT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150.618</td>
<td>TOPICS IN THE HISTORY OF PHILOSOPHY (3) Greenberg</td>
<td></td>
<td></td>
<td>Consideration of Early Modern discussions of FREEDOM</td>
</tr>
<tr>
<td>150.621</td>
<td>SEMINAR IN HEGEL'S PHENOMENOLOGY OF SPIRIT (Part one of two part course)</td>
<td>Förster</td>
<td></td>
<td>Limit 35 A two semester course devoted to Hegel's masterpiece The Phenomenology of Spirit. Students should have read the book at least once before class begins.</td>
</tr>
<tr>
<td>150.637</td>
<td>SEMINAR IN THE THEORY OF KNOWLEDGE (3) Williams (Michael)</td>
<td></td>
<td></td>
<td>This seminar will examine problems of knowledge and perception.</td>
</tr>
<tr>
<td>150.639</td>
<td>SEMINAR IN THE PHILOSOPHY OF MIND: CONCEPTS (3) Williams (Meredith)</td>
<td></td>
<td></td>
<td>This will be an examination of contemporary theories of concepts, drawing on both philosophical and psychological literature. We will consider both robust theories of concepts as well as deflationary accounts.</td>
</tr>
<tr>
<td>040.601</td>
<td>MYTHOLOGY OF THE GREEK GODS: HERMES AND APOLLO (3) Detienne</td>
<td></td>
<td></td>
<td>Cross-listed with Anthropology, Classics, and the Humanities Center</td>
</tr>
<tr>
<td>030.623</td>
<td>MIRACLES, EVENTS, EFFECTS (3) deVries</td>
<td></td>
<td></td>
<td>Limit 20 Cross-listed with Anthropology, the Humanities Center, and Political Science</td>
</tr>
<tr>
<td>030.639</td>
<td>PSYCHOANALYSIS AND ART HISTORY (3) Fried / Lays</td>
<td></td>
<td></td>
<td>Limit 20 Cross-listed with History, the Humanities Center, and Romance Languages and German</td>
</tr>
<tr>
<td>090.641</td>
<td>HEGEL ON ETHICS AND THE THEORY OF TRAGEDY (3) Mendle</td>
<td></td>
<td></td>
<td>Limit 12 Two month intensive course</td>
</tr>
<tr>
<td>090.656</td>
<td>THEORIZING EMOTIONALITY (3) Pahl</td>
<td></td>
<td></td>
<td>Limit 12 Cross-listed with Study of Women, Gender and Sexuality, the Humanities Center, and German</td>
</tr>
<tr>
<td>300.678</td>
<td>DIFFERENCE AND REEPICTION AND ITS SOURCES (3) Marrati</td>
<td></td>
<td></td>
<td>Limit 20 Cross-listed with Humanities Center, Political Science, Anthropology, German &amp; Romance Languages</td>
</tr>
<tr>
<td>150.810</td>
<td>INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td>Sec. 01 Staff</td>
</tr>
<tr>
<td></td>
<td>Sec. 02 Förster</td>
<td></td>
<td></td>
<td>Sec. 03 Tumulty</td>
</tr>
<tr>
<td></td>
<td>Sec. 04 Moyar</td>
<td></td>
<td></td>
<td>Sec. 05 Williams (Michael)</td>
</tr>
<tr>
<td></td>
<td>Sec. 06 William (Meredith)</td>
<td></td>
<td></td>
<td>Sec. 07 Bok</td>
</tr>
<tr>
<td></td>
<td>Sec. 08 Bett</td>
<td></td>
<td></td>
<td>Sec. 09 William (Michael)</td>
</tr>
<tr>
<td></td>
<td>Sec. 10 Greenberg</td>
<td></td>
<td></td>
<td>Sec. 11 Achinstein</td>
</tr>
<tr>
<td>150.811</td>
<td>DIRECTED STUDY</td>
<td></td>
<td></td>
<td>Please see 150.810 for section numbers to use when registering.</td>
</tr>
</tbody>
</table>
## PHYSICS AND ASTRONOMY

### 171.101 (EN)
**GENERAL PHYSICS FOR PHYSICAL SCIENCE MAJORS I**  
*(4) Ford*  
Limit 23 per section  
Coreq: 173.111-112, 110.108-109  
One-year course in general physics covering mechanics, heat, sound, electricity and magnetism, optics, and atomic physics.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>Th</th>
<th>10:30-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-13</td>
<td>T 8</td>
<td></td>
</tr>
</tbody>
</table>

### 171.102 (EN)
**GENERAL PHYSICS FOR PHYSICAL SCIENCE MAJORS II**  
*(4) Barnett*  
Limit 22 per section  
Prereq: C- or better in 171.101  
Coreq: 173.112; 110.109  
One-year course in general physics covering mechanics, heat, sound, electricity and magnetism, optics, and atomic physics.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>04</td>
<td>05</td>
<td>06</td>
</tr>
<tr>
<td>07</td>
<td>08</td>
<td>09</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

### 171.103 (EN)
**GENERAL PHYSICS I FOR BIOLOGICAL SCIENCE MAJORS**  
*(4) Feldman*  
Limit 22 per section  
Coreq: 173.111-112; 110.108-109 or 110.106-107  
Standard calculus based physics tailored to students majoring in one of the biological sciences. Topics in modern physics and in fluid dynamics will be covered in this course.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>M 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>01-09</td>
</tr>
<tr>
<td>01</td>
<td>02</td>
</tr>
<tr>
<td>04</td>
<td>05</td>
</tr>
<tr>
<td>07</td>
<td>08</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>

### 171.105 (EN)
**CLASSICAL MECHANICS I**  
*(4) Tchernyshyov*  
Coreq: 173.115-116 and 110.108-109  
Recommended for students who plan to major or minor in Physics. Students enrolled in this course should enroll in the Classical Mechanics Lab only.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>04</td>
<td>05</td>
<td>06</td>
</tr>
<tr>
<td>07</td>
<td>08</td>
<td>09</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

### 173.111 (N)
**GENERAL PHYSICS LAB I (1)**  
Swartz  
Limit 22 per section  
Experiments are chosen from both physical and biological sciences and are designed to give students background in experimental techniques as well as to reinforce physical principles.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>M 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>01</td>
</tr>
<tr>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>04</td>
<td>05</td>
</tr>
<tr>
<td>06</td>
<td>07</td>
</tr>
<tr>
<td>08</td>
<td>09</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>24</td>
<td>25</td>
</tr>
</tbody>
</table>

### 173.112 (N)
**GENERAL PHYSICS LAB II (1)**  
Swartz  
Limit 22 per section  
Experiments are chosen from both physical and biological sciences and are designed to give students background in experimental techniques as well as to reinforce physical principles.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>W 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>01</td>
</tr>
<tr>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>04</td>
<td>05</td>
</tr>
<tr>
<td>06</td>
<td>07</td>
</tr>
<tr>
<td>08</td>
<td>09</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>24</td>
<td>25</td>
</tr>
</tbody>
</table>

### 173.113 (N)
**SUBATOMIC WORLD (3)**  
Blumenfeld  
Limit 44  
Introduction to concepts of physics of the subatomic world: Symmetries, relativity, quanta, neutrinos, particles, and fields. Emphasis on ideas of modern physics, not on the mathematics. Intended for nonscience majors.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

### 172.113 (N)
**INTRODUCTION TO FRONTIER PHYSICS (3)**  
Henry  
Limit 45  
Explores modern experimental methods and theoretical ideas in physics.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>M 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td>01</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>173.115 (N)</td>
<td>CLASSICAL MECHANICS LABORATORY (3) Swartz</td>
</tr>
<tr>
<td>171.201 (EN)</td>
<td>SPECIAL RELATIVITY AND WAVES (4) Leheny</td>
</tr>
<tr>
<td>171.203 (N)</td>
<td>CONTEMPORARY PHYSICS SEMINAR (1) Reiner</td>
</tr>
<tr>
<td>171.207 (N)</td>
<td>SPECIAL REALTIVITY (1) Leheny</td>
</tr>
<tr>
<td>171.209 (N)</td>
<td>WAVE PHENOMENA WITH BIOPHYSICAL APPLICATIONS (4) Reiner</td>
</tr>
<tr>
<td>171.301 (N)</td>
<td>ELECTROMAGNETIC THEORY II (4) Kaplan</td>
</tr>
<tr>
<td>171.303 (N)</td>
<td>QUANTUM MECHANICS I (4) Broholm</td>
</tr>
<tr>
<td>173.308</td>
<td>ADVANCED PHYSICS LAB (3) Armitage</td>
</tr>
</tbody>
</table>

- PHYSICS AND ASTRONOMY
- PHYSICS OF THE EVERYDAY WORLD: Introduction to concepts of physics and their consequences for everyday experience.
- CLASSICAL MECHANICS LABORATORY: Experiments chosen to complement the lecture course Classical Mechanics I. Introduce students to experimental techniques and statistical analysis.
- SPECIAL RELATIVITY AND WAVES: Special theory of relativity, mathematics of waves, harmonic oscillation, forced and damped oscillators, electromagnetic waves, diffraction, interference.
- CONTEMPORARY PHYSICS SEMINAR: This seminar exposes physics majors to a broad variety of contemporary experimental and theoretical issues in the field. Students read and discuss reviews from the current literature, and are expected to make an oral or written presentation.
- SPECIAL REALTIVITY: Introduction to special relativity for physics majors who elect to take 171.209 instead of 171.105-106 (preferred) or 171.101-102 or 171.103-104; Calculus 110.108-109.
- WAVE PHENOMENA WITH BIOPHYSICAL APPLICATIONS: Introduction to wave phenomena, primarily through study of biophysical probes that depend on the interaction of electromagnetic radiation with matter. Topics include Fourier Analysis, standing waves, sound and hearing, diffraction and crystallography, geometrical and physical optics – the physics of modern light microscopy, quantum mechanics – how living things absorb light; NMR and MRI. Occasional laboratory exercises are included.
- ELECTROMAGNETIC THEORY II: Static electric and magnetic fields in free space and matter; boundary value problems; electromagnetic induction; Maxwell's equations; and an introduction to electrodynamics.
- QUANTUM MECHANICS I: Fundamental aspects of quantum mechanics. Uncertainty relations, Schrodinger equation in one and three dimensions, tunneling, harmonic oscillator, angular momentum, hydrogen atom, spin, Pauli principle, perturbation theory (time-independent and time-dependent), transition probabilities and selection rules, atomic structure, scattering theory.

- ADVANCED PHYSICS LAB: A broad exposure to modern laboratory procedures such as holography, chaos, and atomic, molecular, and particle physics.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Prerequisite(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>171.312 (N)</td>
<td>STATISTICAL PHYSICS AND THERMODYNAMICS (4)</td>
<td>Markovic</td>
<td></td>
<td>Undergraduate course that develops the laws and general theorems of thermodynamics from a statistical framework.</td>
</tr>
<tr>
<td>171.313 (N)</td>
<td>INTRODUCTION TO STELLAR PHYSICS (3)</td>
<td>Wyse</td>
<td>110.108-109, 171.202</td>
<td>Survey of stellar astrophysics. Topics include stellar atmospheres, stellar interiors, nucleosynthesis, stellar evolution, supernovae, white dwarfs, neutron stars, pulsars, black holes, binary stars, accretion disks, protostars, and extrasolar planetary systems.</td>
</tr>
<tr>
<td>171.405 (N)</td>
<td>CONDENSED MATTER PHYSICS (3)</td>
<td>Chien, C.L.</td>
<td>171.304, 110.201-202</td>
<td>Undergraduate course covering basic concepts of condensed matter physics: crystal structure, diffraction and reciprocal lattices, electronic and optical properties, band structure, phonons, superconductivity and magnetism.</td>
</tr>
<tr>
<td>171.415 (N)</td>
<td>MATHEMATICAL METHODS FOR PHYSICISTS (4)</td>
<td>Kovesi-Domokos</td>
<td></td>
<td>Selection of topics in applied mathematics most frequently used by physicists. First term focuses on analytic methods: functions of complex variables, series and perturbation methods for solving differential equations, Sturm-Liouville theory and special functions, Fourier series and transforms.</td>
</tr>
<tr>
<td>110.369 (Q, N)</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY (4)</td>
<td>Morava</td>
<td>110.107, 110.302 Cross-listed with Mathematics</td>
<td></td>
</tr>
<tr>
<td>171.501</td>
<td>INDEPENDENT RESEARCH: UNDERGRADUATES</td>
<td>Staff</td>
<td></td>
<td>Students may register for independent research with a faculty member in the Department of Physics and Astronomy. A research plan should be sent to the Director of Undergraduate Study before the add/drop date that includes project details, the number of hours of effort each week and the number of credits. This course may not be used for one of the two electives required for a BA, but one semester of research may be used as one of four focused electives in a BS program.</td>
</tr>
<tr>
<td>171.503 (W)</td>
<td>SENIOR THESIS</td>
<td>Staff</td>
<td></td>
<td>Open to Senior Dept. majors only. Preparation of a substantial thesis based upon independent student research, supervised by at least one faculty member in Physics and Astronomy. This course may only be taken for credit during one semester. However, students are expected to have engaged in their research project during previous semesters through 171.501-502, summer research, etc. This course may not be used as one of the two electives required for a BA, but can be used as one of the four focused electives in a BS program.</td>
</tr>
<tr>
<td>171.603</td>
<td>ELECTROMAGNETIC THEORY</td>
<td>Domokos</td>
<td></td>
<td>Theory of the Maxwell equations, with static and dynamic applications, boundary-value problems, guided and free waves, diffraction, scattering, special relativity, electron theory.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Title</td>
<td>Lecturer</td>
<td>Section</td>
<td>Time</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>171.605</td>
<td>QUANTUM MECHANICS</td>
<td>Tesanovic</td>
<td>01</td>
<td>F 1</td>
</tr>
<tr>
<td></td>
<td>Review of wave mechanics and the Schrodinger equation, Hilbert space, harmonic oscillator, the WKB approximation, central forces and angular momentum, scattering, electron spin, density matrix, perturbation theory (time-independent and time-dependent), quantized radiation field, absorption and emission of radiation, identical particles, second quantization, Dirac equation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>173.608</td>
<td>ADVANCED LABORATORY</td>
<td>Armitage</td>
<td>01</td>
<td>M 12</td>
</tr>
<tr>
<td></td>
<td><em>Averages</em> <em>Covers a thorough survey of analog and digital electronics with a strong emphasis on integrated-circuit technology.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171.612</td>
<td>INTERSTELLAR MEDIUM AND ASTROPHYSICAL FLUID DYNAMICS</td>
<td>Norman</td>
<td>01</td>
<td>MWF 10</td>
</tr>
<tr>
<td></td>
<td><em>Normay</em> <em>Physical states of interstellar gas; diagnostics: commonly encountered emission and absorption lines, continuum processes, refraction, dispersion, and scintillation; ionization equilibrium; heating and cooling, multi-phase systems and thermal instabilities; dust physics: optical properties, temperature and ionization; basic equations of fluid mechanics: mass continuity, Navier-Stokes and equations of state; hydrostatic equilibrium and the Jeans mass, puls instabilities, shock waves and similarity solutions for blast waves; MHD equations and magnetized equilibria.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171.613</td>
<td>RADIATIVE ASTROPHYSICS / QUANTUM PHYSICS</td>
<td>Bennett</td>
<td>01</td>
<td>MW 2-3:20</td>
</tr>
<tr>
<td></td>
<td><em>Bennett</em> <em>A two-term sequence including equation of transfer, connection to thermodynamics, diffusion; linear EM waves: dispersion relations, polarization; special relativity; classical EM radiation; Bremsstrahlung; synchrotron radiation; Compton scattering; properties of plasmas, charged particles in matter; atomic and molecular spectroscopy; time-dependent perturbation theory; calculation of quantum transition rates for both radiative and collisional processes; techniques for solution of the transfer equation, applications to stellar atmospheres and interstellar nebulae.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171.619</td>
<td>MOLECULAR ASTROPHYSICS</td>
<td>Neufeld</td>
<td>01</td>
<td>MW 10:30-12</td>
</tr>
<tr>
<td></td>
<td><em>Neufeld</em> <em>An advanced graduate level course that emphasizes the importance of molecules in astrophysical environments as diverse as interstellar clouds, circumstellar outflows, cometary comae, and active galactic nuclei.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171.621</td>
<td>CONDENSED MATTER PHYSICS</td>
<td>Chien, C.L.</td>
<td>01</td>
<td>ThF 10:30-12</td>
</tr>
<tr>
<td></td>
<td><em>Chien, C.L.</em> <em>This sequence is intended for graduate students in physics and related fields. Topics include: metals and insulators, diffraction and crystallography, phonons, electrons in a periodic potential, transport.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171.703</td>
<td>ADVANCED STATISTICAL MECHANICS</td>
<td>Robbins</td>
<td>01</td>
<td>ThF 9-10:30</td>
</tr>
<tr>
<td></td>
<td><em>Robbins</em> <em>Prereqs: 171.305-306, 171.312 or equivalents. Brief review of basic statistical mechanics and thermodynamics. Then hydrodynamic theory is derived from statistical mechanics and classical treatments of phase transitions, including Ginzburg-Landau theory.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PHYSICS AND ASTRONOMY

171.801 INDEPENDENT RESEARCH - GRADUATES

- Sec. 01: Staff
- Sec. 02: Sundrum
- Sec. 03: Feldman
- Sec. 04: Chien, Chih-yung
- Sec. 05: Domokos
- Sec. 06: Beach
- Sec. 07: Chien, Chih-yung
- Sec. 08: Krolik
- Sec. 09: Barnett
- Sec. 10: Norman
- Sec. 11: Blumenfeld
- Sec. 12: Heckman
- Sec. 13: Moos
- Sec. 14: Szalay
- Sec. 15: Ford
- Sec. 16: Bagger
- Sec. 17: Wyse
- Sec. 18: Henry
- Sec. 19: Neufeld
- Sec. 20: Tesanovic
- Sec. 21: Blair
- Sec. 22: Robbins
- Sec. 23: Glazebrook
- Sec. 24: Broholm
- Sec. 25: Bianchi
- Sec. 27: Kaplan
- Sec. 28: Finkenthal
- Sec. 29: Leheny
- Sec. 30: Markovic
- Sec. 31: Tchernyshyov
- Sec. 32: Bennett
- Sec. 33: Vishniac
- Sec. 34: Gritsan

SEMINARS

172.631 PHYSICS SEMINAR

- Broholm
- First year graduate students only
- Intended for beginning graduate students. Study of the methods and results of modern physics and other topics of interest. Each student will discuss some phase of the subject.

172.711 INTERMEDIATE SEMINAR

- Henry
- Nonspecialized seminar in which second-year graduate students discuss subjects of general interest, supplementing the material of the standard courses and including recent advances in physics.

172.722 HOT TOPICS IN ASTROPHYSICS

- Norman

172.731 CAS RESEARCH SEMINAR

- Meurer

172.735 STARBURST JOURNAL CLUB

- Heckman

172.751 ELEMENTARY PARTICLE PHYSICS SEMINAR

- Staff

172.753 ADVANCED PARTICLE THEORY SEMINAR

- Kaplan

172.763 CONDENSED MATTER PHYSICS SEMINAR

- Markovic

POLITICAL SCIENCE

190.101 (S) INTRODUCTION TO AMERICAN POLITICS (AP) (3)

- Ginsberg
- Lecture: Sec. 01, T 2
- This course is an introduction to government and politics through the study of the government and politics of the United States. All governments combine coercion and legitimacy. In a stable and legitimate system of government, coercion is hardly noticed by most citizens. Government comes to be seen as a source of benefits. The purpose of this course is to look behind institutions, practices, and benefits to appreciate how, for what and by whom we are governed.

190.102 (S) INTRODUCTION TO COMPARATIVE POLITICS (CP) (3)

- Lecture: Sec. 01, M 10
- This course is an introduction to political institutions and processes with a stress on how economic and political development occur over time. Interests, identities and Institutions are compared across countries and contexts.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>190.213</td>
<td><strong>INTERNATIONAL POLITICS (IR) (3)</strong></td>
<td>Deudeny</td>
<td>3</td>
<td>Limit 20 per section</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intensive analysis of major approaches to</td>
<td></td>
<td></td>
<td>W 1</td>
<td>TW 1</td>
</tr>
<tr>
<td></td>
<td>international politics (realism, liberalism, Marxism)</td>
<td></td>
<td></td>
<td>02</td>
<td>Th 1</td>
</tr>
<tr>
<td></td>
<td>Topics include: anarchy, geopolitics, states, nations, balance of power, hegemony, empire, democratic peace, regimes, nuclear weapons, European Union.</td>
<td></td>
<td></td>
<td>03</td>
<td>W 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>04</td>
<td>Th 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>05</td>
<td>T 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>06</td>
<td>Th 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>07</td>
<td>M 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>08</td>
<td>Th 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>09</td>
<td>Th 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>Th 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td>W 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>W 2</td>
</tr>
<tr>
<td>190.311</td>
<td><strong>MIDDLE EAST POLITICS (IR/CP) (3)</strong></td>
<td>Hazbun</td>
<td>3</td>
<td>Limit 35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A study of the dynamics of state building, identity construction, and foreign policy across the Middle East framed by the evolution of regional geopolitics and US foreign policy.</td>
<td></td>
<td></td>
<td>Sec. 01 MT 3</td>
<td></td>
</tr>
<tr>
<td>190.320</td>
<td><strong>POLITICS OF EAST ASIA (CP) (3)</strong></td>
<td>Chung</td>
<td>3</td>
<td>Limit 20 per section</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examines some of the central ideas and institutions that have transformed politics in the contemporary world through the lens of East Asia, focusing on Japan, South Korea, Taiwan, and China. Topics include state-society relations, late development, nationalism, democratization, political culture, social movements, and globalization.</td>
<td></td>
<td></td>
<td>Lec. W 2-4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>01</td>
<td>Th 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>02</td>
<td>F 10:30-11:30</td>
</tr>
<tr>
<td>190.323</td>
<td><strong>INTRODUCTION TO INTERNATIONAL LAW (IR) (3)</strong></td>
<td>Groogui</td>
<td>3</td>
<td>Limit 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A limited survey of international law, its sources, and uses in international relations. It has five basic aims: 1) to explore the place, origins and changing contexts of international law and its instrumentality in international life; 2) to examine the sources of personalities and institutions that influence its development; 3) to survey select international legal dispositions concerning the peaceful resolutions of conflict and the immunities that apply to certain legal subjects; 4) to examine the immunities that apply to certain legal subjects; 5) to examine differing views on the future of international law in light of recent events.</td>
<td></td>
<td></td>
<td>Sec. 01 Th 1-3</td>
<td></td>
</tr>
<tr>
<td>190.333</td>
<td><strong>AMERICAN CONSTITUTIONAL LAW (LP) (3)</strong></td>
<td>Grossman</td>
<td>3</td>
<td>Limit 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A two semester exploration of the Supreme Court’s interpretation of the Constitution and the Court’s role in the American political system. The first semester focuses on how the court makes its decisions: on its development and articulation of fundamental principles such as judicial review, federalism, and the separation of powers; and on the powers of Congress and the president. The second semester focuses on issues of civil liberties and civil rights, with major emphasis on the rights of defendants and the criminal justice system; issues of racial, gender, and political equality; the constitutional right of privacy; selected free speech and religious freedom issues; and a final assessment of the policy impact and implementation capacities of the Court.</td>
<td></td>
<td></td>
<td>Sec. 01 MW 3-4:30</td>
<td></td>
</tr>
<tr>
<td>191.335</td>
<td><strong>THE HISTORY AND DYNAMICS OF THE ARAB – ISRAELI CONFLICT (3)</strong></td>
<td>Freedman</td>
<td>3</td>
<td>Limit 35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The course will focus on the origin and development of the Arab-Israeli conflict from its beginnings when Palestine was controlled by the Ottoman Empire, through World War I, the British Mandate over Palestine, and the first Arab-Israeli war (1947-1948). It will then examine the period of the Arab-Israeli wars of 1956, 1967, 1973, and 1982; the Palestinian Intifadahs (1987-1993 and 2000-2005); and the development of the Arab-Israeli peace process from its beginnings with the Egyptian-Israeli treaty of 1979, the Oslo I and Oslo II agreements of 1993 and 1995, Israel’s peace treaty with Jordan of 1994, the Road Map of 2003; and the periodic peace talks between Israel</td>
<td></td>
<td></td>
<td>Sec. 01 T 4-6pm</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Instructor</td>
<td>Limit</td>
<td>Section</td>
<td>Time</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
<td>-------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>190.340</td>
<td>POLITICAL SCIENCE and Syria. The conflict will be analyzed against the background of great power intervention in the Middle East, the rise of Political Islam, and the dynamics of Intra-Arab politics.</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>Th 10:30-12:20</td>
</tr>
<tr>
<td>190.340</td>
<td>BLACK POLITICS (AP) (3) Spose - Limit 30 This course is an historical survey of the bases and substance of politics among black Americans and the relation of black politics to the American political system. The sweep of the course covers the period from Emancipation to the present. The intention is both to provide a general sense of pertinent issues and relations over this period as a way of helping to make sense of the present and to develop criteria for evaluating political scientists' and others' claims regarding the status and characteristics of black American political activity. Cross-listed with Africana Studies.</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>Th 2-4</td>
</tr>
<tr>
<td>191.340</td>
<td>EDUCATION POLITICS IN URBAN AMERICA (3) Hayes - Limit 15 This course analyzes the politics of urban public schooling, concentrating on community political dynamics and the struggle for equal educational opportunity and quality education. The course emphasizes the impact of urban transformation, socioeconomic class inequality, and racial and ethnic politics on the changing character of public school reform since the 1954 Supreme Court decision of Brown v. Board of Education. Cross-listed with Africana Studies, Anthropology, History and Sociology.</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td></td>
</tr>
<tr>
<td>190.351</td>
<td>PUNISHMENT AND POLITICS: THE DEATH PENALTY IN THE UNITED STATES (PT) (3) Collet - Limit 20 per section This course examines a number of questions related to the negotiation of law, politics, and morality in modern society. What is the purpose of punishment in our society? What is the proper role of the state in carrying out punishment? Does capital punishment differ from other kinds of punishment? If so, how? Answering these questions, the course explores topics in political theory, constitutional law, legal interpretation, and cultural studies.</td>
<td></td>
<td></td>
<td>Lec. T 10-12</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>190.354</td>
<td>THE POLITICS OF HEALTH POLICY (AP) (3) Smithgate - Limit 30 Prereq: One course in Political Science or Perm. Req'd Trace the evolution of the American health care system, emphasizes on the political forces that shape public and private provision of health care in the United States. Cross-listed with Public Health Studies.</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>TW 1</td>
</tr>
<tr>
<td>191.370</td>
<td>MEDIA AND POLITICS (3) Staff - Limit 16 Aitchenson Fellowship students only</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td>191.371</td>
<td>THE MORALITY OF WAR (3) Staff - Limit 16 Aitchenson Fellowship students only</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td>190.372</td>
<td>POLITICAL VIOLENCE (IR) (3) David - Limit 20 Prereq: 190.209 or equivalent An examination of the ways in which violence has been used to secure political ends. Topics include terrorism, assassination, genocide, coups, rebellions and war itself. Students examine what makes types of political violence unique and what unites them.</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>Th 10:30-12:20</td>
</tr>
<tr>
<td>190.379</td>
<td>MASS MEDIA AND POLITICS (AP, CG) (3) Katz - Limit 30 This class will focus on the mass media, particularly television, as both inputs into the political system (portrayals of politics in drama; framing and reporting of news) and as outputs of the political system (e.g., through regulation). Although the emphasis will be primarily on the United States, comparisons of the American</td>
<td></td>
<td></td>
<td>Sec. 01</td>
<td>TW 2</td>
</tr>
</tbody>
</table>
Experience to those of other industrial democracies will be a significant part of the class.

190.389 (S) (W) SEMINAR ON THE INSTITUTIONAL DEVELOPMENT OF THE CONGRESS AND PRESIDENCY (AP) (3) Cooper, Perm, Req’d, Limit 15
An examination of the development of the modern Congress and the presidency. Emphasis will be placed on the evaluation of patterns of structure, process and leadership, and their impact on the roles of Congress in the American political system.

190.399 (S) CAPITALISM AND CHRISTIANITY (PT) (3) Connolly, Limit 15, Prereq: A previous course in Political Theory Seminar examining the history of imbrications between capitalism and Christianity, up to the contemporary era. Texts will include The Gospels, Calvin, Marx, Weber, Tawney, Delleuze and Kuntz.

190-402 (S) WASHINGTON INTERNSHIP PROGRAM (3) Ginsberg, Coreq: 190.403
Economists believe that policy can be analyzed through the application of cost-benefit analysis. Philosophers believe that policy can be analyzed through the application of ethical principles. Political scientists know that policy can only be understood in political terms, that is, in terms of underlying struggles among important groups and forces. The winners of these struggles generally invent the appropriate ethical principles and cost-benefit studies needed to justify the policies they want. This seminar examines the relationship between political struggles and public policies in contemporary America. Every student will be asked to prepare a seminar paper dealing with an important current policy issue.

190.408 (S) ADVANCED READINGS IN MIDDLE EAST HISTORY AND POLITICS (IR) (3) Hazbun, Limit 13, Prereq: 190.311 and 190.346 or Perm, Req’d
Readings on Middle East topics, including Islam, Arab political thought, regional politics, nationalism and political identity.

190.409 (S) COMPARATIVE POLITICS OF SOCIAL MOVEMENTS (CP) (3) Keck, Limit 20, Prereq: prior course in Comparative Politics Course examines major approaches to social movement organizations, dynamics, and significance. Case materials come from U.S., Europe, and Third World examples. Students are expected to write a significant research paper.

191.420 (S) SPEED AND POLITICS (PT) (3) Glezos, Limit 15, Prereq: Junior or Senior standing or permission of instructor
A theoretical analysis of the effects of speed and technology on politics, specifically as the area of Media, war and democracy. Will include readings by Virilio, Baudrillard, Negri, Kant and Schreneman. Cross-listed with Philosophy Dean’s Teaching Fellowship Course

190.422 (S) REPUBLICANISM (IR/PT) (3) Deudney, Limit 40, Readings in classical and contemporary texts (Polybius, Machiavelli, Montesquieu, Rousseau, Kant, the Federalist, Calhoun, World Federalism, and nuclear arms control). Focus on security, freedom, and geopolitics, both domestic and international.
POLITICAL SCIENCE

190.471 (S) SENIOR THESIS SEMINAR: INTERNATIONAL RELATIONS AND POLITICAL SCIENCE (3) Suk. Limit 50

195.477 (S) INTRODUCTION TO URBAN POLICY (3) Newman. Limit 15 per section. Prereq. 195.476. Cross-listed with Public Policy, Sociology, and Geography. Engineering


230.150 (S) ISSUES IN INTERNATIONAL DEVELOPMENT (3) Agarwala. Limit 15 per section. Cross-listed with Sociology, German Languages, and Humanities Center.

300.343 (H) BERGSON AND THE PROBLEM OF NOVELTY IN PHILOSOPHY (3) Smith. Limit 15 per section. Cross-listed with Sociology, French, and German Languages.


190.501 POLITICAL SCIENCE INTERNSHIP. Staff. Prereq. 190.503.

190.503 INTERNATIONAL RELATIONS INTERNSHIP. Staff. Prereq. 190.501.

190.535 INDEPENDENT STUDY - FRESHMAN

190.537 INDEPENDENT STUDY - SOPHOMORES

190.539 INDEPENDENT STUDY - JUNIORS

190.541 INDEPENDENT STUDY - SENIORS

190.543 INDEPENDENT RESEARCH

190.602 INTRODUCTION TO QUANTITATIVE POLITICAL SCIENCE (3) Katz. Limit 15. Juniors and Seniors. Prereq. 190.607. An introduction to measurement and data analysis in contemporary American political science. Measurement topics will include the formation of indices and cumulative scales. Analytic topics will include sampling variations, statistical association and causation, as manifested in contingency tables and correlation and regression. Emphasis will be on fundamental concepts and assumptions, and on comprehension and evaluation of the scholarly literature. No mathematical prerequisites.

190.607 COMPARATIVE RACIAL POLITICS (3) Chang/Spence. Limit 15. Graduate students only. This course surveys the major trends and approaches to the comparative study of race in the social sciences and critically examines the link between race and politics. Topics include the racial state, neo-racism, the political economy of race, and racial micro-regimes.

190.611 THE CONSTITUTION AND THE INTERNATIONAL SYSTEM (3) Deardorff/Grossman. Limit 20. Analysis of interaction between the U.S. Constitution and international threats, crises, and institutions. Topics include presidential, congressional, and judicial roles, sovereignty, international law and organizations, the ICC, laws of war, torture, and surveillance. Advanced undergraduates admitted with permission of instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>190.616</td>
<td>AMERICAN POLITICAL DEVELOPMENT (AP)</td>
<td>Sheingate</td>
<td>Grad.</td>
<td>An examination of state-building and nation-building throughout American political history.</td>
</tr>
<tr>
<td>190.619</td>
<td>CAUSES OF PEACE (IR)</td>
<td>David</td>
<td>Grad.</td>
<td>An examination of why peace (excepting Iraq) has seemingly broken out in the post-Cold War era. Causes of peace to be examined include democracy, nuclear weapons, globalization, changes in human nature, American hegemony and international institutions. Whether peace will continue and its impact on international relations theory, particularly realism, will also be considered.</td>
</tr>
<tr>
<td>190.620</td>
<td>WOMEN IN DARK TIMES</td>
<td>Bennett / Culbert</td>
<td>Grad.</td>
<td>A survey of female voices—feminist and non-feminist—in political theory. What constitutes political action? What is the relationship of bodies to politics? How is power defined and distributed? Authors included: Hannah Arendt, Simone de Beauvoir, Judith Butler, Elizabeth Grosz, Rosa Luxenberg, Saba Mahmood, Catherine McKinnon, Carol Pateman, Patricia Williams, and other contemporary theorists.</td>
</tr>
<tr>
<td>190.651</td>
<td>SKEPTICISM, ETHICS AND POLITICS</td>
<td>Flathman</td>
<td></td>
<td>An examination of the place of skepticism in political moral thought. Emphasis will be on David Hume but attention will also be given to Sextus, Hobbes, Montaigne and some 20th Century thinkers.</td>
</tr>
<tr>
<td>190.661</td>
<td>TRANSNATIONAL POLITICS</td>
<td>Keck</td>
<td>Grad.</td>
<td>Theoretical issues in the study of local, national, transnational, cross-national, international, universal and other locations and movements of political phenomena. Course will combine shared readings and the development of a research project by each participant. Students are encouraged to discuss potential research interests with the professor prior to deciding to take the course.</td>
</tr>
<tr>
<td>190.667</td>
<td>NATIONS, IMPERIALISM, AND DECOLONIZATION</td>
<td>Grovogui</td>
<td>Grad.</td>
<td>Structured around the historical advent of imperialism and decolonization, this course places special emphasis on the historical contingency of national identity and the connections between particular forms of national identity and imperialism. It also examines the political alienation of colonial peoples from European political forms leading to decolonization. Theoretical perspectives include liberal / modernist, postmodernist, postcolonial, etc.</td>
</tr>
<tr>
<td>190.672</td>
<td>IDEAS AND POLITICS</td>
<td>Blyth</td>
<td></td>
<td>Graduate seminar exploring ideational, cultural, and constructivist analyses of politics and economics.</td>
</tr>
<tr>
<td>190.673</td>
<td>SEMINAR: INSTITUTIONAL ANALYSIS (AP)</td>
<td>Cooper</td>
<td>Grad.</td>
<td>An examination of major variants of the &quot;new institutionalism&quot; as applied to Congress. Emphasis is placed on the substantive and methodological character of similarities and differences in current institutional approaches to the study of Congress, and their impacts.</td>
</tr>
<tr>
<td>190.685</td>
<td>PROSEMINAR: POLITICAL SCIENCE AS A PROFESSION</td>
<td>Ginsberg</td>
<td></td>
<td>The first half explores The first half explores</td>
</tr>
<tr>
<td>190.692</td>
<td>PERCEPTION, THE MEDIA AND POLITICS (PT)</td>
<td>Connolly</td>
<td>Grad.</td>
<td>Graduate students only or permission of instructor The first half explores</td>
</tr>
<tr>
<td>Sec. 01</td>
<td>M 4-6pm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
imbrications between culture and biology in perception, drawing upon Bergson, Damasio and Merleau-Ponty. The second half explores the role of the media, including texts by Deleuze, Cinema II: Massumi, Parables for the Virtual and Hansen, New Philosophy for New Media.

300.623 MIRACLES, EVENTS, EFFECTS (Hent de Vries) Limit 20 Cross-listed with Anthropology, Philosophy, and Humanities Center

300.678 DIFFERENCE AND REPETITION AND ITS SOURCES (Marrati) Limit 20 Cross-listed with Philosophy, Humanities Center, Anthropology, German & Romance Languages

190.880 INDEPENDENT STUDY
Sec. 01 Staff
Sec. 02 Keck
Sec. 03 Connolly
Sec. 04 Gouzman
Sec. 05 Katz
Sec. 06 Cooper
Sec. 07 Zarlin
Sec. 08 Cronon
Sec. 09 David
Sec. 10 Donahue
Sec. 12 Tsui
Sec. 13 Skingane

190.849 DISSERTATION RESEARCH
Please use the sections listed for 190.880 when registering.

PSYCHOLOGICAL & BRAIN SCIENCES

200.101 (N,S) INTRODUCTION TO PSYCHOLOGY (3) Drigotas Limit 225 This course surveys all the major areas of scientific psychology, including the physiological bases of behavior; sensation and perception; learning, memory and cognition; developmental, social, and personality psychology; and psychopathology.

Sec. 01 M 11

200.110 (N,S) INTRODUCTION TO COGNITIVE PSYCHOLOGY (3) Shelton Stark Limit 250 Introductory survey of current research and theory on topics in cognitive psychology. The course will cover a range of topics in perception, attention, learning, reasoning, and memory, emphasizing relationships among mind, brain, and behavior.

Sec. 01 ThF 9-10:30

200.132 (S) INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3) Mazzoco Limit 100 An introductory survey of developmental psychology from birth through adulthood. Consideration of developmental theories and methods and of research investigating biological, psychological, and social factors and their interactions within a cultural framework.

Sec. 01 MW 2:30-4

200.141 (N,S) INTRODUCTION TO PHYSIOLOGICAL PSYCHOLOGY (3) Getman Limit 100 A survey of neuropsychology relating the organization of behavior to the integrative action of the nervous system. Cross listed with Behavioral Biology

Sec. 01 ThF 9-10:30

200.159 (S) FRESHMAN SEMINAR: EVOLUTIONARY PSYCHOLOGY (3) Egeth Freshmen only In this course we discuss evolutionary psychology, which is the idea that the mind can be understood as an adaptation to our ancestral environment by means of natural selection.

Sec. 01 Th 2

200.204 (N,S) HUMAN SEXUALITY (3) Kraft Limit 25 Not open to Freshmen Junior & Senior Psychology, Behavioral Biology, and WGS majors only. Perm Req'd. Course focuses on sexual development, sexuality across the lifespan, gender identity, sexual attraction and arousal, sexually transmitted disease, and the history of commercial sex workers and pornography. Formerly taught as 200.302

Sec. 01 M 12-3

200.205 (N,S) BEHAVIOR MODIFICATION (3) Fogel Limit 30 This course will help students to increase their efficacy in creating behavior change, for both themselves and others, through the understanding and utilization of empirically-
PSYCHOLOGICAL & BRAIN SCIENCES

tested psychological principles. In addition, it will provide an overview of modern-day Behavior Therapies and their approaches to treating psychological disorders.

200.207 (Q,S) LAB IN ANALYSIS OF PSYCHOLOGICAL DATA (2) Egeth Limit 20 per section
Laboratory in the fundamentals of data collection and analysis in experimental and differential psychology. Formerly 200.114
Sec. 01 W 1-3
Sec. 02 W 1-3
Sec. 03 W 1-3
Sec. 04 W 1-3

200.209 (S) INTRODUCTION TO PERSONALITY THEORY (3) Fijoret Limit 100
An overview of the major theories of personality with their empirical bases and applications.
Sec. 01 MW 2-3:30

200.211 (S) SENSATION AND PERCEPTION (3) Fantis
Limit 106 An overview of the major theories of perception with their empirical bases and applications.
Sec. 01 MTW 9

200.212 (S) INTRODUCTION TO ABNORMAL PSYCHOLOGY (3) Vaillant
Limit 125 A survey of the major syndromes of psychological disorders. Research and theory about the mechanisms, development, and diagnosis of psychopathology are emphasized.
Sec. 01 TTh 2:30-4

200.301 (H,S) HISTORY OF PSYCHOLOGY (3) Hofer
Limit 35 Prereq: Two prior Psychology courses
Juniors and Seniors only
A survey of leading figures, schools, and systems in the history of psychology. The course will emphasize the development of experimental psychology in late 19th century Germany and its establishment in America at Johns Hopkins, Harvard, Chicago, and Columbia. Special topics will include the development of clinical and applied psychology and psychological testing.
Sec. 01 T 4-6:30pm

200.314 (Q,S) ADVANCED STATISTICAL METHODS (3) Yamani
Prereq: One statistics course Limit 15
Perm. Req’d during Add/Drop only
Topics in applied probability and statistical inference; analysis of variance; experimental design. Intended for graduate students in psychology.
Sec. 01 TW 2-3:30pm

200.328 (S) THEORY & METHODS IN CLINICAL PSYCHOLOGY (3) Edwin
Limit 25
Prereq: 200.131 Senior Psychology Majors Only
A critical examination of the methods of observation, description, reasoning, and inference that underlie the clinical practice of psychology and psychiatry.
Cross-listed with Behavioral Biology
Sec. 01 M 6-8:30pm

200.333 (S) ADVANCED READING IN SOCIAL PSYCHOLOGY (3) Drigotas
Limit 18
Junior & Senior Psychology majors only
The class is designed as a seminar including discussion of primary readings of social psychology articles ranging in topics from interpersonal relationship to behavior in large groups.
Sec. 01 W 2-4:30

200.339 (S) ISSUES IN COUNSELING AND MENTAL HEALTH CARE (3) McComb
Limit 30 Priority to Psychology Majors
This course examines important mental health issues in the context of contemporary clinical practice. It explores major theories of counseling and psychotherapy through readings, case narratives, accounts of clinical processes, and research studies of clinical effectiveness.
Cross-listed with Behavioral Biology
Sec. 01 Th 12-3

200.344 (N,S) BEHAVIORAL ENDOCRINOLOGY (3) Ball
Limit 80 Prereq: 200.141 or 080.205 or Perm. Req’d
An examination of the effects of hormones on behavior in non-human and human animals. Topics will include the effects of hormones on sexual differentiation, reproductive behavior, parental behavior, homeostasis and biological rhythms, regulation of body weight, learning and memory.
Cross-listed with Behavioral Biology and Neuroscience
Sec. 01 ThF 10:30-12
PSYCHOLOGICAL & BRAIN SCIENCES

200.355 (S)  PSYCHOLOGY OF DECISION MAKING: BEHAVIORAL FINANCE (3) Raifman
Juniors and Seniors only  Limit 40
Prereq: Six credits of Psychology course work
This course will apply insights from cognitive psychology decision-making research to the stock market. The course investigates whether investors can beat the market benchmarks by exploiting marketplace investor sentiment. Cross-listed with Behavioral Biology
Sec. 01  T 3-5:30pm

200.356 (N,S)  SPECIAL TOPICS IN COGNITIVE DEVELOPMENT (3) Halberda/Landau
Juniors and Seniors only  Limit 4
Prereq: 600.203, 600.205 & 600.304 or Perm. Req’d
Limit 30
Co-listed with Cognitive Science
Sec. 01  W 12-2:30

200.374(S,N)  BEHAVIORAL MEDICINE (3) Pillari
Prereq: 200.114 or 200.141 or 200.146  Limit 50
This course deals with the investigation of biomedical and behavioral knowledge relevant to health promotion and medical treatment. Topics include heart disease, cancer, compliance, smoking, exercise, biofeedback, stress and pain.
Sec. 01  MW 12-1:30

080.330 (N)  BRAIN INJURY AND RECOVERY OF FUNCTION (3) Gorman
Prereq: 080.203, 080.205 & 080.304 or Perm. Req’d
Limit 30
Cross-listed with Neuroscience and Behavioral Biology
Sec. 01  ThF 1-2:30

080.335 (N)  NEUROSCIENCE OF PAIN (3) Haythornthwaite
Prereq: 080.205 or 200.141
Limit 30
Cross-listed with Neuroscience
Sec. 01  M 2-5

080.352 (N)  PRIMATE BRAIN FUNCTIONS (3) Hendry
Prereq: 080.205
Limit 35
Cross-listed with Neuroscience
Sec. 01  MWFh 5

290.420 (S)  HUMAN SEXUAL ORIENTATION (3) Kraft
Juniors and Seniors only  Cross-listed with Behavioral Biology, Studies of Women, Gender and Sexuality
Sec. 01  T 3-6pm

080.352 (N)  PRIMATE BRAIN FUNCTIONS (3) Hendry
Prereq: 080.205
Limit 35
Cross-listed with Neuroscience
Sec. 01  MWFh 5

200.501  PSYCHOLOGY RESEARCH - FRESHMEN
Sec. 01  Th 12

200.503  PSYCHOLOGY RESEARCH - SOPHOMORES
Sec. 01  W 12-2:30

200.505  PSYCHOLOGY READINGS - FRESHMEN
Sec. 01  W 2

200.507  PSYCHOLOGY READINGS - SOPHOMORES
Sec. 01  TBA

200.509  PSYCHOLOGY INTERNSHIP
Sec. 01  W 1-2:30

200.511  PSYCHOLOGY RESEARCH - JUNIORS
Sec. 01  W 2-5

200.513  PSYCHOLOGY RESEARCH - SENIORS
Sec. 01  W 2-5

200.517  PSYCHOLOGY READINGS - SENIORS
Sec. 01  W 2-5

200.529  SENIOR HONORS RESEARCH
Sec. 01  W 2-5

200.539  INDEPENDENT STUDY - JUNIORS
Sec. 01  TBA

200.543  PSYCHOLOGY - RESEARCH Staff
Sec. 01  TBA

THE FOLLOWING COURSES ARE FOR GRADUATE STUDENTS ONLY

200.615  GRADUATE SEMINAR IN FUNCTIONAL NEUROIMAGING
Sec. 01  Th 12

200.627  GRADUATE SEMINAR: MEMORY
Sec. 01  W 2

200.631  TOPICS IN SPATIAL COGNITION
Sec. 01  TBA

200.656  SPECIAL TOPICS IN COGNITIVE DEVELOPMENT Halberda/Landau
Prereq: Six credits of Psychology course work
This course will apply insights from cognitive psychology decision-making research to the stock market. The course investigates whether investors can beat the market benchmarks by exploiting marketplace investor sentiment. Cross-listed with Behavioral Biology
Sec. 01  W 12-2:30

200.661  PROFESSIONAL PSYCHOLOGY
Sec. 01  T 12

200.670  ADVANCED SEMINAR: VISION
Sec. 01  F 9-10:50
PSYCHOLOGICAL & BRAIN SCIENCES

200.805 SEMINAR: MEMORY AND SPATIAL COGNITION Stark Limit 30 Sec. 01 T 1

200.807 SEMINAR: BEHAVIORAL NEUROENDOCRINOLOGY Ball This graduate seminar concerns the interrelationships among hormones, brain and behavior. The primary scientific literature relevant to both how hormones cause behavior and how behavior influences hormones will be covered. Sec. 01 TBA

200.810 RESEARCH IN PSYCHOLOGY Staff Sec. 01 TBA

200.811 RESEARCH SEMINAR: HUMAN PERFORMANCE Egeth Sec. 01 TBA

200.813 RESEARCH SEMINAR: COGNITIVE DEVELOPMENT Feigenson Sec. 01 TBA

200.815 RESEARCH SEMINAR: LEARNING Holland Sec. 01 Th 12-1:30

200.818 NEUROSCIENCE DECISION MAKING Stephenson Sec. 01 TBA

200.820 DIRECTED READINGS AND RESEARCH Staff Sec. 01 TBA

200.821 RESEARCH SEMINAR: BEHAVIORAL NEUROSCIENCE Ball Sec. 01 W 12-1:30

200.828 RESEARCH SEMINAR: PERCEPTION Jantzi Sec. 01 Th 1-3

200.841 RESEARCH SEMINAR: NEURAL SYSTEMS OF MEMORY AND ATTENTION Courtesy Sec. 01 F 12-1:30

200.849 TEACHING PRACTICUM Staff Sec. 01 TBA

PUBLIC HEALTH STUDIES

280.156 (H,S) THE INVENTION OF TROPICAL DISEASE (3) Goodyear Limit 17 Freshmen only A focus on the idea of Tropical Disease as a cultural legacy of European colonization in tropical latitudes. Cross-listed with History of Science and Technology and Latin American Studies Sec. 01 WF 1-2:30

280.345 (Q,S) BIOSTATISTICS IN PUBLIC HEALTH (4) Staff Limit 30 per section Prereq: Four years of high school math Sec. 01 M 4 T 4
Using problem-based learning focusing on public health topics, students learn to describe & summarize data, make inferences regarding population parameters, & test hypotheses.

280.399 (H,S) PRACTICUM IN COMMUNITY HEALTH (3) Goodyear Limit 35 Seniors & Juniors only Perm. Req'd. Students will participate in community-based health services intervention programs, working with community leaders & health interventionists from the schools of Medicine & Public Health. Classroom presentation. Paper required. Sec. 01 M 4-5:30

280.495 (S) HONORS IN PUBLIC HEALTH-SEMINAR (3) Gebo Perm Req'd. A research methods seminar to prepare students doing honors in Public Health Studies. Sec. 01 T 3:30-5

100.120 (H,S) (W) SLAVERY: FROM AFRICA TO AMERICA 3 Larson Limit 25 per section Cross-listed with History Sec. 01 MT 3

140.105 (H,S) HISTORY OF MEDICINE, ANTIQUITY TO SCIENTIFIC REVOLUTION (3) Staff Limit 20 per section Cross-listed with History of Science and Technology Sec. 01 MT 10 W 10

140.346 (H,S) HISTORY OF CHINESE MEDICINE (3) Hanson Limit 25 Cross-listed with History of Science and Technology Sec. 01 MTW 9

150.219 (H) BIOETHICS (3) Rat Limit 20 per section Cross-listed with Philosophy Sec. 01 MT 12

200.805 SEMINAR: MEMORY AND SPATIAL COGNITION Stark Limit 30 Sec. 01 T 1

200.807 SEMINAR: BEHAVIORAL NEUROENDOCRINOLOGY Ball This graduate seminar concerns the interrelationships among hormones, brain and behavior. The primary scientific literature relevant to both how hormones cause behavior and how behavior influences hormones will be covered. Sec. 01 TBA

200.810 RESEARCH IN PSYCHOLOGY Staff Sec. 01 TBA

200.811 RESEARCH SEMINAR: HUMAN PERFORMANCE Egeth Sec. 01 TBA

200.813 RESEARCH SEMINAR: COGNITIVE DEVELOPMENT Feigenson Sec. 01 TBA

200.815 RESEARCH SEMINAR: LEARNING Holland Sec. 01 Th 12-1:30

200.818 NEUROSCIENCE DECISION MAKING Stephenson Sec. 01 TBA

200.820 DIRECTED READINGS AND RESEARCH Staff Sec. 01 TBA

200.821 RESEARCH SEMINAR: BEHAVIORAL NEUROSCIENCE Ball Sec. 01 W 12-1:30

200.828 RESEARCH SEMINAR: PERCEPTION Jantzi Sec. 01 Th 1-3

200.841 RESEARCH SEMINAR: NEURAL SYSTEMS OF MEMORY AND ATTENTION Courtesy Sec. 01 F 12-1:30

200.849 TEACHING PRACTICUM Staff Sec. 01 TBA

PUBLIC HEALTH STUDIES

280.156 (H,S) THE INVENTION OF TROPICAL DISEASE (3) Goodyear Limit 17 Freshmen only A focus on the idea of Tropical Disease as a cultural legacy of European colonization in tropical latitudes. Cross-listed with History of Science and Technology and Latin American Studies Sec. 01 WF 1-2:30

280.345 (Q,S) BIOSTATISTICS IN PUBLIC HEALTH (4) Staff Limit 30 per section Prereq: Four years of high school math Sec. 01 M 4 T 4
Using problem-based learning focusing on public health topics, students learn to describe & summarize data, make inferences regarding population parameters, & test hypotheses.

280.399 (H,S) PRACTICUM IN COMMUNITY HEALTH (3) Goodyear Limit 35 Seniors & Juniors only Perm. Req'd. Students will participate in community-based health services intervention programs, working with community leaders & health interventionists from the schools of Medicine & Public Health. Classroom presentation. Paper required. Sec. 01 M 4-5:30

280.495 (S) HONORS IN PUBLIC HEALTH-SEMINAR (3) Gebo Perm Req'd. A research methods seminar to prepare students doing honors in Public Health Studies. Sec. 01 T 3:30-5

100.120 (H,S) (W) SLAVERY: FROM AFRICA TO AMERICA 3 Larson Limit 25 per section Cross-listed with History Sec. 01 MT 3

140.105 (H,S) HISTORY OF MEDICINE, ANTIQUITY TO SCIENTIFIC REVOLUTION (3) Staff Limit 20 per section Cross-listed with History of Science and Technology Sec. 01 MT 10 W 10

140.346 (H,S) HISTORY OF CHINESE MEDICINE (3) Hanson Limit 25 Cross-listed with History of Science and Technology Sec. 01 MTW 9

150.219 (H) BIOETHICS (3) Rat Limit 20 per section Cross-listed with Philosophy Sec. 01 MT 12

### PUBLIC HEALTH STUDIES

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Staff</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>180.280</td>
<td>POPULATION ECONOMICS (3)</td>
<td>Staff</td>
<td>80</td>
<td>180.101-102</td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td>180.289</td>
<td>ECONOMICS OF HEALTH (J)</td>
<td>Bishai</td>
<td>50</td>
<td>180.102</td>
<td>Sec. 01</td>
<td>T 3-5</td>
</tr>
<tr>
<td>190.354</td>
<td>THE POLITICS OF HEALTH POLICY (AP)</td>
<td>Sheingate</td>
<td>180.102</td>
<td>Cross-listed with Economics</td>
<td>Sec. 01</td>
<td>TW 1</td>
</tr>
<tr>
<td>195.477</td>
<td>INTRODUCTION TO URBAN POLICY (3)</td>
<td>Newman</td>
<td>15</td>
<td>180.101</td>
<td>Sec. 01</td>
<td>T 5-7pm</td>
</tr>
<tr>
<td>195.478</td>
<td>URBAN POLICY INTERNSHIP (3)</td>
<td>Newman</td>
<td>15</td>
<td>180.101, 195.477</td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td>570.108</td>
<td>INTRODUCTION TO ENVIRONMENTAL ENGINEERING (3)</td>
<td>Alavi</td>
<td></td>
<td>Cross-listed with Geography and Environmental Engineering</td>
<td>Sec. 01</td>
<td>MTW 12</td>
</tr>
<tr>
<td>570.301</td>
<td>THE ENVIRONMENT AND YOUR HEALTH (3)</td>
<td>Kensler</td>
<td></td>
<td>Cross-listed with Geography and Environmental Engineering</td>
<td>Sec. 01</td>
<td>MW 8:30-10</td>
</tr>
<tr>
<td>570.465</td>
<td>WATER RESOURCE DEVELOPMENT: HISTORY AND PRINCIPLES (3)</td>
<td>Wolman</td>
<td>50</td>
<td>195.477</td>
<td>Sec. 01</td>
<td>Th 12:30-2:30</td>
</tr>
<tr>
<td>280.501</td>
<td>INTERNSHIP IN PUBLIC HEALTH</td>
<td></td>
<td></td>
<td>Perm. Req'd, Public Health majors only</td>
<td>Sec. 01</td>
<td></td>
</tr>
<tr>
<td>280.505</td>
<td>INDEPENDENT RESEARCH – Freshman/Sophomores</td>
<td></td>
<td></td>
<td>Perm. Req'd, Public Health majors only</td>
<td>Sec. 01</td>
<td></td>
</tr>
<tr>
<td>280.507</td>
<td>INDEPENDENT STUDY IN PUBLIC HEALTH</td>
<td></td>
<td></td>
<td>Perm. Req'd, Public Health majors only</td>
<td>Sec. 01</td>
<td></td>
</tr>
<tr>
<td>280.511</td>
<td>INDEPENDENT RESEARCH – Juniors/Seniors</td>
<td></td>
<td></td>
<td>Perm. Req'd, Public Health majors only</td>
<td>Sec. 01</td>
<td></td>
</tr>
<tr>
<td>570.600</td>
<td>ENGINEERING HEALTH CRISIS</td>
<td></td>
<td></td>
<td>Perm. Req'd, S/U Only</td>
<td>Sec. 01</td>
<td>Th 6:30-8:30</td>
</tr>
</tbody>
</table>

### PUBLIC POLICY

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Staff</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>195.477</td>
<td>INTRODUCTION TO URBAN POLICY (3)</td>
<td>Newman</td>
<td>15</td>
<td>180.101, 195.477</td>
<td>Sec. 01</td>
<td>T 5-7pm</td>
</tr>
<tr>
<td>195.478</td>
<td>URBAN POLICY INTERNSHIP (3)</td>
<td>Newman</td>
<td>15</td>
<td>180.101, 195.477</td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td>195.605</td>
<td>MICROECONOMICS (3)</td>
<td>Staff</td>
<td>30</td>
<td>180.101</td>
<td>Sec. 01</td>
<td>W 9-11:30</td>
</tr>
</tbody>
</table>

### STATISTICAL AND DATA
PUBLIC POLICY

195.605 ANALYSIS FOR POLICYMAKING I
   Dworak-Fisher Limit 30
   Sec. 01  Th 9:30-12

195.607 THE POLICY PROCESS Posner
   Limit 30
   (W) Sec. 01  M 5:30-7:30pm

195.609 POLICY ANALYSIS IS FOR THE
   REAL-WORLD Newman Limit 50
   Perm. Req’d
   (W) Sec. 01  T 9:30-1

195.610 VALUE, ETHICS, AND PUBLIC
   POLICY Lev Limit 30
   Sec. 01  T 2:30-4:30

195.611 PROGRAM EVALUATION Barnow
   Limit 30
   Sec. 01  T 10:30-12:20

195.621 INTERNSHIP Arndt Limit 30
   Sec. 01  TBA

195.825 INDEPENDENT STUDY
   Sec. 01  TBA

NONPROFIT CERTIFICATE COURSES

195.630 THE NONPROFIT SECTOR: SIZE,
   SCOPE, STRUCTURE Flynn
   Meets 9/7-12/7
   Sec. 01  Th 5-7:30pm

195.631 PARTNERING FOR RESULTS Fuller
   Lab Fee: $100
   Sec. 01  8:30-5pm
   (Meets 10/13-11/18)

195.634 ADVOCACY I Ciekot/Binderman
   Meets 9/11-10/30
   Sec. 01  M 5-7:30pm

195.636 RESOURCE DEVELOPMENT Krupp
   Meets 9/13-10/25
   Sec. 01  W 5-7:30pm

195.641 FINANCIAL MANAGEMENT Hall
   Meets 10/31-12/2
   Sec. 01  T 5-7:30pm

195.644 ADVOCACY II Ciekot/Binderman
   Meets 11/6-12/18
   Sec. 01  M 5-7:30pm

195.649 STRATEGIC PLANNING Pell
   Meets 9/12-10/24 No MPP credit
   Sec. 01  T 5-7:30pm

ROMANCE LANGUAGES AND
LITERATURES

FRENCH

PLEASE NOTE:
Placement in all French language courses is determined either by Webcape (computerized exam to be taken online or during Orientation at the Language Lab) or by completion of a previous class at Hopkins. Contact Claude Guillermard (claude@jhu.edu) for any placement questions.

210.101 FRENCH ELEMENTS (4.5) Beauvois
   Lab Req’d. Prereq: No previous
   knowledge of French and Webcap score of
   0-250 Limit 15 per section
   The Elements, or beginning, French
   program provides a multi-faceted
   approach to teaching language and culture
   to the novice French student. From the
   first day, the students are “immersed” in a
   linguistically rich environment with
   French as the primary language of the
   classroom. The emphasis of the course is
   an aural-oral proficiency without
   neglecting the other basic skills of
   grammar structure, phonetics, reading, and
   writing. Year course; must complete both
   semesters successfully in order to receive
   credit
   No Satisfactory/ Unsatisfactory
   Sec. 01 02
   MTW 9, F 9:30-10:30
   MTW 10, F 10:30-11:30
   MTW 11, F 12

210.103 LEARNER MANAGED SECTION OF
   FRENCH ELEMENTS (3.5) Beauvois
   Limit 12 Lab Req’d Year course, must
   complete both semesters successfully in
   order to receive credit Prereq: No
   previous knowledge of French or
   Webcape score of 0-250 This course is
   designed for students with scheduling
   conflicts. Special section meets two times
   a week for 1 and 1/4 hours. On-line
   materials are designed for 1 and 1/2 more
   hours a week required for the course. It
   must be noted that there is less classroom
   contact time in this course, and therefore
   this course is recommended for those who
   Sec. 01 01
   MW 6-7:15pm
ROMANCE LANGUAGES AND LITERATURES

have some knowledge of French and need a review of the language. Only highly self-motivated students should attempt this course.

No Satisfactory/ Unsatisfactory

210.201 (H) INTERMEDIATE FRENCH (3.5) Sec. 01 MTW 10
Guillemard - Limit 15 per section
Prereq: 210.101-102, 210.103-104 or between 280 and 390 score on Webcape Lab Req'd. Taught in French, this course develops the four communication skills through multimedia material. Movies and readings from French-speaking destinations and extensive study of *Manon des Sources*. WebCT-based.

210.203 (H) ADVANCED INTERMEDIATE FRENCH (3.5) Sec. 01 MTW 9
Roos Limit 17 per section
Prereq: "A" in 210.101-102 or between 391 and 450 on Webcape Lab Req'd. Credit will not be given if you have previously taken 210.201-202. Conducted entirely in French. A two-semester intermediate course offering a systematic review of language structures, conducted exclusively in French. This course is for students who can express themselves more fluently in both their written and oral work and can analyze more difficult texts than in Intermediate French. The first semester will explore the Francophone world, and the second will study autobiographical films. The course is web-based and offers interactive exercises. Required Language Laboratory exercises are based on interactive CD-roms.

210.301 (H) CONVERSATION ET COMPOSITION FRANÇAISE (3.5) Sec. 01 MTW 9
Mobarek Prereq: 210.202 or 210.204 or Webcape and supplementary test (Contact Prof. Guillemard at claude@jhu.edu)
Lab Req'd Limit 12 per section
This is a third-year language course intended to bridge the intermediate level and more advanced levels in French literature and cultural studies. Over two semesters, students will be given the opportunity to continue strengthening their linguistic skills. This course will offer students an individualized review of grammar based on the students’ written work. Students will be presented with a diversity of texts from current newspaper articles covering key national and international issues to a diversity of literary texts.

210.303 (H) BUSINESS FRENCH (3) Sec. 01 MTW 10
Beauvois Prereq: 210.301-302 Limit 15
This course covers the fundamentals of the business world in the French language. It is a two-semester course in which students study commercial and economic vocabulary, trade and business practices in the public and private sectors. Students take the exam for the Chambre de Commerce et d'Industrie de Paris certificate at the end of the spring semester. Only the second semester of 210.303-304 counts as credit for the major.

210.501 FRENCH INDEPENDENT STUDY - LANGUAGE Staff

211.401 (H) LA FRANCE CONTEMPORAINE I (3) Sec. 01 MTW 12
Roos Limit 15 Prereq: 210.301-302 or 210.301 and instructor’s consent
Contemporary French culture and society studied through newspapers, French broadcast news, videos, and directed readings. During the first semester, students study general trends in French society; during the second semester, they concentrate on French youth and family. Oral presentation and independent research are required. Conducted in French.
### WHAT MAKES A NOVEL INTERESTING? (3) Neefs

- **Limit 60**
- Do novels afford a distinctive kind of knowledge about society, history, psychology, human beliefs, ethical and spiritual experiences? How do fictional works retain their interest and vitality over time? How are perennially provocative topics such as power, politics, love, sexuality, social concerns, symbolic figures renewed through formal inventions in narrative? We will consider the interrelation of the form and content of novels, reading some major fictions by Balzac, Hugo, Dickens, Flaubert, Melville, Pérez...

### INTRODUCTION À LA LITTÉRATURE FRANÇAISE I (3) Russo/ Roos

- **Limit 15 per section**
- **Sec. 01** MT 2-3:30
- **Sec. 02** ThF 10:30-12 MWF 12
- **Prereq:** Both semesters of 210.301-302 or at least one semester of 210.301-302 with a grade of “A” and written permission of the instructor
- Readings and discussion of texts of various genres from the Middle Ages to the 20th century. The two semesters may be taken in either order. This sequence is a prerequisite to all further literature courses. Students may coregister with an upper-level course during their second semester.
- **Course conducted in French**

### LOVE, DEATH, AND THE SUPERNATURAL (3) Nichols

- **Limit 20**
- **Sec. 01** T 3-5
- L’amour, la mort, et l’irréel—three themes connected by the belief that love and death operate in a zone apart from the everyday world. Some of the most extraordinary and little-known works of the Middle Ages explore the links between love and death passing through the space of fantasy known in French as l’irréel. Beginning with the development of these themes in four medieval works, the course will then show the transformation of the same impulse in 19th- and 20th-century French novels. Among the works read will be Le Roman de Tristan, Mélusine, Le Coeur mangé, La Manekine, Victor Hugo: Notre Dame de Paris, Flaubert: Saint Julien l’Hospitalier, Jean Giono: Le Hussard sur le Toit, Montherlant: La Reine Morte, Céline: Guignol’s Band.

### VERSAILLES ET LA COUR (3) Jeannevert

- **Limit 13**
- **Sec. 01** W 1-3
- The extravagant construction of Versailles, the rigorous order imposed through it on life at court are both part of Louis XIV’s strategy to establish and demonstrate his absolute control over France. Acknowledging the power of public media such as the arts and literature, the king also mobilises the writers and artists in his political agenda. Molière produces plays for the festivals at Versailles and La Fontaine describes the marvels of the park as it is being constructed. Others, like La Bruyère and Saint-Simon, analyse the complexities and eccentricities of the courtly society. Some admire the brilliance of the Sun King’s universe, others discreetly denounce the growing tyranny of the Crown and ridicule the submissive behaviour of puppet-like courtiers. The underlying theme of the class will be a reflection on the complex relationship between literature and power at a time when most freedoms are curtailed. **Course conducted in French**
ROMANCE LANGUAGES AND LITERATURES

212.423 (H) IMAGES, SYMBOLES ET MYTHES SURREALISTES (3) Delcampagne
Limit 12
A travers des romans, des films, des peintures et des poèmes, on examinera les grands thèmes et les principales orientations du mouvement surréaliste qui s’est développé en Europe entre les deux guerres mondiales.

212.501 FRENCH INDEPENDENT STUDY - LITERATURE Staff

SPANISH

Final placement in all Spanish language courses will be determined by a Spanish Placement exam to be taken during orientation week and in the Department office at other times, or by the previous completion of a Spanish class at Hopkins. See the Spanish Language Coordinator to arrange for the taking of the exam.

210.111 SPANISH ELEMENTS I (3.5) Weingarten
Year course Must complete both semesters successfully in order to receive credit Lab Req’d
Limit 24 (Sec. 01); Limit 17 per section (Secs. 02-06) Development of the four basic language skills of reading, writing, listening and speaking. Extensive use of an online component delivered via WebCT, sustained class participation, and three hourly exams (no midterm and no final). Section 01 (Fall semesters) is offered totally online. In order to receive credit for Spanish 111, Spanish 112 must also be completed with a passing grade.
No Satisfactory/Unsatisfactory

Sec. 01 Sec. 02 Sec. 03 Sec. 04 Sec. 05 Sec. 06
Online MTW 9 MTW 10 MTW 11 MTW 12 MTW 11 MTW 12

210.112 SPANISH ELEMENTS II (3.5) Weingarten
Prereq: 210.111 or placement exam Lab Req’d
Limit 17 per section Continuation of Spanish Elements I. Further development of the four basic language skills of reading, writing, listening and speaking. Extensive use of an online component delivered via WebCT, sustained class participation, and three hourly exams (no midterm and no final). Section 01 (Spring semesters) is offered totally online. No Satisfactory/Unsatisfactory

Sec. 01 Sec. 02 Sec. 03 Sec. 04
MTW 9 MTW 10 MTW 11 MTW 12

210.211 (H) INTERMEDIATE SPANISH I (3.5) Miranda-Díazco
Prereq: 210.111-112 or equivalent Limit 23 (Sec. 01); Limit 17 per section (Secs. 02-06) Continues building on the four essential skills for communication presented in Spanish Elements courses. Extensive use of an online component delivered via WebCT, sustained class participation, and three hourly exams (no midterm and no final). No Satisfactory/Unsatisfactory

Sec. 01 Sec. 02 Sec. 03 Sec. 04 Sec. 05 Sec. 06
Online MTW 9 MTW 10 MTW 11 MTW 12 MTW 11 MTW 12

210.212 (H) INTERMEDIATE SPANISH II (3.5) I. Gonzalez
Prereq: 210.211 or appropriate Webcape score Limit 17 per section Continues building on the four essential skills for communication presented in Intermediate Spanish I. Extensive use of an online component delivered via WebCT, sustained class participation, and three hourly exams (no midterm and no final). No Satisfactory/Unsatisfactory

Sec. 01 Sec. 02 Sec. 03 Sec. 04
MTW 9 MTW 10 MTW 11 MTW 12

210.213 (H) ADVANCED INTERMEDIATE SPANISH (3.5) I. Gonzalez
Prereq: Appropriate Webcape score Limit 17 per section Continues building on the foundation of the four essential skills for communication that was laid in introductory courses taken outside of JHU. Extensive use of an online component delivered via WebCT, sustained class participation, and three hourly exams (no midterm and no final). No Satisfactory/Unsatisfactory

Sec. 01 Sec. 02
MTW 10 MTW 11
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Limit</th>
<th>Section(s)</th>
<th>Days</th>
<th>Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>210.311 (W)</td>
<td>ADVANCED SPANISH I (3) Encinas</td>
<td></td>
<td></td>
<td>Prereqs: 210.212 or 210.213 or appropriate Webcape score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Limit 15 per section</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advanced Spanish I is designed</td>
<td></td>
<td></td>
<td>to improve the four skills: Reading, writing, listening and speaking,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>essential for communication. This third-year course aims to improve the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>students' reading and writing skills by focusing on various types of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>texts. Students will also engage in more formal levels of written</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>communication. This course also focuses on refinement of grammar. Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>are exposed to a deeper understanding of the cultures of the Spanish-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>speaking world. Extensive use of an online component delivered via</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WebCT, sustained class participation, and three hourly exams (no midterm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>and no final). No Satisfactory/ Unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.312 (H)</td>
<td>ADVANCED SPANISH II (3) Encinas</td>
<td></td>
<td></td>
<td>Prereq: 210.311 or appropriate Webcape score Limit 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>This third-year course aims at</td>
<td></td>
<td></td>
<td>improving the students' oral skills by focusing on the use of standard,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>improving the four skills:</td>
<td></td>
<td></td>
<td>spoken Spanish with an emphasis on colloquial and idiomatic expressions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>students will engage in more</td>
<td></td>
<td></td>
<td>Students will also focus on vocabulary acquisition.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>formal levels of communication</td>
<td></td>
<td></td>
<td>by discussing assigned literary and non-literary topics. They will increase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>by focusing on the use of</td>
<td></td>
<td></td>
<td>their listening skills through movies and other listening comprehension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>standard, spoken Spanish</td>
<td></td>
<td></td>
<td>exercises. The course will also focus on vocabulary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>with an emphasis on colloquial</td>
<td></td>
<td></td>
<td>acquisition.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and idiomatic expressions</td>
<td></td>
<td></td>
<td>No Satisfactory/ Unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.313 (H)</td>
<td>MEDICAL SPANISH (3) Sánchez</td>
<td></td>
<td></td>
<td>Prereqs: 210.311 Webcape score above 650 Students will increase their</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limit 22</td>
<td></td>
<td></td>
<td>vocabulary and practice grammar structures closely related to the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All language skills are equally</td>
<td></td>
<td></td>
<td>medical and health administration professions. All language skills are</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>emphasized. Highly recommended to</td>
<td></td>
<td></td>
<td>equally emphasized. Highly recommended to students in any of the health-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>students in any of the health-</td>
<td></td>
<td></td>
<td>related majors. There will be an intensive on-line component.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>related majors.</td>
<td></td>
<td></td>
<td>No Satisfactory/ Unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.314 (H)</td>
<td>BUSINESS SPANISH (3) Sánchez</td>
<td></td>
<td></td>
<td>Prereqs: 210.311 Webcape score above 650 Students will increase their</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limit 15</td>
<td></td>
<td></td>
<td>vocabulary and practice grammar structures closely related to trade and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All language skills are equally</td>
<td></td>
<td></td>
<td>business practices in the public and private sectors. All language skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>emphasized. Highly recommended to</td>
<td></td>
<td></td>
<td>are equally emphasized. Highly recommended to students majoring in Business</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>students majoring in Business</td>
<td></td>
<td></td>
<td>and International Relations. There will be an intensive on-line component.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and International Relations.</td>
<td></td>
<td></td>
<td>No Satisfactory/ Unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.316 (H)</td>
<td>CONVERSATIONAL SPANISH (3)</td>
<td></td>
<td></td>
<td>Prereqs: 210.311 or Webcape score above 650 This course is designed for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encinas</td>
<td></td>
<td></td>
<td>students who have attained an advanced level of proficiency in Spanish</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limit 15</td>
<td></td>
<td></td>
<td>and wish to improve their oral skills by focusing on the use of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>This course is designed for</td>
<td></td>
<td></td>
<td>standard, spoken Spanish with an emphasis on colloquial and idiomatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>students who have attained an</td>
<td></td>
<td></td>
<td>expressions. Students are exposed to a deeper understanding of the cultures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>advanced level of proficiency</td>
<td></td>
<td></td>
<td>of the Spanish-speaking world through movies and other listening</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>in Spanish 210.312 and wish</td>
<td></td>
<td></td>
<td>comprehension exercises. The course will mainly focus on conversation and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to improve their oral skills by</td>
<td></td>
<td></td>
<td>vocabulary acquisition.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Instructor</td>
<td>Credits</td>
<td>Prerequisites/Notes</td>
<td>Section</td>
<td>Days/Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------</td>
<td>------------</td>
<td>---------</td>
<td>----------------------------------------------------------</td>
<td>---------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.411 (H)</td>
<td>SPANISH TRANSLATION FOR THE PROFESSIONS (3) Sánchez/González</td>
<td></td>
<td>3</td>
<td>Prereqs: 210.313, 210.314, or 210.315</td>
<td>Sec. 01</td>
<td>M/T/W 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Satisfactory/Unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.412 (W)</td>
<td>SPANISH LANGUAGE INTERNSHIP (3) Sánchez</td>
<td></td>
<td>3</td>
<td>Prereq: 210.411</td>
<td>Sec. 01</td>
<td>M/W 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Spanish Language Internship involves a specially designed project related to student’s minor concentration. Provides an opportunity to use Spanish language in real world contexts. May be related to current employment context or developed in agencies or organizations that complement student’s research and experimental background while contributing to the improvement of language proficiency. No Satisfactory/Unsatisfactory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>212.339 (H)</td>
<td>BORGES &amp; PHILOSOPHY (3) Egginton</td>
<td></td>
<td>3</td>
<td>Limit 25</td>
<td>Sec. 01</td>
<td>Th 12-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In this course we will read some of the most important works of the Argentinian writer, thinker, and critic Jorge Luis Borges, as they intersect with fundamental questions in modern philosophy. The relation of Borges to thinkers like Kant, Leibniz, Heidegger, and Derrida will be at the core of our discussions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>212.356 (H)</td>
<td>LATIN AMERICAN CULTURE THROUGH THE STUDY OF POETRY, SHORT FICTION, TESTIMONIO, AND VIDEO (3) Castro-Klaren</td>
<td></td>
<td>3</td>
<td>Limit 35</td>
<td>Sec. 01</td>
<td>T 12-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>An examination of the key ideas that constitute the idea of Latin American Culture though the study of poetry, short fiction, testimonio and video. Cross-listed with the Program in Latin American Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>212.357 (H)</td>
<td>REALISM, MAGIC, RELIGION, AMOR Y LOCURA (3) E. Gonzalez</td>
<td></td>
<td>3</td>
<td>Limit 25</td>
<td>Sec. 01</td>
<td>W 1-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Three classics of realismo mágico studied in reference to religious and magical phenomena and cross-cultural conceptions of madness and passion. Gabriel García Márquez’s El amor en los tiempos del cólera and El amor y otros demonios, Isabel Allende’s La casa de los espíritus, and Laura Restrepo’s Delirio. Taught in Spanish. Cross-listed with the Program in Latin American Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>212.369 (H)</td>
<td>SPANISH NEW YORK (3) Galasso</td>
<td></td>
<td>3</td>
<td>Prereq: 210.228 or 210.229 or Webcape placement in 210.326 Limit 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significance to the work of major Hispanic writers, examines the various ways in which New York has functioned as a complex contact zone for Spanish speakers (to the United States, to Anglophone U.S. culture and literature, and to each other), and interrogates the different constructions of Hispanic identity vis-à-vis New York. This course will be taught in Spanish. Dean’s Teaching Fellowship Course</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>212.525</td>
<td>SPANISH INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ROMANCE LANGUAGES AND LITERATURES

ITALIAN

Final placement in all Italian language courses will be determined by an Italian Placement exam, or by the previous completion of an Italian class at Hopkins. See the Italian Language Coordinator to arrange for the taking of the exam.

210.151  ITALIAN ELEMENTS (3.5) Zannirato  Sec. 01  MTW 9
Limit 17 per section
Year course; must complete both semesters for credit. The aim of the course is to provide the student with the basic skills in reading, writing, and speaking the language through the use of grammatical texts, elementary readings, videos, and electronic didactic materials. All classes are conducted in Italian; oral participation is encouraged from the beginning.

No Satisfactory/ Unsatisfactory

Sec. 02  MTW 10
Sec. 03  MTW 11
Sec. 04  MTW 12
Sec. 05  MTW 12

210.251 (H)  INTERMEDIATE ITALIAN (3.5) Zannirato
Limit 17 per section
Prereq: 210.151-152 or placement exam
Lab Req'd. Intensive review of grammatical and syntactical structures; improvement of reading and composition skills through the use of contemporary texts, reinforcement of the student's knowledge of the language through oral and written presentations on predetermined subjects. All classes are conducted in Italian. Class participation is essential.

No Satisfactory/ Unsatisfactory

Sec. 01  MTW 10
Sec. 02  MTW 11
Sec. 03  MTW 12
Sec. 04  MTW 12

210.351 (H) (W)  ADVANCED ITALIAN COMPOSITION AND CONVERSATION (3) Zannirato
Limit 12 per section
Prereq: 210.251-252 or placement exam
This third-year level course presents a systematic introduction to a variety of contemporary cultural topics, emphasizing role-playing, vocabulary building, and style and clarity in writing. Texts drawn from different media (newspapers, magazines, and literary work), and ample use of audio-visual and electronic materials will stress everyday spoken Italian.

Sec. 01  MTW 11
Sec. 02  MTW 12

210.361 (H)  WORLD OF DANTE (3) Forni
Limit 15
This course focuses on the social, political, and moral concerns that shape Dante's Divine Comedy. Close readings of selected cantos from the Comedy are at its core. (Taught in Italian).

Sec. 01  M 1-3

210.373 (H)  ITALIAN COMEDY (3) Stephens
Prereq: 210.251-252
Limit 12
Readings and discussion, in Italian, of the grand tradition of comedy, satire, and humor in Italian literature and culture: from the humor of the Middle Ages through the reinvention of the theater by Italian authors around 1500, to the modern classics of opera, stage, and film. Class will be paced to build linguistic and literary competence. Emphasis on reading, writing, speaking, and recitation. If enrollment suffices, a one-act play can be produced. Readings in Dante, Boccaccio, Machiavelli, Ariosto, Goldoni, Mozart/ Da Ponte, Pirandello, Calvino; films by Totò, Roberto Benigni, and others.

Sec. 01  ThF 10:30-12

212.379 (H)  THE INTELLECTUAL WORLD OF THE ITALIAN RENAISSANCE (3) Celenza
Limit 15
This course will allow students to explore the intellectual background to the fifteenth-century Italian Renaissance. Most Italian intellectuals from the late fourteenth century through to the early sixteenth century wrote, not in Italian, but in a "new" Latin, like the Latin used in ancient Rome, rather than (what they saw as) the inauthentic Latin of medieval universities and the Church. Recent scholarship has allowed us to have greatly increased access to these authors who wrote in the era between Dante and...
**ROMANCE LANGUAGES AND LITERATURES**

(1265-1321) and Niccolò Machiavelli (1469-1527). Thinkers such as Leonardo Bruni (perhaps the best-selling author of the fifteenth century), Lorenzo Valla (who is now emerging as a major philosopher of language), and Marsilio Ficino (whose influence on literature and the arts in his own era is comparable to that of Freud in ours), are comparatively little known today. But their work represented the intellectual backbone of Renaissance Italy and was widely diffused in succeeding centuries in early modern Europe. This course will allow students to explore this forgotten legacy and thus to understand a missing chapter in the history of western thought. Cross-listed with History, Classics, the Humanities Center, and Philosophy.

212.561 **ITALIAN INDEPENDENT STUDY**

**PORTUGUESE**

Final placement in all Portuguese language courses will be determined by a Portuguese Placement exam to be taken during orientation week and in the Department office at other times, or be the previous completion of a Portuguese class at Hopkins. See the Portuguese Language Coordinator to arrange for the taking of the exam.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>210.177</td>
<td><strong>PORTUGUESE ELEMENTS</strong> (3.5)</td>
<td>Bensabat-Ott</td>
<td>3.5</td>
<td>Sec. 01 MWF 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Limit 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This course introduces students to the basic skills in reading, writing, and speaking the Portuguese language. Basic texts, music, and folklore are used to acquaint students with Portugal and Brazil, as well as the cultural influences of Africa on Brazilian society. Students are encouraged to speak from the very beginning of the course, and class participation is a must. All classes are conducted in Portuguese. Language lab is required. Both semesters must be completed with passing grades to receive credit. <strong>No Satisfactory/Unsatisfactory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.277 (H)</td>
<td><strong>INTERMEDIATE/ADVANCED PORTUGUESE</strong> (3.5)</td>
<td>Bensabat-Ott</td>
<td>3.5</td>
<td>Sec. 01 MWF 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Limit 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More advanced training in the skills of the language through short stories, poetry, and miscellaneous readings from Brazil, Portugal, and Portuguese-speaking Africa that reflect the mix of cultures at work in contemporary Lusophone world. Throughout the course emphasis is placed on vocabulary building, ease, and fluency in the language. All classes are conducted in Portuguese. Language lab is required. Both semesters must be completed with passing grades to receive credit. <strong>No Satisfactory/Unsatisfactory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210.391 (H)</td>
<td><strong>PORTUGUESE LANGUAGE &amp; LITERATURE</strong> (3.5)</td>
<td>Bensabat-Ott</td>
<td>3.5</td>
<td>Sec. 01 MWF 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Limit 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This third year Advanced Portuguese course focuses on reading, writing, and oral expression. Under the supervision of the instructor, students will read one or two complete works by major Brazilian, Portuguese, and/or Afro-Portuguese writers each semester, followed by intensive writing and oral discussion on the topics covered. Grammar will be reviewed as necessary.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300.335 (H)</td>
<td><strong>PROUST AND PHILOSOPHY</strong> (3)</td>
<td>de Vries</td>
<td>3.0</td>
<td>Sec. 01 TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Limit 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cross-listed with German, Humanities Center and Philosophy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300.343 (H)</td>
<td><strong>BERGSON AND THE PROBLEM OF NOVELTY IN PHILOSOPHY</strong> (3)</td>
<td>Marrari</td>
<td>3.0</td>
<td>Sec. 01 TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Limit 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cross-listed with Anthropology, German &amp; Humanities Center, and Political Science</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ROMANCE LANGUAGES AND LITERATURES

### GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Instructor(s)</th>
<th>Section</th>
<th>Days and Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>210.610</td>
<td>METHODS OF FOREIGN LANGUAGE TEACHING</td>
<td>Beauvois</td>
<td>01</td>
<td>Th 11-1</td>
</tr>
<tr>
<td></td>
<td>限制 30 Required for all incoming teaching assistants in the Dept. of RL&amp;L, this course will focus on an overview of the tenets of second language acquisition (SLA) and the research which informs current teaching practice. Students will study the state of the TLL profession past and present, and will look at different methods and techniques for effective second language teaching and learning. The basis of the course is a balance between the practical and the theoretical.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>212.692</td>
<td>RESEARCH METHODS</td>
<td>Waterman</td>
<td>01</td>
<td>Th 9-10:30</td>
</tr>
<tr>
<td></td>
<td>Department majors only. Limit 20 Seminar and lab in the methods, resources, and systems of research for graduate students of literature.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>210.601</td>
<td>FRENCH FOR READING AND TRANSLATION</td>
<td>Staff</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>Intensive study of French grammar structure plus experience in reading and translating expository prose. Students do independent work (vocabulary acquisition and translation) in their particular field of study. Designed for graduate students in other departments who need to complete a language requirement in French. Open to undergraduates only with the permission of the language coordinator.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>212.609</td>
<td>LE THEATRE ET SES CENSEURS (XVIIe SIECLE)</td>
<td>Jeanneret</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>Far from being the expression of wisdom and order, an literary history would have it, XVIIth century theatre, either tragic or comic, challenged the morality and rationality of the time. Its assault on conventional values, whether those of religion, of sex or of poetics, upset censors of different sorts, who tried to tame or silence it. We will meditate on the flamboyance and courage of the great playwrights and show that their plays allow the expression of what is usually repressed – the world of desires and fantasies. The quarrels around Corneille’s Le Cid and Molière’s infamous trilogy (l’Ecole des femmes, Tartuffe, Don Juan) will be centre stage. Under such pressure, self-censorship was also active; the balance between provocation and restraint will be studied through the example of Racine. The seminar will be held in French.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>212.610</td>
<td>THE SACRED AND THE SECULAR: THE MANUSCRIPT CODEX 1200-1500</td>
<td>Nichols, Noel</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>This course discusses manuscript production and consumption in the high middle ages, including relations of text and image. It concentrates particularly on manuscript evidence for reading practices, in monastic, private and courtly contexts. Many of the classes will be held in the Walters Art Museum, where students will be able to examine original manuscript material, and will be introduced to the many different ways in which manuscripts can be displayed and studied to provide insights into medieval art and culture.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>212.621</td>
<td>FLAUBERT, FROM BOVARY TO BOUVARD</td>
<td>Neely</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>The seminar will propose a reading of the first published novel of Flaubert, Madame Bovary and the last novel he was writing when he died, Bouvard et Pecuchet. The others works by Flaubert will be occasionally considered. The new fiction patterns that Flaubert invented, the deep irony of those novels, the narrative</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
integration of knowledge and sciences, will be one of the main topics that will be examined in those two novels. Drafts, scenarios, manuscript materials will be examined to stress on the strongness that Flaubert gave to the art of Prose. October 2006 will be the 150 years anniversary of Madame Bovary. Flaubert, Madame Bovary, Le Livre de poche classique Flaubert, Bovard et Pécuchet, GF Flammarion.

212.741 JEAN-JACQUES ROUSSEAU: ENLIGHTENMENT AND DISSENT Russo Limit 12 A reading of Rousseau’s major works in light of the debates they have triggered both within the Enlightenment and in postmodernism. Secondary readings by Sturinbiski, De Man, Derrida.

212.748 IMAGINER L’AVENIR Delacampagne Sec. 01 Th 1-3 Ce qui est à venir est par définition impossible à imaginer. Et pourtant l’art et la littérature européenne ne cessent de tenter de représenter l’inrepréhensible, mettant ainsi en œuvre une esthétique de la représentation qu’on s’efforcera de reconstruire.

212.774 TRAVAIL, ÉCRITURE ET PENSÉE DE LA FIN Noudelmann Sec. 01 M 1-5 L'idée de la fin a hanté l'Occident qui s'est représenté sa propre histoire en termes de mort et de renaissance. Elle est devenue constitutive d'un genre artistique, littéraire et philosophique cherchant à promouvoir une ère régénératrice sur le dénué affirmin d'une époque rivolue. A partir de la fin du XIXe siècle, ce fantasme apocalyptique, manifesté par les avant-gardes, n'est plus seulement une prophétie mais un travail consistant à mener au bout le processus de l'achèvement. On étudiera les machines conceptuelles et textuelles visant à réaliser la fin, à la fois terminus et finition, augurant une possible recomposition à partir des figures déchues de l'humanisme. L'objectif du séminaire consistera à suivre des œuvres-vie (Nietzsche, Artaud, Sartre, Beckett) qui se sont confrontés à la question de la fin, pour montrer ce qui les différencie de la thématique largement repérable de la génération corrompue, et pour dégager à partir d'elles une perspective post-généalogique.

212.801 FRENCH INDEPENDENT STUDY
212.802 FRENCH DISSERTATION RESEARCH
212.803 FRENCH PROPOSAL PREPARATION

SPANISH

212.758 LA NOVELA Y DE LA TIERRA EN AMERICA Y ESPAÑA E. Gonzalez Sec.01 T 2-4 Novels written in Spanish America and Spain in the nineteenth and twentieth centuries characterized by rural and pastoral themes, barbarism and civility, and the question of nationhood. Ignacio Manuel Altamirano (México), La navidad en las montañas (1871). Emilia Pardo Bazán (Spain), Los pazos de Ulloa (1886); José Eustacio Rivera (Colombia), La vorágine (1924); Rómulo Gallego (Venezuela), Doña Bárbara (1929); Alejo Carpentier (Cuba/Venezuela), Los Pasos perdidos (1953); Juan Benet (Spain), Volverás a tu región (1967).

212.759 AUTHORSHIP AND NOBILITY IN EARLY LYRIC POETRY Altschul/ Sieber Sec.01 W 3-5 This seminar will begin
212.773  BAROQUE AND NEOBAROQUE  Sec.01  F 3-5
Egginton  Limit 12  Works from the Spanish Baroque and colonial period will be read in conjunction with that aesthetic production of the 20th century that has come to be known as neobaroque. We will attempt to confront the question of what, if anything, connects these periods aesthetically, politically, and philosophically. Media beyond the textual will be included in our considerations.

212.774  TRAVAIL, ÉCRITURE, ET PENSÉE DE LA FIN  Sec.01  M 1-3
Noël-Düllmann  Limit 12

212.776  CANON FORMATION IN THE IDEA OF LATIN AMERICA  Sec.01  Th 2-4
Castro-Klaren  Limit 10
The seminar explores, in the work of major Latin America’s writers and critics such as Rodo, Borges, Mariategui, Neruda, Jean Franco, Antonio Cordero, Ángel Rama, Antonio Cándido, Elisa Panteau Cunha, Rosario Castellanos, John Beverley and Walter Mignolo, the key concepts that have allowed for the construction of a canon in Latin American culture and literature. Cross-listed with the Program for Latin American Studies

212.826  SPANISH INDEPENDENT STUDY
212.827  SPANISH DISSERTATION RESEARCH
212.828  SPANISH PROPOSAL PREPARATION

ITALIAN

212.761  BOOKS, READERS, AND WRITERS IN PRE-MODERN EUROPE  Sec. 0  T 4-6pm
Colenbac/  Izbicki  Prereq: Basic reading knowledge of Latin or Perm. Req’d. Limit 15
This course is designed to familiarize students with the basics of Latin paleography; to offer them resources and skills in the study of textual transmission and editing; to understand the changes in western graphic culture that went along with the emergence of printing with movable type; to study the emergence in the eighteenth century of the “auxiliary” disciplines of paleography and diplomatics as part of the intellectual history of western Europe; and to become familiar with current scholarly concerns which center around the history of the book and the history of written culture. Cross-listed with Classics, History, German, and the Humanities Center

212.769  POESIA ITALIANA DELLE ORIGINI  Sec. 01  T 1-3
Forni  Limit 15  This course is an introduction to the Scuola siciliana and the Dolce stil nuovo.

212.771  LITERATURE, PHILOSOPHY, AND CHRISTIANITY: GIANFRANCESCO PICO DELLA MIRANDOLA (1469-1533)  Sec. 01  Th 3-5
Stephens  Limit 12
Reading and commentary of texts by a major author in the Renaissance philosophical canon. Gianfrancesco Pico was a key figure in the reintroduction of classical skepticism, but also a poet, a theorist of witchcraft, and a persecutor of witches. We will read selected works on skepticism, imagination, Christianity, and witchcraft, both in their Latin originals and in sixteenth-century Italian translations. Gianfrancesco's intellectual inheritance from his uncle Giovanni Pico and other humanists will be examined, as will his influence on later writers in the philosophical and literary traditions, both Latin and vernacular. Reading knowledge
PETRARCH AND AUGUSTINE
Kupper  Limit 12  Amongst his favourite authors Petrarch mentions ever and again Augustine. Indeed, Petrarch’s works, not only the Secretum, but his lyric poetry as well, are imbued with vestiges of Augustine’s thinking. The use Petrarch makes of the church father’s main theological concepts, though, is highly provocative.—The graduate course focuses on the relation between theological and literary discourse. Under this perspective, Petrarch’s writings can be considered as paradigmatic for a wide range of early modern literature, from Dante to Montaigne. The course will be taught during four weeks, twice a week, starting on September 12.

ITALIAN INDEPENDENT STUDY
ITALIAN DISSERTATION RESEARCH
ITALIAN PROPOSAL PREPARATION

PSYCHOANALYSIS AND ART HISTORY Fried & Levy  Cross-listed with the Humanities Center, History, and Philosophy

DIFFERENCE AND REPEITION AND ITS SOURCES Murray  Limit 20  Cross-listed with the Humanities Center, Philosophy, Political Science, and Anthropology

INTRODUCTORY SOCIOLOGY (3) Bennett / Charles  Limit 15 per section
The course introduces students to the basic sociological concepts and perspectives, and applies them to a variety of topics including family, work, and the dynamics of class, gender, and racial/ethnic inequalities in the United States and globally.

LATIN AMERICANS AND LATINOS IN THE UNITED STATES: HISTORICAL CONNECTIONS AND CONTEMPORARY ISSUES (3) Ybarra  Limit 25  Formerly 230.350
This course will discuss the historical and socio-political antecedent leading to Latin American immigration to the U.S., and the subsequent Latino immigration patterns that have emerged in this country. The course will focus on the impact of this immigration on Latino identity and culture, particularly in terms of language, traditions, gender and familial issues, and social and political organizations and movements. While this course is based on sociological analysis, it will be taught in an interdisciplinary fashion and will utilize film, music, and literature to supplement sociological readings.

ISSUES IN INTERNATIONAL DEVELOPMENT (3) Agarwala  Limit 15 per section
This course focuses on problems of development and underdevelopment in third world countries, on global inequalities in wealth and welfare more generally. Students will be introduced to the main theoretical perspectives on international development, as well as debates around historical and contemporary dynamics of global social change.

Cross-listed with Political Science
This course will introduce students to the application of statistical techniques commonly used in sociological analysis. Hands-on computer experience with statistical software and analysis of data from various fields of social research.

This course presents an in-depth study of racial and ethnic residential segregation and its relationship to social and economic inequality. Students will explore the history of residential segregation in the United States, its patterns and causes, as well as its social, economic, and demographic consequences. Through lectures, readings, discussions, and films, students will gain insight into racial and ethnic inequality across several social economic and demographic domains. Cross-listed with Africana Studies.

This course explores various aspects of social inequality in China during the Mao Zedong and the post-Mao reform eras. We will examine inequality within villages, the rural/urban divide, urban inequality, education and health policies, and gender and ethnic relations. Each of these issue areas will be tackled analytically, but the aim is also to understand what it was/is like to live in China during and after the Mao era. The course is designed for both undergraduate and graduate students.

This course will introduce students to the application of statistical techniques commonly used in sociological analysis. Hands-on computer experience with statistical software and analysis of data from various fields of social research.
SOCIOMETRY

research literature in this domain, with special
attention to the logic of cross-national
comparative analysis and to the methods used
for assuring comparability of concepts and
indices in cross-national research.

230.617 SEMINAR ON IMMIGRATION Hao
Limit 15 In-depth reading and discussion
of theories and research on immigration to the
U.S. Theoretical issues include international
migration, immigration, and assimilation.
Research topics include: the impact of U.S.
immigration laws on immigrant inflows and
stocks, self-selection of immigrants, the
impact of immigration on the native-born
population, and the adaptation of the first and
second generations. The course focuses on
immigration since 1965 and its related
controversies and debates.

230.622 SEMINAR ON LIMITED DEPENDENT
VARIABLE MODELS Clarin
Limit 15 This course introduces students to
techniques for the analysis of event histories
and categorical data such as logistic
regression, hazard models, and other censored
and truncated regression models. Students
will do exercises using sample data and
statistical software.

230.800 INDEPENDENT STUDY
230.801 RESEARCH ASSISTANTSHIP
230.802 DISSERTATION RESEARCH
230.804 RESEARCH APPRENTICESHIP
230.811 TEACHING ASSISTANTSHIP

THE PROGRAM IN THEATRE ARTS &
STUDIES

225.300 (H) CONTEMPORARY THEATRE
AND FILM: AN INSIDER’S VIEW (3)
Astin An introduction to the Performing Arts, including an
overview of theatre history, acting
styles, and the interaction of art and
society. A personal view from inside.

225.301 (H) ACTING AND DIRECTING
WORKSHOP IA (3)
Astin, Miller-Smith
Limit 12 per section Audition req.
An introduction to the fundamentals
of acting through exercises,
improvisation and work on scenes
from established plays, based on the
teachings of Stanislavsky, Greet,
Michael Chekhov, Clarisan and Uta
Hagen. Emphasis on playing of
actions. Auditions (one minute — any
material of your choice) held 10AM-
noon at Merrick Barn on April 8, 15,
16; Aug. 31, Sept 1, 2, 2006
Sec. 01 MTW 10
225.306 (H) ACTING AND DIRECTING
WORKSHOP IB (3)
Astin, Smith
Limit 12 per section Audition req.
An introduction to the fundamentals
of acting through exercises,
improvisation and work on scenes
from established plays, based on the
teachings of Stanislavsky, Greet,
Michael Chekhov, Clarisan and Uta
Hagen. Emphasis on relaxation and
voice. Auditions (one minute — any
material of your choice) held 10AM-
noon at Merrick Barn on April 8, 15,
16; Aug. 31, Sept 1, 2, 2006
Sec. 01 MTW 10
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>225.302 (H)</td>
<td>ACTING AND DIRECTING WORKSHOP II (3)</td>
<td>Astin / Smith</td>
<td>12</td>
<td>Prereq: 225.301 and 225.306 or Perm. Req’d.</td>
<td>Sanford Meisner repetition exercises are introduced. They form the basis of Workshop II. The Uta Hagen exercises are also pursued. As in Workshop I, the principal classroom activities will consist of scene work, exercises, lectures, and discussion. Some rehearsal will also take place during school hours. It is expected that substantial out-of-class time be spent on rehearsals and exercises.</td>
</tr>
<tr>
<td>225.303 (H)</td>
<td>ACTING AND DIRECTING WORKSHOP III (3)</td>
<td>Astin</td>
<td>10</td>
<td>Prereq: 225.302 or 225.320</td>
<td>Special attention is given to the development of spontaneity and emotional freedom using the principles of Workshops I and II. Hands-on work with John Astin’s “The Process” and the second Silverberg workbook are employed, along with the Uta Hagen text. Boleslavsky and Michael Chekhov are introduced. The Clurman, Meisner, Stanislavsky and Strasberg approaches are included. Substantial out of class time is required.</td>
</tr>
<tr>
<td>225.307 (H)</td>
<td>DIRECTING SEMINAR (3)</td>
<td>Glossman</td>
<td>12</td>
<td></td>
<td>Fundamentals of mounting, casting and staging the play, various theories of directing, students must commit to a practical lab. It is understood that students have a working familiarity with acting fundamentals.</td>
</tr>
<tr>
<td>225.314 (H)</td>
<td>THEATRE: TECHNICAL DIRECTION FOR THE THEATRE (3)</td>
<td>Staff</td>
<td>8</td>
<td>Prereq: 225.301 and 225.306 or Perm. Req’d.</td>
<td>An introduction to Technical Direction including pre-production and production with an overview of materials, tools, rigging and safety, together with design and its implementation.</td>
</tr>
<tr>
<td>225.320 (H)</td>
<td>PERFORMANCE (4)</td>
<td>Astin / Smith</td>
<td>20</td>
<td>Prereq: 225.301 and 225.306 or Perm. Req’d.</td>
<td>The student is given specific acting assignments, and develops them as special projects for public performance under the direct supervision of the instructor. A professional level performance is the goal.</td>
</tr>
<tr>
<td>225.322 (H)</td>
<td>CRITICAL MOMENTS IN 20TH CENTURY AMERICAN RADICAL THEATRE (4)</td>
<td>Astin / Walters</td>
<td>20</td>
<td></td>
<td>An in-depth examination of selected significant events in twentieth century American radical theatre.</td>
</tr>
<tr>
<td>225.520</td>
<td>PROJECTS IN THEATRE (3)</td>
<td>Astin</td>
<td></td>
<td>Permitted or Req’d.</td>
<td>Special projects created for and tailored to the individual theatre student. Enrollment limited.</td>
</tr>
</tbody>
</table>
### INTRODUCTION TO FICTION AND POETRY WRITING I:
**TELLING IT STRAIGHT** (3)**
- **Instructor:** Staff
- **Limit:** 17 per section
- **Course Prerequisite:** For majors
- **Sections:**
  - **Sec. 05** Limited to Writing Seminars majors

#### Schedule:
- MTW 9
- MTW 12
- ThF 10:30-
- ThF 10:30-
- ThF 10:30-
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12

### INTRODUCTION TO FICTION AND POETRY WRITING II:
**TELLING IT SLANT** (3)**
- **Instructor:** Staff
- **Prerequisite:** 220.105
- **Sections:**
  - **Sec. 01**
  - **Sec. 02**
  - **Sec. 03**
  - **Sec. 04**

#### Schedule:
- MTW 9
- MTW 12
- MTW 12
- ThF 10:30-
- ThF 10:30-
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12
- MTW 12

### INTRODUCTORY PLAY WRITING (3)**
- **Instructor:** Lapadula
- **Limit:** 15
- **Prerequisite:** Perm Req'd
- **Sec. 01**
  - F 12:30-
  - F 12:30-

### INTRODUCTION TO POETRY WORKSHOP (3)**
- **Instructor:** Smith
- **Limit:** 15
- **Prerequisite:** Perm Req'd
- **Sec. 01**
  - Th 2-4

### INTRODUCTION TO NONFICTION: MATTER OF FACT (3)**
- **Instructor:** Biddle
- **Limit:** 15
- **Prerequisite:** Perm Req'd
- **Sec. 01**
  - W 12-2

### UNDERGRADUATE WORKSHOP IN SCIENCE WRITING (3)**
- **Instructor:** Staff
- **Limit:** 15
- **Sec. 01**
  - M 12-2

### RUDIMENTS OF FICTION (3)**
- **Instructor:** Davies
- **Limit:** 15
- **Prerequisite:** Perm Req'd
- **Sec. 01**
  - M 4-6pm
  - T 3-5

### OPINION WRITING (3)**
- **Instructor:** Kane
- **Limit:** 15
- **Prerequisite:** Perm Req'd
- **Sec. 01**
  - W 7-9pm

### FORMS OF FICTION (3)**
- **Instructor:** Davies
- **Limit:** 15
- **Prerequisite:** Perm Req'd
- **Sec. 01**
  - Th 3-5
WRITING SEMINARS

220.374 (H)  FOUR AMERICAN WOMEN POETS (3) Salter
Limit 15  Perm. Req'd.
A study of four American poets (Emily Dickinson, Marianne Moore, Elizabeth Bishop, and Amy Clampitt), none of whom saw themselves primarily as women poets. All are known for their originality, and shaped the course of poetry in our time—by both women and men—in significant ways. Student poets will engage in poetic exercises including memorization and imitation, as well as some critical writing. Questions about gender, and about poetic mentoring and influence, will be addressed, while we pay close attention to poetic form.

220.377 (H)  POETIC FORMS I (3) Williamson
Limit 15  Perm. Req'd.

220.394 (H)  FAULKNER, FITZGERALD & HEMINGWAY (3) Irwin
Limit 15  Perm. Req'd.

220.396 (H)  ADVANCED POETRY (3) Irwin
Limit 10  Perm. Req'd.

220.501  INDEPENDENT STUDY

220.507  HONORS THESIS

220.509  PRACTICING JOURNALISM INTERNSHIP  Perm. Req’d.
Satisfactory/ Unsatisfactory only

220.513  INTERNSHIP: TEACHING WRITING IN THE SCHOOLS (3) Dixon  Perm. Req’d.
Juniors & Seniors only
Satisfactory/ Unsatisfactory only

220.613  WRITING ABOUT SCIENCE  Finkbeiner  Limit 8

220.619  GRADUATE POETIC FORMS I  Williamson

220.623  FICTION WORKSHOP  McDermott
Limit 12

220.625  POETRY WORKSHOP  M. Salter
Limit 12

220.627  CHARACTERS  McGarry
A study of fictional persons in works by Henry James, James Joyce, F. Scott Fitzgerald, William Carlos Williams, R.M. Rilke, and various contemporary writers. Students will write weekly sketches and one or more stories.

360.133 (H)  GREAT BOOKS: WESTERN TRADITION OR THE HUMANITIES: A TRADITION OF CLASSICS (3) Bett, Biddle, Talle, Valládares
Limit 20 per section
Open to all Undergraduates
Cross-listed with Interdepartmental, Music, Classics and Philosophy

360.233 (H,S)  FEMINIST AND QUEER THEORY (3) Staff
Limit 20  This course is an introduction to theories of Feminism, gender, and sexuality. It examines classic and recent texts and considers problems and cases from a variety of languages and historical periods in local, national and
INTERDEPARTMENTAL

360.353 (S) HISTORY OF U.S. LATIN AMERICAN RELATIONS (3) Smith Limit 25
Cross-listed with Political Science and Latin American Studies
Sec. 01 T 2-4

360.376 (HS) THE BODY OF ISLAM (3) Baxstrom Limit 15 “The Body of Islam” seeks to understand how, through the interplay between bodies, behavior and belief, notions of proper human living, gender and sexuality are constituted in the Muslim World. Cross-listed with Studies of Women, Gender, and Sexuality
Sec. 01 ThF 10-11:30

360.528 APPLIED ECONOMICS INTERNSHIP Hanke Prereq: 180.101-102 Perm. Req’d. Course given in conjunction with private business and financial institutions, governmental entities and economic research institutes in the Baltimore-Washington metropolitan area. Requirements include 120 hours of internship time and a research paper on an applied economics topic. Satisfactory/ Unsatisfactory only Cross-listed with Economics and Geography and Environmental Engineering
Sec. 01 TBA

360.533 DIRECTED READINGS - WGS Cross-listed with Studies of Women, Gender, and Sexuality

360.535 DIRECTED WRITING – WGS Cross-listed with Studies of Women, Gender, and Sexuality

360.605 SEMINAR: ENVIRONMENT AND APPLIED FLUID MECHANICS Meneveau Cross-listed with Geography and Environmental Engineering, Earth & Planetary Sciences, and Mechanical Engineering
Sec. 01 F 11

NON-DEPARTMENTAL PROGRAMS

CENTER FOR AFRICANA STUDIES

362.111 (HS) INTRODUCTION TO AFRICAN AMERICAN STUDIES (3) Richards Limit 15 This course is an introduction to the origins and emergence of Black Studies as an academic discipline in the American academy. The course is centered on the social realities of people of African descent living in the United States. Cross-listed with Sociology
Sec. 01 ThF 12-1:30

362.375 (HS) BEBOP, MODERNISM AND CHANGE (3) Hayes Limit 25 The seminar explores the social & political content, meanings & intent of bebop music from the 1940’s to the 1960’s and its impact on the social transformation of America.
Sec. 01 T 2-5

070.103 (HS) AFRICA AND THE MUSEUM (3) Guyer Limit 20 Cross-listed with Anthropology and the Program in Museums and Society.
Sec. 01 MTW 11

190.340 (S) BLACK POLITICS (AP) (3) Spence Limit 30 Cross-listed with Political Science
Sec. 01 Th 10:30-12:30

191.340 (S) EDUCATION POLITICS IN URBAN AMERICA (3) Hayes Limit 15 Cross-listed with Anthropology, History, Political Science, and Sociology
Sec. 01 Th 2-4

230.309 (S) SEBREGATION AND SOCIAL INEQUALITY Bennett Limit 30 Cross-listed with Sociology
Sec. 01 TW 2-3:30
DEAN'S TEACHING FELLOWSHIP COURSES

ANTHROPOLOGY

070.330 (H,S) ANTHROPOLOGY AND HUMAN RIGHTS (3) Selby Limit 15 This course examines the central debates on human rights, while emphasizing the contributions anthropology has made to these debates, and to providing innovations within the field of human rights scholarship.

070.370 (H,S) THE ANTHROPOLOGY OF WORK (3) Mulla Limit 25 This course examines the social aspects of work in everyday life, specifically in relation to the religious belief systems and values that work rewards, conflicts with, perpetuates, impacts, or absorbs.

070.381 (H,S) TRANSFORMATIONS IN POST-SOVIET SOCIETIES (3) Fournier Limit 25 This course examines the complexities of post-Soviet societies as they undergo radical social change. It focuses on local engagements with Western constructs such as ‘market’, ‘democracy’, and ‘civil society’.

BIOLOGY

020.336 (N) STEM CELL BIOLOGY IN DEVELOPMENT & DISEASE (3) Casper/Barrila Limit 20 Lectures and discussion of primary literature will deepen students' understanding about the biology of various stem cell niches and explore how that knowledge is applied in treatment of disease.

CLASSICS

040.356 (H) ANCIENT GREEK DEMOCRACY: DEFENDERS AND CRITICS (3) Jones Limit 25 This course surveys the theory, practices, and development of classical Athenian democracy by examining the competing perspectives of its critics and champions in both ancient and modern sources.

ENGLISH

060.223 (H) MARRIAGE PROBLEMS (3) Jarvis, Claire Limit 18 Prereq: One English course What is “marriage”? This course reads a variety of historical literary texts to examine why “marriage” is currently such a vexed and contentious term.

060.384 (H) INTERRACIAL INTIMACY AND THE AMERICAN NOVEL (3) Conn Limit 18 Must have taken one English literature course. This course examines the novel of interracial intimacy in light of the social, legal, and literary contexts of intermarriage and interracial sex. Course readings include Faulkner, Baldwin, Kerouac, Himes, and others.

HISTORY

100.274 (H,S) SLAVERY AND FREEDOM IN THE AMERICAS (3) Roberts Limit 25 What is slavery? This course investigates definitions of slavery (and freedom) and the experience of enslavement throughout the Americas from the 16th to the 19th century.

100.275 (H,S) ENTERPRISE AND THE LEGAL SYSTEM: INTRODUCTION TO THE AMERICAN LEGAL SYSTEM (3) Revesz Limit 25 This course is designed to introduce the student to the historical development of American law with particular reference to the business corporation and to the fundamentals of legal reasoning. The emphasis will be on the nineteenth century establishment of a distinctly American position on the corporation, the evolution of that position in the twentieth century, and the changes that are currently taking place in the law related to business corporations.

100.282 (H,S) PRACTICING DIFFERENCE, PRODUCING SIMILARITY: NATIVE AMERICANS AND ENGLISH EXPLORERS IN EARLY AMERICA Of Steve Spivay Limit 15 This seminar provides an introduction to the history and historiography of Native American and British American encounters from early exploration to the American Revolution, while introducing interdisciplinary methods of studying cross-cultural encounters.
PHILOSOPHY
150.467 (H) ABSTRACT PHILOSOPHY AND PRACTICAL LIFE (3) Smith  Limit 20
This course examines the ways in which philosophical ideas about knowledge and reality can influence ethics, politics, and everyday life. Readings will be from Plato, Marcus Aurelius, Thomas Hobbes, and William James.

POLITICAL SCIENCE
191.420 (S) SPEED AND POLITICS (3) Glezos  Limit 15
Prereq: Junior or Senior standing or permission of instructor. A theoretical analysis of the effects of speed and technology on politics, specifically in the areas of Media, war and democracy. Will include readings by Virilio, Baudrillard, Negri, Kant and Schelerman.

ROMANCE LANGUAGES & LITERATURES
212.369 (H) SPANISH NEW YORK (3) Galasso  Limit 15
Prereq: 210.228 or 210.229 or Webcape placement in 210.326. This course traces New York's significance to the work of major Hispanic writers, examines the various ways in which New York has functioned as a complex contact zone for Spanish speakers (to the United States, to Anglophone U.S. culture and literature, and to each other), and interrogates the different constructions of Hispanic identity vis-a-vis New York. This course will be taught in Spanish.

JEWISH STUDIES
Please refer to the departmental listings for complete information regarding these courses.

GERMAN
090.386 (H) GERMAN JEWISH THOUGHT SINCE THE ENLIGHTENMENT (3) Tobias

HISTORY
100.129 INTRODUCTION TO MODERN JEWISH HISTORY Meis
100.320 THE INVENTION OF MODERN JEWISH CULTURE: GENEALOGIES, FORMATIONS, DILEMMAS Meis
100.415 JEWS IN THE WORLD OF AMERICAN ENTERTAINMENT: A CULTURAL HISTORY Gevinson
100.447 JUDAISM AND CHRISTIANITY IN CONFLICT Cohen
100.606 JEWISH HISTORY AND JEWISH MEMORY IN THE MIDDLE AGES Cohen
100.657 JUDAISM, CHRISTIANITY, AND ISLAM Nirenberg

HUMANITIES
300.153 PHILOSOPHY OF RELIGION: AN INTRODUCTION TO JEWISH PHILOSOPHY Shuster

NEAR EASTERN STUDIES
130.140 INTRODUCTION TO THE HEBREW BIBLE/OLD TESTAMENT Lewis
130.195 THE ARCHAEOLOGY OF THE HOLY LAND FROM THE DAWN OF CIVILIZATION TO THE END OF THE IRON AGE Ilan
130.330 SEX AND THE GARDEN Robbins
130.440 ELEMENTARY BIBLICAL HEBREW Kang
130.450 ELEMENTARY MODERN HEBREW Braun
130.452 INTERMEDIATE MODERN HEBREW Braun
130.454 ADVANCED MODERN HEBREW Braun
131.622 ARCHAEOLOGY OF IRON AGE PALESTINE Ilan
134.602 WISDOM LITERATURE AND THE HEBREW BIBLE Lewis
134.660 HISTORY OF SYRIA / PALESTINE McCarter
### JEWISH STUDIES

Please refer to the departmental listings for complete information regarding these courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>134.700</td>
<td>NORTHWEST SEMITIC EPIGRAPHY</td>
<td>McCarter</td>
</tr>
</tbody>
</table>

### PROGRAM IN LATIN AMERICAN STUDIES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Instructor(s)</th>
<th>Gen Ed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>361.130</td>
<td>INTRODUCTION TO LATIN AMERICAN STUDIES (1)</td>
<td>3</td>
<td>Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>361.353</td>
<td>HISTORY OF U.S. AND LATIN AMERICAN RELATIONS (3)</td>
<td>3</td>
<td>Smith</td>
<td></td>
<td></td>
</tr>
<tr>
<td>070.320</td>
<td>FILM, FATE AND LAW: COMPARATIVE PERSPECTIVES ON THE OUTLAW IN MEXICAN AND INDIAN FILMS (3)</td>
<td>3</td>
<td>Khan, Poole</td>
<td>Limit 35</td>
<td>Cross-listed with Anthropology</td>
</tr>
<tr>
<td>212.356</td>
<td>LATIN AMERICAN CULTURE THROUGH THE STUDY OF POETRY, SHORT FICTION, TESTIMONIO, AND VIDEO (3)</td>
<td>3</td>
<td>Castro-Klaren</td>
<td>Limit 35</td>
<td>Cross-listed with Romance Languages</td>
</tr>
<tr>
<td>212.357</td>
<td>REALISM, MAGIC, RELIGION, AMOR Y LOCURA (3)</td>
<td>3</td>
<td>E. Gonzalez</td>
<td>Limit 25</td>
<td></td>
</tr>
<tr>
<td>212.776</td>
<td>CANON FORMATION IN THE IDEA OF LATIN AMERICA</td>
<td>3</td>
<td>Castro-Klaren</td>
<td>Limit 10</td>
<td>Cross-listed with Romance Languages</td>
</tr>
<tr>
<td>230.110</td>
<td>LATIN AMERICANS AND LATINOS IN THE UNITED STATES: HISTORICAL CONNECTIONS AND CONTEMPORARY ISSUES (3)</td>
<td>3</td>
<td>Ybarra</td>
<td>Limit 25</td>
<td></td>
</tr>
<tr>
<td>280.156</td>
<td>THE INVENTION OF TROPICAL DISEASE (3)</td>
<td>3</td>
<td>Goodyear</td>
<td>Limit 17</td>
<td>Freshmen only</td>
</tr>
<tr>
<td>360.353</td>
<td>HISTORY OF U.S. LATIN AMERICAN RELATIONS (3)</td>
<td>3</td>
<td>Smith</td>
<td>Limit 25</td>
<td>Cross-listed with Political Science</td>
</tr>
</tbody>
</table>

### PROGRAMS IN MUSEUMS AND SOCIETY

Please refer to the departmental listings for complete information regarding these courses.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Instructor(s)</th>
<th>Gen Ed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTHROPOLOGY</td>
<td>070.103</td>
<td>AFRICA AND THE MUSEUM</td>
<td>3</td>
<td>Guyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HISTORY OF ART</td>
<td>010.390</td>
<td>ART MUSEUM POLICY AND PRACTICE</td>
<td>3</td>
<td>Maguire, E.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>010.411</td>
<td>ART COLLECTING AND THE RISE OF THE MUSEUM</td>
<td>3</td>
<td>Campbell</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>010.599</td>
<td>INTERNSHIPS-HISTORY OF ART</td>
<td></td>
<td></td>
<td></td>
<td>Satisfactory/ Unsatisfactory only</td>
</tr>
</tbody>
</table>

### STUDIES OF WOMEN, GENDER & SEXUALITY

Please refer to the departmental listings for complete information regarding these courses.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Instructor(s)</th>
<th>Gen Ed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEHAVIORAL BIOLOGY</td>
<td>290.420</td>
<td>ORIGINS OF HUMAN SEXUAL ORIENTATION AND VARIATION</td>
<td>3</td>
<td>Kraft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GERMAN</td>
<td>090.656</td>
<td>THEORIZING EMOTIONALITY</td>
<td>3</td>
<td>Pahl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERDEPARTMENTAL</td>
<td>360.233</td>
<td>FEMINIST AND QUEER THEORY</td>
<td>3</td>
<td>Staff</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
STUDIES OF WOMEN, GENDER & SEXUALITY
Please refer to the departmental listings for complete information regarding these courses.

360.376  THE BODY OF ISLAM  Baxstrom
360.533  DIRECTED READINGS - WGS
360.535  DIRECTED WRITING - WGS

NEAR EASTERN STUDIES
130.330  SEX AND THE GARDEN  Robbins
APPLIED MATHEMATICS & STATISTICS

550.111 (E,Q) STATISTICAL ANALYSIS (4) Maiste
Limit 35 per section  Prereq: Four years high school math  First semester of a general survey of statistical methodology. Topics include descriptive statistics, probability models, random variables, expectation, sampling, the central limit theorem, classical and robust estimation of location, confidence intervals, hypothesis testing, two-sample problems, introductory analysis of variance, and introductory nonparametric methods. Three lectures and a conference weekly. Some use of computing with the Minitab statistical package, but prior computing experience not required. Students who may wish to undertake more than two semesters of probability and statistics should consider 550.420-430.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>W 4</td>
</tr>
<tr>
<td>02</td>
<td>Th 9</td>
</tr>
<tr>
<td>03</td>
<td>Th 10:30</td>
</tr>
<tr>
<td>05</td>
<td>Th 1</td>
</tr>
<tr>
<td>06</td>
<td>Th 2</td>
</tr>
<tr>
<td>07</td>
<td>W 2</td>
</tr>
</tbody>
</table>

550.171 (E,Q) DISCRETE MATHEMATICS (4) Torcaso
Limit 35 per section  Prereq: Four years high school math
Introduction to the mathematics of finite systems. Logic, Boolean algebra, induction and recursion; sets, functions, relations, equivalence, and partially ordered sets; elementary combinatorics; modular arithmetic and the Euclidean algorithm; group theory, permutations and symmetry groups, graph theory. Selected applications. The concept of a proof and development of the ability to recognize and construct proofs are part of the course.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Th 9</td>
</tr>
<tr>
<td>02</td>
<td>Th 12</td>
</tr>
<tr>
<td>03</td>
<td>Th 1</td>
</tr>
</tbody>
</table>

550.252 (E,Q) MATHEMATICAL MODELS FOR DECISION MAKING: STOCHASTIC MODELS (4) Castello
Limit 40  Prereq: Calculus I
An introduction to management science and the quantitative approach to decision making. Focus will be on the formulation and analysis of stochastic models, where some problem data may be uncertain. Covered topics may include Project Scheduling, Decision Analysis, Time Series Forecasting, Inventory Models with Stationary or Nonstationary Demand, Queueing Models, Discrete-Event Simulation, and Quality Management. Emphasize on model development and case studies, using spreadsheets and other computer software. The applications studied occur in variety of applications.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Th 12</td>
</tr>
</tbody>
</table>

550.291 (E,Q) LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS (4) Castello
Limit 35 per section  Prereq: One year of Calculus, computing experience
An introduction to the basic concepts of linear algebra, matrix theory, and differential equations that are used widely in modern engineering and science. Intended for engineering and science majors whose program does not permit taking both 110.201 and 110.302.

<table>
<thead>
<tr>
<th>Lec.</th>
<th>MTW 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec.</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Th 12</td>
</tr>
<tr>
<td>02</td>
<td>Th 2</td>
</tr>
</tbody>
</table>

550.310 (E,Q) PROBABILITY & STATISTICS FOR THE PHYSICAL SCIENCES AND ENGINEERING (4) Maiste
Limit 35 per section  Prereq: One year of Calculus; Recommended Coreq: 110.202
An introduction to probability and statistics at the calculus level, intended for engineering and science students planning to take only one course on the topics. Students are encouraged to consider 550.420-430 instead. Combinatorial probability, independence, conditional probability, random variables, expectation and moments, limit theory, estimation, confidence intervals, hypothesis testing, tests of means and variances, goodness-of-fit. Students cannot receive credit for both 550.310 and 550.311.
APPLIED MATHEMATICS & STATISTICS

550.311 (E,Q) PROBABILITY AND STATISTICS FOR BIOLOGICAL SCIENCES AND ENGINEERING (4) Geman  Limit 35 per section Prereq: One year of Calculus; Recommended Coreq: 110.202. An introduction to probability and statistics at the calculus level, intended for students in the biological sciences planning to take only one course on the topics. The basic scope of this course is similar to 550.310, with an emphasis on examples and problems in the biological sciences. Students are encouraged to consider 550.420-430 instead. Combinatorial probability, independence, conditional probability, random variables, expectation and moments, limit theory, estimation, confidence intervals, hypothesis testing, tests of means and variances, and goodness-of-fit will be covered.

550.361 (E,Q) INTRODUCTION TO OPTIMIZATION (4) Castello  Limit 35 per section Prereq: 550.291 or approved alternative, 110.188-109, computing experience. An introductory survey of optimization methods, supporting mathematical theory and concepts, and application to problems of planning, design, prediction, estimation, and control in engineering, management, and science. Study of various optimization techniques including linear programming, network-problem methods, dynamic programming, integer programming, and nonlinear programming. Appropriate for undergraduate and graduate students without the mathematical background required for 550.661.

550.385 (E,Q) SCIENTIFIC COMPUTING: LINEAR ALGEBRA (4) Fishkind  Limit 30 Prereq: Calculus III and 550.291 or approved alternative (ex. 110.201). A first course on computational linear algebra and applications. Topics include floating-point arithmetic, algorithms and convergence, Gaussian elimination for linear systems, matrix decompositions (LU, Cholesky, QR), iterative methods for systems (Jacobi, Gauss–Seidel), and approximation of eigenvalues (power method, QR-algorithm). Theoretical topics such as vector spaces, inner products, norms, linear operators, matrix norms, eigenvalues, and canonical forms of matrices (Jordan, Schur) are reviewed as needed. Matlab is used to solve all numerical exercises; no previous experience with computer programming is required.

550.391 (E,Q) DYNAMICAL SYSTEMS (4) Eyink  Limit 25 Prereq: 550.291 or approved alternative (ex. 110.201). A first course on computational linear algebra and applications. Topics include floating-point arithmetic, algorithms and convergence, Gaussian elimination for linear systems, matrix decompositions (LU, Cholesky, QR), iterative methods for systems (Jacobi, Gauss–Seidel), and approximation of eigenvalues (power method, QR-algorithm). Theoretical topics such as vector spaces, inner products, norms, linear operators, matrix norms, eigenvalues, and canonical forms of matrices (Jordan, Schur) are reviewed as needed. Matlab is used to solve all numerical exercises; no previous experience with computer programming is required.

550.400 (E,Q) MATHEMATICAL MODELING AND CONSULTING (4) Torcaso  Limit 15 Prereq: Probability, statistics, and optimization at the 300-level or higher. Formulation, analysis, interpretation, and evaluation of mathematical models. Synthesis of ideas, techniques, and models from mathematical sciences, science, and engineering. Case studies to illustrate basic features of the modeling process. Project-oriented practice and guidance in modeling techniques, research techniques, and written and oral communication of mathematical concepts.

550.420 (E,Q) INTRODUCTION TO PROBABILITY (4) Wierman  Limit 35 per section Prereq: 110.108-109; Coreq: 110.202 Probability and its applications, at the
APPLIED MATHEMATICS & STATISTICS

550.433 (E,Q)  MONTE CARLO SIMULATION AND RELIABILITY (3)
Sec. 01  MTW 9
Prereq: 550.430; computing experience.
Linear least squares; random number generation; Monte Carlo techniques; analysis of variance; time series computations; numerical integration. Emphasis on computational aspects relevant to practical statistical problems.

550.436 (E,Q)  DATA MINING (4)
Sec. 01  MTW 3
Th 1
Prereq: 550.310 or equivalent; Recommended Prereq: 550.413. Data mining is a relatively new term used in the academic and business world, often associated with the development and quantitative analysis of very large databases. Its definition covers a wide spectrum of analytic and information technology topics, such as machine learning, artificial intelligence, statistical modeling, and efficient database development. This course will review these broad topics, and cover specific analytic and modeling techniques such as advanced data visualization, decision trees, neural networks, nearest neighbor, clustering, logistic regression, and association rules. Although some of the mathematics underlying these techniques will be discussed, our focus will be on the application of the techniques to real data and the interpretation of results. Because use of the computer is extremely important when “mining” large amounts of data, we will make substantial use of data mining software tools to learn the techniques and analyze datasets.

550.440 (Q)  STOCHASTIC CALCULUS (3)
Sec. 01  MTW 1
Prereq: 550.420. Stochastic processes recommended, but not required. Introduction to stochastic integration, stochastic differential equations, and the Itô calculus. Emphasis will be on underlying ideas rather than rigorous development. Stochastic processes, Brownian motion, conditional expectation, martingales, Itô and Stratonovich integrals and their calculus, stochastic differential equations, some applications to finance, stochastic flow systems, or other areas should be provided.

550.463 (E,Q)  NETWORK MODELS IN OPERATIONS RESEARCH (4)
Sec. 01  MTW 11
Th 11
Prereq: 550.361 or 550.661. In-depth mathematical study of network flow models in operations research, with emphasis on combinatorial approaches for solving them. Introduction to techniques for constructing efficient algorithms, and to some related data structures, used in solving shortest-path, maximum volume flow, and minimum-cost flow problems. Emphasis on linear models and flows, with brief discussion of nonlinear models and network design.

550.471 (E,Q)  COMBINATORIAL ANALYSIS (4)
Sec. 01  MTW 11
Th 11

550.491 (E,Q)  APPLIED ANALYSIS FOR ENGINEERS AND SCIENTISTS (4)
Sec. 01  MTW 10
Th 10
Prereq: 550.291 and 500.361 or 110.201 and
110.302 This course will cover techniques and applications of differential and integral analysis that are important for advanced work in engineering and science, including partial differential equations and transform methods.

550.493 (E,Q) MATHMATICAL IMAGE ANALYSIS
3 Taures - Limit 45 - Prereq: Elementary Calculus (110.108-109) and Linear Algebra (110.201) or equivalent. This course introduces a series of mathematical concepts for low-level image processing and the numerical algorithms that are derived from them. These include linear and non-linear smoothing and enhancement, PDE-based isotropic and anisotropic filters, variational energy-minimization methods, data analysis and decomposition methods allowing low-level image understanding: standard image transforms (Fourier, cosine, wavelets), techniques of principal and independent component analysis.

Sec. 01 MTW 3

550.500 UNDERGRADUATE RESEARCH
Reading, research, or project work for undergraduate students. Pre-arranged individually between students and faculty. Recent topics and activities: percolation models, data analysis, course development assistance, and dynamical systems.

Sec. 01 TBA

550.501 SENIOR THESIS
Preparation of a substantial thesis based upon independent student research, under the pre-arranged supervision of at least one faculty member in Applied Mathematics and Statistics.

550.600 DEPARTMENT SEMINAR Fill
Limit 40 - A variety of topics discussed by speakers from within and outside the university. Required of all resident department graduate students.

Sec. 01 Th 3-3:50

550.620 PROBABILITY THEORY I Fill
Lect. 25 - Prereq: 110.405 and 550.420 or equivalent. Probability as a mathematical discipline, including introductory measure theory. Axiomatic probability, combinatorial probability, random variables, conditional probability, independence, distribution theory, expectation, Lebesgue-Stieltjes integration, variance and moments, probability inequalities, characteristic functions, conditional expectation.

Lec. Sec. 01 M 2:30-4:15, W 2:30-3:20, F 2-2:50

550.630 STATISTICAL THEORY Priebe
Lect. 23 - Prereq: 550.420 or 550.620. The fundamentals of mathematical statistics. Distribution theory for statistics of normal samples; exponential statistical models; sufficiency principle; least squares, maximum likelihood, and UMVU estimation; hypothesis testing, the Neyman-Pearson lemma, likelihood ratio procedures; the general linear model, the Gauss-Markov theorem, multiple comparisons, contingency tables, chi-square methods, goodness-of-fit, nonparametric and robust methods; decision theory, Bayes and minimax procedures.
550.635 TOPICS IN BIOINFORMATICS Geman
Limit 20   Prerequisites: A course in Statistics is required; previous exposure to machine learning or pattern recognition is recommended. Course is recommended for prepared seniors through postdocs and faculty. A “readings” course organized around selected papers (research articles, tutorials, etc.) in bioinformatics and computational biology. The major objective is to prepare students to comfortably read the literature and to understand the nature of research in this field. The common theme is learning from data, for instance inferring phenotype from genotype, or modeling regulatory networks, based on gene or protein expression data. By and large, the students will present the papers. In addition, these expositions will be supplemented by lectures on various aspects of statistical learning, predictive inference and pattern recognition (e.g., class discovery and prediction, feature selection, p-values and permutation analyses, overfitting, the bias/variance dilemma and cross-validation).
Sec. 01 T 4:30-7pm

550.661 FOUNDATIONS OF OPTIMIZATION Han
Limit 25   Prereq: Multivariable Calculus, Linear Algebra; Coreq: 110.405
Study of the fundamental theory underlying linear and nonlinear optimization. Unconstrained optimization, constrained optimization, saddle point conditions, Kuhn-Tucker conditions, linear programming, the simplex algorithm, post-optimality, duality, convexity, quadratic programming.
Sec. 01 MTW 10

550.664 MODELING, SIMULATION, AND MONTE CARLO Spall
Limit 20   Prereq: Basic Matrix algebra and a grade course in probability and statistics. Familiarity with some programming language. Concepts and statistical techniques critical to constructing and analyzing effective simulations; emphasis on generic principles rather than specific applications. Topics include model building (bias-variance tradeoff, model selection, Fisher information), benefits and drawbacks of simulation modeling, random number generation, simulation-based optimization, discrete multiple comparisons using simulations, Markov chain Monte Carlo (MCMC), and input selection using optimal experimental design.
Sec. 01 T 2-3:20

550.671 COMBINATORIAL ANALYSIS Scheinerman
Sec. 01 MTW 11

550.692 MATRIX ANALYSIS AND LINEAR ALGEBRA Fishkind
Limit 25   Prereq: 110.405, Linear Algebra, multi-variable calculus. A second course in linear algebra with emphasis on topics useful in analysis, economics, statistics, control theory, and numerical analysis. Review of linear algebra, decomposition and factorization theorems, positive definite matrices, norms and convergence, eigenvalue location theorems, variational methods, positive and nonnegative matrices, generalized inverses.
Sec. 01 MTW 9

550.750 TOPICS IN OPERATIONS RESEARCH Goldman
Limit 20   Applied Matching: Mathematical models/analyses/solution algorithms for "matching markets" like auctions (buyers & sellers), labor markets (firms & workers), and college admissions.
Sec. 01 TBA

550.800 DISSERTATION RESEARCH Staff
Reading, research, or project work for advanced graduate students. Arranged individually between students and faculty.
Sec. 01 – Eyink
Sec. 02 – Fill
Sec. 03 – Fishkind
Sec. 04 – Geman
Sec. 05 – Goldman
Sec. 06 – Han
BME MODELING & DESIGN (2)  Allen Haase  Limit 6 per section  
Bme Freshmen only  
(Formerly BME Design Group) Working in teams with upperclassmen this course (1) introduces biomedical engineering principles to solve design problems that are biological, physiological, and/or medical. Freshmen are expected to use the informational content being taught in calculus, physics, and chemistry and to apply this knowledge to the solution of practical problems encountered in biomedical engineering. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Th 12</td>
</tr>
<tr>
<td>02</td>
<td>Th 8-10</td>
</tr>
<tr>
<td>03</td>
<td>Th 1-3</td>
</tr>
<tr>
<td>04</td>
<td>Th 3-5</td>
</tr>
<tr>
<td>05</td>
<td>Th 5-7pm</td>
</tr>
<tr>
<td>06</td>
<td>F 8-10</td>
</tr>
<tr>
<td>07</td>
<td>F 2-4</td>
</tr>
<tr>
<td>08</td>
<td>F 2-4</td>
</tr>
<tr>
<td>09</td>
<td>Th 1-3</td>
</tr>
<tr>
<td>10</td>
<td>Th 3-5</td>
</tr>
<tr>
<td>11</td>
<td>Th 5-5</td>
</tr>
<tr>
<td>12</td>
<td>F 2-4</td>
</tr>
</tbody>
</table>

MOLLECULES AND CELLS (4)  Kuo  
Prereq: 030.101, 030.104 Limit 15 per section  
An introduction to modern molecular and cellular biology in the context of potential biomedical engineering applications. Topics covered: reactions between molecules, including receptor-ligand and antigen-antibody specificity, protein structure, enzyme catalysis, genetic information, protein processing and secretion, cell physiology and cell functions. Advanced quantitative treatment including multi-state kinetics, Monte Carlo simulations of biochemical reactions, and transport phenomena. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>TTh 3-4:30</td>
</tr>
<tr>
<td>02</td>
<td>F 9</td>
</tr>
<tr>
<td>03</td>
<td>F 10</td>
</tr>
<tr>
<td>04</td>
<td>F 12</td>
</tr>
<tr>
<td>05</td>
<td>F 1</td>
</tr>
<tr>
<td>06</td>
<td>F 2</td>
</tr>
</tbody>
</table>

INTRODUCTION TO HUMAN PHYSIOLOGY (3)  Allen  
Freshmen and Sophomores only  
This course will provide students with an understanding of the structure and function relationships of the human body. The associations that exist between cells, tissues, and organs will be presented and discussed from multiple perspectives: from the molecular level to studies of human pathology through the use of clinical correlations. The course structure will include lectures and seminar style discussions of the primary literature. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MWF 1</td>
</tr>
</tbody>
</table>

BME DESIGN GROUP (3)  Allen  
Perm. Req’d.  
A two-semester course sequence where juniors and seniors work with a team leader and a group of BME freshmen and sophomores, to solve open-ended problems in biomedical engineering. Upperclassmen are expected to apply their general knowledge and experience, and their knowledge in their concentration area, to teach lower classmen and to generate the solution to practical problems encountered in biomedical engineering. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>TBA</td>
</tr>
</tbody>
</table>

BME TEACHING PRACTICUM (2)  Haase  
Senior biomedical engineering students will assist the BME Modeling & Design course instructor in managing the laboratory component of the class. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>TBA</td>
</tr>
</tbody>
</table>

BME DESIGN GROUP (3)  Allen  
Perm. Req’d.  Senior-level version of 580.311-312. 
A two-semester course sequence where juniors and seniors work with a team leader and a group of BME freshmen and sophomores, to solve open-ended problems in biomedical engineering. Upperclassmen are expected to apply their general knowledge and experience, and their knowledge in their concentration area, to teach lower classmen and to generate the solution to practical problems encountered in biomedical engineering. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>TBA</td>
</tr>
</tbody>
</table>

DESIGN TEAM - TEAM LEADER (4)  Allen  
Perm. Req’d.  
A two-semester course sequence where juniors and seniors work with a team leader and a group of BME freshmen and sophomores, to solve open-ended problems in biomedical engineering. Upperclassmen are expected to apply their general knowledge and experience, and their knowledge in their concentration area, to teach lower classmen and to generate the solution to practical problems encountered in biomedical engineering. 

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>TBA</td>
</tr>
</tbody>
</table>
BIOMEDICAL ENGINEERING

sequence where leaders direct a team of undergraduate biomedical engineering students in a series of design problems. Prior design team experience and permission of course director required.

580.421 (E,N)
SYSTEMS BIOENGINEERING I (4)
Yue
Pre-req: 580.221 & 580.222
Limit 25 per section
A quantitative, model-oriented investigation of the cardiovascular system. Topics are organized in three segments. (1) Molecular/cellular physiology, including electrical signaling and muscle contraction. (2) Systems cardiovascular physiology, emphasizing circuit-diagram analysis of hemodynamics. (3) Cardio-vascular horizons and challenges for biomedical engineers, including heart failure and its investigation/treatment by computer simulation, by gene-array analysis, by stem-cell technology, and by mechanical devices (left-ventricular assist and total-heart replacement).

Sec. 01 Lec. MW 4-5:30
Sec. 02 T 4-5:30
Sec. 03 T 7-8:30
Sec. 04 T 7-8:30

580.423 (N)
SYSTEMS BIOENGINEERING LAB I (2)
Prereq: 580.421
Priority to Junior BME major.
A two-semester laboratory course in which various physiological preparations are used as examples of problems of applying technology in biological systems. The emphasis in this course is on the design of experimental measurements and on physical models of biological systems.

Sec. 01 Lab Th 4
Sec. 02 Lab Th 5
Sec. 03 Lab F 9

580.435 (E,N)
BIOELECTROMAGNETIC PHENOMENA (3)
Tung
Prereq: 110.202, 110.302 or 550.291, 520.213, 520.214, 520.219, 580.421 or equivalent
This course reviews theoretical concepts and experimental approaches used to characterize electric, magnetic and electromagnetic phenomena that arise in biological tissues. Topics include the passive and active behavior of cell membranes, volume conductor models of cells and tissues, the bidomain model, bioelectric and biomagnetic measurements, electric and magnetic stimulation, and impedance plethysmography and tomography.

Sec. 01 TTh 2-3:30

580.439 (E,N)
MODELS OF THE NEURON (4)
Young
Prereq: 110.301, 580.421-422 or equivalent
Single-neuron modeling, emphasizing the ion of computational models as links between the properties of neurons at several levels of detail. Topics include thermodynamics of ion flow in aqueous environments, biology and biophysics of ion channels, gating, nonlinear dynamics as a way of studying the collective properties of channels in a membrane, synaptic transmission, integration of electrical activity in multi-compartment dendrite tree models, and properties of neural networks. Students will study the properties of computational models of neurons, graduate students will develop a neuron model using data from the literature.

Sec. 01 MW 8:30-10
T 9

580.440 (E)
CELLULAR AND TISSUE ENGINEERING (3)
Elissef/ Yarema
Pre-req: 580.421-422
Lectures provide an overview of molecular biology fundamentals, an exensive overview on extracellular matrix and basics of receptors, followed by topics on cell-cell and cell-matrix interactions at both the theoretical and experimental levels. Subsequent lectures will cover the effects of physical (shear, stress, strain), chemical (cytokins, growth factors), and electrical stimuli on cell function, emphasizing topics on gene regulation and signal transduction processes. Material on cell-cycle, apoptosis, metabolic engineering and gene

Sec. 01 MW 2-3:30
BIOMEDICAL ENGINEERING

cell and tissue engineering is a field that relies heavily on experimental techniques. This laboratory course will consist of three six experiments that will provide students with valuable hands-on experience in cell and tissue engineering. Students will learn basic cell culture procedures and specialized techniques related to faculty expertise in cell engineering, microfluidics, gene therapy, microfabrication and cell encapsulation. Experiments include the basics of cell culture techniques, gene transfection and metabolic engineering, basics of cell-substrate interactions I, cell-substrate interactions II, and cell encapsulation and gel contraction.

Co-listed with 530.451

580.471 (E,N) PRINCIPLES OF DESIGN OF BIOMEDICAL INSTRUMENTATION (4) Thakor  Limit 16 per section
Prereq: 520.213-214, electronics lab or 580.470  Lab Fee: $100.00
This core design course will cover lectures and hands-on labs. The material covered will include fundamentals of biomedical sensors and instrumentation, FDA regulations, designing with electronics, biopotentials and ECG amplifier design, recording from heart, muscle, brain, etc., diagnostic and therapeutic devices (including pacemakers and defibrillators), and applications in prosthetics and rehabilitation, and safety. This course includes extensive laboratory work involving circuits, electronics, sensor design and interface, and building complete biomedical instrumentation. The students will also carry out design challenges projects, individually or in teams (examples include “smart cane for blind,” “computer interface for quadriplegic”)

Sec. 01 Lec. Th 4-6pm
F 1-5

Sec. 02 Lec. F 8-12
F 1-5

580.495 (E) MICRO/NANOSCIENCE AND BIOTECHNOLOGY (3) Wang
An introduction to the physical and chemical principles important to MEMS, BioMEMS, and Bionanotechnology. Topics include scaling laws, colloidals and surfaces, micro and nanofluids, thermal forces and diffusion, chemical forces, electrokinetics, electric aspects of surface chemistry, capillary forces and surface tension, and top-down and bottom-up nanofabrication.

Sec. 01 Lec. MW 11-12:30

TBA

580.501 FRESHMAN-SOPHOMORE RESEARCH OR PRACTICUM IN BIOMEDICAL ENGINEERING

580.511 FRESHMAN- SOPHOMORE INDEPENDENT STUDY IN BIOMEDICAL ENGINEERING

580.531 JUNIOR - SENIOR RESEARCH OR PRACTICUM IN BIOMEDICAL ENGINEERING

580.541 JUNIOR - SENIOR INDEPENDENT STUDY IN BIOMEDICAL
580.551 BIOMEDICAL ENGINEERING

580.571 HONORS INSTRUMENTATION (2)
Thakor Co-req: Enrollment in 580.471
Students enrolled jointly in 580.471 and 580.571 will not be required to take exams. Instead, students will develop a term paper and patent application and carry out a hands-on individual or team project throughout the semester and the intersession. Previous projects include design of EEG amplifier, voltage clamp and patch clamp, vision aid of blind, pacemaker/defibrillator, sleep detection and alert device, glucose sensor and regulation, temperature controller, eye movement detection and device control, ultrasound ranging and tissue properties, impedance plethysmography, lie detector, blood alcohol detector, pulse oximeter, etc.

580.580 SENIOR DESIGN PROJECT (3)
Allen Perm. Req’d
Independent or team design project to design and evaluate a system. The design should demonstrate creative thinking and experimental skills, and must draw upon advanced topics of biomedical and traditional engineering. Project proposals must be submitted by September 15, 2006

580.625 STRUCTURE AND FUNCTION OF THE AUDITORY AND VESTIBULAR SYSTEMS
May / Staff Prereq: 580.421-422 or equivalent. Recommend: 110.302, 520.214 (taught at Medical Campus)

580.628 TOPICS IN SYSTEM NEUROSCIENCE
Wang Prereq: Intro. to Neuroscience, 110.302, 520.214, 580.421 or equivalent
This course consists of weekly discussions of current literature in systems neuroscience. The selected readings will focus on neural mechanisms for perception, attention, motor behavior, learning, and memory, as studied using physiological, psychophysical, computational, and imaging techniques. Students are expected to give presentations and participate in discussions.

580.659 MODELS OF THE NEURON
Young Prereq: 110.301-302, 580.421-422 or equivalent. See description for 580.439.

580.660 CELLULAR AND TISSUE ENGINEERING
Yarema See 580.440 for full description.

580.671 STATISTICAL MECHANICAL BIO SYSTEMS
Sun

580.703 SEMINAR IN NEUROENGINEERING
Thakor Weekly seminar in which faculty, staff, graduate students, and outside speakers discuss topics of current research interest in the area of neuroengineering.

580.771 PRINCIPLES OF BME INSTRUMENTATION
Graduate students only

580.801 RESEARCH IN BIOMEDICAL ENGINEERING
Graduate Students only
CHEMICAL & BIOMOLECULAR ENGINEERING

540.101 (E) CHEMICAL AND BIOMOLECULAR ENGINEERING TODAY  (1) Kermis
Freshmen Only  Limit 150  Prereq: none A series of weekly lectures to introduce students to chemical and biomolecular engineering and its role as a profession in addressing contemporary technological, social, ethical, and economic issues in today’s world. The lectures will include examples of how chemical and biomolecular engineers apply the principles of physics and chemistry to develop new products, improve process efficiencies, and alleviate the strain on the ecosystem through the design of novel environmentally conscious processes. In addition, the lectures will highlight exciting new areas now being advanced by chemical and biomolecular engineers, such as biochemical engineering, tissue engineering, nanoparticle fabrication, and processing smart polymers for applications in computer technology and as sensors.

540.202 (E) INTRODUCTION TO CHEMICAL AND BIOLOGICAL PROCESS ANALYSIS (4) Drazer  Limit 115  Prereq: 038.101, 171.101  Introduction to chemical and biomolecular engineering and the fundamental principles of chemical process analysis. Formulation and solution of material and energy balances on chemical processes. Reductionist approaches to the solution of complex, multi-unit processes will be emphasized. Introduction to the basic concepts of thermodynamics as well as chemical and biochemical reactions.

540.204 (E) APPLIED PHYSICAL CHEMISTRY (3) Graciar  Prereq: 540.203  Limit  70  Introduction of the methods used to solve thermodynamic problems faced by chemical and biomolecular engineers, including phase and chemical equilibria problems, the thermodynamic properties of interfaces, and the thermodynamics of macromolecules. The basic thermodynamic relationships to describe phase equilibrium of single-component and multicomponent systems are developed. Thermodynamic models for calculating fugacity are presented. Multi-component phase equilibrium problems addressed include liquid-vapor, liquid-liquid, and liquid-liquid-vapor equilibrium. Basic thermodynamic relationships to describe chemical equilibria, the physical chemistry of liquid-liquid and liquid-solid interfaces, and the conformation of biological macromolecules are also presented.

540.311 (E) CHEMICAL ENGINEERING LAB I (6)
Katz/Kermis
Prereq: 540.301, 540.304, 540.306, 540.490
Limit 12 per section
Students are challenged with laboratory projects that are not well-defined and learn to develop an effective framework for approaching experimental work by identifying the important operating variables, deciding how best to obtain them, and using measured or calculated values of these operating variables to predict, carry out, analyze and improve upon experiments. Each student analyzes three of the following four projects: distillation, gas absorption, liquid-liquid extraction and chemical kinetics in a tubular flow reactor and also one of the projects in 540.313. In addition to technical objectives, this course stresses oral and written communication skills and the ability to work effectively in groups.

Sec. 01 02
T 1-6pm Th 1-6pm

540.313 (E) CHEMICAL AND BIOMOLECULAR ENGINEERING LAB I (6)
Limit 12 per section Ostermeier/Wirtz
Prereq: 540.301, 540.304, 540.306, 540.490
Students are challenged with laboratory projects that are not well-defined and learn to develop an effective framework for approaching experimental work by identifying the important operating variables, deciding how best to obtain them, and using measured or calculated values of these operating variables to predict, carry out, analyze and improve upon experiments. Each student analyzes three biomolecular engineering projects and one of the projects in 540.311. In addition to technical objectives, this course stresses oral and written communication skills and the ability to work effectively in groups.

Sec. 01 02 03
T 1-6pm Th 1-6pm F 1-6pm

540.409 (E,Q) MODELING, DYNAMICS AND CONTROL OF CHEMICAL AND BIOLOGICAL SYSTEMS (3)
Gray
Limit 25 per section Correq: 500.303 or a Differential Equations course, 540.203, 540.301, 540.303. 020.305 and 020.306 or equivalent is recommended but not required.
Introduction to modeling, dynamics, and control. Unsteady state analysis of biomolecular and chemical process control systems. State space and Laplace transform techniques, block diagram algebra, and transfer functions. Feedback and feedforward control. Frequency response and stability analysis. Model construction for biomolecular and cellular systems including pharmacokinetic modeling, biomolecular modeling using the central dogma of biology/control of gene expression, large scale biosimulation. Introduction to nonlinear dynamics.

Sec. 01 02
Lec. MW 2-3:30 F 2

540.490 CHEMICAL AND LABORATORY SAFETY (1)
Katz
Perm. Req’d.
Limit 48 (Sec.1) Limit 36 (Sec.2)
This course is meant to provide the student with a basic knowledge of laboratory safety, hazards, regulations, personal protective equipment, good laboratory practice, elementary toxicology, and engineering controls. It has been developed by the Department of Chemical and Biomolecular Engineering to assist with regulatory compliance, minimize hazards, and reduce the severity of any incidents that may occur in the department’s laboratories. The course is a prerequisite of 540.311/540.313. It is required of all Chemical and Biomolecular Engineering undergraduates. In addition once per year a three-hour refresher seminar must be taken by all students involved in laboratory research.

Sec. 01 02
TBA

540.501 INDEPENDENT STUDY

540.521 INDEPENDENT RESEARCH

540.600 CHEMICAL ENGINEERING SEMINAR
Katz
Limit 100

Sec. 01
Th 11

540.645 MICRO AND NANOTECHNOLOGY: A RESEARCH PERSPECTIVE
Gracias

Sec. 01
F 11
CIVIL ENGINEERING

560.201 (E,N)  STATICS AND MECHANICS OF MATERIALS (4)  Graham-Brady  
Limit 20 per section  Freshmen by permission only  Co-listed with 5.30.201  
Sec. 01  MTW 11
Sec. 02  M 4-6pm
Sec. 03  T 5-7pm
Sec. 04  W 4-6pm
Sec. 05  Th 4-6pm

560.305 (E)  SOIL MECHANICS (4)  Anandarajah  Limit 30  
Prereq: 560.206  Coreq: 570.351  
Sec. 01  ThF 10:30-12:10
Lab  F 1-4

560.325 (E)  CONCRETE STRUCTURES (5)  Staff  Limit 25  
Prereq: 560.206  
Principles of behavior of reinforced concrete beams, columns, and slabs, with application to the design of elementary structures are introduced. The ultimate strength and the elastic methods of analysis are used.  
Sec. 01  W 5:30-8:30pm

560.349 (E)  DESIGN AND SYNTHESIS I (2)  Russo/Vigener  
Prereq: Senior status or Perm. Req’d.  
A study of the engineering design process from problem definition to the final design. There are team projects which include written and oral presentations.  
Sec. 01  Th 4:30-6:30pm

560.445 (E)  ADVANCED STRUCTURAL ANALYSIS (3)  Arwade  
Prereq: 560.301  
Matrix methods for the analysis of statically indeterminate framed structures such as beams, plane trusses, space trusses, plane frames, grids and space frames. Stiffness and flexibility methods.  
Sec. 01  MTW 11

560.491 (E)  CIVIL ENGINEERING SEMINAR FOR JUNIORS (0.5)  Staff  Limit 75  
Sec. 01  T 4

560.493 (E)  CIVIL ENGINEERING SEMINARS FOR SENIORS (0.5)  Staff  Limit 75  
Sec. 01  T 4

560.525  INDEPENDENT STUDY

560.535  RESEARCH

560.691  GRADUATE SEMINAR Staff  Sec. 01  T 4

560.729  STRUCTURAL MECHANICS  Graham-Brady  
Basic solid mechanics for structural engineers. Stress, strain and constitutive laws. Linear elasticity and viscoelasticity. Introduction to nonlinear mechanics. Static, dynamic and thermal stresses. Specialization of theory to one- and two-dimensional cases: plane stress and plane strain, rods, and beams. Work and energy principles; variational formulations.  
Sec. 01  MW 3:30-4:30pm

560.734  ADVANCED PROBABILITY AND STATISTICS FOR ENGINEERS  Igusa  Limit 25  
Prereq: 560.435 or introductory course in probability and statistics. Theory and applications with an emphasis on statistical learning techniques for large experimental or computer-generated data sets. Applications will include problems in solid and fluid mechanics.  
Sec. 01  MTW 12

560.780  COASTAL ENGINEERING  Dalrymple  
Coastal processes and their influence on engineering at the shoreline. Waves and current, equilibrium beach profiles, littoral  
Sec. 01  MW 4:30-6:30pm
CIVIL ENGINEERING
transport, shoreline modeling and the behavior of tidal inlets. The impact of structures on the shoreline.

560.782 HYDRODYNAMICS Shen
Limit 20  This course covers fundamentals of hydrodynamics with applications in ocean science and engineering. Topics include fluids transport, elementary potential flows, method of conformal mapping, Green’s theorem, hydrodynamic forces in potential flows, free-surface flows, ship and ocean waves, air-sea interactions, boundary layers, flow past bluff bodies, vortex shedding and vortex-induced vibrations, scaling laws and model testing.

560.787 STRUCTURAL OPTIMIZATION Guest
Introduction to structural optimization with focus on topology optimization using finite element methods. Applications to design of structural and mechanical systems and use of inverse homogenization to design material microstructures that yield extreme/ prescribed properties.

560.835 GRADUATE RESEARCH

COMPUTER SCIENCE

600.101 (E) COMPUTER FLUENCY (4) Houlahan
Limit 15 per section  This course replaces the older version 600.101 Computer Literacy, and will incorporate some topics from 600.113 Internet as well. Students will become fluent with information technology through coverage of basic underlying concepts and use of common applications. Concepts will include the building blocks of computer systems and software, as well as historical perspectives and social implications. Students will learn basic and selected advanced skills with MS Office (word processing, spreadsheets, presentations, databases), as well as webpage design with programming in JavaScript, and unix operating system basics. The goal is to empower students so that they remain skilled computer users and will have confidence and success learning and applying new technologies on their own in the future.

600.102 (E) CS FOUNDATIONS (4) Froehlich
Limit 15 per section  Prereq: 600.101 or equiv. knowledge (Students who previously may have taken 600.103 Intro to CS or 600.113 Internet should consider this course instead.) This course is an introduction to computer science for majors and non-majors. Students are exposed to the discipline through vignettes of logic and algebra, computer systems and networks, algorithms, programming languages, computation theory, and selected applications. CS majors can only take this course in their first year of CS coursework.

600.105 (E) M & Ms: FRESHMEN EXPERIENCE (1) Houlahan
Limit 20  Satisfactory/ Unsatisfactory only CS Freshman only. This course is required for all freshmen Computer Science majors. Transfers into the major and minors may enroll by permission only. Students will attend three 4-week blocks of meetings with different computer science professors, focused on a central theme. Active participation is required.

600.107 (E) INTRODUCTION TO PROGRAMMING IN JAVA (3) Staff
Limit 120. Prereq: familiarity with computers  This course introduces the fundamental programming concepts and techniques in Java and is intended for all who plan to use computer programming in their studies and careers. Topics covered include control structures, arrays, functions,
COMPUTER SCIENCE

recursion, dynamic memory allocation, simple data structures, files, and structured program design. Elements of object-oriented design and programming are also introduced. Students without experience are strongly advised to also take 600.108.

600.108 (E) INTRODUCTORY PROGRAMMING LAB (1) Staff Satisfactory/Unsatisfactory Limit 12 per section Cor: 600.107
The purpose of this course is to give novice programmers extra hands-on practice with guided supervision. Students will work in pairs each week to develop working programs, with checkpoints for each development phase.

600.120 (E) INTERMEDIATE PROGRAMMING (4) Staff Lmt 25 per section Prereq: 600.107 or 600.109
This course covers intermediate to advanced programming in both C and C++. The focus of the course is on programming techniques, class design, and the use of class libraries. Topics to be covered include: polymorphism, overloading, inheritance, pointers, dynamic memory allocation, templates, collections, exceptions, and others as time permits. Students are expected to learn syntax and low-level language features independently.

Coursework involves significant programming projects in both languages.

600.226 (E,Q) DATA STRUCTURES (3) Staff Lmt 40 Prereq: 600.107 or 600.109
This course covers the design and implementation of data structures including collections, sequences, trees, and graphs. Other topics include sorting, searching, and hashing. Course work involves both written homework and Java programming assignments.

600.271 (E,Q) AUTOMATA & COMPUTATION THEORY (3) Kosaraju Limit 60
This course is an introduction to the theory of computing. Topics include design of finite state automata, pushdown automata, linear bounded automata, Turing machines and phrase structure grammars, correspondence between automata and grammars, computable functions, decidable and undecidable problems, P and NP problems, NP-completeness, and randomization.

600.315 (E) DATABASE SYSTEMS (3) Yarowsky Limit 35 Prereq: 600.315 or 600.415, but not both. Introduction to database management systems and database design, focusing on the relational and object-oriented data models, query languages and query optimization, transaction processing, parallel and distributed databases, recovery and security issues, commercial systems and case studies, heterogeneous and multimedia databases, and data mining.

600.321 (E) OBJECT ORIENTED SOFTWARE ENGINEERING (3) Smith Limit 50 Prereq: 600.226 and 600.120/121
Students receive credit for 600.321 or 600.421, but not both. This course covers object-oriented software construction methodologies and their application. The main component of the course is a large team project on a topic of your choosing. Course topics covered include object-oriented analysis and design, UML, design patterns, refactoring, program testing, code repositories, team programming, and code reviews.

600.324 (E) NETWORK SECURITY (3) Montrose Limit 20 Prereq: 600.344/444 and 600.226, 600.120 (or equivalent) and 600.349/449 recommended. Students may receive credit for 600.324 or 600.424, not both. This course focuses on communication security in computer systems and networks. The course is
COMPUTER SCIENCE
intended to provide students with an introduction to the field of network security. The course covers network security services such as authentication and access control, integrity and confidentiality of data, firewalls and related technologies, web security, anonymity, and privacy. Course work involves implementing various security techniques. A course project is required.

600.333 (E) COMPUTER SYSTEM FUNDAMENTALS (3) Massow  Limit 50
Prereq: 600.107/109, 600.109. Students may receive credit for 600.333 or 600.433, but not both. CSF addresses the design and performance of the principal operational components of a reduced-instruction-set computing system (RISC) which supports the efficient execution of widely used instruction sets. Arithmetic and logic units, memory hierarchy designs, state-machine controllers, and other related hardware and firmware components are studied, and the qualities of their combined processing capabilities are assessed by means of execution times associated with a range of benchmark programs. Assembly language programming projects, homework problems, and exams are employed to assess a student's fundamental understanding of the tradeoffs resulting from an assortment of variations in digital system design decisions that ultimately characterize the performance of the computing system architecture that is developed.

600.337 (E) DISTRIBUTED SYSTEMS (3) Amir  Limit 30
Prereq: 600.120/121, 600.226, 600.211 recommended. Students may receive credit for 600.337 or 600.437, but not both. This course teaches how to design and implement protocols that enable processes to exchange information, cooperate, and coordinate efficiently in a consistent manner over a computer network. Topics include communication protocols, group communication, distributed databases, distributed operating systems, and security.

600.349 (E) INTERNET PROTOCOLS (3) Terzis  Limit 20
Prereq: 600.120 & 600.344/444 Recommended: 600.211
Students may receive credit for 600.349 or 600.449, but not both. This course covers the most important Internet protocols in detail. The goal is to get a solid technical understanding of the Internet's foundations and a concrete example of complete network protocol family. The course material will be taken from the textbook but the students will also be required to read the actual protocol specifications (RFCs). A major part of this course is the two group projects where students are going to implement realistic network protocols. In addition to the projects, there will be homework assignments, a midterm and a final.

600.363 (E,Q) INTRODUCTION TO ALGORITHMS (3) Awerbuch  Limit 30
Prereq: 600.226 or Perm. Req'd. Students may receive credit for 600.363 or 600.463, but not both. This course concentrates on the design of algorithms and the rigorous analysis of their efficiency. Topics include the basic definitions of algorithmic complexity (worst case, average case), basic tools such as dynamic programming, sorting, searching, and selection, advanced data structures and their applications (such as union-find); graph algorithms and searching techniques such as minimum spanning trees, depth-first search, shortest paths, design of online algorithms and competitive analysis.

600.392 (E) SENIOR DESIGN PROJECT (3) Froehlich  Limit 30
Prereq: 600.226, 600.321 recommended. This course will give senior CS majors an intensive capstone design project.

Sec. 01 MTW 10
Sec. 01 M 3
Sec. 01 W 3-5
Sec. 01 ThF 2:30-3:45
Sec. 01 MTW 9
Sec. 01 MTW 4
experience. Students will work in groups with real world customers to develop a working system. Project design, management and communication skills will be emphasized. Software development methodologies may also be presented. Software development methodologies may also be presented.

600.415 (E) DATABASE SYSTEMS (3) Yarowsky
Prepar. 600.226 Limit 30 Students may receive credit for 600.315 or 600.415, but not both. Graduate level version of 600.315. Cross listed with Information Security Institute. Sec. 01 Th F 2:30-3:45

600.421 (E) OBJECT ORIENTED SOFTWARE ENGINEERING (3) Smith Limit 30 Prepar. 600.226 and 600.120/121. Students may receive credit for 600.321 or 600.421, but not both. Graduate level version of 600.321. Cross listed with Information Security Institute. Sec. 01 Th-F 1-2:15

600.424 (E) NETWORK SECURITY (3) Monrose Limit 20 CS Graduate students only Prepar. 600.344/444 and 600.226. 600.120 (or equivalent) and 600.349/449 recommended. Students may receive credit for 600.324 or 600.424, not both. Graduate level version of 600.324. Cross listed with Information Security Institute. Sec. 01 MW 2-3:15

600.433 (E) COMPUTER SYSTEMS (3) Masson
Limit 50 Students may receive credit for 600.333 or 600.433, but not both. Graduate version of 600.333. Cross listed with Information Security Institute. Sec. 01 MTW 10

600.437 (E) DISTRIBUTED SYSTEMS (3) Amir
Limit 50 Students may receive credit for 600.337 or 600.437, but not both. Sec. 01 M, W 3-5

600.442 (E,Q) CRYPTOGRAPHY AND NETWORK SECURITY (3) Ateniese
Limit 20 Prepar. 600.226 and 300-level or above systems course, 600.271 and 550.171 or equivalent. This course focuses on algorithms and protocols for secure network communication. Topics include cryptographic algorithms (DES, Diffie-Hellman, RSA), authentication, key management, secure networking, certification, trust management, and secure electronic commerce. Cross listed with Information Security Institute. Sec. 01 Th-F 1-2:15

600.445 (E) COMPUTER - INTEGRATED SURGERY I (4) Taylor
Limit 40 Prepar. 600.120, 600.226 and linear algebra. Recmd. 600.457, 600.461, image processing. This course focuses on computer-based techniques, systems, and applications exploiting quantitative information from medical images and sensors to assist clinicians in all phases of treatment from diagnosis to preoperative planning, execution, and follow-up. It emphasizes the relationship between problem definition, computer-based technology, and clinical application and includes a number of guest lectures given by surgeons and other experts on requirements and opportunities in particular clinical areas. Sec. 01 Th-F 1-2:15

600.449 (E) INTERNET PROTOCOLS (3) Terzis
Limit 50 Prerequisites: 600.120 and 600.344/600.444. 600.211 is recommended. Students receive credit for 600.349 or 600.449 but not both. Graduate version of 600.349. Cross listed with Information Security Institute. Sec. 01 Th F 2:30-3:45

600.461 (E,Q) COMPUTER VISION (3) Hager
Limit 60 Prepar: 600.226 This course gives an overview of fundamental methods in computer vision from a computational perspective. Methods include computation of 3-D geometric constraints from binocular stereo, motion, texture, shape-from-shading, and photometric stereo. Edge detection and color perception are studied as well. Elements of machine vision and biological

Sec. 01 Th F 9-10:15
600.463 (E,Q) **ALGORITHMS I (3)** Awertch Limit 30 Sec. 01 MTW 9
Prereq: 600.226 or Perm. Req'd
Students may receive credit for 600.463 or 600.363, but not both. Graduate version of 600.363. Cross listed with Information Security Institute.

600.465 (E) **NATURAL LANGUAGE PROCESSING** (3) Eisner Limit 60 Sec. 01 MTW 2
Prereq: 600.226  Previous exposure to probability or linguistics may be helpful. This course is an in-depth overview of techniques for processing human language. How should linguistic structure and meaning be represented? What algorithms can recover them from text? And crucially, how can we build statistical models to choose among the many legal answers? The course covers methods for trees (parsing and semantic interpretation), sequences (finite-state transduction such as morphology), and words (sense and phrase induction), with applications to practical engineering tasks such as information retrieval and extraction, text classification, part-of-speech tagging, speech recognition and machine translation. There are a number of structured but challenging programming assignments.

600.491 (E) **COMPUTER SCIENCE WORKSHOP I**
An applications-oriented, computer science project done under the supervision and with the sponsorship of a faculty member in the Department of Computer Science. Perm. of faculty supervisor req'd
01 – Masson
02 – Kosaraju
03 – Awertch
04 – Taylor
05 – Smith
06 – Houlahan
07 – Lehmann
08 – Salzberg
09 – Hager
10 – Chilkiian
11 – Kannar
12 – Amir
13 – Yanovsky
14 – Cohen
15 – Burns
16 – Eisner
17 – Shapiro
18 – Schiebecker
19 – Stanton
20 – Ateniese
21 – Rubin
22 – Monroe
23 – Teziri
24 – Sheinerman
25 – Winslow
26 – Kazhdan
27 – Jelinek
28 – Froehlich
29 – Szalay

600.501 **INDEPENDENT STUDY** (FRESHMEN, SOPHOMORES)
Individual, guided study under the direction of a faculty member in the department. The program of study, including the credit to be assigned, must be worked out in advance between the student and the faculty member involved. Permission required. See 600.491 for faculty section numbers.

600.503 **INDEPENDENT STUDY** (JUNIORS, SENIORS)
Individual guided study under the direction of a faculty member in the department. The program of study, including the credit to be assigned, must be worked out in advance between the student and the faculty member involved. Permission required. See 600.491 for faculty section numbers.
COMPUTER SCIENCE

600.507 INDEPENDENT RESEARCH
Individual research under the direction of a faculty member in the department. The program of research, including the credit to be assigned, must be worked out in advance between the student and the faculty member involved. Permission required. See 600.491 for faculty section numbers.

600.509 COMPUTER SCIENCE INTERNSHIP
Individual work in the field with a learning component, supervised by a faculty member in the department. The program of study and credit assigned must be worked out in advance between the student and the faculty member involved. Students may not receive credit for work that they are paid to do. As a rule of thumb, 40 hours of work is equivalent to one credit. Perm. Req'd. See 600.491 for faculty section numbers.

600.519 SENIOR HONOR THESIS (3)
Prereq: 3.5 GPA in C.S. courses at end of junior year and permission of faculty sponsor. C.S. majors only. See 600.491 for faculty section numbers. The student will undertake a substantial independent research project under the supervision of a faculty member, potentially leading to the notation "Departmental Honors with Thesis" on the final transcript. Students are expected to enroll in both semesters of this course during their senior year. Project proposals must be submitted and accepted in the preceding spring semester (junior year) before registration. Students will present their work publicly before April 1st of senior year. They will also submit a first draft of their project report (thesis document) at that time. Faculty will meet to decide if the thesis will be accepted for honors.

600.546 SENIOR THESIS IN COMPUTER INTEGRATED SURGERY
Taylor
Prereq: 600.445 or Perm. Req &

600.601 COMPUTER SCIENCE SEMINAR
Staff
Sec. 01 ThF 10:30-12
Required for all full-time CS Graduate students
Limit 150

600.619 ADVANCED STORAGE & TRANSACTION PROCESSING SYSTEMS
Burns
Sec. 01 MW 1
Prereq: 600.419 or permission of instructor. In this course, we will examine advanced research topics in storage systems, file systems, transaction processing, and network data management. The readings are taken from the current research literature and articles of historical significance. This course is intended for graduate students interested in conducting research on or related to these topics and for students who face management, availability or performance issues with data in their own research. Students will conduct a semester long research project and present their results to the class. In addition to the scheduled meetings, students will have weekly one-on-one meetings with the professor. [Systems]
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.643</td>
<td>ADVANCED TOPICS IN COMPUTER SECURITY</td>
<td>Rubin</td>
<td>Sec. 01 ThF</td>
<td>2:30-3:45</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.660</td>
<td>FFT IN GRAPHICS AND VISION</td>
<td>Kazhdan</td>
<td>Sec. 01 MW</td>
<td>2-3:15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.726</td>
<td>SEMINAR IN PROGRAMMING LANGUAGES</td>
<td>Smith</td>
<td>Sec. 01 W</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.745</td>
<td>SEMINAR IN COMPUTER INTEGRATED SURGERY</td>
<td>Fichtinger</td>
<td>Sec. 01 W</td>
<td>12-1:30</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.757</td>
<td>SEMINAR IN COMPUTER GRAPHICS</td>
<td>Kazhdan</td>
<td>Sec. 01 TBA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.765</td>
<td>SEMINAR IN NATURAL LANGUAGE PROCESSING</td>
<td>Zisser</td>
<td>Sec. 01 Th</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.801</td>
<td>DISSERTATION RESEARCH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.803</td>
<td>GRADUATE RESEARCH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.809</td>
<td>INDEPENDENT STUDY (graduate students)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ELECTRICAL & COMPUTER ENGINEERING

520.137 (E,Q) INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING (3) Tran Limit 40 per section. Open to freshman Engineering majors & any Arts & Sciences majors. An introductory course covering the principles of electrical engineering including sinusoidal waveforms, electrical measurements, digital circuits, and applications of electrical and computer engineering. Laboratory exercises, the use of computers, and a design project are included in the course.

520.213 (E,Q) CIRCUITS (4) Weinert Lec. MTW 12
Prereq: 110.108-109 Limit 35 per section. An introductory course on electric circuits covers analysis techniques in time and frequency domains, transient and steady-state response, and operational amplifiers.

520.219 (E,N) FIELDS, MATTER & WAVES (3) Joseph Lec. MTW 3
Prereq: 171.101-102, 110.108-109; Coreq: 110.202 Limit 40. Vector analysis, electrostatic fields in vacuum and material media, stationary currents in conducting media, magnetostatic fields in vacuum and material media. Maxwell's equations and time-dependent electric and magnetic fields, electromagnetic waves and radiation, transmission lines, wave guides, applications.

520.349 (E) MICROPROCESSOR LAB I (3) Glaser Lec. Th 8
Glasser Prereq: 520.142 or equivalent. Limit 20 per section. This course introduces the student to the programming of computers at the machine level. General concepts relevant to microcontrollers are presented, including memory access, numerical representations, programming models, and coding techniques.

520.353 (E,Q) CONTROL SYSTEMS (3) Iglesias Lec. MTW 10
Prereq: 520.214 & 110.201 or 550.291 Limit 65. Modeling, analysis, and an introduction to design for feedback control systems. Topics include state equation and transfer function representations, stability, performance measures, root locus methods, and frequency response methods (Nyquist, Bode).
ELECTRICAL & COMPUTER ENGINEERING

520.391 (E) CAD DESIGN/ DIGITAL VLSI (3) Pouliquen Limit 10 Prereq: 520.142, 520.216 or equiv.; Coreq: 600.333, 600.334, 520.349 or 520.372. An introductory course in which students, manually and through computer simulations, design digital CMOS integrated circuits and systems. The design flow covers transistor, physical, and behavioral level descriptions, using SPICE, Layout, and VeriLOG HDL/VLSI CAD tools. After design computer verification, students can fabricate and test their semester-long class projects.

Sec. 01 TW 5:30-7pm

520.401 (E) BASIC COMMUNICATIONS (3) Davidson Limit 45 Prereq: 520.214. This course covers the principles of modern analog and digital communication systems. Topics include: amplitude modulation formats (DSB, SSB, VSB), exponential modulation formats (PM, FM), superheterodyne receivers, digital representation of analog signals, sampling theorems, pulse code modulation formats (PCM, DPCM, DSD, spread-spectrum), signals with additive Gaussian noise, maximum likelihood receiver design, matched filtering, and bit error rate analyses of digital communication systems.

Sec. 01 MTW 11

520.414 (E) IMAGE PROCESSING & ANALYSIS (3) Goutsias Limit 40 Prereq: 520.214. The course covers fundamental methods for the processing and analysis of images and describes standard and modern techniques for the understanding of images by humans and computers. Topics include elements of visual perception, sampling and quantization, image transforms, image enhancement, color image processing, image restoration, image segmentation, and multiresolution image representation. Laboratory exercises demonstrate key aspects of the course.

Sec. 01 MW 4:15

520.419 (E,Q) THEORY AND DESIGN OF ITERATIVE ALGORITHMS (3) Meyer Limit 20 Prereq: 110.201-202. An introduction to the study of the structure, behavior and design of iterative algorithms. Topics include problem formulations, algorithm description and classification, the deterministic iterative (DI) schema, doubling schema, cluster point sets, periodic points, DI schemes without stop rule, the monotonic DI schema, contractive and affine maps, bounded and Cauchy sequences, asymptotically regular sequences, monotonic sequences.

Sec. 01 MTW 9

520.424 (E,Q) FPGA SYNTHESIS LABORATORY (3) Jenkins Limit 15 per section Prereq: 520.142, 520.345, 600.333 or 520.349 or 520.372. Advanced competence in computer systems. An advanced laboratory course in the application of FPGA technology to information processing, using VHDL synthesis methods for hardware development. The student will use commercial CAD software for VHDL simulation and synthesis, and implement their systems in programmable XILINX 20,000 gate FPGA devices. The lab will consist of a series of digital projects demonstrating VHDL design and synthesis methodology, building up to final projects at least the size of an 8-bit RISC computer. Projects will encompass such things as system clocking, flip-flop registers, state-machine control, and arithmetic. The students will learn VHDL methods as they proceed through the project set, and prior experience with VHDL is not a prerequisite.

Sec. 01 Lec. Th 2-4, 02 M 3-5:30


Sec. 01 MTW 1
ELECTRICAL & COMPUTER ENGINEERING

520.447 (E,Q)  INTRODUCTION TO INFORMATION THEORY AND CODING (3) Jelinek  Prereq: 550.310 or equivalent  Limit 25  This course will address some basic scientific questions about systems that store or communicate information. Mathematical models will be developed for (1) the process of error-free data compression leading to the notion of entropy, (2) data (e.g. image) compression with slightly degraded reproduction leading to rate-distortion theory and (3) error-free communication of information over noisy channels leading to the notion of channel capacity. It will be shown how these quantitative measures of information have fundamental connections with statistical physics (thermodynamics), computer science (string complexity), economics (optimal portfolios), probability theory (large deviations) and statistics (Fisher information, hypothesis testing).

520.466 (E,Q)  DIGITAL COMMUNICATIONS II (3) Cooper  Prereq: 520.465  Limit 25  Achieving reliable and efficient digital communications over noisy channels is studied. Shannon’s Noisy Channel Coding Theorem provides the basis and the goal. Bounds on code performance in noisy channels are developed. Important block and convolutional codes and codes on graphs are examined jointly with their respective decoders.

520.491 (E)  CAD DESIGN OF DIGITAL VLSI SYSTEMS I (3) Etienne-Cummings  Lec.  Prereq: 520.142, 520.216 or equiv.; Coreq: 600.333, 600.334, 520.349 or 520.372  An introductory course in which students, manually and through computer simulations, design digital CMOS integrated circuits and systems. The design flow covers transistor, physical, and behavioral level descriptions, using SPICE, Layout, and VerilogHDL VLSI CAD tools. After design computer verification, students can fabricate and test their semester-long class projects.

520.494 (E)  ASYNCHRONOUS DIGITAL SYSTEMS (3) Ekanayake  Prereq: 520.142, 520.216 or equivalents  Introduction to asynchronous design in the context of computer architecture and VLSI. We will focus on modeling digital systems as concurrent programs and synthesizing robust self-timed (clockless) digital circuits through formal program transformations. Topics include delay-insensitive design techniques, circuit compilation, asynchronous circuit templates, high-performance micro-architectures, timing/energy analysis, and case studies of complex asynchronous designs. Students will complete an asynchronous digital design project.

520.495 (E)  MICROFABRICATION LAB (4) Wang/Andreou  Perm. Req’d.  Seniors only  Limit 9 per section  This laboratory course is an introduction to the principles of microfabrication for microelectronics, sensors, MEMS, and other synthetic microsystems that have applications in medicine and biology. Course comprises of laboratory work and accompanying lectures that cover silicon oxidation, aluminum evaporation, photolithography, etching, packaging, design and analysis CAD tools, and foundry services. Co-listed as 580.495 & 530.495

520.501  INDEPENDENT STUDY  Individual, guided study under the direction of a faculty member in the department. The program of study or research, including the credit to be assigned, must be worked out in advance between the student and the faculty member involved. May be taken either term by freshmen or sophomores.
# ELECTRICAL & COMPUTER ENGINEERING

## 520.545 INDEPENDENT RESEARCH
- **Sec. 01 MTW 2**

## 520.601 LINEAR DYNAMICAL SYSTEMS
- **Sec. 01 MTW 2**
  - Staff
  - Prereq: Undergraduate courses in Control Systems & Linear Algebra
  - A beginning graduate course in linear, time-invariant systems. Topics include state-equation representations, input-output representations, response properties, controllability, observability, realization theory, stability, and linear feedback.

## 520.619 OPTICAL COMMUNICATIONS
- **Sec. 01 MW 4:5-15**
  - Davidson
  - Limit 15
  - Fundamentals of direct and coherent (heterodyne) detection optical communication receivers. Topics include Poisson nature of photon detection; estimation and detection for photon counting receivers; marked, filtered and doubly stochastic Poisson processes; and information theory for the photon communication channel.

## 520.636 FEEDBACK CONTROL IN BIOLOGICAL SIGNALING PATHWAYS
- **Sec. 01 MTW 1**
  - Iglesias
  - Limit 20
  - A course covering second-order properties of random processes with applications in estimation and detection. A foundation course for further work in stochastic systems, signal processing, and communications. Prerequisites: elementary courses in probability, signals, and linear systems.

## 520.651 RANDOM SIGNAL ANALYSIS
- **Sec. 01 ThF 9:10-10:30**

## 520.773 ADVANCED TOPICS IN FABRICATION AND MICROENGINEERING
- **Sec. 01 Th 11-12**
  - Lab
  - Th 8-11
  - Andreou
  - Perm. Req'd.
  - Limit 20
  - Graduate-level course on topics that relate to microsystem integration of complex functional units across different physical scales from nano to micro and macro. Topics will include emerging fabrication technologies, micro-electromechanical systems, nanolithography, nanotechnology, soft lithography, self-assembly, and soft materials. Discussion will also include biological systems as models of microsystem integration and functional complexity.

## 520.800 INDEPENDENT STUDY
- **Sec. 01 TBA**

## 520.801 DISSERTATION RESEARCH
- **Sec. 01 TBA**

## 520.809 SPECIAL STUDIES
- **Sec. 01 TBA**

## ENTREPRENEURSHIP & MANAGEMENT

### 660.105 (S) (W)
**INTRODUCTION TO BUSINESS (4)**
- **Lec. MTW 1**
  - Aronhime
  - Limit 35 per section
  - The course provides a survey and overview of the various functions of business in a global market economy. After completing the course students will have a general understanding of the nature of business and the importance of profit motive, financial concepts, business ownership, management, marketing, and labor relations.

### 660.203 (Q,S)
**FINANCIAL ACCOUNTING (3)**
- **Sec. 01 MTW 2**
  - Limit 35 per section
  - Staff
  - Sec. 01: Staff
  - Sec. 02: Staff
  - Sec. 03: Kingsley
  - Sec. 04: Staff
  - Sec. 05: Staff
  - Focuses on production of the financial statements required by Generally Accepted Accounting Principles (GAAP) for "for profit" business entities. Course uses a problem solving approach to account maintenance and financial statement production.

### 660.205 (S)
**BUSINESS LAW I (3)**
- **Sec. 01 M 6:15-9pm**
  - Limit 30 per section
  - Staff
  - Sec. 01: Fisher
  - Sec. 02: Franceschini
  - Sec. 03: Smythe
  - Sec. 04: Sandhu
  - Sec. 05: Goldenberg
  - Focuses on production of the financial statements required by Generally Accepted Accounting Principles (GAAP) for "for profit" business entities. Course uses a problem solving approach to account maintenance and financial statement production.
ENTREPRENEURSHIP & MANAGEMENT

Designed for the student who is interested in either a broad knowledge of law as it relates to modern business or a survey of many business-related aspects of law with a view to further legal studies. This course, plus Business Law II provides a complete, self-contained, well-rounded, in-depth study of Business Law and a foundation for further legal study.

660.206 (S) BUSINESS LAW II (3)
Prereq: Business Law I (660.205)
Limit 35 per section
Sec. 01: Fisher
Sec. 02: Goldenberg
An examination of the legal environment in which a business operates as well as basic business law concepts involved in real and personal property. Topics include: bankruptcy, entrepreneurship options, and government regulations of business.

660.220 (S) PRINCIPLES OF MANAGEMENT (3)
Rec.: Intro. To Business (660.105)
Limit 35 per section
Sec. 01: Aronhime
Sec. 02: Petrovici
Sec. 03: Petrovici
Examines the role of manager from both traditional and contemporary perspectives while applying decision-making and critical thinking skills to the challenges facing managers. Issues include: techniques for controlling, planning and leading the workforce.

660.231 (S) CASE STUDIES IN BUSINESS ETHICS (3)
Limit 35 per section
Sec. 01: Goldenberg
Sec. 02: Franceschini
Introduces students to ethical concepts relevant to resolving moral issues in contemporary business and social settings both globally and locally. The course focuses on clear reasoning and effective communication concerning ethical issues in business and society.

660.250 (S) PRINCIPLES OF MARKETING (3)
Limit 40
Attendance at 1st class is mandatory
Examines the role of marketing in society and within the organization. Examines the process of promoting and distributing products to consumer and business markets. Encouraged for students planning on entering the Business Plan Competition.

660.302 (Q,S) CORPORATE FINANCE (3)
Prereq: Financial Accounting (660.203)
Limit 35
Designed as a practicum for exploring basic concepts and techniques used by today’s corporate financial professionals. Financial statement analysis, capital budgeting and the cost of capital are explored.

660.326 (S) ORGANIZATIONAL DEVELOPMENT (3)
Prereq: Intro. to Business (660.105)
The course will help future entrepreneurs learn methodologies for improving their organization’s effectiveness and performance. It is also intended to help the individual develop his/her potential to make maximum contributions towards the successful growth of the organization.
ENTREPRENEURSHIP & MANAGEMENT

661.330 (S) LEADERSHIP DYNAMICS (3) Schnell
Lim 35 Rec: Introduction to Business (660.105), Principles of Management (660.220), or Human Resources Management (660.327)
Focuses on the dynamics associated with taking charge in a group or organizational setting. Topics include: visioning, delegation, power, charisma and managing change.
Sec. 01 M 3-5:45pm

660.335 (S) NEGOTIATION AND CONFLICT MANAGEMENT (3) Schnell
Limit 35 Attendance at 1st class is mandatory
Prereq: at least one course in the E&M program or junior standing.
Sec. 01 T 3-5:45pm

660.341 (E) BUSINESS PROCESS & QUALITY MANAGEMENT (3) Reiter
Lim 40 This course focuses on both quantitative and qualitative analytical skills and models essential to operations process design, management, and improvement in both service and manufacturing oriented companies.
Sec. 01 Th 12-2:45

660.358 (S) INTERNATIONAL MARKETING (3) Kendrick
Limit 35 Rec: Principles of Marketing (660.250)
This course covers product, pricing, promotion, distribution, market research, organization, and implementation and control policies relating to international marketing. It also explores the economic, cultural, political and legal aspects of international marketing.
Sec. 01 F 12-2:45

660.360 (S) SMALL BUSINESS MANAGEMENT (3) Rec: Business (660.105), Principles of Management (660.220)
Limit 35 per section
Sec. 01 Schnell
Sec. 02 Petrovici
Provides the tools needed to successfully launch and manage a small business in a competitive, global environment. Examines the challenges of entrepreneurs, business plans, marketing and financial issues, and the hiring and managing of employees.
Sec. 01 MTW 1
02 M 6:15-9pm

660.450 (S) ADVERTISING & PROMOTION (3) Kendrick
Limit 30 Prereq: Principles of Marketing (660.250)
Students form advertising agency teams and create and implement a marketing program on the JHU campus using funds provided by a specific company. Students also learn marketing communications strategies and tactics.
Sec. 01 Th 3-5:45pm

660.460 (S) ENTREPRENEURSHIP (3) Aronhime
Limit 30 Juniors and Seniors only
Recommended: Financial Accounting (660.203), and Principles of Marketing (660.250)
Introduction to the entrepreneurial process of creating new businesses. Course will cover the principal components of building a successful venture and will feature several guest speakers.
Sec. 01 MTW 2

660.500 BUSINESS INTERNSHIP Wierman
Permission required
Internship application due by the first week of intake. If the student accepts the position, they must submit a letter of completion and complete the Internship Application form to the Internship Office at 104 Whitehead Hall.

660.501 PRACTICUM IN ENTREPRENEURSHIP Aronhime
Permission required
ENTREPRENEURSHIP & MANAGEMENT

Students work on existing business plans under close supervision of an Entrepreneurship & Management faculty member. Students are expected to meet regularly with the faculty member and complete assigned readings and projects. Completed application must be submitted to 104 Whitehead Hall.

GEOGRAPHY & ENVIRONMENTAL ENGINEERING

570.108 (E) INTRODUCTION TO ENVIRONMENTAL ENGINEERING (3) (d) Overview of environmental engineering including water/wastewater issues, water supply/wastewater treatment, hazardous/solid waste management, pollution prevention, global environmental issues, public health considerations/environmental laws, regulations and ethics. Cross listed with Public Health Studies

570.205 (N) ECOLOGY (3) Brush Introduction to processes governing the organization of individual organisms into populations, communities, and ecosystems. Interactions between individual organisms, groups of organisms, and the environment, including adaptation, natural selection, competition.

570.301 (E,N) ENVIRONMENTAL ENGINEERING FUNDAMENTALS I (3) O’Melia Prereq: Calculus and one year of Chemistry Coreq: 570.351 or Perm. Req’d. Mass and energy balances, hazardous substances and risk analysis, water quality modeling, water and wastewater treatment, air pollution.

570.303 (E) THE ENVIRONMENT AND YOUR HEALTH (3) Knowles This course surveys basic environmental health sciences (toxicology, risk assessment), current public health issues (hazardous waste, radon, waterborne diseases), and emerging global health threats (global warming, ozone depletion, sustainability). Cross-listed with Public Health Studies

570.305 (E,Q) ENVIRONMENTAL ENGINEERING SYSTEMS DESIGN (4) Ellis Techniques from systems analysis applied to environmental engineering design and management problems: reservoir management, power plant siting, nuclear waste management, air pollution control, and transportation planning. Design projects are required.

570.334 (E,S) ENGINEERING MICROECONOMICS (3) Norman/Hobbs Prereq: Calculus III This course uses a calculus-based approach to introduce principles of engineering economics and microeconomics (demand and production theory) and their uses in engineering decision-making.

570.351 (E) INTRODUCTION TO FLUID MECHANICS (3) Wilcock Prereq: Statistics, Dynamics and Differential Equations. Introduction to the use of the principles of continuity, momentum, and energy to fluid motion. Topics include hydrostatics, ideal-fluid flow, laminar flow, turbulent flow.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
<th>Prerequisites/Notes</th>
<th>Section</th>
<th>Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>570.353 (E)</td>
<td>HYDROLOGY (3) Hilpert</td>
<td></td>
<td></td>
<td>Prereq: Differential equations, fluid mechanics</td>
<td>Sec. 01</td>
<td>M W T 10</td>
</tr>
<tr>
<td>570.367 (S)</td>
<td>THE ECONOMICS OF FINANCIAL AND FOREIGN EXCHANGE</td>
<td>Hilpert</td>
<td>3</td>
<td>Markets</td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td>MARKETS (3) Hosta-Limit 3 Perm Req'd</td>
<td></td>
<td></td>
<td>Prereq: 180.011-102 Theoretical and empirical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>analysis of how spot, futures, and options</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>markets function and how they affect resource</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>allocation. Markets covered include financial</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>instruments, interest rate options, and stock</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>indices) and foreign currencies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.404 (E,N)</td>
<td>POLITICAL ECOLOGY (3) Schloenberger</td>
<td></td>
<td>3</td>
<td>Political ecology analyzes social and</td>
<td>Sec. 01</td>
<td>Th 1-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>institutional &quot;rules of the game&quot; concerning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>use of ecological resources and adaptations to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>environmental conditions. Reading seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>covering classic works in the field and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>emerging trends.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.411 (E,N)</td>
<td>ENVIRONMENTAL MICROBIOLOGY (4) Browse/Ward</td>
<td></td>
<td>4</td>
<td>Fundamental aspects of microbiology and</td>
<td>Sec. 01</td>
<td>Th F 9:10-30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>biochemistry as related to environmental</td>
<td></td>
<td>Lab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>pollution and water quality control processes,</td>
<td></td>
<td>Th 2-5 or 6-9 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>biogeochemical cycles, microbiological ecology,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>energetics and kinetics of intercellular</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>growth, and biological fate of pollutants.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.419 (E)</td>
<td>ENVIRONMENTAL ENGINEERING DESIGN I (1) Alavi/Bouwer</td>
<td></td>
<td>1</td>
<td>Limit 10 Through general lectures and</td>
<td>Sec. 01</td>
<td>T 4:30-6:30 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>case study examples, this course will expose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>students to some of the non-technical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>professional issues that they will face as</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>professional engineers and in their</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>second-semester senior design project.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.442 (N)</td>
<td>ENVIRONMENTAL ORGANIC CHEMISTRY (3) Roberts</td>
<td></td>
<td>3</td>
<td>Prereq: 030.104 or Perm. Req’d. Advanced</td>
<td>Sec. 01</td>
<td>MW 3-4:30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>undergraduate course focusing on examination of</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>processes that affect the behavior and fate of</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>anthropogenic organic contaminants in aquatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>environments. Students learn to predict</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>chemical properties influencing transfers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>between hydrophobic organic chemicals, air,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>water, sediments, and biota, based on a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fundamental understanding of intermolecular</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>interactions and thermodynamic principles.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.443 (E,N)</td>
<td>AQUATIC CHEMISTRY (3)  Stone</td>
<td></td>
<td>3</td>
<td>Limit 60 Prereq: One year of both</td>
<td>Sec. 01</td>
<td>M T W 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chemistry and Calculus Thermodynamics and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>equilibrium applied to processes in natural</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>waters and water and wastewater treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>systems. Chemistry of electrolyte solutions,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>acids and bases, complex formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>precipitation and dissolution, oxidation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>and reduction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.444 (E,N)</td>
<td>COLLOID CHEMISTRY (3) Shchukin</td>
<td></td>
<td>3</td>
<td>Prereq: General Chemistry and Physics</td>
<td>Sec. 01</td>
<td>MW 2-3:30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Disperse, i.e. microheterogeneous state of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>matter and predominant influence of surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(interfacial) phenomena in dispersive systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>are regarded as universal in nature and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>technology; these rocks and soils, materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>suspensions, emulsions, foams and aerosols,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>living tissues. Formation and general colloid-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>chemical properties of these systems are</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>considered, role of high dispersity,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>problems of stability, and ways to control</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>them in industry and environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Instructor</td>
<td>Credits</td>
<td>Prerequisites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.445 (E)</td>
<td>PHYSICAL AND CHEMICAL PROCESSES FOR WATER AND WASTEWATER TREATMENT (3)</td>
<td>Ball</td>
<td>3</td>
<td>Prereq: 570.301-302 or Perm. Req'd. Principles of chemical equilibrium and reaction, reaction engineering, interphase mass transfer, and adsorption are presented in the context of process design for unit operations in common use for water and wastewater treatment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.450 (E,N)</td>
<td>MOLECULAR BIOLOGY FOR ENGINEERING APPLICATIONS (4)</td>
<td>Ward</td>
<td>4</td>
<td>Perm. Req'd. The application of basic physical and chemical concepts to the analysis of environmental engineering problems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.465 (H,S)</td>
<td>WATER RESOURCE DEVELOPMENT: HISTORY AND PRINCIPLES (3)</td>
<td>Wolman</td>
<td>3</td>
<td>Perm. Req'd. An attempt to review utilization and development of water in diverse environments beginning with early irrigation systems revealed by archaeology including those in the Middle East, Asia, and Latin America.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.470 (S)</td>
<td>APPLIED ECONOMICS AND FINANCE (3)</td>
<td>Hanke</td>
<td>3</td>
<td>Perm. Req'd. This course focuses on the workings of equity markets. It includes an analytical review of valuation models and their application to data contained in financial statements. Research reports are required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.487 (S)</td>
<td>FUTURES MARKET RESEARCH (3)</td>
<td>Hanke</td>
<td>3</td>
<td>Perm. Req'd. Cross-listed with Economics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.490 (E)</td>
<td>SOLID WASTE ENGINEERING AND MANAGEMENT (3)</td>
<td>Hanke</td>
<td>3</td>
<td>Perm. Req'd. This course covers advanced engineering and scientific concepts and principles applied to the management of municipal solid waste (MSW) to protect human health and the environment and the conservation of limited resources through resource recovery and recycling of waste materials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.492 (S)</td>
<td>DEPARTMENT SEMINAR (1)</td>
<td>Ward</td>
<td>1</td>
<td>Undergraduates only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.493 (E,S,Q)</td>
<td>ECONOMIC FOUNDATIONS (3)</td>
<td>Norman</td>
<td>3</td>
<td>Perm. Req: 180.101-102, 110.202 or equivalent This course includes an exposition of intermediate level price theory, combined with a survey of applications to the analysis of public sector decisions. Theoretical topics include demand, supply, the function and behavior of the market, and introductory welfare economics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>570.495 (E,Q)</td>
<td>MATHEMATICAL FOUNDATIONS FOR PUBLIC DECISION MAKING</td>
<td>Williams/Hobbs</td>
<td>3</td>
<td>Perm. Req: Calculus I &amp; II A collection of systems analytic techniques which are frequently used in the study of public decision making is presented. Emphasis is on mathematical programming techniques. Primarily linear programming, integer and mixed-integer programming, and multiobjective programming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100.147 (H,S)</td>
<td>ADAM SMITH AND KARL MARX</td>
<td>Jelavich/Schoenberger</td>
<td>3</td>
<td>Freshmen only Cross-listed with History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>270.375 (N)</td>
<td>GROUNDWATER (3)</td>
<td>Garven</td>
<td>3</td>
<td>Cross listed with Earth and Planetary Sciences</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INTRODUCTION TO URBAN POLICY (3)  
Newman  
Limit 15  
Perm. Req'd. Coreq: 195.477  
Cross-listed with Political Science, Sociology, Public Health Studies, and Public Policy  
Sec. 01  T 5-7pm

URBAN POLICY INTERNSHIP (3)  
Newman  
Perm. Req'd. Limit 15  
Coreq: 195.477  
Cross-listed with Political Science, Sociology, Public Health Studies, and Public Policy  
Sec. 01  TBA

570.501 UNDERGRADUATE RESEARCH
570.505 INDEPENDENT STUDY
360.528 APPLIED ECONOMICS INTERNSHIP Hanke  
Prereq: 180.101-102  
Perm. Req'd.  
Course given in conjunction with private business and financial institutions, governmental entities and economic research institutes in the Baltimore-Washington metropolitan area.  
Requirements include 120 hours of internship time and a research paper on an applied economics topic.  
Satisfactory/Unsatisfactory only  
Cross-listed with Economics and Interdepartmental

ENGINEERING HEALTH CRISIS (3)  
Roberts  
Limit 50  
This course addresses strategies for stopping and preventing waterborne disease outbreaks both in the U.S. and settings without piped water supplies, with special emphasis on refugee populations.  
Cross-listed with Public Health Studies

SEMINAR: GEOMORPHOLOGY  
Wilcock  
Sec. 01  T 12-2

DEPARTMENT SEMINAR  
Ward  
Sec. 01  T 3-5,  F 1:30-3

APPLIED MATH FOR ENGINEERING (3)  
Hilpert  
Limit 65  
This course presents a broad survey of the basic mathematical methods used in the solution of ordinary and partial differential equations: linear algebra, power series, Fourier series, separation of variables, integral transforms.

PUBLIC SYSTEMS SEMINAR  
Williams  
Sec. 01  T 1-3

ENVIRONMENTAL ENGINEERING SEMINAR  
Bouwer  
Sec. 01  F 12-1:30

SEMINAR: ENVIRONMENT AND APPLIED FLUID MECHANICS  
Meneveau  
Cross-listed with Interdepartmental, Earth & Planetary Sciences, and Mechanical Engineering

INDEPENDENT STUDY  
Sec. 01 Staff
Sec. 02 Stone
Sec. 03 Boland
Sec. 05 Wolman
Sec. 07 Bouwer
Sec. 08 Ellis
Sec. 09 O'Melia
Sec. 10 Brash
Sec. 11 Hilpert
Sec. 13 Roberts
Sec. 16 Hobbs
Sec. 17 Parlange
Sec. 18 Schoenberger

RESEARCH  
See 570.800 for faculty sections
650.414 (E) RIGHTS IN THE DIGITAL AGE (3) Jacobs  Limit 20  Perm. Req’d.
Sec. 01  M 4-6pm

650.433 (E) EMBEDDED COMPUTER SYSTEMS (3) Kalb  Limit 20  Perm. Req’d.
Course taught On-line

650.453 (E) ENGINEERING DESIGN IN COMPUTER SCIENCE SYSTEMS (3) Stubblefield  Limit 20  Prereq: Knowledge of C, 110.109, 171.102, 600.333 or equivalent  JHUSI MSSI majors only
This course explores engineering oriented topics from a computer science perspective. Material covered will address various relationships between software and hardware design. For example: Why would I ever want to use a union type in C? What does functional programming have to do with programmable logic? Why do I need calculus to understand why a wireless network protocol is dropping packets? If I needed all those pins on my old printer port, what happened to them on USB? This course includes a significant lab component where students teamed in pairs will learn to program microcontrollers and FPGAs and deal with analog (in particular, RF) components.
Sec. 01  W 4:30-7pm

650.457 (E) COMPUTER FORENSICS (3) Lavine  Limit 25  This course introduces students to the field of computer forensics and it will focus on the various contemporary policy issues and applied technologies. Topics to be covered include: legal and regulatory issues, investigation techniques, data analysis approaches, and incident response procedures for Windows and UNIX systems. Homework in this course will relate to laboratory assignments and research exercises. Students should also expect that a group project will be integrated into this course.
Sec. 01  MT 1:30-4

650.651 HEALTH INFORMATION PRIVACY LAW AND POLICY (3) Hodge  Limit 26  Core health course for MSSI
This course pertains to issues relating to health information privacy in the modern era. Course begins in late October – date TBA
Sec. 01  T 11-2:15

650.736 INFORMATION SECURITY PROJECTS (3) Wilson  Limit 16  Perm. Req’d.  MSSI students only
NOTE: The following courses are cross-listed from the Computer Science Department – see the Computer Science Department’s listings for descriptions.

600.415 (E) DATABASE SYSTEMS (3) Yarowsky  Prereq: 600.226  Limit 10  Students may receive credit for 600.315 or 600.415, but not both.
Sec. 01  ThF 2:30-3:45

600.421 (E) OBJECT ORIENTED SOFTWARE ENGINEERING (3) Smith  Prereq: 600.226 and 600.120  Students may receive credit for 600.321 or 600.421, but not both.
Sec. 01  ThF 1-2:15

600.424 (E) NETWORK SECURITY (3) Monrose  Prereq: 600.344/444 and 600.226  Recommended: 600.121 (or equivalent) and 600.349/449  CS and MSSI graduate students only  Students may receive credit for 600.324 or 600.424, but not both.
Sec. 01  MW 2-3:15

600.433 (E) COMPUTER SYSTEMS (3) Masson  Prereq: 600.107 or 600.109  Students may receive credit for 600.333 or 600.433, but not both.  Foundation course for MSSI
Sec. 01  MTW 10

600.442 (E,Q) CRYPTOGRAPHY AND NETWORK SECURITY (3) Ateniese  Prereq: 600.226 and 300-level or above systems course; 600.271 and 550.171 or equivalent.  CS and MSSI students only
Sec. 01  ThF 1-2:15

600.449 (E) INTERNET PROTOCOLS (3) Terzis  Prereq: 600.120,600.344/444  Students may receive credit for 600.211 or 600.111
Sec. 01  ThF 2:30-3:45
INFORMATION SECURITY INSTITUTE

CS and MSSI graduate students only, undergrads with permission. Students receive credit for 600.349 or 600.449 but not both.

600.463 (E,Q) Algorithms I (3) Awerbuch
Prereq: 600.226 or Perm. Req’d. Students may receive credit for 600.463 or 600.363, but not both.

600.643 Advanced Topics in Computer Security (Fall) Limit 20
Prereq: any 600.4xx level course in computer security or cryptography including 600.442, 600.443 or 600.424

NOTE: The following course is taught through the School of Professional Studies in Business and Education and must be for interdivisionally. Descriptions and times are found in the SPSBE catalogue, on the JHUISI website, and outside of Wyman 407.

774.715 Financial Issues in Managing a Secure Operation (Agresti)

MATERIALS SCIENCE AND ENGINEERING

510.101 (E,N) Introduction to Materials Chemistry (3) Katz
Limit 50
Basic principles of chemistry and how they apply to the behavior of materials in the solid state. The relationship between electronic structure, chemical bonding, and crystal structure is developed. Attention is given to characterization of atomic and molecular arrangements in crystalline and amorphous solids: metals, ceramics, semiconductors, and polymers (including proteins). Examples are drawn from industrial practice (including the environmental impact of chemical processes), from energy generation and storage (such as batteries and fuel cells), and from emerging technologies (such as biomaterials).

510.107 (E,N) Modern Alchemy (3) Spicer
Limit 25
Can you really turn lead into gold? Converting common substances into useful materials that play important roles in today's technologies is the goal of many modern scientists and engineers. In this course, we will survey selected topics related to modern materials, the processes that are used to make them as well as the inspiration that led to their development. Topics will include the saga of electronic paper, the sticky stuff of gecko feet and the stretchy truth of metal rubber.

510.311 (E,N) Structure of Materials (3) Searson
Limit 50
Prereq: Calculus I, Freshmen/Sophomore Chemistry, Physics or Perm. Req’d. First of the Introduction to Materials Science series, this course is devoted to study of the structure of materials. Lecture topics include bonding, atomic packing, crystal structure, imperfections in crystals, noncrystalline solids, and composite materials. Among the techniques treated are X-ray diffraction, stereographic projection, and optical and electron microscopy.

510.312 (E,N) Physical Chemistry of Materials I: Thermodynamics (3) Mao
Limit 25
Prereq: Calculus I & II, Freshmen/Sophomore Chemistry & Physics or Perm. Req’d. Second of the Introduction to Materials Science series, this course examines the principles of thermodynamics as they apply to materials. Topics include the fundamental principles of thermodynamics, equilibrium in homogeneous and heterogeneous systems, thermodynamics of multicomponent systems, phase diagrams, thermodynamics of defects, and
elementary statistical thermodynamics.

510.316 (E,N)  BIOMATERIALS I (3) Yu
Limit 50  Prereq: Organic Chemistry I & II and Organic Chemistry Lab I & II
Sixth of the Introduction to Materials Science series, this course offers an overview of principles and properties of biomedical materials. Topics include properties of materials used in medicine, synthesis and properties of polymeric materials, polymeric biomaterials, natural and recombinant biomaterials, biodegradable materials, hydrogels, stimuli-sensitive materials, and characterizations of biomaterials.

510.402 (E,N)  STRUCTURAL MATERIALS ENGINEERING (3) Green
Limit 25  Prereq: Organic Chemistry I & II and Organic Chemistry Lab I & II
This course provides a detailed look at materials used in applications where mechanical properties (such as strength, stiffness, or toughness) are of primary importance. The perspective of the class is to show how a desired set of properties can be achieved through an understanding of structure-properties-processing relationships. Examples include heat treatment of steels, metallic alloys for orthopedic implants, ceramics for high temperature applications, and polymer composite materials.

510.428 (E,N)  MATERIALS SCIENCE LAB I (3) Weihs
Lab assignment by professor
This course focuses on characterizing the microstructure and mechanical properties of structural materials that are commonly used in modern technology. A group of Al alloys, Ti alloys, carbon and alloy steels, and composite materials that are found, for example, in actual bicycles will be selected for examination. Their microstructures will be studied using optical metallography, scanning electron microscopy, X-ray diffraction, and transmission electron microscopy. The mechanical properties of these same materials will be characterized using tension, compression, impact, and hardness tests. The critical ability to vary microstructure and therefore properties through mechanical and heat treatments will also be demonstrated and investigated in the above materials.

510.433 (E,N)  SENIOR DESIGN RESEARCH (3) Hristova
Limit 20  Prereq: 510.311-312, 510.428-429
Coreq: 510.803
This course is the first half of a two-semester sequence required for seniors majoring or double majoring in materials science and engineering. It is intended to provide a broad exposure to many aspects of planning and conducting independent research. During this semester, students join ongoing graduate research projects for a typical 10-12 hours per week of hands-on research.

510.456 (E,N)  INTRODUCTION TO SURFACE SCIENCE (3) Cammarata
Limit 20  Prereq: 510.311-315 or permission of instructor
Introduction to the structure and properties of solid surfaces. Topics include Gibbsian and gradient thermodynamics of surfaces; crystallography and structure of free solid surfaces; characterization methods; surface mobility and phase transitions; gas-solid interactions; crystal growth; electronic structure; solid-solid surfaces; thin film epitaxy.

510.501  RESEARCH
Student participation in ongoing research activities. Research is conducted under the supervision of a faculty member and often in conjunction with other members of the research
INDIVIDUAL programs of study are worked out between students and the professor supervising their independent study project. Topics selected are those not formally listed as regular courses and include a considerable design component.

STRUCTURE OF MATERIALS

Prerequisites: Basic Chemistry, Physics and Calculus or Perm. Req'd. An introduction to the structure of inorganic and polymeric materials. Topics include the atomic scale structure of metals, alloys, ceramics, and semiconductors; structure of polymers; crystal defects; elementary crystallography; tensor properties of crystals; and an introduction to the uses of diffraction techniques (including X-ray diffraction and electron microscopy) in studying the structure of materials.

THERMODYNAMICS OF MATERIALS

An introduction to the classical and statistical thermodynamics of materials. Topics include the zeroth law of thermodynamics; the first law (work, internal energy, heat, enthalpy, heat capacity), the second law (heat engines, Carnot cycle, Clausius inequality, entropy, absolute temperature); equilibrium of single component systems (free energy, thermodynamic potentials, virtual variations, chemical potential, phase changes); equilibrium of multicomponent systems and chemical thermodynamics; basics of statistical physics (single and multiple particle partition functions, configurational entropy, third law; statistical thermodynamics of solid solutions); and equilibrium composition-temperature phase diagrams.

CHEMICAL AND BIOLOGICAL PROPERTIES OF MATERIALS

An introduction to the chemical and biological properties of organic and inorganic materials. Topics include an introduction to polymer science, polymer synthesis, chemical synthesis, and modification of inorganic materials, biomineralization, biosynthesis, and properties of natural materials (proteins, DNA, and polysaccharides); structure-property relationships in polymeric materials (synthetic polymers and structural proteins), and materials for biomedical applications.

SOLID STATE PHYSICS

An introduction to solid state physics for advanced undergraduates and graduate students in physical science and engineering. Topics include crystal structure of solids, band theory; thermal, optical, and electronic properties; transport and magnetic properties of metals, semiconductors, and insulators; and superconductivity. The concepts and applications of solid-state principles in modern electronics, optical, and structural materials are discussed.
MATERIALS SCIENCE AND ENGINEERING

510.624 THEOREY OF X-RAY DIFFRACTION Hufnagel Limit 30
Prereq. 510.601 An introduction to diffraction theory and the uses of diffraction in structural characterization of materials. Topics include X-ray scattering by atoms, kinematic theory, Fourier series methods, diffraction from single crystals and polycrystalline materials, diffraction from multilayers, scattering by liquids and amorphous solids, small-angle scattering, dynamic theory.

510.656 INTRODUCTION TO SURFACE SCIENCE Cammarata Limit 20
Prereq. 510.311-315 or permission of instructor Meets with 510.456

510.733 SPECIAL TOPICS IN ELECTRONICS/OPTICAL MATERIALS INTERACTION Spicer Limit 20 Topics in this course concentrate on the understanding of interactions of electromagnetic fields with materials. These interactions range from the absorption of optical frequency waves to the excitation of materials using low frequency electromagnetic waves in the sub-megahertz regime. Emphasis is on studying representations and the corresponding analytical techniques used to model electromagnetic interactions with materials. Additionally, transduction techniques for the measurement of these interactions are discussed.

510.739 SURFACE CHEMISTRY SEMINAR Searson Limit 10 Perm. Req’d. Topics in surface chemistry and materials chemistry are discussed. The seminar covers various topics in these fields, including a review of the current literature.

510.801 MATERIALS RESEARCH SEMINAR Cammarata Sec. 01 W 2-3:30
510.803 MATERIALS SCIENCE SEMINAR Green Sec. 01 W 3:30-5
510.807 GRADUATE RESEARCH IN MATERIALS SCIENCE Cammarata Sec. 01 TBA

MECHANICAL ENGINEERING

530.101 (E) FRESHMAN EXPERIENCES IN MECHANICAL ENGINEERING (4) Busch-Vishniac Limit 9 per sec. An overview of the field of mechanical engineering along with topics that will be useful throughout the mechanical engineering program. Examples of the latter are dissection of an IC engine, MatLab, the design process, report preparation, and team work.

530.201 (E) STATICS AND MECHANICS OF MATERIALS (4) Brady Limit 20 per section (Lab) Equilibrium of rigid bodies, free-body diagrams, design of trusses. One-dimensional stress and strain, Hooke’s law. Properties of areas. Stress, strain, and deflection of components subjected to uniaxial tension, simple torsion, and bending. Cross listed with 566.201


530.327 (E,N) INTRODUCTION TO FLUID MECHANICS (4) Sar Limit 60 Sec. 01 MTW 10
MECHANICAL ENGINEERING

530.341 (E) ELECTRONICS AND INSTRUMENTATION (3) Cowan
Limit 20 per section
Prereq: 171.101-102, 110.201, 110.302
Perm. Req'd. Department Majors only
Introduction to basic analog electronics and instrumentation with emphasis on basic electronic devices and techniques relevant to mechanical engineering. Topics include basic circuit analysis, laboratory instruments, discrete components, transistors, filters, op-amps, amplifiers, differential amplifiers, power amplification, power regulators, AC and DC power conversion, system design considerations (noise, precision, accuracy, power, efficiency), and applications to engineering instrumentation.

530.352 (E) MATERIALS SELECTION (4) Hemker
Limit 50
Prereq: 530.215 or Perm. Req'd.
An introduction to the properties and applications of a wide variety of materials: metals, polymers, ceramics, and composites. Considerations include availability and cost, formability, rigidity, strength, and toughness. This course is designed to facilitate sensible materials choices so as to avoid catastrophic failures leading to the loss of life and property.

530.403 (E,Q,N,W) ENGINEERING DESIGN PROJECT (4) Conn
Limit 25 per section
Prereq: ME Majors: 530.215, 530.327 or 530.405, and 530.327
This senior year capstone design course is intended to give some practice and experience in the art of engineering design. Students working in teams of two to four will select a small-scale, industry-suggested design problem in the area of small production equipment, light machinery, or manufacturing systems and methods. A solution to the problem is devised and constructed by the student group within limited time and cost boundaries. Preliminary oral reports of the proposed solution are presented at the end of the first semester or sooner. A final device, product, system, or method is presented orally and in writing at the end of the second semester. Facilities of the Engineering Design Laboratory (including machine shop time) and a specified amount of money are allocated to each student design team for purchases of parts, supplies, and machine shop time where needed.

530.414 (E) COMPUTER-AIDED DESIGN (3) Stoanovici
Limit 21
Prereq: 530.215, 530.405
This course attempts to integrate the concepts developed in 530.215 with the use of the computer as a design tool. The topics covered include the design of mechanical systems. Extensive use is made of computer-aided design software, including object modeling, system assembly, and mechanism-solution procedures. Computer-aided drafting and dimensioning.

530.416 (E,N) ADVANCED MECHANICAL DESIGN (3) Sharpe
Limit 70
Prereq: 550.215
A continuation of
MECHANICAL ENGINEERING

530.215 expanding on topics such as fatigue, fracture, and various mechanical components and including linkage synthesis and cars. Student teams will be assigned different experimental or computational projects. Three lectures per week initially and then two per week during the project work.

530.421 (E) MECHATRONICS (3) Okamura  
Limit 20 per section  Prereq: 530.420 or Perm Req’d  Mechatronics is the synergistic integration of mechanism, electronics, and computer control to achieve a functional system. This interdisciplinary course includes lectures, lab assignments, and projects that teach the student to design and build mechatronic devices, building upon the themes of 530.420 Robot Sensors & Actuators. We expand on the topics of mechanism design, motors and sensors, interfacing and programming microprocessors, mechanical prototyping, and creativity in the design process. Course labs and projects are performed in small student groups. Each group develops a microcontroller-controlled electromechanical device, such as a mobile robot or art-making machine. Project topics vary from year-to-year.

530.446 (E,N) EXPERIMENTAL BIOMECHANICS (3) Belkoff  
Limit 50  Prereq: 530.445  An introduction to experimental methods used in biomedical research. Standard experimental techniques will be applied to biological tissues, where applicable and novel techniques will be introduced. Topics include strain gauges, extensometers, load transducers, optical kinematic tracking, digital image correlation, proper experimental design, calibration and error analysis. Of particular emphasis will be maintaining native tissue temperature and hydration. Laboratory will include “hands-on” testing and may involve cadaveric tissue. Students will need to arrange occasional transportation to the Biomechanics Lab on the Bayview Campus.

530.451 (E,N) CELL AND TISSUE ENGINEERING LAB (2) Haase/  
Wang  Limit 50  Seniors and Graduate students only  This laboratory course will consist of three experiments that will provide students with valuable hands-on experience in cell and tissue engineering. Experiments include the basics of cell culture techniques, gene transfection and metabolic engineering, basics of cell-substrate interactions I, cell-substrate interactions II, and cell encapsulation and gel contraction.

530.454 (E) MANUFACTURING ENGINEERING (3) Sharpe  Limit 50  An introduction to the various manufacturing processes used to produce metal and nonmetal components. Topics include casting, forming and shaping, and the various processes for material removal including computer-controlled machining. Simple joining processes and surface preparation are discussed. Economic and production aspects are considered throughout.

530.461 (E) ENGINEERING BUSINESS AND MANAGEMENT (3)  
Staff  Limit 50  An introduction to the business and management aspects of the engineering profession, project management, prioritization of resource allocation, intellectual property protection, management of technical projects, and product/production management.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Description</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>530.491</td>
<td>SPECIAL TOPICS (1)</td>
<td>Staff</td>
<td>1</td>
<td>Offered by faculty adviser and instructor in charge. Selected topics for third- and fourth-year students in mechanical engineering and other engineering departments.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.495 (E)</td>
<td>MICROFABRICATION LABORATORY (4)</td>
<td>Wang, Andreou</td>
<td>4</td>
<td>Seniors only. This laboratory course is an introduction to the principles of microfabrication for microelectronics, sensors, MEMS, and other synthetic microsystems that have applications in medicine and biology. Course comprised of laboratory work and accompanying lectures that cover silicon oxidation, aluminum evaporation, photoreis deposition, photolithography, plating, etching, packaging, design and analysis CAD tools, and foundry services.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.496 (E)</td>
<td>MICRO/NANOSCIENCE AND BIOTECHNOLOGY (3)</td>
<td>Wang</td>
<td>3</td>
<td>Co-listed with 580.496. An introduction to the physical and chemical principles important to MEMS, BioMEMS, and Bionanotechnology. Topics include scaling laws, colloids and surfaces, micro and nanofluids, thermal forces and diffusion, chemical forces, electrokinetics, electric aspects of surface chemistry, capillary forces and surface tension, and top-down and bottom-up nanofabrication.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.525</td>
<td>INDEPENDENT RESEARCH</td>
<td></td>
<td></td>
<td></td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.527</td>
<td>INDEPENDENT STUDY</td>
<td></td>
<td></td>
<td></td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.601</td>
<td>CONTINUUM MECHANICS</td>
<td>Staff</td>
<td>3</td>
<td>An introduction to the foundations of continuum mechanics. Vectors and tensors; properties and basic operations. Kinematics of deformation; Eulerian and Lagrangian descriptions of motion. Stress in a continuum. Conservation laws; mass and momentum balance. Thermodynamics; energy balance and entropy. Introduction to statistical mechanics. Constitutive equations; linear elasticity, finite elasticity, and mechanics of soft matter.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.632</td>
<td>CONVECTION</td>
<td>Prosperi</td>
<td>2</td>
<td>Co-listed with 580.632. Limit 20. This course begins with a review of the phenomenological basis of the constitutive models for energy and mass flux. Then, using the transport theorems, general conservation and balance laws are developed for mass, species, energy, and entropy. Sealing analysis is used to determine when simplifications are justified, and simplified cases are solved analytically. Experimental results and correlations are given for more complex situations. Free, mixed, and forced internal and external convection are studied, and convection with a phase change is also explored.</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>530.646</td>
<td>INTRODUCTION TO ROBOTICS</td>
<td>Cowan</td>
<td>3</td>
<td>Co-listed with 580.646. Limit 50. Graduate-level introduction to robotics with emphasis on the mathematical tools for kinematics and dynamics. Topics include forward and inverse kinematics, trajectory generation, position sensing and actuation, and</td>
<td>Sec. 01</td>
</tr>
<tr>
<td>Course Code</td>
<td>Title</td>
<td>Instructor</td>
<td>Limit</td>
<td>Section</td>
<td>Days</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
<td>-------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>530.651</td>
<td>HAPTIC SYSTEMS FOR TELEOPERATION AND VIRTUAL REALITY</td>
<td>Okamura</td>
<td>40</td>
<td>Sec. 01</td>
<td>MTW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>530.671</td>
<td>STATISTICAL MECHANICS IN BIOLOGICAL SYSTEMS</td>
<td>Sun</td>
<td>20</td>
<td>Sec. 01</td>
<td>MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>530.710</td>
<td>APPLIED OPTICS</td>
<td>Katz</td>
<td>20</td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>530.748</td>
<td>STRESS WAVES, IMPACT, AND SHOCKS</td>
<td>Ramesh</td>
<td>25</td>
<td>Sec. 01</td>
<td>Th</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>530.759</td>
<td>RESEARCH SEMINAR: PLASTICITY</td>
<td>Ramesh</td>
<td>25</td>
<td>Sec. 01</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>530.766</td>
<td>NUMERICAL METHODS</td>
<td>Kato</td>
<td>25</td>
<td>Sec. 01</td>
<td>MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MECHANICAL ENGINEERING

Computer assignments requiring programming.

270.621 TRANSMISSION ELECTRON MICROSCOPY: PRACTICE AND APPLICATIONS (Web)
Cross-listed with Earth & Planetary Sciences
Sec. 01 TBA

360.605 SEMINAR: ENVIRONMENT & APPLIED FLUID MECHANICS
Veblen Limit 100
Cross-listed with Geography & Environmental Engineering, Earth & Planetary Sciences, & Interdepartmental
Sec. 01 F 11

530.800 INDEPENDENT STUDY
(Ref to 530.801 for registering with faculty)
Sec. 01 TBA

530.801 GRADUATE RESEARCH
Use the following section when registering with a faculty member:
Sec. 01 Chirikjian
Sec. 02 Meneveau
Sec. 03 Stoianovici
Sec. 04 Chen
Sec. 05 Herman
Sec. 06 Ramesh
Sec. 07 Taylor
Sec. 08 Prosperetti
Sec. 09 Sharpe
Sec. 10 Kizer
Sec. 11 Hemker
Sec. 12 Chao
Sec. 13 Whitcomb
Sec. 14 Okamura
Sec. 15 Oguz
Sec. 16 Molinari
Sec. 17 Staff
Sec. 18 Chao
Sec. 19 Su
Sec. 20 Wang
Sec. 21 Yan
Sec. 22 Cowan
Sec. 23 Boushehri
Sec. 24 Katz

530.803 MECHANICAL ENGINEERING SEMINAR
Prosperetti Limit 100
Sec. 01 Th 3

PROFESSIONAL COMMUNICATION

661.110 (H,S) TECHNICAL COMMUNICATION (3)
(W)
Sec. 01 Knorr Limit 20 per section
Sec. 02 Allocca
Sec. 03 Rice
Sec. 04 Porosky
Sec. 05 Rice
Sec. 06 Winett
MTW 10
MTW 11
M 3-5:45
M 6-8:45pm
T 3-5:45pm
W 3-5:45pm
MTW 12
M 6-8:45pm
T 6-8:45pm
W 3-5:45pm
This course introduces students to the principles of developing and delivering effective oral presentations. Students practice these skills in a variety of contexts and submit written documents (speaking scripts) to accompany them.

661.120 (H,S) BUSINESS COMMUNICATION (3)
(W)
Sec. 01 Staff Limit 20 per section
Sec. 02 Dunfee
Sec. 03 Cavanaugh-Simpson
Sec. 04 Porosky
MTW 12
M 6-8:45pm
T 6-8:45pm
W 3-5:45pm
This course introduces students to the principles of developing and delivering effective oral presentations. Students practice these skills in a variety of contexts and submit written documents (speaking scripts) to accompany them.

661.150 (H,S) ORAL PRESENTATIONS (3)
(W)
Sec. 01 Kulanko Limit 16 per section
Sec. 02 Kulanko
Sec. 03 Kulanko
Sec. 04 Kulanko
Sec. 05 Kulanko
Sec. 06 Kulanko
M 3-5:45
M 6-8:45pm
Th 12-2:45
F 12-2:45
This course introduces students to the principles of developing and delivering effective oral presentations. Students practice these skills in a variety of contexts and submit written documents (speaking scripts) to accompany them.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>661.310</td>
<td>SCIENTIFIC WRITING (3) Stone</td>
<td>Stone</td>
<td>20</td>
<td>Students write original work, critique articles for content and style, and present work to class. They improve written work that requires synthesis and evaluation. The goal is to weld critical thinking to compelling writing.</td>
</tr>
<tr>
<td>661.330</td>
<td>WRITING FOR THE HEALTH PROFESSIONS (3) Berlinski</td>
<td>Berlinski</td>
<td>20</td>
<td>Students will write a variety of papers including a personal statement, resume, cover letter, and a medical research paper, in order to gain a better understanding of the composition process.</td>
</tr>
<tr>
<td>661.610</td>
<td>RESEARCH WRITING Dunfee</td>
<td>Dunfee</td>
<td>20</td>
<td>This course provides writing and organizational support to graduate students developing journal articles, dissertations, theses, or conference papers. Those interested in writing, formatting, and content development would benefit from this course.</td>
</tr>
</tbody>
</table>