2008–2009
FIRST TERM
SCHEDULE
OF
ARTS AND
SCIENCES
AND
ENGINEERING COURSES

Office of the Registrar  March, 2008
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, 1999: 1012
% of freshman returning as sophomores: 96%
% graduating within 4 years: 81%
% graduating within 5 years: 89%
% graduating within 6 years: 90%

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 2008. Updated information can be found at http://www.jhu.edu/registrar/schedule.html

1. The course number includes both a departmental and course indicator. The number preceding the decimal identifies the department offering the course (See below):

ZANVYL KRIEGER SCHOOL OF ARTS & SCIENCES

<table>
<thead>
<tr>
<th>Course</th>
<th>Department</th>
<th>Number</th>
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<tbody>
<tr>
<td>Africana Studies 362</td>
<td>Mathematics</td>
<td>110</td>
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<tr>
<td>Anthropology 070</td>
<td>Military Science</td>
<td>374</td>
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<tr>
<td>Art 371</td>
<td>Museums &amp; Society Programs</td>
<td>389</td>
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<tr>
<td>Behavioral Biology 290</td>
<td>Music</td>
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<td>Biology 020</td>
<td>Near Eastern Studies</td>
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<td>Biophysics 250</td>
<td>Neuroscience</td>
<td>080</td>
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<td>Chemistry 030</td>
<td>Philosophy</td>
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<td>Classics 040</td>
<td>Physics &amp; Astronomy</td>
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<tr>
<td>Cognitive Science 050</td>
<td>Political Science</td>
<td>190-191</td>
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<tr>
<td>Earth &amp; Planetary Science 270</td>
<td>Psychological &amp; Brain Sciences</td>
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<td>Economics 110</td>
<td>Public Health Studies</td>
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<td>English 060</td>
<td>Public Policy</td>
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<td>Film and Media Studies 061</td>
<td>Sociology</td>
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<td>German and Romance 210</td>
<td>Theatre Arts and Studies</td>
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<td>Languages and Literatures 215</td>
<td>Writing Seminars</td>
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<td>History of Art 010</td>
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<td>History of Science and Technology 140</td>
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<td>Humanities Center 300</td>
<td>Applied Math. &amp; Statistics</td>
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<td>Interdepartmental 360</td>
<td>Biomedical Engineering</td>
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<td>Arabic 375</td>
<td>Civil Engineering</td>
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<tr>
<td>Chinese 373</td>
<td>Computer Science</td>
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<td>E.S.L. 370</td>
<td>Entrepreneurship &amp; Mgmt</td>
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<td>Hindi 381</td>
<td>Electrical &amp; Computer Engr.</td>
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<td>Japanese 378</td>
<td>General Engineering</td>
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<td>African Languages 379</td>
<td>Geography &amp; Environ. Engr.</td>
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<td>Korean 380</td>
<td>Information Security Institute</td>
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<tr>
<td>Persian 382</td>
<td>Materials Science &amp; Engr.</td>
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<tr>
<td>Russian 377</td>
<td>Mechanical Engineering</td>
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<tr>
<td>Sanskrit 383</td>
<td>Professional Communication</td>
<td>661</td>
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<tr>
<td>Latin American Studies 361</td>
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</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
  - 500-599: 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 100-499-course number identifies the broad area of study for the fulfillment of undergraduate distribution requirements.

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

3. The number in parentheses after each 100-499-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 AN/EN catalog for a more complete statement of any prerequisite requirements.

6. Meeting times are indicated whenever they are known. 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 and click on ‘Room Schedule’ to see a complete listing.
## Africana Studies

### 362.111 (S) INTRODUCTION TO AFRICAN AMERICAN STUDIES (3)
- **Limit**: 15
- **Cross-listed with Sociology**

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.

**Sec. 01** TTh 12-1:15

### 362.200 (H) AFRICAN AMERICAN POETRY AND POETICS (3)

This course will explore the category, history, and development of African American poetry from Phillis Wheatley to the present. We will focus on poetry and poetics specifically but will consider the general movement of literature produced by African American writers over the course of three centuries. We will read works by the key contributors to this particular American literary tradition with the goal of understanding the aesthetic, cultural, and critical legacy of African-American poetry to the American literary and musical sensibility of the 21st century. From 18th century odes to 19th century shouts and spirituals to the jazz poets of the Harlem Renaissance to Black Arts poetry to the blues, hip hop, and rap tradition, we will examine the role that race, cultural identity, legal status, and the impersonal structures (or shackles) of poetic forms have played in shaping and reshaping African American verse.

**Sec. 01** MW 1:30-2:45

### 362.340 (S) POWER & RACISM (3)

This is an interdisciplinary course that examines white supremacy and anti-black racism as a global system of power. Through reading texts in philosophy, history, sociology, politics, and law, the course will focus on trends, developments, and future challenges related to the social relations of racism and power in America and in Brazil.

**Sec. 01** TTh 12-1:15

### 010.290 (H) AT THE VERY EDGE: THE ART OF ISLAMIC SPAIN AS A FURTIVE INTRODUCTION TO ‘ISLAMIC ART’ (3)

**Cross-listed with History of Art and Near Eastern Studies**

**Sec. 01** TTh 9-10:15

### 100.157 (H,S) RACE AND EMPIRE (3)

**Cross-listed with History**

**Sec. 01** MW 3-3:50

### 100.304 (H,S) NEW WORLD SLAVERY (3)

**Cross-listed with History**

**Sec. 01** MW 12-1:15

### 100.338 (H,S) CONTEMPORARY AFRICAN POLITICAL ECONOMIES IN HISTORICAL PERSPECTIVES (3)

**Cross-listed with History**

**Sec. 01** TTh 10:30-11:45

### 100.343 (H,S) THE POWER OF PLACE: RACE AND COMMUNITY IN EAST BALTIMORE (3)

**Cross-listed with History, Public Health Studies, and Anthropology**

**Sec. 01** T 4:30-7:30pm

### 100.445 (H,S) AFRICAN FICTION AS HISTORY (3)

**Cross-listed with History**

**Sec. 01** T 1:30-4

### 100.486 (H,S) JIM CROW IN AMERICA (3)

**Cross-listed with History**

**Sec. 01** TTh 10:30-11:45

### 130.101 (H) ANCIENT NEAR EASTERN CIVILIZATIONS (3)

**Cross-listed with Near Eastern Studies**

**Sec. 01** TTh 10:30-11:45

### 130.400 (H) INTRODUCTION TO MIDDLE EGYPTIAN (Hieroglyphs) (3)

**Cross-listed with History**

**Sec. 01** MW 12-1:30

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**Note:** All courses are subject to availability and may have additional prerequisites. Please consult the official catalog for the most up-to-date information.
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<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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<th>Limit</th>
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<tr>
<td>190.214 (S)</td>
<td>INTRODUCTION TO RACIAL AND ETHNIC POLITICS (3)</td>
<td>Spence</td>
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<td>191.329 (S)</td>
<td>THE POLITICS, HISTORY AND CULTURE OF THE MAGHREB (3)</td>
<td>Lawrence</td>
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<td>Cross-listed with Political Science</td>
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<td>195.477 (S)</td>
<td>INTRODUCTION TO URBAN POLICY (3)</td>
<td>Newman</td>
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<td>195.478 (W)</td>
<td>URBAN POLICY INTERNSHIP (3)</td>
<td>Newman</td>
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<tr>
<td>215.491 (H)</td>
<td>MUSLIM SPAIN (3)</td>
<td>Altschul</td>
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<td>Cross-listed with German and Romance Languages and Literatures</td>
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<td>230.112 (S)</td>
<td>FRESHMAN SEMINAR ON RACE AND EDUCATION IN THE U.S.</td>
<td>Bennett</td>
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<td>230.316 (S)</td>
<td>THE AFRICAN-AMERICAN FAMILY (3)</td>
<td>McDonald</td>
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<td>Cross-listed with Sociology and Studies of Women, Gender, and Sexuality</td>
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<td>230.333 (S)</td>
<td>QUALITY AND INEQUALITY IN AMERICAN EDUCATION (3)</td>
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<td>230.334 (S)</td>
<td>THE CITY IN TIME AND SPACE: HISTORICAL SOCIOLOGY OF THE URBAN WORLD (3)</td>
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<td>230.345 (S)</td>
<td>HISTORICAL SOCIOLOGY OF AFRICA (3)</td>
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<td>280.399 (S)</td>
<td>PRACTICUM IN COMMUNITY HEALTHCARE (2)</td>
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<td>Bone/Goodwin</td>
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<td>Limit 35 Seniors &amp; Juniors only</td>
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<tr>
<td>375.115</td>
<td>BEGINNING ARABIC (4.5)</td>
<td>Tahrawi/Abdallah</td>
<td>18</td>
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<td>Tahrawi/Abdallah, Limit 18 per section</td>
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<td>375.215 (H)</td>
<td>INTERMEDIATE ARABIC (4)</td>
<td>Abdallah</td>
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<td>Sec. 01 MWFTh 12:30-1:30</td>
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<td>Prereq: 375.115-116 or equivalent Perm. Req'd.</td>
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<td>375.301 (H)</td>
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<td>Tahrawi Limit 15 Prereq: 375.216 or equivalent</td>
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<td>375.401 (H)</td>
<td>UPPER ADVANCED ARABIC (3)</td>
<td>Tahrawi</td>
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<td>379.151</td>
<td>BEGINNING KISWAHILI I (3)</td>
<td>Kamau</td>
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<td>Sec. 01 TTh 10:30-11:45</td>
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<td>379.251 (H)</td>
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<td>070.265 (H,S)</td>
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<td>LOGIC OF ANTHROPOLOGICAL INQUIRY</td>
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<td>070.373 (H,S)</td>
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<td>Haw</td>
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<td>070.378 (H,S)</td>
<td>CULTURAL PROPERTY AND POLITICS IN LATIN AMERICA</td>
<td>Poole</td>
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<td>070.391 (H,S)</td>
<td>RELIGION AND THE PROBLEM OF SUFFERING</td>
<td>Singh</td>
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<tr>
<td>070.395 (H,S)</td>
<td>ANTHROPOLOGY OF CLOTHES</td>
<td>Haeri</td>
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<td>070.399 (H,S)</td>
<td>BACK TO THE FUTURE</td>
<td>Obarrio, Khan</td>
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<td>100.343 (H,S)</td>
<td>THE POWER OF PLACE: RACE AND COMMUNITY IN EAST BALTIMORE</td>
<td>Shell-Weiss</td>
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<td>12</td>
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</table>
ANTHROPOLOGY

analyzing oral histories with current and former residents. Cross-listed with Africana Studies, Public Health Studies, and History

300.344 (H) (W) GENOCIDE AS A PHILOSOPHICAL PROBLEM (3) Shuster Limit 30 Cross-listed with the Humanities Center, Jewish Studies, History, Philosophy and Political Science
Dean’s Teaching Fellowship Course

Sec. 01 M 4:30-7pm

300.383 (H) WHAT MAKES US DESIRE? (3) Marrati Limit 20 Cross-listed with the Humanities Center

Sec. 01 T 1:30-4

070.503 INDEPENDENT STUDY Staff

070.505 DIRECTED RESEARCH Staff

070.507 DIRECTED READINGS Staff

070.551 INTERNSHIP Staff

070.561 SENIOR ESSAY Staff

070.607 RECENT ETHNOGRAPHICS IN MEDICAL ANTHROPOLOGY Han Limit 10 In this seminar, we will do close readings of eight to ten recent ethnographies in medical anthropology. These ethnographies will be paired with selections of pertinent social theory. The reading list will comprise recently published work with a broad range of topics: HIV/AIDS, desire/affect, and the social lives of technology, to name a few. We will study methodologies employed in these ethnographies, both in terms of fieldwork and in writing. We will pay close attention to how social theory relates to ethnographic insight.

Sec. 01 W 4-6pm

070.616 PROSEMINAR ON ANTHROPOLOGICAL THEORY Poole Limit 10 This course will consist of close reading of anthropological texts in order to elicit the relation between knowledge and institutions. Will not provide a survey but will select one or two salient concepts and place them within the conceptual and institutional history of various anthropologies.

Sec. 01 T 1:30-3:30

070.617 METHODS: ANTHROPOLOGICAL IMAGINATION Pandian Limit 10 This course takes imagination as a rubric through which to explore problems and practices of method and interpretation in sociocultural anthropology.

Sec. 01 Th 4-6pm

070.651 ANTHROPOLOGY OF “THE EVERYDAY” Khan Limit 15 In this course we will treat “the everyday” as an orienting concept by which to engage social theory and ethnography. We will read from among the following: Dukhren, Tante, Lefèbvre, de Certeau, Freud, Nietzsche, Cavell, Brooks, Dau, Giseman, and Pándalio. Cross-listed with Political Science, German and Romance Languages and Literatures, the Humanities Center, and Geography and Environmental Engineering.

Sec. 01 F 10-12

070.659 PROPOSAL WRITING Obuehi Limit 20 The seminar will offer a forum for students to discuss research projects, prepare grant proposals and think further about issues of ethnographic methodology and writing. Open to anthropology graduate students only.

Sec. 01 F 2-4

070.801 DISSERTATION RESEARCH Han

Sec. 01

070.867 DIRECTED READING AND RESEARCH Han

Sec. 01

070.869 DIRECTED READING AND RESEARCH Pandian

Sec. 01

070.871 DIRECTED READING AND RESEARCH Das

Sec. 01

070.879 DIRECTED READING AND RESEARCH Guyer

Sec. 01

070.883 DIRECTED READING AND RESEARCH Reynolds

Sec. 01

070.885 DIRECTED READING AND RESEARCH Poole

Sec. 01
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<th>Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>371.131</td>
<td>STUDIO DRAWING I (2)</td>
<td>Hankin</td>
<td>Sec. 01</td>
<td>T</td>
<td>1:30-5</td>
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<td>ATTENDANCE AT 1ST CLASS IS MANDATORY. 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, Drawing On The Right Side of The Brain, and with the aid of still-life setups and live models.</td>
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<tr>
<td>371.133</td>
<td>PAINTING WORKSHOP I (2)</td>
<td>Hankin</td>
<td>Sec. 01</td>
<td>W</td>
<td>1:30-5</td>
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<td>Haskin, Limit 12, Prereq: Studio Drawing I (371.131) or equivalent. This course offers the fundamentals of oil painting techniques for the serious student with minimal prior studio experience. Observational skills are taught through the extensive use of still-life setups, with particular attention paid to issues of light, color, and composition. Slide lectures and a museum trip give students an art historical context in which to place their own discoveries as beginning painters.</td>
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<tr>
<td>371.134</td>
<td>PAINTING WORKSHOP II (2)</td>
<td>Gruber</td>
<td>Sec. 01</td>
<td>M</td>
<td>1:30-5</td>
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<td>Gruber, Limit 12, Prereq: Painting Workshop I (371.133) or equivalent. 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>
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<tr>
<td>371.146 (H)</td>
<td>BASIC BLACK &amp; WHITE PHOTOGRAPHY (3)</td>
<td>Berger</td>
<td>Sec. 01</td>
<td>F 1</td>
<td>10-1</td>
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<td>F 2</td>
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<td>Berger, Limit 7 per section. ATTENDANCE AT 1ST CLASS IS MANDATORY. An introduction to the technical and creative process of producing black &amp; 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 ten mounted prints. Students must have a 35mm camera with manual aperture and shutter speed. Cross-listed with the Humanities Center</td>
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<tr>
<td>371.149 (H)</td>
<td>VISUAL REALITY (3)</td>
<td>Bakker</td>
<td>Sec. 01</td>
<td>F 1</td>
<td>1:30-4:30</td>
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<td>Bakker, Limit 12, Prereq: Imagination. Freshmen by permission only. 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 not one correct answer. Cross-listed with the Humanities Center</td>
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ART

371.151 (H) PHOTO SHOP AND THE DIGITAL DARKROOM (3) Berger  Limit 10
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 BMA to see its growing collection of digital images.  *Students must have a digital camera. Prior knowledge of Photoshop is not required.*  
Sec. 01  Th 10:30-1:30

371.152 (H) INTRODUCTION TO DIGITAL PHOTOGRAPHY (3) Salazar
Limit 10 per section  
ATTENDANCE AT FIRST CLASS IS MANDATORY  
Students learn to use their digital cameras through a variety of projects which help them develop technical and creative skills. Students explore documentary, landscape and portrait photography. Critiques and slide lectures of historic photographs, which range from post-mortem daguerreotypes to postmodern digital imagery, help students develop a personal vision. Students gain camera proficiency with one-on-one instruction in the field. Basics for print adjustment and output will be covered.  
Students must have a digital camera with manual aperture and shutter speed. Cross-listed with the Humanities Center
Sec. 01 T 1:30-4:30  02 W 1:30-4:30

371.154 INTRODUCTION TO WATERCOLOR (2)
Ober  Limit 12  
Watercolor is simultaneously the most accessible of all painting media and the most misunderstood. Through a structured approach of demonstration and experimentation, and also by examining master artists, students will explore a wide range of approaches to watercolor. Technical aspects include painting techniques, properties of transparent and opaque media, color mixing, and types of paper. Students will also learn how to observe interactions of color in nature and to use these color relationships in figurative and abstract works. Painting indoors and out, students will explore subjects of still life, landscape, and portrait in increasing degrees of complexity as the semester progresses. Students will keep a sketchbook journal to record their visual thoughts and to collect and catalogue their newly acquired vocabulary of techniques and skills.
Sec. 01  Th 1:30-4:30

389.370 (H) CAMERA ARTS: PHOTOGRAPHING EVERGREEN MUSEUM AND LIBRARY (3) Berger  Limit 10  Cross-listed with Programs in Museum & Society
Sec. 01  M 2-5

BEHAVIORAL BIOLOGY

290.420 (S) ORIGINS OF HUMAN SEXUAL ORIENTATION AND VARIATION (3)
Kraft  Limit 25  Perm Req'd Juniors & Seniors PBS, Neuroscience, Public Health, Behavioral Biology, or Biology majors, or PBS or Women's Studies minors only. Pre-registration will be held in 140 Ames/time TBA bobbie@jhu.edu  
This course will examine the historical and current theories of sexual orientation and sexual variation development by examining the biological, psychological and social contributing factors that influence the development of sexual orientations and variations along with treatment and modification of problematic sexual behaviors.  
Cross-listed with Psychological and Brain Science and Studies of Women, Gender and Sexuality
Sec. 01  T 3:30-5:30 pm
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>290.490 (N)</td>
<td>SENIOR SEMINAR IN BEHAVIORAL BIOLOGY (4) Holland Limit 15 Capstone course for senior Behavioral Biology majors, or permission of instructor. Great ideas in Behavioral Biology. Discussion of classic and cutting edge articles in the original literature. Student presentations and reaction papers. Capstone course for senior Behavioral Biology majors.</td>
<td>Sec. 01</td>
<td></td>
<td>TBA</td>
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<tr>
<td>020.151 (N)</td>
<td>GENERAL BIOLOGY I (4) McCarty/Pearlman/Shingles Limit 300 Note: The Tuesday workshop is a required part of this course Cross-listed with Biology</td>
<td>Sec. 01</td>
<td>MWF</td>
<td>12-12:50</td>
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<td>Sec. 02</td>
<td>TBA</td>
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<tr>
<td>020.153 (N)</td>
<td>GENERAL BIOLOGY LAB I (1) Pearlman Coreq. 020.151 Limit: 02 03 04 05</td>
<td>Sec. 01</td>
<td>MWF</td>
<td>12-12:50</td>
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<td>Sec. 02</td>
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<td>080.330 (N)</td>
<td>BRAIN INJURY AND RECOVERY OF FUNCTION (CM) (ST) (3) Gorman Limit 30 Prereq: 080.203, 080.305 &amp; 080.306 or 080.205 and 080.304 or Perm. Req’d Cross-listed with Psychological and Brain Sciences and Neuroscience</td>
<td>Sec. 01</td>
<td>WF</td>
<td>1:30-2:45</td>
</tr>
<tr>
<td>200.141 (N,S)</td>
<td>INTRODUCTION TO PHYSIOLOGICAL PSYCHOLOGY (3) Gorman Limit 100 Cross-listed with Psychological and Brain Sciences</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>9-10:15</td>
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<tr>
<td>200.328 (S)</td>
<td>THEORY &amp; METHODS IN CLINICAL PSYCHOLOGY (3) Edwards Limit 25 Prereq: Abnormal Psychology (200.212) Senior Psychology Majors Only Cross-listed with Psychological and Brain Sciences</td>
<td>Sec. 01</td>
<td>M</td>
<td>6-8:30pm</td>
</tr>
<tr>
<td>200.339 (S)</td>
<td>ISSUES IN COUNSELING AND MENTAL HEALTH CARE (3) McComb Limit 30 Priority to Psychology Majors Cross-listed with Psychological and Brain Sciences</td>
<td>Sec. 01</td>
<td>Th</td>
<td>1:30-4</td>
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<tr>
<td>200.344 (N,S)</td>
<td>BEHAVIORAL ENDOCRINOLOGY (3) Ball Limit 70 Prereq: 200.141 or 080.205 or Perm. Req’d Cross-listed with Psychological and Brain Sciences and Neuroendocrine</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>1:30-2:45</td>
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<tr>
<td>200.355 (S)</td>
<td>PSYCHOLOGY OF DECISION MAKING; BEHAVIORAL FINANCE (3) Raifman Juniors and Seniors only Limit 40 Prereq: Six credits of Psychology course work Cross-listed with Psychological and Brain Sciences</td>
<td>Sec. 01</td>
<td>T</td>
<td>3-5:30pm</td>
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<tr>
<td>290.501</td>
<td>FRESHMEN RESEARCH IN BEHAVIORAL BIOLOGY</td>
<td>Sec. 01</td>
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<td>290.503</td>
<td>SOPHOMORE RESEARCH IN BEHAVIORAL BIOLOGY</td>
<td>Sec. 01</td>
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<tr>
<td>290.505</td>
<td>JUNIOR RESEARCH IN BEHAVIORAL BIOLOGY</td>
<td>Sec. 01</td>
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<tr>
<td>290.507</td>
<td>SENIOR RESEARCH IN BEHAVIORAL BIOLOGY</td>
<td>Sec. 01</td>
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<td>TBA</td>
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<tr>
<td>290.519</td>
<td>INDEPENDENT STUDY IN BEHAVIORAL BIOLOGY</td>
<td>Sec. 01</td>
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020.104 (N) FRESHMEN SEMINAR: FROM GENES TO DNA AND BACK (1.5) Moudrianakis Limit 20 Freshmen Only
A course consisting of introductory lectures followed by student presentations in the form of seminars. The issues analyzed will be: How did we arrive at the concept of the “gene”? Early experiments that gave substance to this concept. How did we arrive at the “one gene, one enzyme” dogma? What is the chemical nature of the gene? Is DNA enough for regulated gene expression? Is it “all in our genes”? What is genetic plasticity and epigenetics? What about genomics and proteomics?
Sec. 01 M 1:30-3

020.106 (N) FRESHMEN SEMINAR: TUBERCULOSIS (1) Horner Freshmen only Limit 12
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.
Sec. 01 M 3-4

020.110 (N) FRESHMEN SEMINAR: THE BIOLOGY OF PLASTIDS (1) McCarty Freshmen only Limit 12
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.
Sec. 01 T 1:30-2:20

020.111 (N) THE “NOBELS” IN MEDICINE AND CHEMISTRY (1) Brand Freshmen only Limit 20 Key events in our understanding of the life sciences will be traced with the aid of Nobel awards.
Sec. 01 W 1:30-2:20

020.151 (N) GENERAL BIOLOGY I (4) McCarty/Pearlman/Shingles Limit 300
Note: The Tuesday workshop is a required part of this course. 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. Cross-listed with Behavioral Biology
Sec. 01 Lec. MWF 12-12:50 Wkshp T 12-12:50

020.153 (N) GENERAL BIOLOGY LAB I (1) Pearlman Coreq: 020.151 Limit 50
This course reinforces the topics covered in 020.151. Laboratory exercises explore topics ranging from forest ecology to molecular biology to animal behavior. Students participate in a semester-long project, identifying bacteria using DNA sequencing. Cross-listed with Behavioral Biology
Sec. 01 Lec. Th 12-12:50

020.161 (N) BIOLOGY WORKSHOP I (1) Pearlman Limit 50 Prelim: Score of 4 or 5 on AP Biology exam The workshop covers applications and current trends in Biology through guest lectures from researchers and hands-on computer programs. Credit will be awarded for EITHER 020.151 or 020.161, but not both
Sec. 01 T 12-12:50
BIOLOGY

020.207 (N,S)  INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY (3)  Teaford
Limit 75  The biology and evolution of humans and their closest living relatives.

020.305 (N)  BIOCHEMISTRY (4)  Hill/Schildbach  Limit 470
Prereq: 030.101-102[Intro Chemistry]
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, proteins, and nucleic acids will illustrate the similarity of the biomolecules and metabolic processes involved in diverse forms of life.

020.315 (N)  BIOCHEMISTRY LAB (2)  Horner
1st class starts on 9/08/08
Coreq: 020.305
Limit 60 per section
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.

020.317 (N)  SIGNALING IN DEVELOPMENT AND DISEASE (3)  Kuruvilla
Biology, Molecular and Cellular Biology and Neuroscience Majors only
An advanced undergraduate level seminar on current topics on signal transduction mechanisms underlying neuronal morphology, development and function. The proper functioning of the nervous system relies on the establishment of precise neuronal circuits through a developmental program including proliferation, neuronal migration, axonal growth and neuronal survival. This course pertains to the extracellular cues and downstream neuronal signaling pathways that coordinate these key events during neuronal development. The course will also cover the role of aberrant signaling mechanisms in neuronal degeneration and disease.

020.330 (N)  GENETICS (3)  Hoyt/Cunningham
Prereq: 020.305  Limit 320
Presentation of the principles of heredity and variation, and their application to evolution and development; physico-chemical nature of the gene; problems of recombination; gene action.
Cross listed with Neuroscience

020.331 (N)  HUMAN GENETICS (2)  Hedgecock
Limit 70  Prereq: 020.330
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.

020.340 (N)  GENETICS LAB (2)  Kondo
Limit 20 per section  Prereq: 020.315-316 (Biochemistry and Cell Biology Labs)
Coreq: 020.330
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)  Salamon
Limit 25  Perm. Req'd.
Post-Bac Students Only

020.379 (N)  EVOLUTION (3)  Morris
Limit 25  Perm. Req'd.
This course will explore the principles of natural selection and examine the origin of species from both the geologic time and current topics in evolution and speciation.
BIOLOGY

record (palaeontology) 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)  EUKARYOTIC MOLECULAR BIOLOGY (3)
Moudrianakis/Beemon/Huang
Limit 50  Prereq: 020.330  The class will read and discuss original research papers
highlighting important developments in molecular biology.

020.401 (N)  ADVANCED SEMINAR IN MOLECULAR AND CELLULAR BIOLOGY (3) Staff  Limit 20
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  Limit 25  S/U only
Perm. Req’d  Successful completion 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 4/08/08. 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.

080.305 (N)  THE NERVOUS SYSTEM I (3) Hendry
Limit 200  Prereq: 080.203 or 200.141
Cross-listed with 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  An independent
course of study may be pursued under the direction of an adviser on those topics
not specifically listed in the form of regular courses. Freshmen and Sophomores only

020.503  INTRODUCTION TO RESEARCH  Perm. Req’d  Usually students are not
prepared for research or independent study until their junior year. This course is
offered to accommodate the exceptional freshman or sophomore who has already
had extensive laboratory and/or course experience enabling him/her to undertake
advanced work. Freshmen and Sophomores only

020.505  INTERNSHIP  Consent of adviser required  An independent course of study may be
pursued under the direction of an adviser on those topics not specifically listed in the form of regular courses.

020.511  INDEPENDENT STUDY  Perm. Req’d.  An independent course of study may be
pursued under the direction of an adviser on those topics not specifically listed in the form of regular courses.

020.513  RESEARCH PROBLEMS  Prereq: Permission of faculty member in charge  Original laboratory investigations
on biological problems.

020.551  MENTORED RESEARCH PROGRAM IN MOLECULAR AND CELLULAR BIOLOGY  Harper  BA/MS candidates
BIOLOGY

This course provides B.A./M.S. students with intensive research experience for a full academic year. Students in the program work under the direction of a research mentor on an original research project, produce a written report in the form of a thesis, and make a presentation of the work to the Biology Department.

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

020.601 CURRENT BIOLOGY RESEARCH
Sec. 01 MTWRF 10-10:50
Graduate students only
Research on current biology topics.

020.614 SIGNALING IN DEVELOPMENT AND DISEASE
Sec. 01 MW 4:30-6
Kuruvilla Limit 50
Prereq: 020.305
(Biochemistry), 020.306 (Cell Biology)
Course will cover signaling in development and disease.

020.630 HUMAN GENETICS
Hodgecock Limit 30
Sec. 01 TTh 10:30-11:45
First year Biology Graduate students only
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.

020.634 CHROMATIN AND GENE EXPRESSION
Sec. 01 TTh 1:30-3
Beemon/ Moudrianakis/ Huang
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.

020.668 ADVANCED MOLECULAR BIOLOGY
Sec. 01 TTh 8:30-10
Schleif Limit 75
Prereq: 020.665
An advanced course in organization and function of eukaryotic and prokaryotic genes, including discussion of techniques to analyze gene structure and transcription.

020.686 ADVANCED CELL BIOLOGY
Sec. 01 MWF 8:30-10
Cunningham Limit 30
Prereq: 020.306 (Cell Biology)
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.

020.738 SEMINAR: BIOLOGICAL SPECTROSCOPY
Sec. 01 Th 2-4
Brand Limit 35
Biology Graduate students only
We will discuss important current and classical papers in the area of biological spectroscopy.

020.801 RESEARCH ON BIOLOGY PROBLEMS
Staff Limit 50
Independent research for the Ph.D. dissertation.
Biology Graduate students only

020.823 INTRODUCTION TO BIOLOGY RESEARCH
Sec. 01 First year Biology Graduate students only
Training in techniques of biological research in research laboratories. Open to first-year biology graduate students.

020.824 INTRODUCTION TO BIOLOGY RESEARCH
Sec. 01 First year Biology Graduate students only
Training in techniques of biological research in research laboratories. Open to first-year biology graduate students.
BIOPHYSICS

250.131 (N)  TOPICS IN BIOPHYSICS RESEARCH  
(Fleming, K. Limit 50  
Freshmen and Sophomores only  
Discussion emphasized. Biophysics faculty present seminars on their current work or contemporary biophysics research. Satisfactory/Unsatisfactory only  
Sec. 01  T 4:30-6pm

250.351 (N)  REPRODUCTIVE PHYSIOLOGY  
(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, spermatogenesis and male accessory sex organs, female reproductive tract, menstrual cycle, ovulation and gamete transport, fertilization and fertility enhancement, sexually transmitted diseases, and male and female contraceptive methods. Introductory lectures on each topic followed by research-oriented lectures and readings from current literature. Cross-listed with Biology  
Sec. 01  W 3-4:45pm

250.353 (N)  COMPUTATIONAL BIOLOGY  
(Fleming, P. Limit 15  
Prereq: Biochemistry 020.305 and Organic Chemistry 030.205-206  
This course introduces several computational approaches to the study of biological macromolecules. Students will learn to use computational tools to analyze protein structure and dynamics and to develop a basic understanding of computer programming. The focus is biological rather than mathematical, and no programming experience is required.  
Sec. 01  TTh 10:30-11:45

250.381 (N)  SPECTROSCOPY AND ITS APPLICATION IN BIOPHYSICAL REACTIONS  
(Lecomte/Barrick  Limit 20  
Prereq: 250.372  
Continues Biophysical Chemistry (250.372). Fundamentals of quantum mechanics underlying various spectroscopies (absorbance, fluorescence, NMR); application to dynamics and kinetic transitions of enzymes and nucleic acids, including single-molecule analysis.  
Sec. 01  TBA

250.391 (N)  INTRODUCTION TO UNIX/PYTHON & PROTEINS AND NUCLEIC ACIDS  
(Woodson/Brown/Reece  Limit 35  
Prereq: 020.305, 250.172  
Basic computing for biological applications. First two weeks of class are an introduction to programming through Python. The rest of the course is on the structure of proteins, DNA, and RNA and their functions in living systems. Advanced lecture and discussion course, with discussion based on readings from scientific literature.  
Sec. 01  TBA

250.519  INDEPENDENT STUDY

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.  
Sec. 01  M 4-5

250.601  BIOPHYSICS SEMINAR  
(Cone  Limit 80  
First and Second year Graduate students only  
Students and invited speakers present current biophysics topics.  
Sec. 01  TBA

250.631  LABORATORY RESEARCH IN BIOPHYSICS  
(Limit 20  
Biophysics research training.  
Sec. 01  TBA

250.673  SEMI-ANNUAL THESIS  
(Fleming, K.  
Biophysics Graduate students only  
Limit 20  
Once each term, advanced graduate students give a 10-minute
250.685 PROTEINS AND NUCLEIC ACIDS Woodson/Bowman/Lecomte Limit 35 Pre req: Undergraduate biochemistry and physical chemistry, or permission of the instructor. Basic computing for biological applications, with introduction to programming in Python. The structure of proteins, DNA, and RNA and their functions in living systems. Students are required to participate in class discussions based on readings from the primary scientific literature.

250.689 PHYSICAL CHEMISTRY OF BIOLOGICAL MACROMOLECULES Garcia-Moreno Limit 35 Introduction to the principles of thermodynamics and kinetics as applied to the study of the relationship between structure, energy dynamics, and biological function of proteins and nucleic acids. Topics include classical, chemical, and statistical thermodynamics, kinetics, theory of ligand binding, and conformational equilibria.

250.801 DISSERTATION RESEARCH

CHEMISTRY

030.101 (N) INTRODUCTORY CHEMISTRY 1 (3) Staff Limit 275 per section Co req: 030.105. An introduction to the fundamental principles of chemistry. The main topics to be covered are atomic and molecular structure at the level of dot structures and VSEPR geometries, the periodic table, stoichiometry and the balancing of chemical equations, the gas laws, the law of mass action and chemical equilibrium, acids and bases, and elementary chemical thermodynamics.

030.105 (N) INTRODUCTORY CHEMISTRY LABORATORY 1 (1) Pasternack Coreq: 030.101-102. Limit 90 per section Laboratory in the fundamental methods of chemistry with related calculations.

030.205 (N) ORGANIC CHEMISTRY 1 (4) Staff Limit 275 per section Pre req: 030.101-104, 030.105-106 Techniques for the organic chemistry laboratory including methods of purification, isolation, synthesis, and analysis. Chemistry majors should take this course in the fall semester.

030.225 (N) INTRODUCTORY ORGANIC CHEMISTRY LABORATORY (5) Greco Limit 60 (Secs. 01,02,04) Limit 44 (Secs.03&05) Coreq: 030.104 or 030.205 Pre req: 030.101-102, 030.105 This course is designed to illustrate the principles of physical chemistry and to introduce the student to techniques and instruments used in modern chemical research. Chemistry majors are expected to take this sequence of courses, rather than 030.307.

030.301 (N) PHYSICAL CHEMISTRY I (3) Poland Limit 60 Pre req: General physics, general chemistry, and calculus (two semesters recommended). The laws of thermodynamics, their statistical foundation, and application to chemical phenomena.

030.305 (N) PHYSICAL CHEMISTRY INSTRUMENTATION LAB I (3) Fairbrother Pre or co req: 030.301-302. Limit 25 per section Chemistry majors only. This course is designed to illustrate the principles of physical chemistry and to introduce the student to techniques and instruments used in modern chemical research. Chemistry majors are expected to take this sequence of courses, rather than 030.307.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Section</th>
<th>Type</th>
<th>Notes</th>
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<tr>
<td>030.307 (N)</td>
<td>CHEMISTRY</td>
<td></td>
<td>Sec. 01</td>
<td>Lab</td>
<td>T 1:30-2:20</td>
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<tr>
<td></td>
<td>LABORATORY III (3)</td>
<td>Trapani</td>
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<td>T 2:30-6:30</td>
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<td>Sec. 02</td>
<td>Lab</td>
<td>Th 1:30</td>
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<td>Th 2:30-6:30</td>
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<tr>
<td>030.356 (N)</td>
<td>ADVANCED INORGANIC CHEMISTRY LAB (3)</td>
<td>Roth</td>
<td>Lec.</td>
<td>T 1:30-2:20</td>
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<td>Sec. 01</td>
<td>Lab</td>
<td>W 1:30-6:30</td>
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<td>F 1:30-6:30</td>
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<tr>
<td>030.441(N)</td>
<td>SPECTROSCOPIC METHODS ORGANIC STRUCTURE DETERMINATION</td>
<td>Tower</td>
<td>Lec.</td>
<td>MWF 11-11:50</td>
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<tr>
<td>030.451 (N)</td>
<td>INTERMEDIATE QUANTUM CHEMISTRY (3)</td>
<td>Silverstone</td>
<td>Sec. 01</td>
<td>Lab</td>
<td>TTh 9-10:15</td>
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<tr>
<td>030.453 (N)</td>
<td>INDEPENDENT RESEARCH IN PHYSICAL CHEMISTRY I</td>
<td></td>
<td>Sec. 01</td>
<td>Lab</td>
<td>MWF 11-11:50</td>
</tr>
<tr>
<td>030.455 (N)</td>
<td>MATERIALS AND SURFACE CHARACTERIZATION (3)</td>
<td>Fairbrother</td>
<td>Sec. 01</td>
<td>Lab</td>
<td>TTh 12-1:15</td>
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<tr>
<td>030.501</td>
<td>INDEPENDENT RESEARCH IN PHYSICAL CHEMISTRY I</td>
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<tr>
<td>030.503</td>
<td>INDEPENDENT RESEARCH INORGANIC CHEMISTRY I</td>
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<tr>
<td>030.505</td>
<td>INDEPENDENT RESEARCH ORGANIC CHEMISTRY I</td>
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<tr>
<td>030.507</td>
<td>INDEPENDENT RESEARCH IN BIOCHEMISTRY</td>
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<tr>
<td>030.509</td>
<td>INDEPENDENT RESEARCH IN BIOCHEMISTRY II</td>
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<tr>
<td>030.521</td>
<td>INDEPENDENT RESEARCH INORGANIC CHEMISTRY II</td>
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<tr>
<td>030.523</td>
<td>INDEPENDENT RESEARCH IN PHYSICAL CHEMISTRY</td>
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</table>
CHEMISTRY
Prereq: 030.501-502 and permission of instructor. Research under the direction of the physical chemistry faculty.

030.525 INDEPENDENT RESEARCH
ORGANIC CHEMISTRY II
Prereq: 030.505-506 and permission of instructor. Research under the direction of the organic chemistry faculty.

030.527 INDEPENDENT STUDY

030.551 INTERNSHIP IN CHEMISTRY

030.605 MECHANISTIC METALLO-ENZYMOLoGY
Roth Limit 15
Mechanistic metallo-enzymology will be explored.

030.610 CHEMICAL KINETICS
Bowen Limit 20 Pre-or corequisite: one year of quantum mechanics. The molecular mechanism of elementary physical and chemical rate processes will be studied. Topics such as elastic scattering, collisional vibrational and rotational energy transfer, chemically reactive collisions, and the theory of unimolecular decay will be covered.

030.613 CHEMICAL BIOLOGY INTERFACE PROGRAM FORUM
Greenberg Limit 20 Chemistry-biology interface (CBI) program students and faculty will meet weekly in a forum that will host presentations from CBI faculty and students as well as invited guest speakers. These meetings will serve as a valuable opportunity for students to develop presentation skills and interact with CBI students and faculty. Enrollment is required for first- and second-year CBI students, and is recommended for advanced-year graduate students.

030.615 SPECIAL TOPICS IN BIOINORGANIC CHEMISTRY
Goldberg Limit 20 Prereq: 030.301-302 or the equivalent; some background in biochemistry or inorganic chemistry is helpful but not required. This course is concerned with the chemistry of metals in biological systems. Major emphasis is placed on metalloproteins in which a transition metal is known to occupy the active site of the protein. Chemical approaches to modeling bioinorganic systems also are discussed. The lectures illustrate how chemical, spectroscopic, and structural methods have been used to understand the structure and function of metals in biology.

030.617 TOPICS IN SPECIAL INORGANIC CHEMISTRY
Kasrlc Limit 15 Special topics in inorganic chemistry will be reviewed.

030.619 CHEMICAL BIOLOGY I
Townsend Limit 20 Prereq: 030.206 or equivalent. Parts I and II constitute the core course of the Chemistry-Biology Interface (CBI) Program. An introduction to the structure, synthesis, reactivity, and function of biological macromolecules (proteins, nucleic acids, carbohydrates, and lipids) will be provided using the principles of organic and inorganic chemistry. Discussion will incorporate a broad survey of molecular recognition and mechanistic considerations, and introduce the tools of molecular and cellular biology that are utilized in research at the interface of chemistry with biology and medicine.

030.621 LITERATURE OF ORGANIC CHEMISTRY
Kasrlc Limit 20 Course will discuss literature pertaining to Organic Chemistry.

030.625 ADVANCED MECHANISTIC ORGANIC CHEMISTRY I
Greenberg Prereq: 030.205-206. Limit 20 The course covers the application of techniques in physical chemistry to the study of organic reaction mechanisms. Topics include chemical bonding and
### CHEMISTRY
structure, stereochemistry, conformational
effects, molecular orbital theory, methods to
determine reaction mechanisms, reactive
intermediates, and photochemistry.

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>030.635</td>
<td>METHODS IN NUCLEAR MAGNETIC RESONANCE</td>
<td>Tolman</td>
<td>Sec. 01</td>
<td>TBA</td>
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<tr>
<td>030.666</td>
<td>ORGANIC SYNTHESIS RESEARCH SEMINAR</td>
<td>Posner</td>
<td>Sec. 01</td>
<td>TBA</td>
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<tr>
<td>030.677</td>
<td>ADVANCED ORGANIC SYNTHESIS I</td>
<td>Lectka</td>
<td>Sec. 01</td>
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</table>

### 030.801 INDEPENDENT STUDY

### CLASSES

#### ELEMENTARY ANCIENT GREEK (4)
Shelfer, Limit 20

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>040.105</td>
<td>ELEMENTARY ANCIENT GREEK</td>
<td>Shelfer</td>
<td>Sec. 01</td>
<td>MWF 11-11:50</td>
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<td></td>
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<td>plus one hour TBA</td>
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<tr>
<td>040.107</td>
<td>ELEMENTARY LATIN (3.5)</td>
<td>Schröngers/Rosenberg</td>
<td>Sec. 01</td>
<td>MWF 9-9:50</td>
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<td>MWF 10-10:50</td>
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<tr>
<td>040.205 (H)</td>
<td>INTERMEDIATE ANCIENT GREEK</td>
<td>Shapiro</td>
<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
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<tr>
<td>040.207 (H)</td>
<td>INTERMEDIATE LATIN (3)</td>
<td>Solez</td>
<td>Sec. 01</td>
<td>MWF 10-10:50</td>
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<tr>
<td>040.223 (H)</td>
<td>EVERYTHING IN MODERATION? EXPLORING WINE IN ANCIENT GREECE (3)</td>
<td>Coccagna</td>
<td>Sec. 01</td>
<td>MW 3-4:15</td>
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<tr>
<td>040.305 (H)</td>
<td>ADVANCED ANCIENT GREEK (3)</td>
<td>Staff</td>
<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
</tr>
<tr>
<td>Class Code</td>
<td>Course Title</td>
<td>Instructor</td>
<td>Section</td>
<td>Days</td>
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<tr>
<td>040.308 (H)</td>
<td>Advanced Latin Poetry</td>
<td>Roller</td>
<td>Sec. 01</td>
<td>WF</td>
</tr>
<tr>
<td></td>
<td>Prereq: 040.207-208 or equivalent</td>
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<td>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. (Same as 040.70)</td>
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<tr>
<td>040.408 (H)</td>
<td>Tragedy and Athenian Culture</td>
<td>Rosenbloom</td>
<td>Sec. 01</td>
<td>TTh</td>
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<tr>
<td></td>
<td>Prereq: 040.207-208 or equivalent</td>
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<td></td>
<td>Tragedy is often considered the distinctive art form of Classical Athens. This class will read a selection of plays in the contexts of contemporary Athenian culture.</td>
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<tr>
<td>040.387 (H)</td>
<td>Roman Imperial Sculpture</td>
<td>Koortbojian</td>
<td>Sec. 01</td>
<td>TTh</td>
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<td></td>
<td>Prereq: 040.207-208 or equivalent</td>
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<td>This class will explore the history and topography of the major Attic sanctuaries, with a focus on the dedications in their religious and archaeological contexts.</td>
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<tr>
<td>010.387 (H)</td>
<td>Introduction to Greek Philosophy</td>
<td>Staff</td>
<td>Sec. 01</td>
<td>MF</td>
</tr>
<tr>
<td>150.201 (H)</td>
<td>Western Intellectual History, 1200-1500</td>
<td>Staff</td>
<td>Sec. 01</td>
<td>MF</td>
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<tr>
<td>360.133 (H)</td>
<td>Great Books: Western Tradition or the Humanities: A Tradition of Classics</td>
<td>Staff</td>
<td>Sec. 01</td>
<td>TTh</td>
</tr>
<tr>
<td>389.342 (H)</td>
<td>Understanding the Materials and Techniques of the Art Objects</td>
<td>Staff</td>
<td>Sec. 01</td>
<td>TTh</td>
</tr>
<tr>
<td>040.501</td>
<td>Independent Study</td>
<td>Staff</td>
<td></td>
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<tr>
<td>040.519</td>
<td>Honors Research</td>
<td>Staff</td>
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<tr>
<td>040.579</td>
<td>Master's Research</td>
<td>Staff</td>
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</tr>
<tr>
<td>040.627</td>
<td>Sanctuaries of Athens and Attika</td>
<td>Shapiro</td>
<td>Sec. 01</td>
<td>T</td>
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<tr>
<td>040.629</td>
<td>Representing Tiberius</td>
<td>Roller</td>
<td>Sec. 01</td>
<td>M</td>
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<tr>
<td>040.631</td>
<td>Athens' 415: Empire and Theater</td>
<td>Rosenbloom</td>
<td>Sec. 01</td>
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</tr>
</tbody>
</table>
CLASSICS

040.704 READING ANCIENT GREEK  Staff  Limit 20  Prerequisite: Greek  This reading seminar is intended to train graduate students in direct and critical work on primary sources.  (Same as 040.305)  Sec. 01  TTh 10:30-11:45

040.710 READING LATIN POETRY  Roller  Limit 20  Prerequisite: Latin  This reading seminar is intended to train graduate students in direct and critical work on primary sources.  (Same as 040.308)  Sec. 01  WF 1:30-2:45

010.675 THE QUESTION OF PROGRAMMES (TOMB AND DOMUS)  Akrębogian  Limit 25  Cross-listed with History of Art  Sec. 01  M 2-5pm

214.700 LORENZO VALLA  Celenza  Limit 15  Cross-listed with History and German and Romance Languages and Literatures  Sec. 01  T 3-5

040.801 INDEPENDENT STUDY  Staff

040.814 DISSERTATION RESEARCH  Staff

COGNITIVE SCIENCE

050.105 (N,S) INTRODUCTION TO COGNITIVE NEUROPSYCHOLOGY (3)  McCloskey  Limit 125  Explores 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  Sec. 01  TTh 1:30-2:45

050.205 (N,S) 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.  Sec. 01  WF 12-1:15

050.327 (N,S) PHONOLOGY II (3)  Staff  Limit 30  Prereq: 050.325 or Perm. Req’d.  This course extends the material covered in 050.325 with more advanced topics in morphology, phonology, and phonetics, varying from year to year.  Sample topics include: stress systems and metrical phonology, tone and auto-segmental phonology, reduplication and prosodic morphology, tonal constraint and optimality theory, feature geometry, articulatory phonology, and phonetics/phonology interface.  Meets with 050.627  Sec. 01  MW 3-4:15

050.339 (N,S) INTRODUCTION TO COGNITIVE DEVELOPMENT (3)  Landau  Limit 15  This is a survey course in developmental psychology, designed for individuals with some basic background in psychology or cognitive science, but little or none in development.  The course is strongly theoretically oriented, with emphasis on issues of nature, nurture, and development.  Meets with 050.639.  Cross-listed with Psychological and Brain Sciences and Neuroscience  Sec. 01  MW 1:30-2:45

050.370 (N,S) FORMAL METHODS IN COGNITIVE SCIENCE (3)  Frank  Limit 30  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.  Meets with 050.670.  Sec. 01  TTh 12-1:15
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Prerequisite</th>
<th>Description</th>
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<tr>
<td>050.527</td>
<td>PHONOLOGY II</td>
<td>Staff</td>
<td>10</td>
<td>Perm. Req'd.</td>
<td>This course extends the material covered in 050.325 with more advanced topics in morphology, phonology, and phonetics, varying from year to year. Sample topics include stress systems and metrical phonology, tone and auto-segmental phonology, reduplication and prosodic morphology, non-concatenative morphology, constraints and optimality theory, feature geometry, articulators phonology, and phonetics/phonology interface. Meets with 050.327.</td>
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<tr>
<td>050.639</td>
<td>INTRODUCTION TO COGNITIVE DEVELOPMENT</td>
<td>Landau</td>
<td>25</td>
<td>Perm. Req'd.</td>
<td>This is a survey course in developmental psychology, designed for individuals with some basic background in psychology or cognitive science, but little or none in development. The course is strongly theoretically oriented, with emphasis on issues of nature, nurture, and development. Meets with 050.339. Cross-listed with Psychological and Brain Sciences and Neuroscience.</td>
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<tr>
<td>050.670</td>
<td>FORMAL METHODS IN COGNITIVE SCIENCE</td>
<td>Frank</td>
<td>10</td>
<td>Perm. Req'd.</td>
<td>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. Meets with 050.370.</td>
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<tr>
<td>050.800</td>
<td>DIRECTED READINGS</td>
<td>Staff</td>
<td>40</td>
<td>Perm. Req'd.</td>
<td>Guided independent readings in special fields of cognitive science.</td>
</tr>
<tr>
<td>050.801</td>
<td>RESEARCH SEMINAR IN COGNITIVE NEUROPSYCHOLOGY</td>
<td>Rapp</td>
<td>20</td>
<td>Perm. Req'd.</td>
<td>Participants in this graduate seminar will read and discuss current research articles in cognitive neuropsychology of vision or language, and present their own research.</td>
</tr>
<tr>
<td>050.802</td>
<td>RESEARCH SEMINAR IN COGNITIVE PROCESSES</td>
<td>McCloskey</td>
<td>20</td>
<td>Perm. Req'd.</td>
<td>Current issues and on-going research on human cognition are discussed.</td>
</tr>
<tr>
<td>050.811</td>
<td>RESEARCH SEMINAR IN LANGUAGE AND COGNITION</td>
<td>Landau</td>
<td>20</td>
<td>Perm. Req'd.</td>
<td>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.</td>
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</table>
COGNITIVE SCIENCE

050.821 RESEARCH SEMINAR IN GRAMMATICAL STRUCTURE. Frank Limit 25 Perm. Req’d. A critical review of evidence bearing on the question of how words are represented and stored in the mind. Topics in phonological, morphological, syntactic, and/or semantic theory. Discussion of the current literature and specifically of the relevance of linguistic results for the study of the mind.

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

050.839 RESEARCH IN COGNITIVE SCIENCE Staff Perm. Req’d.

050.849 TEACHING PRACTICUM Perm. Req’d. Limit 25 Essential for Teaching Assistants

DEAN’S TEACHING FELLOWSHIP COURSES

ANTHROPOLOGY

070.391 (H,S) RELIGION AND THE PROBLEM OF SUFFERING. Singh Limit 25 How do different religious traditions interpret the meaning of human suffering? How are secular responses to suffering inflected by religious or moral imaginations? Key authors include Nietzsche, Weber, Mauss, Deleuze, René Girard, Michael Taussig, Veena Das and the anthropological literature on social suffering.

CLASSICS

040.223 (H) EVERYTHING IN MODERATION? EXPLORING WINE IN ANCIENT GREECE. Coccagna Limit 25 This course explores wine consumption in ancient Greece, including its role in religion, gender, childhood, and ethnicity as well as Greek attitudes toward moderation and excess in drinking and other behavior.

HISTORY

100.202 (H,S) CHILDREN WITHOUT PARENTS: ORPHANED, ABANDONED AND STOLEN CHILDREN IN AMERICAN HISTORY. Adelman Limit 20 This course studies children separated from parents by death, poverty, abandonment, and coercion, and the ways Americans have cared for them—including indenture, orphanages, “orphan trains,” adoption, and foster care.

100.399 (H,W) SAILORS ASHORE, AFLOAT, AND ACROSS THE LINE TO PIRACY: PERSPECTIVES IN 18 CENTURY MARITIME HISTORY. Roberts Limit 20 Prereq: 100.103 This course looks at the maritime history of the 18th century Anglo-Atlantic and Caribbean from the perspectives of merchant, naval, pirate and enslaved seamen in their communities at sea and ashore.

HISTORY OF ART

010.290 (H) AT THE VERY EDGE: THE ART OF ISLAMIC SPAIN AS A FURTIVE INTRODUCTION TO ‘ISLAMIC ART’. Bauer Limit 25 The course aims at introducing the problematics of Islamic art by focusing on the art of Al-Andalus (Islamic Spain), where intensive encounters with numerous cultures shaped the formation of a unique and indigenous Islamic art.

HISTORY OF SCIENCE

140.383 (H,S) THINKING AND LIVING WITH ANIMALS: HUMAN-ANIMAL RELATIONSHIPS IN HISTORY. Petrozzi Limit 20 The course analyzes the history of human-animal interactions focusing on the way in which discourses and knowledge about animals shaped fundamental concepts such as gender, culture, agency, and knowledge.
This class will be an empirical and philosophical examination of genocide, particularly focused on perpetrators. In addition to looking at historical case studies of genocide in both the ancient and modern world, we will attempt to deal with the philosophical questions that emerge from these cases. These include but are not limited to genocide definition, legal issues in genocide prosecution, and meta issues such as the relationship between modernity and genocide.

**NEAR EASTERN STUDIES**

136.257 (H)  THE ARCHAEOLOGY OF FOOD (3)  Malkovich  Limit 25  Food is the basis of life and the foundation of civilization. This class will explore the role food has played in Mesopotamian, Egyptian, Mesoamerican, and Andean cultures as evidenced in the archaeological record.

**PHILOSOPHY**

150.480 (H)  PHILOSOPHY AND GEOMETRY IN HISTORY: EPISODES FROM THE EARLY MODERN PERIOD (3)  Holtzman  Limit 20  Students will explore the relationship between philosophy and geometry in the period from Descartes to Kant from 1650 to 1800, through a study of crucial historical episodes.

**EARTH & PLANETARY SCIENCES**

270.102 (N)  FRESHMAN SEMINAR: CONVERSATION WITH THE EARTH  Sec. 01  Marsh  Limit 55 per section  Freshmen only  Sec. 02  Credits (normal participation)  Sec. 02  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.

270.103 (N)  OUR CHANGING PLANET (3)  Olson/Szlaveczko  Limit 110  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.

270.104 (N)  HISTORY OF THE EARTH AND ITS BIOTA (3)  Fisken  Limit 110  The history of the earth and life as understood through the geologic record. The evolution and extinction of major life forms will be examined from the perspective of interactions among the solid earth, ocean, atmosphere, and biosphere.

270.220 (N)  THE DYNAMIC EARTH: AN INTRODUCTION TO GEOLOGY (3)  Pre/Req.: 030.101 or 171.101-102 or equivalent Coreq (for EPS Majors): 270.221, optional for others. Basic concepts in geology, including plate tectonics, Earth’s internal structure, geologic time, mineralogical formations of igneous, sedimentary, and metamorphic rocks, development of faults, folds and earthquakes; geomagnetism.
THE DYNAMIC EARTH LABORATORY (1) Olsen Limit 12
Course 270.220
This course is a hands-on learning experience for introductory geological concepts and techniques using geological tools, such as mineral/rock samples, microscopes, and maps. Field trips are an essential part.

THE ENVIRONMENT AND YOUR HEALTH (3) Kenefick Limit 110
This course surveys the basic environmental health sciences (toxicology, risk assessment), current public health issues (hazardous waste, radon, water-borne diseases) and emerging global health threats (global warming, ozone depletion, sustainability). Cross-listed with Public Health Studies and Geography and Environmental Engineering.

GEOCHEMISTRY OF THE EARTH & ENVIRONMENT (3) Sverjensky Limit 30
Prereq: 270.103, 270.114, 270.220, or 270.222. The chemical principles needed to understand and predict how the elements migrate through the Earth and the sub-surface environment. Applications to metallic resources and nuclear waste migration.

PRESENT AND FUTURE CLIMATE (3) Arking Limit 20
Prereq: Calculus I & II (110.108-109 and General Physics (171.101-102)). Intended for majors who are interested in the science that underlies the current debate on global warming, the focus is on recent observations, and one can glean from model simulations.

REMOTE SENSING OF THE ENVIRONMENT (3) Del Castillo Limit 20
This course is an introduction to the use of remote sensing technology to study Earth’s physical and biochemical processes. Topics covered include remote sensing of the atmosphere, land, and oceans, as well as remote sensing as a tool for policy makers.

EARTH AND PLANETARY FLUIDS (3) Welhan/Olson Limit 20
Prereq: Basic Physics, Calculus, and familiarity with ordinary differential equations. An 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, oceans, crust, mantle, and core of the Earth and other planets. Open to graduate and advanced undergraduate students.

INDEPENDENT STUDY An independent course of study may be pursued under the direction of an adviser on those topics not specifically listed in the form of regular courses.

INDEPENDENT RESEARCH

INTERNERSHIP

GEOCHEMISTRY SEMINAR Sverjensky Limit 20
A variety of topics of current interest involving mineral fluid interactions will be reviewed.

SEMINAR IN GEOPHYSICAL PETROLOGY Marsh Limit 15
Discussion of present research topics in geophysics and igneous petrology.

JOURNAL CLUB Staff Limit 50
Review and discussion of new geologic literature and current research. All geology students participate and deliver at least one
EARTH & PLANETARY SCIENCES

270.623 PLANETARY ATMOSPHERES Strobel

270.626 OCEAN GENERAL CIRCULATION Haine
Limit 20 The aim of this course is to achieve conceptual understanding of the large scale low frequency ocean general circulation. The role of the ocean circulation in earth’s climate is emphasized throughout. Sec. 01 TBA

270.627 SEMINAR IN SOIL ECOLOGY Sáez
Limit 20 Prereq: Soil Ecology (270.332) or Perm. Req'd Discussion of current research topics in soil ecology and biogeochemistry. Sec. 01 TBA

270.630 SEMINAR IN ATMOSPHERIC CHEMISTRY Li
Limit 20 Discussion of current research topics in atmospheric chemistry. Sec. 01 TBA

270.652 PHYSICS OF MAGMA Marsh
Limit 10 The principles of viscous fluid flow, heat conduction and convection are treated in reference to all aspects of the mechanics of magma. Emphasis is placed on understanding petrologic processes as observed in rocks and rock sequences. Sec. 01 TBA

270.662 SEMINAR IN PLANETARY SCIENCE Strobel
Limit 15 Major problems of current interest in planetary science are critically discussed in depth. Sec. 01 T 3-3:50

270.673 TIME SERIES AND DATA ANALYSIS Osborn
Limit 15 Spectral analysis, digital filtering, convolutions, and other techniques for processing data will be covered. Sec. 01 W 2-4

500.602 SEMINAR: ENVIRONMENT AND APPLIED FLUID MECHANICS Meneveau
Cross-listed with Geography and Environmental Engineering, General Engineering, and Mechanical Engineering Sec. 01 F 10:30-12:30

270.807 RESEARCH

ECONOMICS

180.101 (S) ELEMENTS OF MACROECONOMICS DiMacio
Prereq: Basic facility with graphs and algebra. Limit 18 per section Sec. 01 MW 9-9:50

180.228 (S) ECONOMIC DEVELOPMENT (3) Gerwitz
Prereq: 180.101-102 Diagnostic test on Elements of Economics is required to be taken in the second week The review of the historical experience in presently developed economies, models of development, planning techniques and development Sec. 01 MW 1:30-2:20
policies. The course is aimed at identifying major economies and to showing how economic analysis can be used further to understand the obstacles to development and to formulate appropriate policies.

180.233 (S) INTRODUCTION TO THE EUROPEAN UNION (3) Heinsenberg Limit 40. This lecture course introduces students to the European Union (EU) by examining the history and institutions in order to understand the EU's policies, strengths and weaknesses. Requires extensive reading, mid-term, final.

180.235 (S) INTRODUCTION TO INTERNATIONAL POLITICAL ECONOMY (3) Heinsenberg Limit 40. Focusing on the politics of international economic relations, this course examines how political economics differs from "regular" economics. Alternative analytical and theoretical perspectives are examined. Requires extensive reading, mid-term, final.

180.241 (S) INTERNATIONAL TRADE (3) Weiss Limit 150. Prereq: 180.101-102. Theory of comparative advantage and the international division of labor, the determinants and patterns of trade, factor price equalization, factor mobility, gains from trade and distribution of income, and theory and practice of tariffs and other trade restrictions.

180.266 (S) FINANCIAL MARKETS AND INSTITUTIONS (3) Fohlin Limit 50. Prereq: 180.101-102. Understanding design and functioning of financial markets and institutions, connecting theoretical foundations and real-world applications and cases. Basic principles of asymmetric information problems, management of risk. Money, bond, and equity markets, investment banking, securities brokers, and venture capital firms; structure, competition, and regulation of commercial banks. Importance of electronic technology on financial systems.

180.289 (S) ECONOMICS OF HEALTH (3) Bishai Limit 75. Prereq: 180.102. Application of economic concepts and analysis to the health services system. Review of empirical studies of demand for health services, behavior of providers, and relationship of health services to population health levels. Discussion of current policy issues relating to financing and resource allocation. Cross-listed with Public Health Studies.

180.302 (S) MACROECONOMIC THEORY (4.5) Staff Limit 45 per section. Lec. Sec. 01 F 10-10:50; F 1:30-2:20. Prereq: 180.101-102 (can be taken concurrently with 180.101-102). Differential Calculus 110.106 or Perm. Req'd. This course provides treatment of macroeconomic theory including a static analysis of determination of output, employment, the price level, the rate of interest, and the dynamic analysis of growth, inflation and business cycles. In addition the use and effectiveness of monetary and fiscal policy to bring about full employment, price stability, and economic growth will be discussed.

180.310 (S) ECONOMICS OF ANTITRUST (3) Hamilton/Levy. Limit 20. Prereq: 180.301-Microeconomic Theory. This course explores the economic rationale for, and consequences of, antitrust laws. In addition to economic analysis we will study landmark antitrust cases.

180.334 (S,Q) ECONOMETRICS (3) Routerson Limit 40. Prereq: Statistical Analysis (550.111 or 550.420) or permission of instructor. Introduction to the methods of estimation in economic research. The first part of the course develops the primary method employed in economic research, the method of least squares. This is followed by an investigation of the
ECONOMICS performance of the method in a variety of
important situations. The development of a
way to handle many of the situations in
which ordinary least squares is not useful,
the method of instrumental variables,
concludes the course.

180.337 (S,Q) FINANCIAL ECONOMETRICS (3)
Woutersen Limit 30 Prereq: 180.334,
180.367, 550.420 recommended
This course introduces financial models and
the necessary techniques to estimate and
test these models, e.g., ARCH, GARCH,
integrated volatility models, efficient
market hypothesis, as well as risk
management models.

180.351 (S) LABOR ECONOMICS (3) Morgan
Limit 30 Prereq: 180.301, or Perm.
Req’d The economics of the
determination of earnings and the
allocation of labor. The theory of labor
supply and labor demand will be developed
and then applied to questions of income
distribution, unions, government
intervention in the labor market, and
discrimination.

180.365 (S) PUBLIC FINANCE (3) Macaulay
Limit 80 Prereq: 180.301
Examines competing views of the
appropriate role of government in the
economy and its actual role, including
analysis of the principal taxes and
expenditure programs, with a particular
emphasis on Social Security and other
social insurance programs.

180.367 (S) INVESTMENTS AND PORTFOLIO
MANAGEMENT (3) Shore
Limit 50 Prereq: 180.301
Investment securities and their markets,
especially the stock market. The relation
between expected return and risk. The
determination of security prices, Financial
portfolio selection. The assessment of
performance of managed portfolios.

180.371 (S) INDUSTRIAL ORGANIZATION (3)
Shum Limit 20 Prereq: 180.301 or Perm.
Req’d Investigation of firm behavior in
markets characterized by imperfect
competition. Imperfect competition lies in
between monopoly and perfect competition
and characterizes most major industries in
modern capitalist economies. Central issues
to be covered in the course include what
determines the intensity of competition?
What determines the extent of entry and
exit? How is it that some firms consistently
dominate their industries?

570.470 (S) APPLIED ECONOMICS AND
FINANCE (3) Hanke Limit 10
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. Cross-listed with Geography and
Environmental Engineering

570.487 (S) FUTURES MARKET RESEARCH (3)
Hanke Perm Req’d.
Cross-listed with Geography and
Environmental Engineering

360.528 APPLIED ECONOMICS INTERNSHIP
Hanke Limit 10 - Prereq: 180.101-102
Perm. Req’d Satisfactory
Unsatisfactory only 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;
Cross-listed with Interdepartmental and
Geography and Environmental Engineering

180.501 INDEPENDENT STUDY Staff
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>180.521</td>
<td>RESEARCH IN ECONOMICS (2)</td>
<td>Fohlin</td>
<td>10</td>
<td>Open to Senior Economics majors. Perm. Req'd</td>
<td>Note: This course cannot be counted as one of the five elective economics courses required for the Economics major. The assignment in this course is to complete the initial stages of research for the Senior Honors Thesis in Economics. Students will work independently under the supervision of a research/thesis advisor. The contact (in spring of Junior year) should be the course instructor listed for this course. He/she will coordinate registration and grade-reporting, and will also be available to discuss research ideas and to help put students in touch with possible thesis advisors.</td>
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<tr>
<td>180.601</td>
<td>MICROECONOMIC THEORY</td>
<td>Staff</td>
<td>30</td>
<td>180.301-302, 110.556 or Perm. Req'd</td>
<td>First term: a systematic presentation of microeconomic theory in both its partial equilibrium and general equilibrium aspects. Topics covered include preferences and utility, exchange, production, theory of the firm, capital and interest, competition and monopoly, stability of equilibrium, and welfare economics.</td>
</tr>
<tr>
<td>180.603</td>
<td>MACROECONOMIC THEORY</td>
<td>Maccini</td>
<td>30</td>
<td>180.301-302 or Perm. Req'd</td>
<td>A comprehensive treatment of macroeconomic theory, including static analysis of aggregate output employment, the rate of interest, and the price level; aggregate theory of investment, consumption, demand and supply of money; empirical work on aggregate relationships.</td>
</tr>
<tr>
<td>180.605</td>
<td>ADVANCED MACROECONOMICS</td>
<td>Ball</td>
<td>20</td>
<td>180.603-604</td>
<td>Topics of recent research in macroeconomics. Content will vary from year to year. Likely topics include implicit contract theory, search theory and unemployment, disequilibrium macroeconomic models, monetary policy and the control of inflation, contract-based rational expectations models, imperfect competition in macromodels, business-cycle models, empirical tests of rational expectations models, theories of investment behavior, and debt neutrality.</td>
</tr>
<tr>
<td>180.607</td>
<td>MACROECONOMETRICS I</td>
<td>Faust</td>
<td>20</td>
<td>180.633-634</td>
<td>This course teaches techniques of time series analysis as used in macroeconomics. The emphasis will be on application and the theory required to reliably conduct applications.</td>
</tr>
<tr>
<td>180.611</td>
<td>ECONOMICS OF UNCERTAINTY</td>
<td>Karni</td>
<td>20</td>
<td>180.601 and 180.603 or Perm. Req'd</td>
<td>A review of the theory of decision making under uncertainty and its applications to problems of optimal insurance, portfolio selection, savings decisions and optimal search. Alternative approaches to decision making under uncertainty will be surveyed. Attitudes toward risk will be characterized and the issues of measurement and comparability of these attitudes discussed, both in the univariate and multivariate cases; applications are given. The theory of optimal search is developed with emphasis on its usefulness for the study of labor markets and unemployment.</td>
</tr>
<tr>
<td>180.615</td>
<td>MATHEMATICAL METHODS IN ECONOMICS</td>
<td>Karni</td>
<td>30</td>
<td>180.301-302 or Perm. Req'd</td>
<td>A course in mathematics for economists not planning to work in quantitative areas, or for those whose mathematics background is weak. The emphasis is on optimization theory; also included are topics in advanced calculus and linear algebra.</td>
</tr>
</tbody>
</table>
ECONOMIC DEVELOPMENT
Gersovitz  Limit 20  Coreqs: 180.601, 180.603 Trade relations between developed and developing countries, trade policies in developed countries, policies by developing countries, project evaluation, and foreign investment.

Sec. 01  F 3-5

STATISTICAL INFERENCE
Shum  Limit 30  Prereq: Differential Calculus and Linear Algebra  Theory and applications of statistical inference. Topics include probability and sampling, distribution theory, estimation, hypothesis testing, and simple regression analysis. Statistical applications will be drawn from economics. Prerequisites: differential calculus and linear algebra. Limited to graduate students in Economics except by permission of the chair

Sec. 01  W 9-11

MICROECONOMETRICS I
Woutersen  Limit 20  Prereq: 180.633-634 or equivalent  This course covers the major econometric techniques that are used in applied work in microeconomics. These include limited dependent variables and selection models, treatment-effect models, duration models, panel data models.

Sec. 01  M 1:30-3:20

INTERNATIONAL TRADE

Sec. 01  T 5:30-7:20pm

LABOR ECONOMICS I
Meffitt  Limit 20  Coreqs: 180.601 Theories of the allocation of time and supply of labor, human capital, demand for labor, market equilibrium, and income distribution. At time allows, other topics, such as unemployment, unions, and compensating differences are discussed.

Sec. 01  T 8:30-10:30  Th 9:30-10:30

INDUSTRIAL ORGANIZATION
Harrington  Limit 20  Prereq: 180.601 An investigation of firm behavior in imperfectly competitive industries from a game-theoretic perspective. Firm decision making with respect to price and quantity, entry and exit, and investment are exploited. Both static and dynamic theories are presented to address questions related to the intensity of competition and the creation and maintenance of market dominance. The course is largely, though not exclusively, theoretical in content. Though no background in game theory is required, students are encouraged to take 180.618 or some other game theory course concurrently.

Sec. 01  Th 12:30-3:20

APPLIED MICROECONOMICS WORKSHOP
Staff  Limit 20  Graduate Students only  This is a weekly seminar series that brings in speakers from other universities to present their research in the field of applied microeconomics.

Sec. 01  W 3:30-5

MICROECONOMIC THEORY WORKSHOP
Staff  Limit 20  Graduate students only  This is a seminar series devoted to the presentation of research in microeconomic theory, typically by speakers from outside the department.

Sec. 01  M 3:30-5

MACROECONOMICS WORKSHOP
Staff  Graduate students only  Limit 20  This course features lectures by economists from other universities. They present research findings at the frontier of the field.

Sec. 01  T 3:30-5

RESEARCH/TEACHING PRACTICUMS
Staff  Limit 10  Economic majors Graduate students only  The purpose of the Ph.D. program in economics is to train students to teach and do research in economics. This course is for graduate students in the Ph.D. program in economics to obtain graduate credit for
ECONOMICS

work off campus that provides training and the development of skills in teaching and/or research. Before the practicum is begun, the graduate student must identify a sponsoring faculty member or seek permission from the student’s faculty adviser. The faculty member or adviser must sign a form that certifies that graduate credit will be granted, verifies the nature of the work to be performed by the student, and explains how the practicum helps to fulfill a degree requirement. Once completed, the sponsoring faculty member or adviser submits a grade of pass or fail for the student. The course may be used for curricular practical training.

ENGLISH

060.100 (H) INTRODUCTION TO EXPOSITORY WRITING (3) Staff Freshmen Only
Limit 10 per section Offered only in the fall, 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.

Sec. 01 MWF 10-10:50
Sec. 02 MWF 11-11:50
Sec. 03 MW 12:15
Sec. 04 MW 1:30-2:45
Sec. 05 TTh 1:30-2:45

060.107 (H) INTRODUCTION TO LITERARY STUDY (3) Staff Limit 18
Required course for English majors Introduction to the analysis of poetry and prose fiction. Prose works by the Brothers Grimm, Poe, Hawthorne, James and Nabokov; poems by Shakespeare, Donne, Keats, Dickinson, Stevens and many others.

Sec. 01 MWF 10-10:50
Sec. 02 MWF 11-11:50
Sec. 03 MWF 12-12:50
Sec. 04 MW 12-1:15
Sec. 05 MW 1:30-2:45
Sec. 06 TTh 10:30-11:45
Sec. 07 TTh 1:30-2:45

060.113 (H) EXPOSITORY WRITING (3) Staff
Limit 15 per section No Seniors
This course teaches students the concepts and strategies of academic argument. Students learn to analyze and evaluate 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 of all sections is using analysis to create arguments. Please note: Each course has a different topic. To check individual course descriptions, go to the EWP web site: http://web.jhu.edu/ewp

Sec. 01 MWF 10-10:50
Sec. 02 MWF 11-11:50
Sec. 03 MWF 12-12:50
Sec. 04 MW 12-1:15
Sec. 05 MW 1:30-2:45
Sec. 06 TTh 10:30-11:45
Sec. 07 TTh 1:30-2:45

060.201 (H) 19TH CENTURY BRITISH NOVEL (3) Anderson Limit 20 per section
In this course we will read major novelists of the nineteenth century, including Austen, Brontë, Dickens, Eliot, Collins, and Hardy.

Sec. 01 Lec. MW 11-11:50
Sec. 02 Lec. F 11-11:50
Sec. 03 Lec. F 11-11:50

060.210 (H) ANCIENT TRAGEDY, MODERN THOUGHT (3) Halpern Limit 18
We will read major plays by Aeschylus, Sophocles, and Euripides and consider the ways in which Greek tragedy served as a spur to thought for modern philosophers and theorists such as Hegel, Nietzsche, Freud, Kierkegaard, Butler and others.

Sec. 01 Sec. 01 Th 1:30-4

060.224 (H) HEAVEN AND HELL IN EARLY AMERICA (3) Noble Limit 18
This course examines the religious imagination of 17th- and 18th-century American writers, paying special attention to the extremes in religious belief that both shape and threaten pre-revolutionary American social formations.

Sec. 01 Sec. 01 TTh 12-1:15
ENGLISH

060.250 (H) A SURVEY OF EIGHTEENTH-CENTURY AND ROMANTIC LITERATURE (3) Ferguson
Limit 20 per section
The course will include readings that identify major literary innovations of the eighteenth and early nineteenth centuries in England—from Defoe's Robinson Crusoe to Pope's technique of using literature to criticize his contemporaries to Sterne's cultivation of sentiment to Wordsworth's efforts to simplify the language of poetry and to let it speak a language less learned and more colloquial and to Austen's depiction of courtship and marriage as a system. Cross-listed with Studies of Women Gender and Sexuality

Lec.  Sec.  Lec.  Sec.  Lec.  Sec.
MW 12-12:50  F 12-12:50  F 12-12:50

060.257 (H) AMERICAN NIGHTMARES: HIGHSMITH, BURROUGHS, DICK (3) Daniel
Limit 18   Freshmen and sophomores only
These three authors share a common starting point: Patricia Highsmith, William S. Burroughs and Philip K. Dick all began their careers writing mass market genre fiction in pre-Stonewall, pre-civil rights, Cold War 1950s America. Absorbing the stylistic codes of their respective marketplaces of suspense writing and lesbian romance, “drug fiend” confessional, and science fiction, each writer’s conformist apprenticeship in pulp resurfaces in increasingly nightmarish forms in the violent and paranoid scenarios that dominate their mature work. Reading broadly in each author’s short fiction, novels, and prose, we will sequentially examine Highsmith’s free indirect discourse gone wrong, Burrough’s “cut-up” techniques and “routines”, and Dick’s disorienting temporal experiments as inflamed allergic reactions to generic codes.

Lec.  Sec.  T 3-5:30

060.337 (H) JAMES JOYCE (3) Mao
A seminar covering the oeuvre of James Joyce, including but not limited to Dubliners, A Portrait of the Artist as a Young Man, Ulysses, and parts of Finnegans Wake. Selected readings in other writers and in relevant historiography; some attention to Joyce criticism.

Sec. 01  T 1:30-4

060.367 (H) EDWARDS, EMERSON, THOREAU (3) Cameron
Limit 18   Prereq: Two lower level English courses
Juniors and Seniors only
We shall examine what “divinity,” “nature,” “Being in general” and “personal identity” differently mean in the writings of Jonathan Edwards, Ralph Waldo Emerson, and Henry Thoreau (the emphasis will be on the two nineteenth-century American writers). We shall also examine features of the prose as well as the genres in which the three authors write: the sermon, the treatise, the journal entry, the lecture, and the essay.

Sec. 01  F 1:30-4

214.370 (H) MAGIC AND MARVEL IN THE RENAISSANCE (3) Stephens
Cross-listed with German and Romance Languages and Literatures

Sec. 01  T 2-4:30

300.363 (H) READING JUDITH SHAKESPEARE WOMEN PLAYWRIGHTS OF EARLY MODERN ENGLAND (3) Patton
Limit 15  Cross-listed with the Humanities Center and Studies of Women, Gender, and Sexuality

Sec. 01  TTh 3-4:15

060.501 INDEPENDENT STUDY  Individual study projects proposed by a student to any member of the department. Prerequisite: Six hours of English beyond the introductory courses, with
The English Department offers qualified majors the option of writing a senior essay. This is to be a one-semester project undertaken in the fall of the senior year, resulting in an essay of 30-35 pages. The senior essay counts as a three-credit course which can be applied toward the requirements for the major. Each project will be assigned both an advisor and a second reader. In addition, students writing essays will meet as a group with the DUS once or twice in the course of the project. The senior essay option is open to all students with a cumulative GPA of 3.8 or higher in English Department courses at the end of the fall term of their junior year. Project descriptions (generally of one to two pages) and a preliminary bibliography should be submitted to a prospective advisor selected by the student from the core faculty. All proposals must be received at least two weeks prior to the beginning of registration period during the spring term of the junior year. Students should meet with the prospective advisor to discuss the project in general terms before submitting a formal proposal. The advisor will determine whether the proposed project is feasible and worthwhile. Individual faculty are not required to direct more than one approved senior essay per academic year. Acceptance of a proposal will therefore depend on faculty availability as well as on the strength of the proposal itself. When completed, the senior essay will be judged and graded by the advisor in consultation with the second reader. The senior essay will not be part of the Department’s honors program, which will continue to be based solely on a cumulative GPA of 3.6 in English Department courses.

This seminar will focus on major literature of the Romantic era and the systems of transmission through which they were disseminated. We’ll read writers like Burke, Wollstonecraft, and Paine on the French Revolution, examine influential anthologies and the reading publics that they were directed toward, read a selection of Wordsworth’s poetry including the posthumously published Prelude and writings like DeQuincey’s that provided advance notice of it before its publication and conclude with prose and poetry of Shelley and Keats.

This course asks what difference the re-introduction of “humor” and “passion” might make into the recent constellation of theoretical writings on feeling, emotion, and affect. How might these philosophical and physiological categories from the intellectual history of early modernity complicate, estrange, or re-organize recent critical accounts of embodiment and psychic life? Tracing a historical transformation from sixteenth century “humors” to seventeenth century “passions”, we will consider a range of early modern texts including Shakespeare’s Love’s Labour’s Lost, Jonson’s Every Man in His Humour, Burton’s preface to The Anatomy of Melancholy, Milton’s “L’Allegro and II Penseroso”, Descartes’ The Passions of the Soul (1649), and Spinoza’s Ethics (1677) in conjunction with a select group of critical texts on feeling, emotion, and affect from Sartre, Paster, Sedgwick, Ngu, Massumi, and Terada.

We shall examine what “divinity,” “nature,” “Being in general” and “personal identity” differently mean in the writings of Jonathan Edwards, Ralph Waldo Emerson, and Henry David Thoreau.
ENGLISH

Emerson and Henry Thoreau (the emphasis will be on the two nineteenth-century American writers), how “the intuitively beheld and immediately felt” (what Edwards called “experiential religion”) are contrastively understood in the writings of the three, and to what end these literary and philosophical writings marginalize persons—and even evacuate them—from their scrutiny. We shall also examine features of the prose (Edwards’s “rhetoric of sensation”; Emerson’s contra-dictions; Thoreau’s infatuation with particulars), and the genres in which the three authors write: the sermon, the treatise, the journal entry, the lecture, and the essay. Finally, we shall consider Adorno’s proposition in “The Essay as Form” that discontinuity is essential to the essay, that “the essay rebels against the doctrine, deeply rooted since Plato, that what is transient and ephemeral is unworthy of philosophy.”

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<th>Code</th>
<th>Course Title</th>
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<td>060.672</td>
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<td>213.614</td>
<td>PROTO-MODERNIST FICTION, 1890-1914</td>
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FILM AND MEDIA STUDIES

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<th>Code</th>
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<tr>
<td>061.140 (H)</td>
<td>INTRODUCTION TO THE STUDY OF FILM (3)</td>
<td>DeLibero</td>
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<td>061.230 (H)</td>
<td>INTERMEDIATE FILM PRODUCTION (3)</td>
<td>Mann</td>
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<td>T 1:30-4</td>
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<tr>
<td>061.245 (H)</td>
<td>INTRODUCTION TO FILM THEORY</td>
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<td>061.308 (H)</td>
<td>EXPERIMENTAL VIDEO (3)</td>
<td>Yasinsky</td>
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FILM AND MEDIA STUDIES

061.314 (H)  SKETCHING THE SCENE: IMAGE AS NARRATIVE TOOL  (3) Porterfield  
Limit 9  Lab fee: $40  Prereq: Introduction To Film Production (061.150) or Introduction To Visual Language (061.145) or Perm Req'd.  Departing from traditional screenwriting technique, this course will promote the precise visual image as a foundation for developing scene, character, and story. Students will explore narrative from the inside out.

061.325 (H)  THE WILDERNESS WITHIN AND WITHOUT  (3) Bucknell  
Limit 15  Lab fee: $40  Prereq: one core course or Perm. Req'd.  Savage landscapes and savage states of mind in films by Ford, Herzog, Boorman, Weir, and others.

061.339 (H)  A CINEMA OF ANXIETY: FILM NOIR  (3) Bucknell  
Limit 15  Lab Fee: $40  Cross-listed with Studies of Women, Gender, and Sexuality

061.401 (H)  DANCE FOR THE CAMERA  (3) Mann  
Limit 6  Lab Fee: $100  Prereq: Advanced Film Production, 061.301 or Perm. Req'd.  Dance for the Camera is a collaborative course taught with dance majors from Towson University. Film students from Film and Media Studies will work with choreographers from Towson to produce a short 16mm dance for the camera film.

061.440 (H)  SENIOR PROJECT IN FILM PRODUCTION  (3) Mann  
Limit 15  Perm. Req'd.  Senior students develop and complete a short 16mm film.

214.420 (H)  ITALIAN NEOREALISMO AND ITS IMPACT ON THE INTERNATIONAL DOCUMENTARY FILM TRADITION  (3) Wegenstein  
Limit 20  Cross-listed with German and Romance Languages and Literatures

215.451 (H)  EL CINE DE PEDRO ALMODOVAR  (3) González, E.  
Limit 40  Cross-listed with German and Romance Languages and Literatures and Studies of Women Gender and Sexuality

360.233 (H)  FEMINIST AND QUEER THEORY  (3) Goodfellow  
Limit 15  Cross-listed with Interdepartmental and Studies of Women, Gender, and Sexuality

061.502  INDEPENDENT STUDY IN FILM AND MEDIA  Staff  
Perm. Req'd.  Lab Fee: $100  (if production related)  For students who wish to explore an aspect of film studies not covered by existing courses. The course may be used for research or directed readings and should include one lengthy essay or several short ones as well as regular meetings with the adviser.

061.504  INDEPENDENT STUDY IN FILM PRODUCTION  Mann  
Perm. Req'd.  Lab Fee: $100  Students work on an individual basis to complete a theoretically based paper related to film production.

061.506  INTERNSHIP IN FILM AND MEDIA  DeLibero  S/U only  Allows students to gain professional experience in film and/or media along with their academic development. Internship must be approved by academic advisor.
GERMAN AND 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 Guillemard (claude@jhu.edu) for any placement questions.

210.101 FRENCH ELEMENTS I (4.5) #wuensch
Sec. 01 MWF 9-9:50, T 10:30-11:20
02 MWF 10-10:50, T 10:30-11:20
03 MWF 11-11:50, T 10:30-11:20

Prereq: No previous knowledge of French and Webcape score of 0-250. May not be taken Satisfactory / Unsatisfactory. Limit 15 per section. Provides a multi-faceted approach to teaching language and culture to the novice French student. The emphasis of the course is an aural-oral proficiency without neglecting the other basic skills of grammar structure, phonetics, reading, and writing; must complete both semesters successfully in order to receive credit.

210.103 LEARNER MANAGED SECTION OF FRENCH ELEMENTS I (4.5) #wuensch
Limit 12. 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 for self-motivated students. On-line materials are designed for 1 and 1/2 more hours a week required for the course. Recommended for those who have some knowledge of French and need a review of the language; must complete both semesters successfully in order to receive credit. No Satisfactory/Unsatisfactory.

210.201 (H) INTERMEDIATE FRENCH I (3.5) #guillemard
Sec. 01 MWF 10-10:50
02 MWF 10-10:50
03 MWF 11-11:50

Prereq: 210.102 or 210.104 or Webcape between 270 and 370. Taught entirely 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) HIGH INTERMEDIATE FRENCH (3.5) #roos
Sec. 01 MWF 10-10:50
02 MWF 11-11:50
03 MWF 3-3:50

Prereq: grade of A in 210.202 or 210.204, or Webcape between 370 and 450. Credit will not be given if previously enrolled in 210.201-202 or the equivalent. 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. Students will study authentic texts, including film “text”, and focus on their written and oral skills. Conducted exclusively in French.

210.301 (H) (W) CONVERSATION ET COMPOSITION FRANCAISE (3.5) #mobarek
Sec. 01 MWF 9-9:50
02 MWF 10-10:50
03 MWF 10-10:50
04 MWF 11-11:50
05 MWF 11-11:50
06 MWF 12-12:50
07 MWF 12-12:50

Prereq: 210.202 or 210.204 or Webcape above 450 and supplementary test (Contact Prof. Guillemard at claude@jhu.edu). 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. Conducted in French.
210.303 (H) BUSINESS FRENCH (3) Guillemard
Limit 12. Prereq: 210.301-302 or supplementary test (Contact Prof. Guillemard at claude@jhu.edu).
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 may 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.

Sec. 01 MWF 11-11:50

210.501 FRENCH INDEPENDENT STUDY - LANGUAGE Guillemard Perm. Req'd

211.340 (H) TOPICS IN FRENCH CINEMA: MASCULIN/FEMININ (3) Roos Limit 12 Prereq: 210.301-302 or supplementary test (Contact Prof. Guillemard at claude@jhu.edu).
This course will focus on the construction of masculinity and femininity in French films. The emphasis of the course will be discussion and analyses of film sequences in class. Additional homework assignments will involve vocabulary and grammar study and an independent project. Entirely conducted in French.

Sec. 01 TTh 3-4:15

211.401 (H) LA FRANCE CONTEMPORAINE I (3) Staff Limit 12 per section Prereq: 210.301-302 or supplementary test (Contact Prof. Guillemard at claude@jhu.edu).
The first semester of this year-long course offers a general survey of contemporary French society, politics and culture. Engaging activities such as debates, individual or group presentations, class discussions on current topics in French news and films will contribute to promoting cultural awareness of the French as a nation. Entirely conducted in French.

Sec. 01 02 MWF 12-12:50 MWF 12-12:50

211.420 (H) REAL FRENCH: FROM SLANG TO SOPHISTICATION (3) Cook-Gailloud Limit 12 per section Prereq: 210.301-302 or supplementary test or by permission (Contact Prof. Guillemard at claude@jhu.edu).
This class will teach the realities of the French language as it is used in French speaking countries, ranging from slang to more sophisticated forms of expression. We will study excerpts of films, literary works, television programs, political speeches, etc. in order to examine which level of speech is at work.

Sec. 01 MW 1:30-2:45

212.201 (H) INTRODUCTION À LA LITTÉRATURE FRANÇAISE I (3) Wismich/Neefs Limit 20 per section Prerequisites: 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 pre-requisite to all further literature courses. Students may co-register with an upper-level course during their second semester.

Sec. 01 MWF 12-12:50
Sec. 02 TTh 10:30-11:45
LOVE, DEATH, AND THE SUPERNATURAL

Limit 15

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, Melusine, Le Coeur mangé, La Manchique, Victor Hugo: Notre Dame de Paris, Flaubert: Saint Julien l’Hospitalier, Jean Giono: Le Hussard sur le Toit, Montherlant: La Reine Marie, Céline: Guignol’s Band.

ALEXANDRE DUMAS

Limit 15

The genre of historical romance analyzed through the novels in the cycle of the Trois Mousquetaires and Le Comte de Monte Cristo. Attention will be paid to Dumas’ use of 17th-century historical accounts and memoirs, and to film adaptations of the novels.

BANQUETS, MEALS, AND TABLE-TALK

Limit 15

People meeting for a meal or a drink engage in a particular ritual, which involves wine, friendship and hence a special freedom of speech. Meal scenes and food displays, heavy with symbolical meaning, are frequent in literature. The seminar will discuss a selection, starting in Antiquity (Plato, Petronius, the Gospels) and then turning to novels by Rabelais, Balzac and Zola. The seminar will be held in French.

FRENCH MASCULINITIES: FOPS, DANDIES, AND REACTIONARIES

Limit 15

A selection of novels, essays and plays from the 17th to the 21st century illustrating the intersection of gender, taste and politics in the construction of a French masculine identity. From the courtly gentleman, to the effeminate male, to the Romantic dandy, to the visionary, post-human man, masculine sexuality is alternately portrayed as normative ideal, as satire, social critique, tragi-comedy or utopia. Texts by Crébillon, Marivaux, Laclos, Stendhal, Chateaubriand, Baudelaire, Proust, Houellebecq. Cross-listed with Studies of Women, Gender, and Sexuality.

FRENCH INDEPENDENT STUDY - LITERATURE

Sec. 01 – Nichols
Sec. 02 – Neefs
Sec. 03 – Russo
Sec. 04 – Jeanneret
Sec. 05 – Anderson

GERMAN ELEMENTS I

Limit 15 per section

Four skills introduction to the German language and culture. Develops proficiency in speaking, writing, reading and listening skills through the use of basic texts, multi-media and communicative language activities. Webet / Language lab required. Both semesters must be completed with passing grades to receive credit. May not be taken on a satisfactory/unsatisfactory basis. Choose section based on MWF...
GERMAN AND ROMANCE LANGUAGES
AND LITERATURES
schedule, T hour is flexible.

210.163  ELEMENARY YIDDISH I (3)
Caplan, B. Limit 12 Year-long course. Includes the four language skills--
reading, writing, listening, and speaking--
and introduces students to Yiddish culture
through text, song, and film. Emphasis is
placed both on the acquisition of Yiddish
as a tool for the study of Yiddish
literature and Ashkenazi history and
and culture, and on the active use of the
language in oral and written
communication. Both semesters must be
taken with a passing grade to receive
credit.

210.261 (H)  INTERMEDIATE GERMAN I (3.5)
Wheeler Limit 15 per section
Prereq: 210.162 or placement by exam.
This course is first semester of a two-
semester proficiency-oriented sequence
designed to continue the four skills
(reading, writing, speaking, and listening)
approach to learning German. Readings
and discussions are topically based and
expanded upon through multi-media
materials. Year long review of grammar
is part of course. WebCT/ Language lab
required. Conducted in German

210.361 (H)  ADVANCED GERMAN I:
CULTURAL FOUNDATIONS (3)
Mifflin Limit 15 per section
Prereq: 210.262 or placement by exam.
Topically, this course focuses on defining
moments in German cultural history of
the second half of the 20th century.
Films, texts and other media provide a
basis for discussing events in post-war
Germany through reunification and
beyond. A review and expansion of
advanced grammatical concepts and
vocabulary underlies the course. Focus
on improving expression in writing and
speaking. Taught in German

210.461 (H)  INTRODUCTION TO LITERARY
GENRE AND STYLISTICS (3)
Wheeler/Mifflin Limit 15
Prereq: 210.362
Introduction to major
literary periods and genres in German
literature. Course will provide a
background for further literary study.
Students will develop critical, interpretive
reading skills through the analysis of
genre-specific language, as well as
improve written and spoken German.
Taught in German

213.251 (H)  FRIEDRICH NIETZSCHE (3)
Pahl Limit 20 Freshmen Only
Friedrich Nietzsche continues to be one of
the most radical and influential
philosophers of the West. Famous and
infamous for announcing the death of
God and the advent of the superhuman,
his irreverence for philosophical tradition
culminated in the call to “philosophize
with a hammer.” He embarrassed the old
philosophers exposing their, as he put it,
clumsy lovemaking with truth. And he
stunned generations of intellectuals after
him with his idea of the eternal return of
the same. But Nietzsche was also a witty
writer, a light-footed thinker, a bold
defender of the experiences of the body, a
tender human being, and a sharp critic of
German narrow-mindedness. This
seminar offers an introduction to
GERMAN AND ROMANCE LANGUAGES
AND LITERATURES

Nietzsche’s work and a first journey into the world of German thought, culture and literature. Readings and discussion will be in English.

213.343 (H) (W) THE HOLOCAUST IN MODERN LITERATURE: THE LIMITS OF REPRESENTATION
Caplan, M. Limit 30 This course will be an advanced-undergraduate, writing-intensive examination of literary, memoiristic, philosophical, and cinematic representations of the Nazi genocide of European Jewry during World War II. In addition to the problems of defining this genocide against larger catastrophes of world war, totalitarianism, racism, and the technologies of mass destruction, we will consider this event as a moment of crisis in the historical, moral, and ideological understanding of European modernity that underscores the limits of language, subjectivity, and representation. Parallel to these discussions we will also consider the Holocaust in the context of Jewish responses to anti-Semitism, the role of the Holocaust in generating subsequent models for Jewish cultural representation, and the role of the Holocaust in underscoring the anomalous position of Jews within the history of modern Europe. Works to be considered will be taken from Czech, English, French, German, Hebrew, Italian, Polish, and Yiddish sources, and will include writers and theorists such as Theodor Adorno, Aharon Appelfeld, Jurek Becker, Tadeusz Borowski, Jacques Derrida, Raul Hilberg, Primo Levi, Georges Perec, Philip Roth, Liliana Segre, Ari Spiegelman, and Ife Wol. All readings and discussions conducted in English
Cross-listed with Jewish Studies, English, and Writing Seminars
Sec. 01 TTh 10:30-11:45

213.399 (H) REALISM (3) Strowick Limit 15 Prereq. 213.362 The course will examine German realism in two respects. First, we will analyze how narrative techniques create what Roland Barthes has called the “reality effect”. Secondly, we will explore how the poetics of realism and media technologies (e.g. photography, stereoscopy) are intertwined. Forms of temporal and spatial representation as developed in the German literature of the second half of the 19th century call into question the opposition between realism and modernism. Readings will include: Gottfried Keller, Adalbert Stifter, Wilhelm Raabe, Theodor Storm, Theodor Fontane, Conrad Ferdinand Meyer. The course will be conducted in German.
Sec. 01 T 1:30-4

213.450 (H) DECADENCE (3) Tobias Limit 20 Early twentieth-century literature has been identified variously as nihilist, fascist, revolutionary, and anti-bourgeois. This course will explore the complex political dimensions of a movement that sought to fashion a purely aesthetic existence. We will trace the development of this movement from the turn-of-the-century in Vienna to the roaring twenties in Berlin. Authors to include Musil, George, Hofmannsthal, Nietzsche, Rilke, and Mann. Readings in English and German, discussions in English and German. Cross-listed with History
Sec. 01 MW 12-1:15

213.501 INDEPENDENT STUDY- LITERATURE
Sec. 01 – Strowick
Sec. 02 – Tobias
Sec. 03 – Pahl
Sec. 04 – Caplan, M.
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 I (4)  Zannirato
Limit 17 per section
Sec. 01  MWF 9-9:50
Sec. 02  MWF 10-10:50
Sec. 03  MWF 11-11:50
Sec. 04  MWF 1:30-2:20
Sec. 05  MWF 3-3:50
Year course; must complete both semesters for credit. The aim of the course is to provide students with basic skills in listening to and reading, writing, and speaking the language through the use of elementary texts, videos, and electronic materials. All classes are conducted in Italian; oral participation is strongly encouraged from the beginning. May not be taken Satisfactory/ Unsatisfactory

210.251 (H)  INTERMEDIATE ITALIAN I (3.5)  Zannirato
Limit 15 per section
Prereqs: 210.152 or placement exam. Continues building on the four essential skills for communication presented in Italian Elements courses. 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 and class discussions on predetermined subjects. All classes are conducted in Italian. May not be taken Satisfactory/ Unsatisfactory

210.351 (H)  ADVANCED ITALIAN I (3.5)  Zannirato
Limit 12 per section
Prereqs: 210.252 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 audiovisual and electronic materials will stress everyday spoken Italian. May not be taken Satisfactory/ Unsatisfactory

214.370 (H) (W)  MAGIC AND MARVEL IN THE RENAISSANCE (3)  Stephens
Limit 20
Discover the Magic and Marvels—both literal and figurative—of Italian literature between 1350 and 1550. Poets, philosophers, political theorists, dramatists, and fiction writers ponder the nature of humanity, in itself and in its relations with the supra-human beings described by religion and literature. Readings include Ariosto’s Orlando furioso, the epic romance that inspired works as varied as Spenser’s Faerie Queene and Cervantes’ Don Quixote. Cross-listed with English and History

214.391 (H)  WESTERN INTELLECTUAL HISTORY, 1200-1500 (3)  Celenza
Limit 20
High and late medieval philosophy will be covered in its historical context. Thinkers such as Thomas Aquinas, William of Ockham, and Lorenzaccio Valla will be treated, as will the contexts for high and late medieval learning, such as universities, courts, and the new, “state” libraries of the fifteenth century in Italy. Cross-listed with History and Classics Gilman Course in the Humanities

214.420 (H)  ITALIAN NEOREALISMO AND ITS IMPACT ON THE INTERNATIONAL DOCUMENTARY FILM TRADITION (3)  Reogniter
Limit 20
This course starts out by revealing the...
GERMAN AND ROMANCE LANGUAGES
AND LITERATURES

birth of the Italian New Realist movement in the early 1940s, when Roberto Rossellini and others made their first documentaries for the fascist LUCE. We will then analyze the highlights of the Italian new realist film movement with the films and scripts by Cesare Zavattini, Vittorio de Sica, Luchino Visconti, and others; the second half of the semester will be dedicated to the question of the Italian new realist cinema’s impact on other international documentary movements and traditions of the 20th century, from the French Nouvelle Vague to the US and Canadian Direct Cinema movement, from the Scandinavian Dogme films to such reality TV phenomena as FOX’s recent “The moment of truth.” Screenings will be held in original language with English subtitles. Readings to be announced. Cross-listed with Film and Media Studies

214.561
ITALIAN INDEPENDENT STUDY
Sec. 01 – Stephens
Sec. 02 – Forni
Sec. 03 – Celenza

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.

210.177
PORTUGUESE ELEMENTS (3.5)
Bensabat-Ott  Limit 20  Perm. Req’d.
This course introduces students to the basic skills in reading, writing and speaking the Portuguese language. Basic texts, films, and folklore are used to acquaint students with Portuguese and Brazil, as well as the cultural influences of Africa and Asia on Brazilian society. Students are encouraged to speak from the very beginning of the course, and class participation is a must. This is a year-long course and both semesters must be taken and passed in order to earn credit. All classes are conducted in Portuguese. Language lab is required. May not be taken Satisfactory/ Unsatisfactory

Sec. 01  MWF 11-11:50

210.277 (H)
INTERMEDIATE/ ADVANCED PORTUGUESE (3.5)
Bensabat-Ott  Limit 20  Prereqs: 210.177-178 or placement exam  Perm. Req’d.
More advanced training in the skills of the language through short stories, plays, poetry, and miscellaneous readings from Brazil, Portugal and Portuguese-speaking Africa that reflect the mix of cultures at work in the 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. May not be taken Satisfactory/ Unsatisfactory

Sec. 01  MWF 10-10:50

210.391 (H)
PORTUGUESE LANGUAGE & LITERATURE (3.5)
Bensabat-Ott  Limit 20  Prereqs: 210.277-278 or placement exam  Perm. Req’d.
This third-year Portuguese course focuses on reading, writing, and oral expression. Under 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 discussions on the topic covered. Grammar will be reviewed as necessary. Lab work required. The course is conducted entirely in Portuguese. May not be taken Satisfactory/ Unsatisfactory

Sec. 01  MWF 9-9:50
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 (4)  Weingarten  
Sec.  01  MWF 9:9:50  
Limit 17 per section  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 midterms and no final). In order to receive credit for Spanish 111, Spanish 112 must also be completed with a passing grade. May not be taken Satisfactory/ Unsatisfactory

210.112  SPANISH ELEMENTS II (4)  Weingarten  
Sec.  01  MWF 9:9:50  
Limit 17 per section  Prerequisite: Spanish Elements I or appropriate Placement Exam (S-Cape) score  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 midterms and no final). May not be taken Satisfactory/ Unsatisfactory

210.211 (H)  INTERMEDIATE SPANISH I (4)  Gonzalez  
Sec.  01  MWF 9:9:50  
Limit 17  Prereqs: 210.112 or appropriate Placement Exam (S-Cape) score  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 midterms and no final). May not be taken Satisfactory/ Unsatisfactory

210.212 (H)  INTERMEDIATE SPANISH II (4)  Gonzalez  
Sec.  01  MWF 9:9:50  
Limit 17  Prereqs: 210.211 or appropriate S-Cape score  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 midterms and no final). May not be taken Satisfactory/ Unsatisfactory

210.311 (H)  ADVANCED SPANISH I (3)  Garcia-Augustin  
Sec.  01  MWF 9:9:50  
Limit 15  Prereqs: 210.212 or 210.213 or appropriate S-Cape score  Advanced Spanish I is designed to improve the four skills: Reading, writing, listening and speaking, essential for communication. This third-year course aims to improve the students' reading and writing skills by focusing on various types of texts. Students will also engage in more formal levels of written communication. This course also focuses on refinement of grammar. Students are exposed to a deeper understanding of the cultures of the Spanish-speaking world. Extensive use of an online component delivered via WebCT, sustained class participation, and three hourly exams (no midterms and no final). May not be taken Satisfactory/ Unsatisfactory

210.312 (H)  ADVANCED SPANISH II (3)  Garcia-Augustin  
Sec.  01  MWF 9:9:50  
Limit 15  Prereqs: 210.311  Advanced Spanish II is designed to improve the four skills: Reading, writing, listening and speaking, essential for communication. This third-year course aims at improving the students' oral skills by focusing on the use of standard, spoken Spanish with an emphasis on colloquial and idiomatic expressions. Students will also engage in more formal levels of
communication by discussing assigned literary and non-literary topics. They will increase their listening skills through movies and other listening comprehension exercises. The course will also focus on vocabulary acquisition. May not be taken Satisfactory/ Unsatisfactory

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Prerequisites</th>
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<tr>
<td>210.313 (H)</td>
<td>MEDICAL SPANISH (3)</td>
<td>Sanchez</td>
<td>3</td>
<td>Limit 15, Prereq: 210.311 (Advanced Spanish I) or appropriate S-Cape score</td>
<td>Students will increase their vocabulary and practice grammar structures closely related to the medical and health administration professions. All language skills are equally emphasized. Highly recommended to students in any of the health-related majors. There will be an intensive on-line component. May not be taken Satisfactory/ Unsatisfactory</td>
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<tr>
<td>210.314 (H)</td>
<td>BUSINESS SPANISH (3)</td>
<td>Sanchez</td>
<td>3</td>
<td>Limit 15, Prereq: 210.311 (Advanced Spanish I) or appropriate S-Cape score</td>
<td>Students will increase their vocabulary and practice grammar structures closely related to trade and business practices in the public and private sectors. All language skills are equally emphasized. Highly recommended to students majoring in Business and International Relations. There will be an intensive on-line component. May not be taken Satisfactory/ Unsatisfactory</td>
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<td>210.316 (H)</td>
<td>CONVERSATIONAL SPANISH (3)</td>
<td>Sanchez</td>
<td>3</td>
<td>Limit 15, Prereq: 210.311 or appropriate WEB-CAPE score.</td>
<td>This course is designed for students who have attained an advanced level of proficiency in Spanish 210.311 and wish to improve their oral skills by focusing on the use of standard, spoken Spanish with an emphasis on colloquial and idiomatic expressions. Students are exposed to a deeper understanding of the cultures of the Spanish-speaking world through movies and other listening comprehension exercises. The course will mainly focus on conversation and vocabulary acquisition. This course is highly recommended for students going to JHU study abroad programs.</td>
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<td>210.411 (H)</td>
<td>SPANISH TRANSLATION FOR THE PROFESSIONES (3)</td>
<td>Sanchez/Gonzalez</td>
<td>3</td>
<td>Limit 12, Prereq: 210.313, 210.314, or 210.315</td>
<td>Students will learn the basics of translation theory and be presented with the tools needed (specialized dictionaries, web resources, etc.) for the translation of literature, business, medical, legal, technological, political, and journalistic texts from Spanish to English and English to Spanish. No Satisfactory/Unsatisfactory</td>
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<td>210.412 (W)</td>
<td>SPANISH LANGUAGE INTERNSHIP (3)</td>
<td>Sanchez</td>
<td>3</td>
<td>Limit 12, Prereq: 210.411 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. May not be taken Satisfactory/Unsatisfactory</td>
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| 211.290 (H) | MODERN SPANISH CULTURE (3)           | Sanchez    | 3       | Limit 20, Prereq: Intermediate Spanish 210.212 or 210.214 or appropriate S-Cape score | This course will explore the fundamental traits of Spanish culture. 恐怕這句的“traits”是個不太對的字眼。
GERMAN AND ROMANCE LANGUAGES AND LITERATURES

as it has developed from the 18th to the 21st centuries (although the first three weeks will serve as a general overview of the historical development of Spain). Class time will focus on discussion of different texts, movies, songs, pictures, and paintings, considering their relation to the specific historical, political, and social contexts. The active participation of students in debates and discussions is fundamental. In addition, students will be expected to make oral presentations on assigned topics. The pace of the course will be determined mainly by the group's progress. This course will be of particular interest for students planning in spending a semester abroad in Spain—specially for those students going to the JHU Fall Semester in Madrid, at Carlos III University. May not be taken satisfactory/unsatisfactory

215.342 (H) INTRODUCTION TO LATIN AMERICA: THE FORMATIVE YEARS (3) Castro-Klaren Limit 25
The course will explore the cultural continuities and fractures in the unfolding of life in the Andes from the appearance of the first urban center on the coastal valleys--2000BC-- to the aftermath of the Spanish conquest at about 1600. Readings will be taken from anthropology and archaeology. Andean and Christian myths of origin and theories of state formation will be examined along with the chronicles written by Spanish conquistadores, Indian intellectuals and Mestizo intellectuals. Cross-listed with Program in Latin American Studies

215.451 (H) EL CINE DE PEDRO ALMODOVAR (3) González, E. Limit 40 From Pepi to Volver, the films will be studied in form, content, and socio-political terms. Cross-listed with Film and Media Studies and Studies of Women Gender and Sexuality

215.459 (H) 20TH AND 21ST CENTURY SPAIN THROUGH GALICIAN EYES (3) Castro-Vasquez Limit 25 Twenty and twenty first century issues of Galicia, located in the north west of Spain, and the World as seen from a Galician perspective in the writings of Manuel Rivas, one of the most important voices of contemporary Spanish literature. Through his texts and film adaptations we will delve into key issues like globalization, migration, ecology, the Spanish Civil War and war in general. Texts will include "Galicia contada a un extraterrestre", (2001 journalism), "La lengua de las mariposas" (1993 short novel), "En salvaje compañía" (1993 short novel), "El pueblo de la noche" (1996 poetry), "Un saxo en la niebla" (1995 short story), "El héroe" (2005 theater) and chapters of "Los libros arden mal" (2006 novel).

215.491 (H) MUSLIM SPAIN (3) Altschul Limit 20 From 711 to 1609 the Iberian Peninsula was a multilingual society administrated by members of the three monotheistic faiths. This course will discuss the Hispano-Muslim, Hispano-Jewish and Hispano-Christian literatures of Iberia during these times. Texts and authors include Ibn Hazm, Shmuel HaNaguid, Petrus Alfonsus, the Kalilah wa Dinnah and the Sendebar. Hebrew and Arabic texts will be read in translation. Taught in Spanish. Cross-listed with Africana Studies
GERMAN AND ROMANCE LANGUAGES
AND LITERATURES

215.525  SPANISH INDEPENDENT STUDY - LITERATURE
Sec. 01 – E. Gonzalez
Sec. 02 – Castro-Klaren
Sec. 03 – Sieber
Sec. 04 – Egginton

UNDERGRADUATE CROSS-LISTINGS

360.133 (H)  GREAT BOOKS: WESTERN TRADITION OR THE HUMANITIES: A TRADITION OF CLASSICS (3)
Egginton/Patton/Giarusso
Limit 15 per section  Freshmen only
Great Books explores some of the greatest works of the literary and philosophical tradition in Europe and the Americas. In lectures and panel sessions, professors from several academic disciplines introduce texts and then lead further discussion in small group sessions. Where appropriate, as in the Faust legend, Peabody resources allow comparison of the literary text and its operatic counterparts. Close reading and intensive writing instruction are hallmarks of Great Books at Hopkins, along with a reading list that begins with Homer’s Odyssey and continues to the modern period, varying each term based on faculty expertise.
Cross-listed with the Humanities Center, Philosophy, Classics, and Interdepartmental

300.223 (H)  THE GERMAN ENLIGHTENMENT
O. Schott  Limit 20
Cross-listed with History and the Humanities Center

GRADUATE COURSES

212.692  RESEARCH METHODS
Waterman
Limit 15  Seminar and lab in the methods, resources, and systems of research for graduate students of literature.

FRENCH

212.610  THE SACRED AND THE SECULAR: THE MANUSCRIPT COHEX 1200-1500
Nichols/Noel  Limit 15
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. After the initial meeting (September 11) 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.

212.613  MARIVAUX AND FRENCH TASTE
Pourquoi Marivaux était-il à la fois un auteur de succès et l’écrivain le plus déconsidéré de la part des philosophes? La lecture de ses oeuvres théâtrales, narratives et journalistiques les plus significatives nous permettra d’explorer les controverses qui travaillant à l’écriture des Lumières, la querelle des anciens et des modernes, le rapport entre goût et politique, et de mieux comprendre l’esthétique dite rococo.

212.718  CONTEXTUALIZING THE FRENCH ENLIGHTENMENT NOVEL
Anderson
Limit 15  The French Enlightenment novel studied in the intellectual and historical context of its time. Texts from Montesquieu, the Encyclopédie, Diderot, Rousseau, Laclos, Voltaire, Buffon, Rétif de la Bretonne. Please see provisional
### LITERATURE, MYTHES, RELIGIONS AU 19EME SIECLE

**Neefs**

**Limit 15**


**Sec. 01**

**W 1-3**

### MONTAIGNE, DESCARTES, PASCAL: TROIS STYLES PHILOSOPHIQUES

**Jeanneret**

**Limit 15**

Within less than a century, three major thinkers appear, who could not be more different from each other. Each embodies a worldview, a method and a style that illustrate a typical trend in the intellectual history of Early Modern France. We will study passages from Montaigne’s Essais and from Pascal’s Pensées, as well as Descartes’ Discours de la méthode. The emphasis will be on the interaction between thought and style. The seminar will be held in French.

**Sec. 01**

**T 11-1**

### FRENCH INDEPENDENT STUDY

**Sec. 01** – Nichols  
**Sec. 02** – Neefs  
**Sec. 03** – Russo  
**Sec. 04** – Jeanneret  
**Sec. 05** – Anderson

### FRENCH DISSERTATION RESEARCH

**Sec. 01** – Nichols  
**Sec. 02** – Neefs  
**Sec. 03** – Russo  
**Sec. 04** – Jeanneret  
**Sec. 05** – Anderson

### FRENCH PROPOSAL PREPARATION

**Sec. 01** – Nichols  
**Sec. 02** – Neefs  
**Sec. 03** – Russo  
**Sec. 04** – Jeanneret  
**Sec. 05** – Anderson

### GERMAN

### READING AND TRANSLATING GERMAN FOR ACADEMIC PURPOSES I

**Mifflin**

**Limit 15**

Graduate students only. This is the first semester of a year-long course designed for graduate students in other departments who wish to gain a reading knowledge of the German language.

**Sec. 01**

**MW 9-9:50**

### PROTO-MODERNIST FICTION, 1890-1914

**Caplan, M.**

**Limit 15**

This course will be a graduate seminar tracing the tentative beginnings of global modernism in late-19th and early-20th century fiction taken from American, Brazilian, French, German, Italian, Hebrew, Norwegian, Russian, and Yiddish sources. Among the topics we will consider are the radical loss of faith in scientific, political, and
GERMAN AND ROMANCE LANGUAGES
AND LITERATURES

philosophical narratives of progress and self-improvement at the end of the 19th century; the breakdown of imperial orders and their impact on social relations as well as definitions of the self; the reconfiguration of narrative conventions in response to technological and intellectual innovations such as photography, film, electricity, and the advent of the social sciences; the intensifying predominance of urban life in the formulation of modern culture; and the interrelations among aesthetic trends such as realism, naturalism, symbolism, impressionism, and expressionism in a variety of artistic media of the era. To what extent does the crisis of faith in political, aesthetic, and philosophical certitudes of a previous age result in the liberation of narrative conventions? To what extent do fin-de-siècle writers throughout the Western world participate in a common literary aesthetic? Authors to be considered will include: David Bergelson, Yosef Haim Brenner, Anton Chekhov, Éduard Dujardin, Knut Hamsun, Franz Kafka, Machado de Assis, Italo Svevo, and Gertrude Stein. All readings and discussions conducted in English. Cross-listed with English and Jewish Studies.

213.652  ETERNAL RETURN  Pahl  Limit 15  
The eternal return of the same was Nietzsche’s most difficult thought. We will discuss its role within his philosophy and explore how thinkers after Nietzsche were haunted by, affirmed, and transformed this idea. Cross-listed with Political Science.

213.680  SUSPICION: SIGNS OF MODERNITY  Strowick  Limit 15  
Modernity gives rise to various forms of suspicion, including modern forms of resentment and practices of self-discipline (a suspicion of oneself), as well as to an epistemology of suspicion as it is developed in the modern human sciences. The course starts out with an analysis of the detective genre and of the specific transformations it undergoes in modern German literature. In a next step, we will examine literary representations of suspicion within a broader cultural-historical frame: Nietzsche’s analysis of resentment serves as one point of reference; another is what Carlo Ginzburg has called the “paradigm of clues.” The modern human sciences, since the last third of the 19th century, have relied on a method that produces knowledge by way of interpreting clues. While suspicion in the human sciences is related to the production of truth, literature uses suspicion as a way to produce aesthetic and logical undecidabilities. We will analyze literary representations of suspicion with respect to the narrative structure (unreliable narration) and the mediality of suspicion. Finally, the course emphasizes the methodological relevance of suspicion: As a practice of deciphering, interpreting and reading traces, suspicion calls for being reformulated literary-theoretically. Readings will include: Heinrich von Kleist, E.T.A. Hoffmann, Nietzsche, Theodor Fontane, Freud, Kafka, Thomas Mann, Heimito von Doderer, Peter Handke, Uwe Johnson. Readings and discussion in German.

213.746  ANTI-MIMESIS: MODERN POETRY AND AESTHETIC THEORY  Zeidler  Limit 15  
In “Das Zeitalter des Weltbildes,” Heidegger argues that the modern period is one in which the subject establishes a relation with the world by producing an image of it. We will draw on this definition of the post-Cartesian world to analyze the rejection of images and more broadly mimesis in Adorno’s Aesthetic Theory, Celan’s poetry, Kafka’s fiction, and...
### GERMAN AND ROMANCE LANGUAGES AND LITERATURES

Benjamin’s writings.

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<td>213.800</td>
<td>INDEPENDENT STUDY</td>
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<td>213.812</td>
<td>DIRECTED DISSERTATION RESEARCH</td>
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<td>213.813</td>
<td>QUALIFYING PAPER PREPARATION</td>
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**ITALIAN**

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<th>Course Title</th>
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<tr>
<td>214.650</td>
<td>THE COSMETIC GAZE: BODY MODIFICATION AND THE CONSTRUCTION OF BEAUTY IN THE 21ST CENTURY Wegenstein</td>
<td>Sec. 01</td>
<td>M 1-3</td>
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<td>Limit 15</td>
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<td>This course is situated in the fields of techno-science studies, the history of medical technologies, and new media studies. Throughout the course’s readings and screenings we will trace “cosmetic gaze” — a gaze through which the act of looking at our bodies and those of others is already informed by the techniques, expectations, and strategies of bodily modification — to both its cultural-historical as well as technological roots from 18th century physiognomy treatises (e.g., Johann Kaspar Lavater) to the 19th and 20th-century politicized discourses of beauty (with their racist counterparts) from the works of Francis Galton and Cesare Lombroso to the Nazis: this material will be compared to current day reality television makeover shows and the beauty ideals they refer to. Readings to be announced. Cross-listed with Studies of Women, Gender, and Sexuality</td>
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<td>214.678</td>
<td>ARISTOTE Stephano Limit 15</td>
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<td>A study of Ariosto’s Orlando furioso in the context of humanistic culture and of his own literary production in shorter genres. The relation of Orlando furioso to the traditions of epic and romance, especially Boiardo and Tasso, will be a major focus. Cross-listed with English and Studies of Women, Gender, and Sexuality</td>
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<td>214.700</td>
<td>LORENZO VALLA Colonna Limit 15</td>
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<td>The life and work of this fifteenth-century philosopher will be treated. Cross-listed with History and Classics</td>
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<td>214.861</td>
<td>ITALIAN INDEPENDENT STUDY</td>
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**SPANISH**

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<td>215.648</td>
<td>WRITING MEXICO: CONQUEST AND CULTURE 1200-1600 Castro-Klaren</td>
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<td>Deploying post-colonial theory, the course will examine the discursive</td>
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215.687 **THEATER AND IDEOLOGY IN THE SPANISH GOLDEN AGE** Egginton  
Limit 15  
An examination of the first mass entertainment industry of urban modernity: the Spanish Golden Age theater. In addition to many canonical works from the period, by authors such as Lope de Vega, Tirso de Molina, and Calderón de la Barca, we will analyze the political circumstances of their production and a variety of theoretical frameworks for understanding their impact, including works by Adorno, Bourdieu, Maraval, Laclau, and Zizek.

215.726 **SPANISH AND ITALIAN POETRY FROM THE MIDDLE AGES TO THE BAROQUE** Küpper  
Limit 15  
In this course, we will discuss poems by Dante, Petrarch, Herrera, and Garcilaso de la Vega. Classes will focus on a close reading of the texts. In addition, we will consider critical problems related to the literary evolution within a 'national' culture on the one hand and in transnational terms on the other. Compact course starting on September 11 and ending on October 3.

215.749 **LA NOVELA ACTUAL EN PERSPECTIVA TRANSATLÁNTICA** González, E.  
Limit 15  
Javier Marías, *Corazón tan blanco* (España); Antonio Muñoz Molina, *Beltenebros* (España); Luis Leante, *Mira si yo te quiero* (España); Tomás Eloy Martínez, *El vuelo de la reina* (Argentina); Roberto Bolaño, *Los detectives salvajes* (Chile); Santiago Roncagliolo, *Pudor* (Perú); Laura Restrepo, *Delirio* (Colombia); Xavier Velázquez, *Diablo guardián* (México).

215.826 **SPANISH INDEPENDENT STUDY**  
Sec. 01 – E. Gonzalez  
Sec. 02 – Castro-Klaren  
Sec. 03 – Sieber  
Sec. 04 – Egginton

215.827 **SPANISH DISSERTATION RESEARCH**  
Sec. 01 – E. Gonzalez  
Sec. 02 – Castro-Klaren  
Sec. 03 – Sieber  
Sec. 04 – Egginton

215.828 **SPANISH PROPOSAL PREPARATION**  
Sec. 01 – E. Gonzalez  
Sec. 02 – Castro-Klaren  
Sec. 03 – Sieber  
Sec. 04 – Egginton

**GRADUATE CROSS-LISTINGS**

070.651 **ANTHROPOLOGY OF “THE EVERYDAY”** Khan  
Limit 15  
Cross-listed with Political Science, Anthropology, the Humanities Center, and Geography and Environmental Engineering

**GILMAN COURSES IN THE HUMANITIES**

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

**GERMAN AND ROMANCE LANGUAGES AND LITERATURES**

214.391 (H) **WESTERN INTELLECTUAL HISTORY, 1200-1500** (3)  
Celenza Limit 20
GILMAN COURSES IN THE HUMANITIES
Please refer to the departmental listings for complete information regarding these courses.

PHILOSOPHY

150.235 (H) PHILOSOPHY OF RELIGION (3) Gross Limit 20 per section

HISTORY

100.102 (H,S) HISTORY OF OCCIDENTAL CIVILIZATION: THE MEDIEVAL WORLD (3) Gardner
   Lec. MW 10-10:50
   Sec. 01 F 9-9:50
   Sec. 02 F 10-10:50
   Sec. 03 F 11-11:50
   Sec. 04 F 12-12:50
   Sec. 05 F 10-10:50
   Sec. 06 F 2-2:50
   Sec. 07 F 3-3:50
   Sec. 08 Th 9-9:50
   Sec. 09 Th 10-10:50
   Sec. 10 Th 11-11:50
   Sec. 11 Th 12-12:50
   Sec. 12 F 10-10:50

100.103 (H,S) HISTORY OF OCCIDENTAL CIVILIZATION: EUROPE AND THE WIDER WORLD (3) Marshall
   Lec. MW 11-11:50
   Sec. 01 F 9-9:50
   Sec. 02 F 10-10:50
   Sec. 03 F 11-11:50
   Sec. 04 F 12-12:50
   Sec. 05 F 11-11:50
   Sec. 06 F 2-2:50
   Sec. 07 F 3-3:50
   Sec. 08 Th 9-9:50
   Sec. 09 Th 10-10:50
   Sec. 10 Th 11-11:50
   Sec. 11 Th 12-12:50
   Sec. 12 F 11-11:50

100.112 (H,S) MAKING AMERICA: MASTERY AND FREEDOM IN BRITISH MAINLAND AMERICA, 1607-1789 (3) Ditz
   Lec. MW 1:30-2:20
   Sec. 01 F 1:30-2:20
   Sec. 02 F 1:30-2:20
   Sec. 03 F 1:30-2:20
   Sec. 04 F 2-2:50
   Sec. 05 F 3-3:50
   Sec. 06 F 3-3:50

100.115 (H,S) COLONIAL LATIN AMERICA (3) Russell-West
   Lec. MW 12-12:50
   Sec. 01 F 12-12:50
   Sec. 02 F 2-2:50
   Sec. 03 F 3-3:50
   Sec. 04 F 12-12:50
   Sec. 05 Th 2-2:50
   Sec. 06 Th 3-3:50

360.147 (H,S) ADAM SMITH AND KARL MARX (3) Jelavich/Schoenberger
   Lec. Sec. 01 W 1:30-4

100.157 (H,S) RACE AND EMPIRE (3) Shepard
   Lec. MW 3-3:50
   Sec. 01 F 3-3:50
   Sec. 02 F 2-2:50
   Sec. 03 F 3-3:50
   Sec. 04 F 2-2:50

Cross-listed with Geography and Environmental Engineering and Interdepartmental

Cross-listed with Africana Studies
HISTORY

100.161 (H,S) JEWISH AND CHRISTIANS IN WESTERN EUROPE: CONFLICT AND CONCORD FROM LATE ANTIQUITY TO THE AGE OF EXPLORATION (3) Rose
Limit 15 per section. The course will examine relations between Christian and Jews in the medieval West beginning in the Patristic period of the early Church down through the age of European explorations in the 15th and 16th centuries. It will, therefore, cover the premodern history of the Jews in light of their evolving and complex relationship to the Christian communities in whose midst they lived.

100.193 (H,S) UNDERGRADUATE SEMINAR IN HISTORY (3) Johnson
Limit 50 Dept. Majors only Year course must be taken both semesters Required for all history majors and normally taken during the sophomore year. Deals with the elements of historical thinking and writing.

100.202 (H,S) CHILDREN WITHOUT PARENTS: ORPHANED, ABANDONED AND STOLEN CHILDREN IN AMERICAN HISTORY (3) Adelman
Limit 20 This course studies children separated from parents by death, poverty, abandonment, and coercion, and the ways Americans have cared for them—including indenture, orphanages, "orphan trains," adoption, and foster care. Cross-listed with Public Health Studies and Studies of Women, Gender, and Sexuality

100.304 (H,S) NEW WORLD SLAVERY (3) Morgan
Limit 25 This course examines the development of the institution, its importance for understanding early America, the world of slaves and masters. Cross-listed with Africana Studies

100.309 (H,S) SAILORS ASHORE, ABOARD, AND ACROSS THE LINE TO PIRACY: PERSPECTIVES IN 18TH CENTURY MARITIME HISTORY (3) Roberts
Limit 20 Prereq: 100.103 This course looks at the maritime history of the 18th-century Anglo-Atlantic and Caribbean from the perspectives of merchant, naval, pirate and enslaved seamen in their communities at sea and ashore.

100.333 (H,S) GLOBAL PUBLIC HEALTH SINCE WORLD WAR II (3) Galambos/Morgan
Limit 15 per section Globalization has dramatically reshaped the world economy, providing great advantages to some but leaving poor nations to struggle with hunger, disease and death on a daily basis. This course explores the impact of globalization on public health in the developed and the developing nations since 1945. Cross-listed with Public Health Studies

100.338 (H,S) CONTEMPORARY AFRICAN POLITICAL ECONOMIES IN HISTORICAL PERSPECTIVES (3) Berry
Limit 60 Contemporary economic and political trends and problems in selected African countries examined with reference to colonialism, independence, globalization, and internal struggles over economic resources, opportunity, and power. Cross-listed with Africana Studies
<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Instructor</th>
<th>Credits</th>
<th>Limit</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>100.342</td>
<td>SPAIN: THE GOLDEN AGE (3)</td>
<td>Kagan</td>
<td>3</td>
<td>40</td>
<td>Sec. 01 MW 1:30-2:45</td>
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<tr>
<td>100.343</td>
<td>THE POWER OF PLACE: RACE AND COMMUNITY IN EAST BALTIMORE (3)</td>
<td>Shell-Weiss</td>
<td>3</td>
<td>12</td>
<td>Sec. 01 T 4:30-7:30pm</td>
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<tr>
<td>100.344</td>
<td>HISTORY OF TWENTIETH CENTURY RUSSIA (3)</td>
<td>Brooks</td>
<td>3</td>
<td>20</td>
<td>Sec. 01 TTh 1:30-2:45</td>
</tr>
<tr>
<td>100.347</td>
<td>EARLY MODERN CHINA (3)</td>
<td>Rowe</td>
<td>3</td>
<td>100</td>
<td>Sec. 01 TTh 10:30-11:45</td>
</tr>
<tr>
<td>100.356</td>
<td>THE BUDDHIST EXPERIENCE (3)</td>
<td>Lievens</td>
<td>3</td>
<td>30</td>
<td>Sec. 01 TTh 10:30-11:45</td>
</tr>
<tr>
<td>100.372</td>
<td>THE VICTORIANS (3)</td>
<td>Walkowitz</td>
<td>3</td>
<td>20</td>
<td>Sec. 01 W 1:30-4</td>
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<tr>
<td>100.422</td>
<td>SOCIETY AND SOCIAL CHANGE IN 18TH CENTURY CHINA (3)</td>
<td>Rowe</td>
<td>3</td>
<td>12</td>
<td>Sec. 01 Th 1:30-4</td>
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<tr>
<td>100.424</td>
<td>WOMEN AND MODERN CHINESE (3)</td>
<td>Meyer-Fong</td>
<td>3</td>
<td>25</td>
<td>Sec. 01 M 1:30-4</td>
</tr>
</tbody>
</table>
sometimes foreign) have represented
women’s experiences for their own
political and social agendas.
Cross-listed with East Asian Studies and
Studies of Women, Gender, and Sexuality

100.434 (H,S) MASTERWORKS OF RUSSIAN
ARTS AND LITERATURE: THE
IMPERIAL ERA (3) ( Brooks
Prereq: Upper level undergraduates and
graduate students
The purpose is to consider certain great
works of Russian culture and their
canonical status in Russian society. The
seminar focuses on the nineteenth and
early twentieth centuries with a mixture
of discussion and lecture. Students will
keep a weekly journal on assigned
readings, make an oral presentation of
their work, and write a research paper
of approximately twenty pages.

100.441 (H,S) SOCIETY, POLITICS, AND
ECONOMICS IN LATIN AMERICA
(Knight
Survey of Latin America since 1940 with special attention
to politics, economics, and culture.
Cross-listed with Program in Latin
American Studies

100.445 (H,S) AFRICAN FICTION AS HISTORY
(W)
An exploration of
Modern African history through the
African historical novel.
Cross-listed with Africana Studies

100.486 (H,S) JIM CROW IN AMERICA (3)
Connolly
Examines the
history of racial segregation in America,
which is commonly known, when written
into law as “Jim Crow” segregation. This
course moves from Jim Crow’s cultural
roots in the early 19th century to the
present-day legacies of legalized
segregation, as they exist in housing
patterns, schools, and popular culture.
Cross-listed with Africana Studies

213.450 (H) DECADENCE (3) Tobias
Cross-listed with German and Romance
Languages and Literatures

214.370 (H) MAGIC AND MARVEL IN THE
RENAISSANCE (3) Stephens
Cross-listed with German and Romance
Languages and Literatures, Studies of
Women, Gender, and Sexuality and
History

214.391 (H) WESTERN INTELLECTUAL
HISTORY, 1200-1500 (3) Celenza
Cross-listed with German and
Romance Languages and Literatures and
Classics

300.223 (H) THE GERMAN ENLIGHTENMENT
(Schott
Cross-listed with Humanities and
German and Romance Languages and
Literatures

389.361 (H) INTRODUCTION TO MATERIAL
CULTURE: PERSONAL HYGIENE
IN EARLY AMERICA (Arthur
Cross-listed with Programs in
Museums & Society

570.109 (H,S) ENVIRONMENT & SOCIETY;
TOWARDS SUSTAINABILITY (3)
Norman
Cross-listed with Public Health Studies
Geography and Environmental
Engineering

100.507 (W) SENIOR THESIS Ryan
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
<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
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<th>Limit</th>
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<tr>
<td>100.633</td>
<td>SPAIN AND ITS EMPIRE Kagan</td>
<td>Sec. 01</td>
<td>T 3-4:50</td>
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<tr>
<td>100.659</td>
<td>GERMAN HISTORY Jelavich</td>
<td>Sec. 01</td>
<td>T 10:30-12:20</td>
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<tr>
<td>100.649</td>
<td>THE AMERICAN SOUTH Johnson</td>
<td>Sec. 01</td>
<td>TBA</td>
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<tr>
<td>100.684</td>
<td>READING SEMINAR IN THE ATLANTIC WORLD, 1500-1815</td>
<td>Sec. 01</td>
<td>W 6-8pm</td>
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<tr>
<td>100.687</td>
<td>AMERICAN ECONOMIC AND POLITICAL HISTORY Galambos</td>
<td>Sec. 01</td>
<td>TBA</td>
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<tr>
<td>100.693</td>
<td>AMERICA LAND IN BLACK HISTORY Walters</td>
<td>Sec. 01</td>
<td>Th 10-12</td>
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<tr>
<td>100.707</td>
<td>COLONIAL LATIN AMERICA Bates-Wood</td>
<td>Sec. 01</td>
<td>TBA</td>
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<tr>
<td>100.709</td>
<td>MODERN LATIN AMERICA Knight</td>
<td>Sec. 01</td>
<td>W 1:30-3:30</td>
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<tr>
<td>100.721</td>
<td>TOPICS IN AFRICAN HISTORY Berry</td>
<td>Sec. 01</td>
<td>T 1:30-4</td>
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<tr>
<td>100.731</td>
<td>COLONIAL AFRICA: FRENCH AFRICAN EMPIRE Larson</td>
<td>Sec. 01</td>
<td>M 1:30-4</td>
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<tr>
<td>100.735</td>
<td>EARLY MODERN BRITAIN Marshall</td>
<td>Sec. 01</td>
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<tr>
<td>100.747</td>
<td>MODERN EUROPEAN EMPIRES Shepard</td>
<td>Sec. 01</td>
<td>M 12-2</td>
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</table>
we will also touch upon other post-1830 histories (Germany, Russia, the USSR, and the USA).

100.757 CULTURAL HISTORIES OF LATE IMPERIAL AND MODERN CHINA  Meyer-Fong  Limit 10  This reading seminar will introduce graduate students and advanced undergraduates (by permission) to recent studies of Late Imperial and Republican China that can be classified as works of cultural history. Open to advanced undergraduates with permission of instructor

100.767 LONDON WORLD CITY  Walkowitz/Mort  Limit 20  This course will explore built environment, commercialized sexual modernities, cosmopolitanism and Diasporic communities, Historical memory and space. Cross-listed with Studies of Women Gender and Sexuality

100.778 TOPICS IN GENDER HISTORY  Ryan  The seminar continues the discussion of gender in a transnational perspective with a focus on the geographical specializations and research interests of the participants.

140.629 BEYOND THE PANOPTICON: OBSERVING, REPRESENTING, AND MANAGING PEOPLE  Marks/Mooney  Limit 20  Cross-listed with History of Science and Technology

214.700 LORENZO VALLA  Celenza  Limit 15  Cross-listed with German and Romance Languages and Literatures and Classics

The following General seminars are for Graduate students only and are for the presentation and critical discussion of research papers. Faculty, graduate students and invited guest speakers will participate in this seminar:

100.763 SEMINAR: COMPARATIVE WORLD HISTORY  Staff  Limit 25

100.781 THE SEMINAR Staff

100.783 SEMINAR: MEDIEVAL EUROPE

100.785 SEMINAR: EARLY MODERN EUROPE

100.787 SEMINAR: MODERN EUROPE

100.789 SEMINAR: AMERICAN

100.791 SEMINAR: LATIN AMERICAN

100.793 SEMINAR: AFRICAN

100.801 DISSERTATION RESEARCH

100.803 INDEPENDENT STUDY

HISTORY OF ART

010.101 (H) INTRODUCTION TO THE HISTORY OF EUROPEAN ART- PART I  (Kessler)  Limit 25 per section A survey of painting, sculpture, and architecture from Egyptian, Greek, Roman, and medieval culture.

010.147 (H) SOUTH ASIAN ART (3)  Brown  Limit 25  This course explores the visual culture of South Asia from archaeology to installation art. Themes will include: the patron, the text and image, ritual/political space, nationalism, modernity, and postcoloniality.

010.170 (H) AMERICAN ART, 1607 - 1860 (3)  Maynard  Limit 25  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.
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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Units</th>
<th>Description</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>010.202 (H)</td>
<td>SACRED ARTS OF AFRICA (3)</td>
<td>Meier</td>
<td>3</td>
<td>This course will focus on how the visual arts are vital conduits of belief, communicating and enacting changing concepts of the divine in sub-Saharan Africa from the early modern period (16th century) to the present. Cross-listed with Africana Studies.</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>12-1:15</td>
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<tr>
<td>010.290 (H)</td>
<td>AT THE VERY EDGE: THE ART OF ISLAMIC SPAIN AS A FUTURISTIC INTRODUCTION TO 'ISLAMIC ART' (3)</td>
<td>Bauer</td>
<td>3</td>
<td>The course aims at introducing the problematics of Islamic art by focusing on the art of Al-Andalus (Islamic Spain), where intensive encounters with numerous cultures shaped the formation of a unique and indigenous Islamic art. Cross-listed with Africana Studies and Near Eastern Studies.</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>9-10:15</td>
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<tr>
<td>010.305 (H)</td>
<td>ARCHITECTURE IN AMERICA AND BRITAIN, 1600-1850 (3)</td>
<td>Maynard</td>
<td>3</td>
<td>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. Cross-listed with Classics.</td>
<td>Sec. 01</td>
<td>Th</td>
<td>4:30-7</td>
</tr>
<tr>
<td>010.366 (H)</td>
<td>NATIVE AMERICAN ART (3)</td>
<td>DeLeonardis</td>
<td>3</td>
<td>Survey of the principle visual arts of North America (1500 B.C. – A.D. 1600) including discussion of Adena-Hopewell, Mogollon, Punik, and Taino. Introduction to interpretive theory and methodology. Collections study in local and regional museums.</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<tr>
<td>010.387 (H)</td>
<td>ROMAN IMPERIAL SCULPTURE</td>
<td>O. Koortbojian</td>
<td>3</td>
<td>The course will examine the imperial monuments, chiefly in the city of Rome, from the mid-first century to the reign of Constantine. Emphasis will be on the constancy (and conventionality) of messages despite changing styles and changing times. Cross-listed with Classics.</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>1:30-2:45</td>
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<tr>
<td>010.396 (H)</td>
<td>ART AFTER 1945 (3)</td>
<td>Tuma</td>
<td>3</td>
<td>This course surveys the major artistic movements in the United States and Europe following World War II. Beginning with Abstract Expressionism, we will explore the European Informel, Post-Painterly Abstraction, Neo-Dada, New Realism, Pop, Minimalism, Postminimalism, Land Art, Arte Povera, Conceptualism, Neo-Expressionism, Postmodernism, and key developments in contemporary art.</td>
<td>Sec. 01</td>
<td>MW</td>
<td>12-1:15</td>
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<tr>
<td>399.302 (H,S)</td>
<td>INTRODUCTION TO THE MUSEUM: ISSUES AND IDEAS (3)</td>
<td>Rodini</td>
<td>3</td>
<td>Survey of the principle visual arts of North America (1500 B.C. – A.D. 1600) including discussion of Adena-Hopewell, Mogollon, Punik, and Taino. Introduction to interpretive theory and methodology. Collections study in local and regional museums.</td>
<td>Sec. 01</td>
<td>TTH</td>
<td>1:30-2:45</td>
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<tr>
<td>130.317 (H)</td>
<td>AKHENATEN, NEFERTITI AND THE AMARNA PERIOD (3)</td>
<td>Bryan</td>
<td>3</td>
<td>This course surveys the major artistic movements in the United States and Europe following World War II. Beginning with Abstract Expressionism, we will explore the European Informel, Post-Painterly Abstraction, Neo-Dada, New Realism, Pop, Minimalism, Postminimalism, Land Art, Arte Povera, Conceptualism, Neo-Expressionism, Postmodernism, and key developments in contemporary art.</td>
<td>Sec. 01</td>
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<tr>
<td>010.604</td>
<td>MEDIEVAL MANUSCRIPT ILLUMINATION</td>
<td>Brine</td>
<td>3</td>
<td>The seminar considers the sources, meaning, and function of medieval book illumination during the early Middle Ages. Cross-listed with Near Eastern Studies.</td>
<td>Sec. 01</td>
<td>W</td>
<td>4-6pm</td>
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<tr>
<td>010.640</td>
<td>VAN EYCK AND HIS LEGACY</td>
<td>Brine</td>
<td>3</td>
<td>Explores the life, work and reputation of Jan van Eyck and his place within the history of Western art, considers the intended audience, function and meaning of van Eyck’s paintings and the later history of their reception.</td>
<td>Sec. 01</td>
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<td>1-3</td>
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</table>
**HISTORY OF ART**

010.648 **TOPICS IN VENETIAN ART (3)**  
Campbell  Limit 25  This seminar examines artistic exchanges between Venice and its territorial state.  
Sec. 01  T 4-6pm

010.675 **THE QUESTION OF PROGRAMMES (TOMB AND DOMUS) Koortbojian  Limit 25**  
The seminar will be devoted to the possible relationship(s) between imagery displayed in Roman tombs and in the rooms of Roman houses, and will examine the historiography devoted to the nature of such reputed relationships. The topic will take advantage of the famous group of sarcophagi at the Walters, and the upcoming Pompeii exhibition at the National Gallery.  
Sec. 01  M 2-5pm

010.696 **SERRA, HESSE, NAUMAN Tuma**  
Limit 8  This seminar investigates the careers of three American artists who emerged in the 1960s: Richard Serra, Eva Hesse, and Bruce Nauman. We will be examining work in a variety of media, including sculpture, painting, drawing, installation, performance, film and video.  
Sec. 01  W 2-4

040.627 **SANCTUARIES OF ATHENS AND ATTICA Shapiro  Limit 20**  
Cross-listed with Classics  
Sec. 01  T 2-4:30

010.801 **SPECIAL RESEARCH AND PROBLEMS**  
Sec. 01 - Campbell  
Sec. 04 - Kessler  
Sec. 08 - Campbell  
This course is for students who wish or need special instruction in areas of art history not included in the currently offered courses.  
Sec. 01- Campbell  Sec. 04 - Kessler  Sec. 08 - Campbell

**HISTORY OF SCIENCE AND TECHNOLOGY**

140.105 (H,S) **HISTORY OF MEDICINE:**  
**ANTIQUITY TO SCIENTIFIC REVOLUTION (3)** Pomata  
Limit 20 per section  Course provides an overview of the development of Western medical traditions from Antiquity to the early modern period, with particular attention to the social and cultural factors that affected medical ideas and practices.  
Cross-listed with Public Health Studies  
Sec. 01  Lec. MW 10-10:50  Sec. 02  Lec. F 10-10:50  Sec. 03  Lec. F 10-10:50

140.113 (H,S) **FRESHMEN SEMINAR: DARWIN, FREUD, PAVLOV: PERSPECTIVES ON HUMAN NATURE (3) Todes**  
Limit 15  Freshmen only  
Exploration of Darwin's, Freud's, and Pavlov's ideas concerning science and human nature, man's place in nature, the human psyche and human society, and the prospects for humanity's future.  
Sec. 01  F 1:30-4

140.143 (H,S) **GENETICS IN MEDICINE AND SOCIETY (3)** Comfort  Limit 20  
We will explore some of the principal concepts of genetics and their social impact, from Gregor Mendel to the Human Genome Project, using both original scientific papers and historical analyses.  
Cross-listed with Public Health Studies  
Sec. 01  MWF 9-9:50
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>140.215</td>
<td><strong>HISTORY OF SCIENCE AND TECHNOLOGY</strong></td>
<td>Leslie</td>
<td>3</td>
<td>60</td>
<td>01</td>
<td>MWF 12-12:50</td>
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<td></td>
<td><strong>MONUMENTS AND MEMORY (3)</strong></td>
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<td>Why do some places, whether manmade or natural, capture and</td>
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<td>hold our imaginations? Why and how do we commemorate particular</td>
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<td>sites? This course will explore the construction or discovery,</td>
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<td>and the enduring significance, of selected monuments in the</td>
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<td>West beginning with the Great Pyramid and ending with the World</td>
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<td>Trade Center. Cross-listed with Programs in Museums &amp; Society</td>
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<tr>
<td>140.321</td>
<td><strong>SCIENTIFIC REVOLUTION (3)</strong></td>
<td>Boner</td>
<td>3</td>
<td>20</td>
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<td>MW 11-11:50</td>
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<td>Lec. Sec. 01: MW 11-11:50</td>
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<td>**Course concerns developments in early modern Europe known as</td>
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<td>the Scientific Revolution. Topics include cosmology, astronomy,</td>
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<td>mechanics, natural history, and chemistry and issues involving</td>
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<td>magic, technology, humanism, and the social content of early</td>
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<td>modern science.</td>
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<tr>
<td>140.349</td>
<td><strong>THE LABORATORY (3)</strong></td>
<td>Leslie</td>
<td>3</td>
<td>29</td>
<td>01</td>
<td>TTB 12-1:15</td>
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<td>You probably spend lots of time in one. Find out where it came</td>
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<td>from, how it works, and what makes it a distinctive place for</td>
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<td>research and teaching. Special attention to the history of the</td>
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<td>laboratory at Johns Hopkins, including medical laboratories.</td>
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<tr>
<td>140.359</td>
<td><strong>MUSEUMS AND GLOBALIZATION (3)</strong></td>
<td>Kargon</td>
<td>3</td>
<td>15</td>
<td>01</td>
<td>W 3-5:30</td>
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<td>Lec. Sec. 01: W 3-5:30</td>
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<td>Examines how museums are linked to wider national, cultural,</td>
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<td>communities, and mobilize resources to address political,</td>
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<td>economic, and social concerns and questions of heritage.</td>
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<td>Jointly with Case Western Reserve University. Cross-listed with</td>
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<td>Programs in Museums &amp; Society.</td>
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<td>140.360</td>
<td><strong>CHANGES IN THE LAND: SCIENCE, TECHNOLOGY, AND ENVIRONMENT (3)</strong></td>
<td>Kingsland</td>
<td>3</td>
<td>15</td>
<td>01</td>
<td>F 1:30-4</td>
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<td></td>
<td>Focus on environmentalism 19th century to present. Theme this</td>
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<td>semester is environmental problems relating to food,</td>
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<td>agriculture, nutrition. Students will do research project.</td>
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<tr>
<td>140.369</td>
<td><strong>THE CITIES IN EAST ASIA: A CULTURAL HISTORY (3)</strong></td>
<td>Son</td>
<td>3</td>
<td>20</td>
<td>01</td>
<td>W 1:30-4</td>
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<td>Focus on the history of the great ancient of East Asia</td>
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<td>(China, Korea and Japan) from the premodern era to the</td>
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<td>modern to understand the impact of space/landscape/architecture</td>
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<td>on politics, society, and culture.</td>
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<tr>
<td>140.383</td>
<td>**THINKING AND LIVING WITH ANIMALS: HUMAN-ANIMAL RELATIONSHIPS</td>
<td>Petrozzi</td>
<td>3</td>
<td>20</td>
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<td>IN HISTORY (3)**</td>
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<td>The course analyzes the history of human-animal interactions</td>
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<td>focusing on the way in which discourses and knowledge about</td>
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<td>animals shaped fundamental concepts such as gender,</td>
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<td>culture, agency, and knowledge. Cross-listed with Studies of</td>
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<td>Women, Gender, and Sexuality. Dean’s Teaching Fellowship Course</td>
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<td>140.411</td>
<td><strong>SENIOR RESEARCH SEMINAR (2)</strong></td>
<td>Leslie</td>
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<td>For majors pursuing independent research.</td>
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<td>140.501</td>
<td><strong>INDEPENDENT STUDY</strong></td>
<td>Leslie</td>
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<tr>
<td>140.601</td>
<td>**HISTORY OF SCIENCE, MEDICINE, AND TECHNOLOGY: METHODS,</td>
<td>Fischetti</td>
<td>3</td>
<td>20</td>
<td>01</td>
<td>Th 10:30-12:30</td>
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<td></td>
<td>APPROACHES, PERSPECTIVES**</td>
<td>Hanson</td>
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<td></td>
<td>Lec. Sec. 01: Th 10:30-12:30</td>
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<td></td>
<td>An introductory course at the graduate level to the interpretation of historical evidence; to the social, intellectual, and political analysis of historical data; and to contemporary methods in the history of science, medicine, and technology.</td>
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<td>140.611</td>
<td><strong>SEMINAR IN THE HISTORY OF THE PHYSICAL SCIENCES</strong></td>
<td>Kargon</td>
<td>1</td>
<td>15</td>
<td>01</td>
<td>T 1:30-3:30</td>
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<td>Sec. 01: T 1:30-3:30</td>
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<td>Course Code</td>
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<td>140.617</td>
<td>Seminar in the History of Biological Sciences</td>
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<td>140.629</td>
<td>Beyond the Panopticon: Observing, Representing, and Managing People</td>
<td>Marks/ Mooney</td>
<td>20</td>
<td>Sec. 01</td>
<td>T 4-6pm</td>
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<tr>
<td>140.659</td>
<td>Empire and Nation in Modern East Asia</td>
<td>Son</td>
<td>10</td>
<td>Sec. 01</td>
<td>M 1:30-3:30</td>
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<td>140.641</td>
<td>Departmental Colloquium</td>
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<td>Th 3-4:50</td>
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<td>140.655</td>
<td>Early Modern Science in France</td>
<td>Principe</td>
<td>10</td>
<td>Sec. 01</td>
<td>T 10:30-12:30</td>
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<tr>
<td>140.710</td>
<td>Scientific Revolution</td>
<td>Principe</td>
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<td>Lec.</td>
<td>MW 11-11:50</td>
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<tr>
<td>300.223(H)</td>
<td>THE GERMAN ENLIGHTENMENT (3) Schott Limit 20</td>
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<td>18th century German thinkers, unlike their counterparts elsewhere, explicitly ask</td>
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<td></td>
<td>“What is Enlightenment?” Against the general historical and cultural background, this introductory course will trace different currents of German Enlightenment thought. Readings include, among others, Mendelssohn, Lessing, Kant, Hamann. Cross-listed with History and German and Romance Languages and Literatures</td>
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<tr>
<td>300.333(H)</td>
<td>MODELS OF NARRATIVE SHAPING THE STORY (3) Mackey Limit 15 A comparative study of fictional forms in theory and practice since 1800. Seminar meets at instructor's home. Cross-listed with Writing Seminars</td>
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<td>300.344(H)</td>
<td>GENOCIDE AS A PHILOSOPHICAL PROBLEM (3) Shuster Limit 30 This class will be an empirical and philosophical examination of genocide, particularly focused on perpetrators. In addition to looking at historical case studies of genocide in both the ancient and modern world, we will attempt to deal with the philosophical questions that emerge from these cases. These include but are not limited to genocide definition, legal issues in genocide prosecution, and meta issues such as the relationship between modernity and genocide. Cross-listed with Anthropology, Jewish Studies, History, Philosophical and Political Science Dean's Teaching Fellowship Course</td>
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<td>300.363(H)</td>
<td>READING JUDITH SHAKESPEARE WOMEN PLAYWRIGHTS OF EARLY MODERN ENGLAND (3) Patton Limit 15 Virginia Woolf's account of the thwarted career of Shakespeare's hypothetical sister, Judith, frames our reading of women playwrights, poets, and diarists of 16th and early 17th century England. Cross-listed with English and Studies of Women, Gender, and Sexuality</td>
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<tr>
<td>300.383(H)</td>
<td>WHAT MAKES US DESIRE? (3) Marriott Limit 20 This course will analyze different philosophical and literary conceptions of desire. Readings will include Plato, J. S. Mill, Freud, Proust, Klein, Nietzsche, Cavell, Deleuze &amp; others. Cross listed with Anthropology</td>
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<td>300.399(H)</td>
<td>POETRY AND PHILOSOPHY (3) Dechand Limit 15 Selected episodes in the &quot;ancient quarrel&quot; between poetry and philosophy. Topics include Plato's objections to Homer, Samuel Taylor Coleridge's belief that &quot;a great Poet must be, implicit if not explicit, a profound Metaphysician,&quot; and Wallace Stevens &amp; his Collect of Philosophers. Supplementary essays by Derrida, Seafie, and M. H. Abrams.</td>
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<tr>
<td>360.223(HS)</td>
<td>INTRODUCTION TO FEMINIST FILM THEORY (3) Gerrits Limit 13 This course explores feminist film theory and the political stakes of cinema in the context of psychoanalysis and semiotics. Cross-listed with Interdepartmental, Film and Media Studies and Studies of Women, Gender, and Sexuality</td>
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<tr>
<td>372.146(H)</td>
<td>BASIC BLACK &amp; WHITE PHOTOGRAPHY (3) Berger Limit 7 per section Attendance at 1st Class is Mandatory</td>
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<td>373.149 (H)</td>
<td>VISUAL REALITY (3)</td>
<td>Bakker</td>
<td>3</td>
<td>Freshmen by permission only</td>
<td>Sec. 01</td>
<td>F 1:30-4:30</td>
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<tr>
<td>373.151 (H)</td>
<td>PHOTOSHOP AND THE DIGITAL DARKROOM (3)</td>
<td>Berger</td>
<td>3</td>
<td>Prior knowledge of Photoshop is not required.</td>
<td>Sec. 01</td>
<td>Th 10:30-11:30</td>
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<tr>
<td>360.133 (H)</td>
<td>GREAT BOOKS: WESTERN TRADITION OR THE HUMANITIES: A TRADITION OF CLASSICS (3)</td>
<td>Egginton/Patton/Giarusso</td>
<td>3</td>
<td>Limit 15 per section</td>
<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
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<tr>
<td>300.503</td>
<td>INDIVIDUAL HONORS WORK – Open only to Juniors admitted to the Honors Program</td>
<td>Macksey and participating faculty</td>
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<td>300.801</td>
<td>INDEPENDENT STUDY-FIELD EXAMS</td>
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<td>300.803</td>
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<td>300.805</td>
<td>LITERARY PEDAGOGY</td>
<td>deVries</td>
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<tr>
<td>360.651</td>
<td>ANTHROPOLOGY OF “THE EVERYDAY”</td>
<td>Khan</td>
<td>15</td>
<td>Cross-listed with Political Science, Anthropology, German and Romance Languages and Literature, and Geography and Environmental Engineering</td>
<td>Sec. 01</td>
<td>F 10-12</td>
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<td>300.810</td>
<td>INDEPENDENT STUDY</td>
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<td>300.813</td>
<td>DISCUSSION RESEARCH</td>
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<td>300.807</td>
<td>LITERARY PEDAGOGY</td>
<td>deVries</td>
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# INTERDEPARTMENTAL

**Philosophy, Classics, and German and Romance Languages and Literatures**

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Section</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>360.147 (H,S)</td>
<td>ADAM SMITH AND KARL MARX (3)</td>
<td>Jelavich/Schoenberger</td>
<td>Sec. 01</td>
<td>W</td>
<td>1:30-4</td>
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<td>Freshmen only</td>
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<td></td>
<td>Smith and Marx are often treated as icons in debates about capitalism and their thinking is reduced to sound bites. In this course we read them closely to see what they really said. You may be surprised. Cross-listed with History and Geography and Environmental Engineering</td>
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<tr>
<th>Course Code</th>
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<th>Instructor</th>
<th>Section</th>
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<tbody>
<tr>
<td>360.223 (H,S)</td>
<td>INTRODUCTION TO FEMINIST FILM THEORY (3)</td>
<td>Gerrits</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>1:30-2:45</td>
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<td>Limit 15</td>
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<td></td>
<td>This course explores feminist film theory and the political stakes of cinema in the context of psychoanalysis and semiotics. Cross-listed with Studies of Women, Gender, and Sexuality, Humanities and Film and Media Studies</td>
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<th>Course Code</th>
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<tr>
<td>360.233 (H)</td>
<td>FEMINIST AND QUEER THEORY (3)</td>
<td>Goodfellow</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td>Limit 15</td>
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<td>This course explores concepts foundational to the development of feminist and queer theory. The class provides the necessary tools to continue future scholarly work in gender and sexuality studies. Cross-listed with Studies of Women, Gender, and Sexuality</td>
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<th>Course Code</th>
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<th>Section</th>
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<tbody>
<tr>
<td>360.528</td>
<td>APPLIED ECONOMICS INTERNSHIP</td>
<td>Hanke</td>
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<td>Prereq: 180.101-102, Limit 10, 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</td>
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<tr>
<td>360.533</td>
<td>DIRECTED READINGS - WGS</td>
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<td>Cross-listed with Studies of Women, Gender, and Sexuality</td>
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## JEWISH STUDIES

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

## GERMAN AND ROMANCE LANGUAGES AND LITERATURES

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<tr>
<td>213.343 (H)</td>
<td>THE HOLOCAUST IN MODERN LITERATURE: THE LIMITS OF REPRESENTATION (3)</td>
<td>Caplan, M.</td>
<td>Sec. 01</td>
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<td>Limit 30, Cross-listed with English and Writing Seminars</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>213.614</td>
<td>PROTO-MODERNIST FICTION, 1890-1914</td>
<td>Caplan, M.</td>
<td>Sec. 01</td>
<td>Th</td>
<td>1-3</td>
</tr>
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<td>Limit 15, Cross-listed with English</td>
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## HUMANITIES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Days</th>
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</thead>
<tbody>
<tr>
<td>300.344</td>
<td>GENOCIDE AS A PHILOSOPHICAL PROBLEM (3)</td>
<td>Shuster</td>
<td>Sec. 01</td>
<td>M</td>
<td>4:30-7pm</td>
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<td>Cross-listed with Anthropology, the Humanities Center, History, Philosophy and Political Science Dean’s Teaching Fellowship Course</td>
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</table>

## NEAR EASTERN STUDIES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>130.330 (H)</td>
<td>SEX AND THE GARDEN (3)</td>
<td>Robbins</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>1:30-2:45</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Limit 8, Cross-listed with Women, Gender, and Sexuality</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>130.341 (H)</td>
<td>TRADITIONALISM VS. ORTHODOXY IN THE MODERN ERA: THE CASE OF JUDAISM (3)</td>
<td>D. Katz</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>9-10:15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Limit 20</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Instructor</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>130.343 (H)</td>
<td>THE DEAD SEA SCROLLS IN ENGLISH (3)</td>
<td>K. McCarter</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>1:30-2:45</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>Limit 60</td>
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</table>
## JEWISH STUDIES

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

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>130.440</td>
<td>ELEMENTARY BIBLICAL HEBREW (3)</td>
<td>Staff</td>
<td>3</td>
<td>10</td>
<td>01</td>
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<td>130.450</td>
<td>ELEMENTARY MODERN HEBREW (3)</td>
<td>Braun</td>
<td>3</td>
<td>15</td>
<td>01</td>
<td>TTh 9-10:15</td>
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<tr>
<td>130.452</td>
<td>INTERMEDIATE MODERN HEBREW (3)</td>
<td>Braun</td>
<td>3</td>
<td>10</td>
<td>01</td>
<td>TTh 10:30-11:45</td>
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<tr>
<td>130.454</td>
<td>ADVANCED MODERN HEBREW (3)</td>
<td>Braun</td>
<td>3</td>
<td>10</td>
<td>01</td>
<td>TTh 12-1:15</td>
</tr>
<tr>
<td>134.608</td>
<td>THE BOOK OF EZEKIEL</td>
<td>Lewis</td>
<td>3</td>
<td>15</td>
<td>01</td>
<td>T 2-4</td>
</tr>
<tr>
<td>134.650</td>
<td>QUMRAN (DEAD SEA) TEXTS</td>
<td>St Carter</td>
<td>3</td>
<td>10</td>
<td>01</td>
<td>TBA</td>
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## LANGUAGE TEACHING CENTER

### ARABIC

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
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<th>Sec.</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>375.115</td>
<td>BEGINNING ARABIC (4.5)</td>
<td>Tahrawi/Abdallah</td>
<td>4.5</td>
<td>18 per section</td>
<td>01</td>
<td>MTWThF 9-9:50</td>
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<tr>
<td>375.215</td>
<td>INTERMEDIATE ARABIC (4)</td>
<td>Abdallah</td>
<td>4</td>
<td>20</td>
<td>01</td>
<td>MTWThF 10-10:50</td>
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<td></td>
<td></td>
<td>02</td>
<td>MTWThF 11-11:50</td>
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<tr>
<td>375.301</td>
<td>ADVANCED ARABIC (3)</td>
<td>Tahrawi</td>
<td>3</td>
<td>15</td>
<td>01</td>
<td>MW 3-4:15</td>
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<tr>
<td>375.401</td>
<td>UPPER ADVANCED ARABIC (3)</td>
<td>Tahrawi</td>
<td>3</td>
<td>18</td>
<td>01</td>
<td>MW 1:30-2:45</td>
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### CHINESE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<th>Credits</th>
<th>Limit</th>
<th>Sec.</th>
<th>Time</th>
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<tbody>
<tr>
<td>373.111</td>
<td>ACCELERATED BEGINNING CHINESE (3.5)</td>
<td>Hsieh</td>
<td>3.5</td>
<td>17</td>
<td>01</td>
<td>MTWThF 10-10:50</td>
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<td></td>
<td></td>
<td>02</td>
<td>MWF 11-11:50</td>
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<tr>
<td>373.115</td>
<td>BEGINNING CHINESE (4.5)</td>
<td>Lievens</td>
<td>4.5</td>
<td>17</td>
<td>01</td>
<td>MTWThF 10-10:50</td>
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<td></td>
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<td>02</td>
<td>MWF 11-11:50</td>
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<td>04</td>
<td>MTWThF 1:30-2:30</td>
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</table>

Notice: All courses listed above are cross-listed with Africana Studies.
LANGUAGE TEACHING CENTER

No Satisfactory/ Unsatisfactory

373.211 (H) ACCELERATED INTERMEDIATE CHINESE (3.5) Feng  Limit 17 per section
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) Lievens/Staff  Limit 17 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 373.211-212.

373.303 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.

373.315 (H) UPPER INTERMEDIATE CHINESE (3.5) Feng  Limit 17 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 feasible and written assignments will be given. Accelerated students should register for Sec. 01.

373.415 (H) ADVANCED CHINESE (3) Hsieh  Limit 25
Prereq: 373.315  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.

373.451 (H) SELECTED READINGS IN CHINESE FICTION AND SHORT STORY (3) Lievens  Limit 17
Prereq: 373.416
This is an advanced reading course devoted primarily to reading literature and fiction in Chinese by some of the most insightful writers of modern China. The main purposes of this course are to enlarge students' vocabulary, to improve students' reading comprehension, to maintain students' conversation skills though class discussion, to increase students' understanding of culture and the society of China, and to enhance students' writing ability through composition assignment and writing the project. Students registering for this course must have finished four years of Chinese language or its equivalent.

ENGLISH AS A SECOND LANGUAGE

370.600 ORAL SKILLS FOR INTERNATIONAL TEACHING ASSISTANTS  Shiffman  Limit 12 per section
Perm. Req’d. No Auditors Open to Graduate students only. Through a variety of communication activities, international TAs who are non-native speakers of English work to improve fluency, accuracy, and intelligibility in speaking and increase listening comprehension in interactions with undergraduates. Additional language lab practice reinforces classwork.
**LANGUAGE TEACHING CENTER**

370.601 COMMUNICATION STRATEGIES IN THE AMERICAN CLASSROOM  
*Sloffman*  
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 practicing teaching.

**HINDI**

381.101 BEGINNING HINDI (3)  
*Shiffman*  
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  
TTh 12-1:15  
02  
TTh 3-4:15

381.201 (H) INTERMEDIATE HINDI I (3)  
*Datla*  
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.  
No Satisfactory/ Unsatisfactory  
Sec. 01  
TTh 4:30-5:45

381.311 (H) HINDURDU CONVERSATION (3)  
*Datla*  
Limit 18  
Prereq: 381.202 or equivalent  
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.  
Sec. 01  
T 6-8:30pm

**JAPANESE**

378.101 SLOW-PACED BEGINNING JAPANESE I  
*Katagiri*  
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. Note: Students who need to fulfill their language requirement of third-year Japanese by the end of their junior year of who want to take the Advanced Japanese course in their senior year should take 378.115-116.  
Sec. 01  
MWF 9-9:50

378.103 SLOW-PACED BEGINNING JAPANESE III  
*Staff*  
Limit 17  
Part three 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. Note: Students who need to fulfill their language requirement of third-year Japanese by the end of their junior year of who want to take the Advanced Japanese course in their senior year should take 378.115-116.  
Sec. 01  
MW 11-11:50, TTh 10:30-11:45  
MW 12-12:50, TTh 12-1:15

378.115 BEGINNING JAPANESE (4.5)  
*Nakao/Katagiri*  
Limit 17 per 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 tests, oral/aural drill in class and work in the language laboratory are important. May not be taken S or U. Those who have conflict on Th or F with lab work may attend a different section.  
No Satisfactory/ Unsatisfactory  
Sec. 01  
MTWTh 11-11:50  
02  
MTWTh 12-12:50  
03  
MTWTh 1:30-2:20

378.215 (H) INTERMEDIATE JAPANESE (4.5)  
*Zon*  
Limit 17 per section  
Prereq: 378.316 or equivalent  
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.  
Sec. 01  
MW 11-11:50,  
TTh 10:30-11:45  
02  
MW 12-12:50,  
TTh 12-1:15

378.311 JAPANESE CONVERSATION (2.5)  
*Zon*  
Prereq: 378.216 or equivalent  
Limit 17  
Advanced training in spoken Japanese, at the completion of Intermediate Japanese, available to those with equivalent proficiency. Students will develop more interactive skills, using authentic audio/video materials.  
Sec. 01  
MW 1:30-2:20
LANGUAGE TEACHING CENTER

reading/writing instructions.

378.315 (H) UPPER INTERMEDIATE JAPANESE (3.5) Katagiri
Prereq: 378.215-216 Lab Req
Limit 17 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.

Sec. 01 MWF 10-10:50

378.415 (H) ADVANCED JAPANESE (3.5) Nakao
Prereq: 378.316 or equivalent Lab Req’d.
Limit 17 By using four skills in participatory activities (reading, presentation, and discussion), students will develop reading skills in modern Japanese and deepen and enhance their knowledge on Kanji and Japanese culture.

Sec. 01 MWF 10-10:50

AFRICAN LANGUAGES

KISWAHILI

379.151 BEGINNING KISWAHILI I (3) Kamau
Limit 20 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). Cross-listed with Africana Studies

Sec. 01 TTh 10:30-11:45

379.251 (H) INTERMEDIATE KISWAHILI I (3) Kamau
Limit 15 Prereq: 379.151-152 This course places emphasis on conversational skills as well as reading, writing and composition skills. It includes analyses of the culture, history and socio aspects of this linguistic group. Resources in the Language Lab are incorporated in the course. Cross-listed with Africana Studies

Sec. 01 TTh 9-10:15

KOREAN

380.101 ELEMENTS OF KOREAN I (3) Kang
Limit 18 Focuses on improving speaking fluency to Limited Proficiency so that one can handle simple daily conversations with confidence. It provides basic high-frequency structures and covers Korean holidays. No Satisfactory/ Unsatisfactory

Sec. 01 TTh 9-10:15

380.201 (H) INTERMEDIATE KOREAN READING AND WRITING (3) Kang
Limit 18 Prereq: Existing demonstrable skills in spoken Korean. 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 tree.

Sec. 01 TTh 10:30-11:45

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.

Sec. 01 TTh 1:30-2:45

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

Sec. 01 MW 4:30-5:45

RUSSIAN

377.131 ELEMENTS OF RUSSIAN I (4) Samilenko/Cascade
Limit 18 per section Designed to give student a firm foundation in the language, with special emphasis on the development of vocabulary, basic reading, and conversational skills. (Section 02 taught at Goucher College)

Sec. 01 MTWF 11-11:50
Sec. 02 MTWF 9-9:50

377.208 (H) INTENSIVE INTERMEDIATE RUSSIAN (4) Cascade
Limit 18 per section Prereq. 377.132 Intensive oral work; continued emphasis on grammar and reading comprehension.

Sec. 01 MTWF 12-12:50
Sec. 02 MTWF 11-11:50
LANGUAGE TEACHING CENTER
(Section 02 taught at Goucher College)

377.211 (H) INTRODUCTION TO RUSSIAN LITERATURE I (3) Samilienko
Prereq: 377.115 Limit 18
An introduction to the important periods of Russian literature. Critical readings in works chosen from the 19th and 20th centuries.
Taught in Russian.

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 IN RUSSIAN COMEDY & DRAMA (3) Samilienko Limit 18 Rotating topics in 20th-century prose, poetry, drama, or film. This course addresses major eighteenth and nineteenth century works of Russian comedy and drama including the works of Fonvizin, Gogol, and Chekhov.
Taught in Russian.

377.501 INDEPENDENT STUDY-RUSSIAN
Samilienko Through arrangement with the instructor.

SANSKRIT

383.111 BEGINNING SANSKRIT (3) Saini
Limit 18 A beginning level course with emphasis placed on the basic listening, reading, and writing of the language. The reading and writing system will be introduced in a very systematic manner, there by, students will not have to learn all the vowels and the consonants at once before getting to read the words. Basic sentences will be drawn from the Sanskrit Literature. Simple Vedic Mantras from the Vedas and Upanishads, verses from the Bhagavad Gita and the sutras from the Yoga Sutras will be read.

PROGRAM IN LATIN AMERICAN STUDIES

361.130 (HLS) LATIN AMERICAN SOCIETIES AND CULTURES: AN INTRODUCTION (3) Cerbone Limit 50
This course is designed to introduce the major characteristics of Latin American societies and cultures. Topics include the impacts of Amerindian civilizations, colonization and Afro-descendants in the shaping of contemporary Latin American societies. May not be taken Satisfactory/Unsatisfactory

Through readings and discussion of texts, viewing of films and performance art, this course studies varied histories of Mexican, Puerto Rican, Cuban and other Latin American peoples in the U.S. Students will develop a general understanding of major issues facing Latinas/os in the 21st century as well as gain an understanding of the impact Latino culture has on US society and politics.

361.315 (HLS) PROTEST, POLITICS, AND DEMOCRACY IN LATIN AMERICA (3) Pagli Limit 25 Are protests as characteristic of democracy as elections? This course examines challenges to traditional ideas of democratic participation in Latin America, focusing on nonelectoral contestation such as protest, charismatic populism, and violent insurgencies. Cross-listed with Political Science

361.323 (HLS) HUMAN RIGHTS IN LATIN AMERICA (3) Rojas-Perez Limit 25 By focusing on the sentences of the Inter American Human Rights Court, this course examines how universal human rights laws, discourses and institutions have been used to transform
PROGRAM IN LATIN AMERICAN STUDIES

cultural norms, social relations and national politics in Latin America.

361.353 (S)  HISTORY OF U.S.-LATIN AMERICAN RELATIONS (3) Smith Limit 55
Honors U.S. relations with Latin America, from founding of the U.S. until today.
Cross-listed with Political Science
Sec. 01  Th 1:30-4

070.373 (H,S)  ANTHROPOLOGY OF MENTAL ILLNESS (3) Han Limit 50
Cross-listed with Public Health Studies, Anthropology, and Studies of Women, Gender, and Sexuality.
Sec. 01  Th 12-1:15

070.378 (H,S)  CULTURAL PROPERTY AND POLITICS IN LATIN AMERICA (3) Poole Limit 55
Cross-listed with Anthropology
Sec. 01  W 1:30-4

100.115 (H,S)  COLONIAL LATIN AMERICA (3) Russell-Wood Limit 25
Survey of Latin America since 1340 with special attention to politics, economics, and culture.
Cross-listed with History
Sec. 01 02 03 04 05 06
MW 12-12:50 F 12-12:50 F 3-3:50 F 12-12:50 Th 3-3:50

100.441 (H,S)  SOCIETY, POLITICS, AND ECONOMICS IN LATIN AMERICA (3) Knight Limit 20
Survey of Latin America since 1940 with special attention to politics, economics, and culture.
Cross-listed with History
Sec. 01  TTh 10:30-11:45

215.342 (H)  INTRODUCTION TO LATIN AMERICA: THE FORMATIVE YEARS (3) Castro-Klaren Limit 25
Cross-listed with German and Romance Languages and Literatures
Sec. 01  M 2-3:50

230.203 (H)  INTRODUCTION TO LATIN AMERICAN SOCIETIES (3) Von Der Heydt Limit 50
Cross-listed with Public Health Studies and Sociology
Sec. 01  WF 1:30-2:45

361.501  INDEPENDENT STUDY

100.707  COLONIAL LATIN AMERICA
Russell-Wood Limit 15
Cross-listed with History
Sec. 01  TBA

100.709  MODERN LATIN AMERICA
Knight Limit 30 Reading knowledge of Spanish.
Graduate Students only
Cross-listed with History
Sec. 01  W 1:30-3:30

MATHEMATICS

110.105 (Q)  INTRODUCTION TO CALCULUS
(4) Staff Limit 50
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.
Sec. 01 02
Lec. MWF 9-9:50 T 3-3:50

110.106 (Q)  CALCULUS I FOR BIOLOGICAL AND SOCIAL SCIENCE
(4) Sacht Limit 25
Differential and integral calculus. Includes analytic geometry, functions, 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.
Sec. 01 02
Lec. MWF 10-10:50 T 4-5:50

110.107 (Q)  CALCULUS II FOR BIOLOGICAL AND SOCIAL SCIENCE
(4) Staff Limit 30
Sec. 01 02
Lec. MWF 10-10:50 T 3-3:50
MATHEMATICS

Prereq: C- or better in Calculus I
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 distribution.

110.108 (Q) CALCULUS I (FOR PHYSICAL SCIENCES AND ENGINEERING) 04 Th 1:30-2:20
(4) Lec. I MWF 10:10-10:50
Sec. 01 T 1:30-2:20
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.

110.109 (Q) CALCULUS II (FOR PHYSICAL SCIENCES AND ENGINEERING) 03 Th 1:30-2:20
(4) Lec. II MWF 11:10-11:50
Sec. 01 T 1:30-2:20
Prereq: C- or better in Calculus I
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, and the courses are designed to meet the needs of students in these disciplines.

110.113 (Q) HONORS ONE VARIABLE CALCULUS (4) 07 T 1:30-2:20
(4) Staff MWF 10:10-10:50
Sec. 01 F 1:30-2:20
Lec. I
This is an honors alternative to the calculus sequences 110.106-107 or 110.108-109 and meets the general requirements for both Calculus I and II (although the credit hours count for only one course). It is a more theoretical treatment of one variable differential and integral calculus and is based on our modern understanding of the real number system as explained by Cantor, Dedekind, and Weierstrass. Students who want to know the "why's and how's" of calculus will find this course rewarding. Previous background in calculus is not assumed. Students will learn differential calculus (derivatives, differentiation, chain rule, optimization, related rates, etc.), the theory of integration, the fundamental theorem(s) of calculus, applications of integration, and Taylor series. Prerequisite: A strong ability to learn mathematics quickly and on a higher level than that of the regular calculus sequences.

110.201 (Q) LINEAR ALGEBRA (4) 02 T 3:30-4:20
Zucker Lec. MWF 10:10-10:50
Sec. 01 T 3:30-4:20

110.202 (Q) CALCULUS III (4) 05 T 4:30-5:20
Wilson Lec. MWF 11:10-11:50
Sec. 01 T 3:30-4:20
Calculus of functions of more than one variable: partial derivatives, and applications; multiple integrals, line and surface integrals; Green's Theorem, Stokes' Theorem, and Gauss' Divergence Theorem.

110.211 (Q) HONORS MULTIVARIABLE CALCULUS (4) 06 T 3:30-4:20
(4) Wilkin Lec. MWF 12:10-12:50
Sec. 01 F 12:10-12:50
Limit 35 Prereq: B+ or better in Calculus II, or 5 on the Calculus BC AP Exam, or 110.113. This course includes the material in Calculus III (110.202) with some additional applications and theory. Recommended for mathematically able
MATHEMATICS

Students majoring in physical science, engineering, or especially mathematics.

110.212 (Q) HONORS LINEAR ALGEBRA (4) Zucker Limit 30  Prereq: Calculus II or III or equivalent, preferably honors. This course includes the material in Linear Algebra (201) with some additional applications and theory. Recommended for mathematically able students majoring in physical science, engineering, or mathematics. 211-212 used to be an integrated yearlong course, but now the two are independent courses and can be taken in either order. This course satisfies a requirement for the math major that its non-honors sibling does not.

110.302 (E,Q) DIFFERENTIAL EQUATIONS WITH APPLICATIONS (4) Brown Limit 35 per section.

Lec. Sec. 01 MW 1:30-2:45 F 1:30-2:20

110.304 (Q) ELEMENTARY NUMBER THEORY (4) Shalika Limit 25  Prereq: Calculus II and Linear Algebra. The student is provided with many historical examples of topics, each of which serves in an illustration of and provides a background for many years of current research in number theory. 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.

110.311 (Q) METHODS OF COMPLEX ANALYSIS (4) Ha  Limit 35  Prereq: Calculus III Limit 35

Sec. 01 TTh 9-10:15

110.401 (Q) ADVANCED ALGEBRA I (4) Consani Limit 40  Prereq: Linear Algebra An introduction to the basic notions of modern algebra. Elements of group theory: groups, subgroups, normal subgroups, homomorphisms. Generators and relations, free groups, products, commutative (Abelian) groups, finite groups. Groups acting on sets, the Sylow theorems. Definition and examples of rings and ideals. Introduction to field theory. Linear algebra over a field. Field extensions, constructible polygons, non-trisectability.

110.405 (Q) INTRODUCTION TO REAL ANALYSIS (4) Khosravi Limit 55  Prereq: Calculus III and
MATHEMATICS

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) Goldberg
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) Kim
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 geometrics): brachistochrones, geodesics, minimum surface area of revolution, isoperimetric problem, curvature flows. Additional material as required (some differential geometry of curves and surfaces) holding prerequisites to a minimum.

110.439 (Q) INTRODUCTION TO DIFFERENTIAL GEOMETRY (4) 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; theorema egregium; elementary global theorems.

110.601 ALGEBRA Kong Limit 25 Prereq: 110.401-402 or equivalent. An introductory graduate course on fundamental topics in algebra to provide the student with the foundations for number theory, algebraic geometry, and other advanced courses. Topics include group theory, commutative algebra, Noetherian rings, local rings, modules, rudiments of category theory, homological algebra, field theory, Galois theory, and non-commutative algebras.

110.443 (E,Q) FOURIER ANALYSIS (4) Staff

110.445 (Q) INTRODUCTION TO DIFFERENTIAL EQUATIONS (4) Sec. 01
Limit 35 Prereq: Calculus III, Linear Algebra Theory of differential equations: existence and uniqueness theorems, fundamental solutions, qualitative behavior, exact and approximate solutions, numerical methods, applications.

Lec. Sec. 01 F 1:30-2:20

Sec. 01 TTh 10:30-11:45

Sec. 01 TTh 1:30-2:45
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Time</th>
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<tbody>
<tr>
<td>110.605</td>
<td>REAL VARIABLES</td>
<td>Sogge</td>
<td>Sec. 01</td>
<td>TTh 12-1:15</td>
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<td></td>
<td>Prereq: 110.405, 110.415, 110.413 or equivalent. Measure and integration on abstract and locally compact spaces (extension of measures, decompositions of measures, the Lebesgue integral, differentiation, Lp-spaces); introduction to functional analysis; integration on groups; Fourier transforms.</td>
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<tr>
<td>110.611</td>
<td>COMPLEX GEOMETRY</td>
<td>Shiffman</td>
<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
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<tr>
<td>110.615</td>
<td>ALGEBRAIC TOPOLOGY</td>
<td>Boardman</td>
<td>Sec. 01</td>
<td>TTh 1:30-2:45</td>
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<td></td>
<td>Prereq: 110.401, 110.413 Polyhedra, simplicial and singular homology theory, Lefschetz fixed-point theorem, cohomology and products, homological algebra, Künneth and universal coefficient theorems, Poincaré and Alexander duality theorems.</td>
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<tr>
<td>110.617</td>
<td>NUMBER THEORY</td>
<td>Consani</td>
<td>Sec. 01</td>
<td>MW 1:30-2:45</td>
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<td></td>
<td>Prereq: 110.601-602 Limit 25 Topics in advanced algebra and number theory, including local fields and adeles, Iwasawa-Tate theory of zeta functions and connections with Hecke’s treatment, semisimple algebras over local and number fields, adeles geometry.</td>
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<tr>
<td>110.631</td>
<td>PARTIAL DIFFERENTIAL EQUATIONS</td>
<td>Zelditch</td>
<td>Sec. 01</td>
<td>MW 12-1:15</td>
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<td></td>
<td>Prereq: 110.605 Limit 25 An introductory graduate course in partial differential equations. Classical topics include first order equations and characteristics, the Cauchy-Kowalevski theorem, Laplace’s equation, heat equation, wave equation, fundamental solutions, Sobolev spaces, maximum principles. The second term focuses on special topics such as second order elliptic theory.</td>
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<tr>
<td>110.643</td>
<td>ALGEBRAIC GEOMETRY</td>
<td>Shokurov</td>
<td>Sec. 01</td>
<td>TTh 1:30-2:45</td>
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<td></td>
<td>Prereq: 110.601-602 Limit 25 Affine varieties and commutative algebra, Hilbert’s theorems about polynomials in several variables with their connections to geometry. General varieties and projective geometry. Dimension theory and smooth varieties. Sheaf theory and cohomology. Applications of sheaves to geometry, e.g., the Riemann-Roch theorem. Other topics may include Jacobian varieties, resolution of singularities, geometry on surfaces, connections with complex analytic geometry and topology, schemes.</td>
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<tr>
<td>110.645</td>
<td>RIEMANNIAN GEOMETRY</td>
<td>Rubinstein</td>
<td>Sec. 01</td>
<td>MW 1:30-2:45</td>
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<td></td>
<td>Prereq: 110.405 or 110.413, 110.413 or equivalent. Recommended: 110.606. Differential manifolds, vector fields, flows, Frobenius’ theorem. Differential forms, deRham’s theorem, vector bundles, connections, curvature, Chern classes, Cartan structure equations. Riemannian manifolds, Bianchi identities, geodesics, exponential maps. Geometry of submanifolds, hypersurfaces in Euclidean space. Other topics as time permits, e.g., harmonic forms and Hodge theorem, Jacob equation, variation of arc length and area, Chern-Gauss-Bonnet theorems.</td>
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<tr>
<td>110.665</td>
<td>REPRESENTATION THEORY</td>
<td>Boardman</td>
<td>Sec. 01</td>
<td>TTh 9-10:15</td>
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<tr>
<td>110.729</td>
<td>TOPICS IN SEVERAL COMPLEX VARIABLES</td>
<td>Staff</td>
<td>Sec. 01</td>
<td>W 3-5:30</td>
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<tr>
<td>110.733</td>
<td>TOPICS IN ALGEBRAIC NUMBER THEORY</td>
<td>Ono</td>
<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
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</table>
MATHEMATICS

110.741
TOPICS IN PARTIAL DIFFERENTIAL EQUATIONS
Minnocci Limit 25
Sec. 01 MW 1:30-2:45

110.745
INTRODUCTION TO CURVATURE FLOWS Sprek
Limit 25
Sec. 01 MW 10:30-11:45

110.800
INDEPENDENT STUDY - GRADUATES
Staff
Sec. 01 TBA

110.801
THESIS RESEARCH Staff
Sec. 01 TBA

MEDICINE TUTORIALS

These School of Medicine courses are open only to selected junior and senior pre-medical students with the approval of their faculty advisor and Preprofessional Advising. Garfield 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.

Note: Medicine tutorials are not assigned an area, carry two credits and are graded Satisfactory/Unsatisfactory.

MILITARY SCIENCE

374.100
LEADERSHIP LAB (1) Ambersley Limit 100 ROTC students only (Required for all ROTC cadets). 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.
Sec. 01 Th 3:30-5:20

374.101
LEADERSHIP AND MANAGEMENT I (2) Ambersley Limit 20 Freshmen only Perm. Req'd. Coreq: 374.100 (non-ROTC students are not required to take the Leadership Lab) 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.
Sec. 01 Th 1:30-3:20

374.201
LEADERSHIP AND TEAMWORK I (2) Levy Limit 20 Sophomores only, Perm Required Coreq: 374.100 (non-ROTC students are not required to take the Leadership Lab).
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.
Sec. 01 Th 1:30-3:20

374.301
ADAPTIVE TEAM LEADERSHIP (2) Ballesteros Limit 25 ROTC students only Coreq: 374.100 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.
Sec. 01 T 3:30-5:20

374.307
LEADERSHIP IN MILITARY HISTORY (1) Ballesteros Limit 20 This course introduces students to the American military experience and the development of the profession of arms. The importance of historical study is highlighted by noting personal and military examples of changes made as a result of lessons learned from history. Accounts from the major wars and battles throughout US history are described with a focus on how leadership decisions affected the success or failure of military operations.
Sec. 01 T 8-8:50

374.401
DEVELOPING ADAPTIVE LEADERS (2) Pomper Limit 20 ROTC students only Coreq: 374.100 Study includes practical exercises on establishing an ethical command climate and developing values required of a
MILITARY SCIENCE

374.501 (W) INDEPENDENT STUDY IN LEADERSHIP Pomper Limit 10
Prep. Req'd: ROTC students only
Students apply their leadership skills in the ROTC battalion and prepare for commissioning.

PROGRAMS IN MUSEUMS AND SOCIETY

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

389.361 (H) INTRODUCTION TO MATERIAL CULTURE: PREGNANCY, CHILDBIRTH, AND FAMILY IN EARLY AMERICA (3) Arthur Limit 10
Students work with Homewood curator to explore early American life. Directed primary research, object study culminates in student curated exhibition opening in January. Optional intersession installation earns M&S practicum credit.

389.202 (H,S) INTRODUCTION TO THE MUSEUM: ISSUES AND IDEAS (3) Rodini Limit 25
Permission of Instructor Req.
This course considers the practical, political, and ethical challenges facing museums today, including the impact of technology and globalization, economic pressures, and debates over the ownership and interpretation of culture. Cross-listed with History of Art.

389.342 (H) UNDERSTANDING THE MATERIALS AND TECHNIQUES OF THE ART OBJECTS (3) Balachandran Limit 10
This course investigates materials and manufacturing techniques used to produce art and archaeological objects by visiting local museum conservation laboratories and artists, and closely examining objects. M&S practicum course. Permission of Instructor Required. Cross-listed with History of Art, Near Eastern Studies, and Classics.

389.361 (H) INTRODUCTION TO MATERIAL CULTURE: PERSONAL HYGIENE IN EARLY AMERICA (3) Arthur Limit 10
Students explore early American life relating to the region and the Carroll family of Homewood House. Primary research, object study culminates in student-curated thematic exhibition. Earns M&S practicum credit. Cross-listed with History.

389.370 (H) CAMERA ARTS: PHOTOGRAPHING EVERGREEN MUSEUM AND LIBRARY (3) Berger Limit 10 Curator and photography instructor lead students in a photographic exploration of the Evergreen collection. Cross-listed with Art.

100.372 (H,S) THE VICTORIANS (3) Walkowitz Limit 20
Cross-listed with History and Studies of Women, Gender, and Sexuality.

140.215 (H,S) MONUMENTS AND MEMORY (3) Leslie Limit 60
Cross-listed with History of Science and Technology.

140.359 (H,S) MUSEUMS AND GLOBALIZATION (3) Kargon Limit 15
Cross-listed with History of Science and Technology.

389.501 (H,S) INDEPENDENT STUDY Independent study allows students to develop and carry out their own research project in a related field. Projects must be approved and overseen by a supervising faculty member and approved by the program’s associate director. Students should also consult the university’s Independent Work policy.
**MUSIC**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructors</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Limit</th>
<th>Instructor</th>
<th>Time</th>
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<tbody>
<tr>
<td>376.111</td>
<td>RUDIMENTS OF MUSIC THEORY AND MUSICALSHIP (3)</td>
<td>Staff</td>
<td>3</td>
<td></td>
<td>15</td>
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<td>MWF 11-11:50</td>
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<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.</td>
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<tr>
<td>376.211</td>
<td>MUSIC THEORY AND MUSICALSHIP I (3)</td>
<td>Staff</td>
<td>3</td>
<td>Prereq: Qualifying examination or 376.111</td>
<td>15</td>
<td></td>
<td>MWF 11-11:50</td>
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<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.</td>
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<tr>
<td>376.212</td>
<td>MUSIC THEORY AND MUSICALSHIP II (3)</td>
<td>Staff</td>
<td>3</td>
<td>Prereq: 376.211</td>
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<td>MWF 12-12:50</td>
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<td>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>
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<tr>
<td>376.213</td>
<td>MUSIC THEORY AND MUSICALSHIP III (3)</td>
<td>Staff</td>
<td>3</td>
<td>Prereq: 376.212</td>
<td>15</td>
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<td>MWF 10-10:50</td>
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<td>This course continues the 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.</td>
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<td>376.231 (H)</td>
<td>INTRODUCTION TO WESTERN CLASSICAL MUSIC (3)</td>
<td>Staff</td>
<td>3</td>
<td></td>
<td>20</td>
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<td>MW 3-3:50</td>
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<td>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.</td>
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<tr>
<td>376.407 (H)</td>
<td>MUSIC AND EVOLUTION (3)</td>
<td>Tolbert</td>
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<td>15</td>
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<td>Th 1:30-4</td>
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<td>This course will examine the biocultural evolution of music in light of recent interdisciplinary research on the social bases of human cognitive evolution, and explore its implications for current debates in musicology, ethnomusicology, psychology of music, and human cognitive evolution.</td>
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**NEAR EASTERN STUDIES**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Limit</th>
<th>Instructor</th>
<th>Time</th>
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<tbody>
<tr>
<td>130.101 (H)</td>
<td>ANCEINT NEAR EASTERN CIVILIZATIONS (3)</td>
<td>Schwartz</td>
<td>3</td>
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<td>80</td>
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<td>TTh 10:30-11:45</td>
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<td></td>
<td>This course will review important issues in ancient Near Eastern history and culture from the Neolithic era to the Persian period, ca. 9000-330 B.C. Included will be an examination of some of the most momentous changes in human history: the Neolithic agricultural revolution; the emergence of cities, states, and writing; and the formation of vast multiethnic empires. Such cultures as Sumer and Akkad, Egypt, the Hittites, the Bronze and Iron Age societies of Syria-Palestine, and the empires of Assyria, Babylonia, and Persia will be discussed. Cross-listed with Africana Studies</td>
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<tr>
<td>130.257 (H)</td>
<td>THE ARCHAEOLOGY OF FOOD (3)</td>
<td>Maslovich</td>
<td>3</td>
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<td>25</td>
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<td>TTh 9-10.15</td>
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<td>Food is the basis of life and the foundation of civilization. This class will explore the role food has played in Mesopotamian, Egyptian, Mesoamerican, and Andean cultures as evidenced in the archaeological record. Dean's Teaching Fellowship Course</td>
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This seminar will consider some of the historical and art historical issues of the time of Akhenaten, Nefertiti, and Tutankhamun. Why and in what ways did Akhenaten change traditional Egyptian religion? Was all of Egypt transformed by the king's new sole god Aten? Who were the Atenists, and what happened to them in the time of Tutankhamun? Did Akhenaten have an unusual physical form, a genetic disorder, or other medical condition? Or was his image in sculpture solely an artistic fiction? Who was Nefertiti and did she become king after Akhenaten's death? The course will investigate the primary evidence regarding these fascinating questions and will look into a variety of scholarly responses to them. Meets with 133.717. Cross-listed with History of Art

An open inquiry into the biblical story of the Garden of Eden, the course will also trace its interpretation, its use and abuse, over the centuries. Cross-listed with Jewish Studies and Studies of Women, Gender, and Sexuality

During the Modern Era in European history, the Traditionalist Jewish civilization of Europe that had evolved over many centuries went into deep crisis. The new political, social, and intellectual realities which characterized Modernity seriously challenged, overwhelmed, and indeed threatened to destroy the Jewish Traditionalist culture and society. In response, different Traditionalist thinkers and communities evolved a number of strategies for surviving in a modern environment, strategies that unexpectedly transformed Traditionalism into something different, which came to be called Orthodox Judaism. This course explores this process of transformation, which has had an important impact on Jewish life in the modern and post-modern eras. Cross-listed with Jewish Studies

A survey of the manuscripts found at Qumran and other sites near the Dead Sea. Cross-listed with Jewish Studies

Survey of grammar and reading of simple texts. Cross-listed with Jewish Studies

Credit given only on completion of both semesters. May not be taken on a Satisfactory/Unsatisfactory basis. Designed to provide reading and writing mastery, to provide a foundation in Hebrew grammar and to provide basic conversational skills. Cross-listed with Jewish Studies

Designed to enrich vocabulary and provide intensive grammatical review, to enhance fluency in reading, writing and
NEAR EASTERN STUDIES

130.454 (H) ADVANCED MODERN HEBREW (3) Braun Limit 10 Prereq: Solid foundation in reading, writing, and grammar Designed to maximize comprehension of the spoken language through literary and newspaper excerpts providing the student with the language of an educated Israeli. Cross-listed with Jewish Studies

010.290 (H) AT THE VERY EDGE: THE ART OF ISLAMIC SPAIN AS A FURTIVE INTRODUCTION TO "ISLAMIC ART" (3) Bauer Limit 25 Cross-listed with Africana Studies and History of Art

389.342 (H) UNDERSTANDING THE MATERIALS AND TECHNIQUES OF THE ART OBJECTS (3) Balachandran Limit 10 Cross-listed with History of Art, Programs in Museums & Society, and Classics

130.501 READINGS AND RESEARCH Staff

130.503 INDEPENDENT STUDY

131.600 SEMINAR: NEAR EASTERN HISTORY Bryant Limit 15 A three-year history cycle required of all graduate students and forming the core of our graduate program. One year each will be devoted to Egyptian history, Mesopotamian history, and Syro-Palestinian history. 2008-09 will cover Egyptian History.

131.634 SEMINAR IN NEAR EASTERN ARCHAEOLOGY Schwartz Limit 20 Topic varies but can include the archaeology of Mesopotamia, Syria, or Palestine, or thematic discussions (e.g., on ideology, state collapse, etc.).

131.800 READINGS AND RESEARCH Sec. 01 - Staff Sec. 02 - McCarter Sec. 03 - Lewis Sec. 04 - Westbrook

131.848 DISSERTATION RESEARCH Sec. 01 - Bryan Sec. 04 - Staff Sec. 02 - Schwartz Sec. 03 - Westbrook Sec. 06 - Lewis Sec. 07 - Jasnow

132.600 ELEMENTARY AKKADIAN Staff Limit 10 An introduction to the paleography, grammar and lexicon of the Akkadian language, and the reading of simpler texts in that language. Undergraduates admitted to this course earn 4.5 credits

132.650 PERIPHERAL AKKADIAN Westbrook Limit 15 Includes texts from Amarna, Emar, Ugarit, Boghazkoi, Nuzi, Alalakh, and Elam.

132.800 MESOPOTAMIAN SEMINAR Schwartz/Westbrook Limit 20 Research and discussion on topics of current interest.

133.600 INTRODUCTION TO MIDDLE EGYPTIAN (HIEROGLYPHS) Jasnow Limit 15 Taught with 130.400 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.

133.611 MIDDLE EGYPTIAN TEXTS Bryan/Jasnow Limit 15 In this course we read a variety of Middle Egyptian hieroglyphic compositions and documents. Knowledge of Middle Egyptian Required.
NEAR EASTERN STUDIES

133.640 LATE EGYPTIAN Jasnow Limit 5
An introduction to the grammar and texts of Late Egyptian.
Sec. 01 W 9-12

133.717 AKHENATEN, NEFERTITI AND THE AMARNA PERIOD Bryan Limit 5
This seminar will consider some of the historical and art historical issues of the time of Akhenaten, Nefertiti, and Tutankhamun. Why and in what ways did Akhenaten change traditional Egyptian religion? Was all of Egypt transformed by the king's new sole god Aten? Who were the Atenists, and what happened to them in the time of Tutankhamun? Did Akhenaten have an unusual physical form, a genetic disorder, or other medical condition? Or was his image in sculpture solely an artistic fiction? Who was Nefertiti and did she become king after Akhenaten's death? The course will investigate the primary evidence regarding these fascinating questions and will look into a variety of scholarly responses to them. Cross-listed with History of Art
Sec. 01 TBA

133.750 SEMINAR: EGYPTIAN ART AND ARCHAEOLOGY Bryan Limit 15
Cross-listed with History of Art
Sec. 01 TBA

134.608 THE BOOK OF EZEKIEL Lewis Limit 15
A rapid reading course aimed at increasing proficiency in reading the Hebrew text of the book of Ezekiel. Various aspects of translation and interpretation will be studied (e.g., grammar, textual criticism, philology) including literary, historical, and theological questions. Cross-listed with Jewish Studies
Sec. 01 T 2-4

134.630 QUMRAN (DEAD SEA) TEXTS McCarter Limit 10
Reading in Hebrew from selected sectarian scrolls from Khirbet Qumran. Cross-listed with Jewish Studies
Sec. 01 TBA

134.720 UGARITIC I Lewis Limit 15
A year-long course studying Ugaritic language and literature. The first semester will focus on grammar and translating a representative selection of mythological texts. The second semester will concentrate on ritual texts. The course will also be epigraphic in nature using both conventional and digital techniques.
Sec. 01 Th 2-4

NEUROSCIENCE

080.105 (N) AN INTRODUCTION TO NEUROSCIENCE Hendry Limit 120
Our knowledge of brain function from the level of single molecules to human behavior continues to expand at something approaching light speed. That knowledge invades our lives every day. And decisions are made based on that knowledge from every corner of life…from physician to politician and every stop in between. This course is meant to provide a fundamental understanding of how the cells and molecules as well as the regions and systems of the brain work to have you see and hear and move and remember. The course is divided into four sections that progress from the cells of the brain and spinal cord to circuits then systems and finally behaviors. Introduction to Neuroscience is designed for any college student who has an interest in the range of disciplines we call neuroscience.
Sec. 01 MWF 4:30-5:20
## NEUROSCIENCE

### NEUROSCIENCE LAB: A PRACTICAL APPROACH (3)

- **Gorman/Fortune**
- Limit 20 per section
- Prereq: 080.305 and 080.306 or 200.141 or Permission of Instructor

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.

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### THE NERVOUS SYSTEM I (3) Hendry

- Limit 200
- Prereq: 080.203 or 200.141

The nervous system is a fully integrated, two-semester course that surveys the cellular and molecular biology of neurons as well as the structure and function of the nervous system. Cross-listed with Biology

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### BRAIN INJURY AND RECOVERY OF FUNCTION (CM) (ST) (3) Gorman

- Limit 30
- Prereq: 080.203, 080.305 & 080.306 or 080.205 and 080.304 or Perm. Req’d

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

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### GREAT DISCOVERIES IN NEUROSCIENCE (3) (CM) (ST)

- Baraban
- Limit 30
- Prereq: 080.205 and 080.304, or 080.305 and 080.306

This course examines the historical and intellectual context of selected, key advances in neuroscience, how they were made and the impact they had on an understanding of the nervous system. Particular attention will be paid to advances in cellular and molecular neuroscience. Among the topics covered will be the discovery of monoamine neurotransmitters and of endocannabinoids, the role of neurotrophins in neural development, and prion-based diseases of the brain.

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### PRIMATE BRAIN FUNCTIONS (3)

- Hendry
- Limit 100
- Prereq: 080.205 and 080.304, or 080.305 and 080.306

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

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### VISUAL SYSTEM II (ST) (3)

- Hendry
- Limit 150
- Prereq: Nervous System I or Systems Neuroscience or Cell Biology or Physiological Foundations or Intro to the Human Brain.

From outer segments of photoreceptors to the Fusiform Face Area of the cerebral cortex we have come to understand how the visual system works at each of many fundamental levels. This course examines the basis for perception of visible objects at each of these levels. We will use the secondary literature (scientific reviews) to accent the hard-won truths about visual system functional organization and to

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The following Advanced Seminars (080.411-080.414) in Neuroscience are the official classes for the students who are admitted to the BA/MS program in Neuroscience. They provide 3 credit hours each semester, and are offered in the Fall and Spring terms. The class is composed of a guest lecture by a prominent scientist at the beginning of each semester followed by student presentations focusing on the areas related to the student’s thesis research. Cumulative credit hours of minimum 6 and maximum 12 are required for graduation. Course numbers reflect the cumulative number of semesters each student has taken this course.

080.411 (N) ADVANCED SEMINAR: NEUROSCIENCE I (3) Yoshioka Limit 25 For students in 4th year of the BA/MS Program Perm. Req’d. Sec. 01 TBA

080.412 (N) ADVANCED SEMINAR: NEUROSCIENCE II (3) Yoshioka Limit 25 For students in 4th year of the BA/MS Program Perm. Req’d. Sec. 01 TBA

080.413 (N) ADVANCED SEMINAR: NEUROSCIENCE III (3) Yoshioka Limit 25 For students in 4th year of the BA/MS Program Perm. Req’d. Sec. 01 TBA

080.414 (N) ADVANCED SEMINAR: NEUROSCIENCE IV (3) Yoshioka Limit 20 For students in 4th year of the BA/MS Program Perm. Req’d. Sec. 01 TBA

020.317 (N) SIGNALING IN DEVELOPMENT AND DISEASE (3) Kuruvilla Limit 100 Biology, Molecular and Cellular Biology and Neuroscience Majors only Cross-listed with Biology Sec. 01 MW 4:30-5:45

020.330 (N) GENETICS (3) Hoyt/Cunningham Prereq: 020.305 Limit 320 Cross-listed with Biology Sec. 01 MWF 10-10:50

050.105 (N,S) INTRODUCTION TO COGNITIVE NEUROPSYCHOLOGY (3) McCouey Limit 30 Cross-listed with Cognitive Science Sec. 01 TTh 1:30-2:45

050.339 (N,S) INTRODUCTION TO COGNITIVE DEVELOPMENT (3) Landau Limit 15 Meets with 050.639. Cross-listed with Psychological and Brain Sciences Sec. 01 MW 1:30-2:45

200.344 (N,S) BEHAVIORAL ENDOCRINOLOGY (3) Ball Limit 75 Prereq: 200.141 or 080.205 or Perm. Req’d. Cross-listed with Behavioral Biology and Psychological and Brain Sciences Sec. 01 TTh 1:30-2:45

080.511 INDEPENDENT STUDY

080.531 RESEARCH IN NEUROSCIENCE FRESHMEN

080.541 RESEARCH IN NEUROSCIENCE SOPHOMORES

080.551 RESEARCH IN NEUROSCIENCE JUNIORS

080.561 RESEARCH IN NEUROSCIENCE SENIORS

080.620 THEORETICAL NEUROSCIENCE Niebur Limit 20 Perm. Req’d. Sec. 01 F 4-4:50

080.630 BODIAN SEMINAR SERIES Von Der Heide Limit 30 Perm. Req’d. for Undergraduate Students The Bodian Seminar is an interdisciplinary
NEUROSCIENCE colloquium for discussion of current research into the neural basis of mental processes. Leading researchers, generally from outside the University, are invited to give lectures, which will be announced per e-mail. Undergraduate students who register for this course are asked to study a publication by the speaker, as provided with the announcement, and to prepare a question for each speaker together with a brief discussion of the possible answers.

050.639 INTRODUCTION TO COGNITIVE DEVELOPMENT Landau Limit 25 Meets with 050.339 Cross-listed with Psychological and Brain Sciences and Cognitive Science

080.810 READINGS IN SYSTEMS NEUROSCIENCE 1 Connor/Niebur Limit 20 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. Pass/Fail only

080.850 MENTORED RESEARCH IN NEUROSCIENCE Yoshioka Holland Limit 30 per section

080.851 MENTORED RESEARCH IN NEUROSCIENCE Yoshioka German Limit 30 per section Departmental consent required

080.852 MENTORED RESEARCH IN NEUROSCIENCE Yoshioka Limit 20 Perm. Req’d

080.854 MENTORED RESEARCH IN NEUROSCIENCE Yoshioka Limit 20 For students in the BA/MS Program Perm. Req’d.

PHILOSOPHY

150.111 (H) PHILosophIC CLASSICs (3) Moyar Limit 20 per section: An 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. Cross-listed with Classics

150.201 (H) INTRODUCTION TO GREEK PHILOSOPHY (3) Bot 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-Socrates and the Sophists. Cross-listed with Classics

150.219 (H) BIOETHICS (3) Bot 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
PHILOSOPHY

150.235 (H) PHILOSOPHY OF RELIGION (3) Gross
  Limit 20 per section. Can one prove or disprove the existence of God? What is the relation between reason and faith? Are science and religion at odds with one another? We will consider historically significant discussions of these questions (for example, by Plato, Anselm, Aquinas, Pascal, Hume, and Kierkegaard) as well as important contemporary writings (for example, by Adams, Boyer, Plantinga, and Van Inwagen). Gilman Course in the Humanities

Lec. W 12-12:50
Sec. 01 T 12:15-1:10
Sec. 02 T 1:15-2:20
Sec. 03 T 2:25-3:30
Sec. 04 T 3:35-4:40

150.245 (H) PHILOSOPHY OF MIND: SELF-KNOWLEDGE (3) Williams (Meredith)
  Limit 15 per section. This is an introduction to the key issues and theories in contemporary philosophy of mind. The focus of the course will be the mind-body problem. It will examine the development of the problem and purported solutions, beginning with behaviorism and the identity theory (that mental states just are brain states) to functionalism and the computational theory of mind. It will also address the problem of consciousness and the nature of self-knowledge of others.

Lec. M 9-10:15
Sec. 01 M 9-10:15
Sec. 02 W 9-10:15
Sec. 03 W 9-10:15
Sec. 04 W 9-10:15

150.402 (H) ARISTOTLE (3) Betz
  Limit 25. A study of major selected texts of Aristotle. Cross-listed with Classics

Sec. 01 MW 4:30-6pm

150.412 (H) KANT’S CRITIQUE OF PRACTICAL REASON (3) Förster
  Limit 15. A historical and systematic study of Kant’s ethics and philosophy of religion, with special attention to his Critique of Practical Reason.

Sec. 01 TTh 9-10:15

150.425 (H) THE NOMINALISM-REALISM DEBATE II: THE MODERN DEBATE (3) Förster
  Limit 15. A study of four exemplary modern thinkers with respect to their theories of universals: Locke, Kant (Nominalism), Goethe, Hegel (Realism).

Sec. 01 TTh 1:30-2:45

150.442 (H) THE PHILOSOPHY OF L. WITTGENSTEIN (3) Williams, Meredith
  Limit 20. The philosophy of L. Wittgenstein. This will be a close reading of Wittgenstein’s two greatest works, Tractatus Logico-Philosophicus and Philosophical Investigations

Sec. 01 TTh 3-4:15

150.480 (H) PHILOSOPHY AND GEOMETRY IN HISTORY: EPISODES FROM THE EARLY MODERN PERIOD (3) Holtzman
  Limit 20. Students will explore the relationship between philosophy and geometry in the period from Descartes to Kant from 1650 to 1800, through a study of crucial historical episodes.

Dean's Teaching Fellowship Course

Sec. 01 MW 3-4:15

300.344 (H) GENOCIDE AS A PHILOSOPHICAL PROBLEM (3) Shuster
  Cross-listed with Anthropology, Jewish Studies, History, Humanities and Political Science

Dean’s Teaching Fellowship Course

Sec. 01 M 4:30-7pm

150.511 (W) DIRECTED STUDY
  Individual study of special topics, under regular supervision of a faculty member. Special permission is required.

150.551 HONORS PROJECT
  See departmental major adviser.

150.629 ISSUES IN CONTEMPORARY METAPHYSICS AND EPISTEMOLOGY: MEANING, TRUTH AND METAPHYSICS
  Staff
  Limit 15. Contemporary philosophers who lean toward pragmatism generally favor a non-representative approach to meaning and a deflationary approach to truth. Such philosophers have also often claimed that these views of meaning and truth offer an exit from traditional metaphysics problems. This course will investigate arguments for and against this “metaphysical quietism”. Readings form Blackburn, Braddock, Gibbard, Price, Sellars, Wright, and others.

Sec. 01 Th 1-4:30

150.658 TOPICS IN THE PHILOSOPHY OF LANGUAGE: Gross
  Limit 20. An examination of significant recent work in

Sec. 01 T 2-3:50
PHILOSOPHY

the philosophy of language.

150.810  INDEPENDENT STUDY
For dissertation students.
Sec. 01 Staff
Sec. 02 Eigler
Sec. 04 Mayar
Sec. 05 Bratkiewicz
Sec. 06 Williams (Meredith)
Sec. 07 Bok
Sec. 08 Bett
Sec. 09 Williams (Michael)

150.811  DIRECTED STUDY
Please see 150.810 for section numbers to use when registering.

PHYSICS AND ASTRONOMY

171.101 (EN)  GENERAL PHYSICS FOR PHYSICAL SCIENCE MAJORS I
Lec.  TTH 9:10-10:15
Sec. 01 F 8:30-9:30
Sec. 02 F 8:30-9:30
Sec. 03 F 8:30-9:30
Sec. 04 F 8:30-9:30
Sec. 05 F 8:30-9:30
Sec. 06 F 8:30-9:30
Sec. 07 F 8:30-9:30
Sec. 08 F 8:30-9:30
Sec. 09 F 8:30-9:30
Sec. 10 F 8:30-9:30
Sec. 11 F 8:30-9:30
Sec. 12 F 8:30-9:30
Sec. 13 F 8:30-9:30
Sec. 14 F 8:30-9:30

171.102 (EN)  GENERAL PHYSICS FOR PHYSICAL SCIENCE MAJORS II
Lec.  MWF 11-11:50
Sec. 01 Th 8:30-9:30
Sec. 02 Th 8:30-9:30
Sec. 03 Th 8:30-9:30
Sec. 04 Th 8:30-9:30
Sec. 05 Th 8:30-9:30
Sec. 06 Th 8:30-9:30
Sec. 07 Th 8:30-9:30
Sec. 08 Th 8:30-9:30
Sec. 09 Th 8:30-9:30
Sec. 10 Th 8:30-9:30
Sec. 11 Th 8:30-9:30
Sec. 12 Th 8:30-9:30
Sec. 13 Th 8:30-9:30
Sec. 14 Th 8:30-9:30

171.103 (EN)  GENERAL PHYSICS I FOR BIOLOGICAL SCIENCE MAJORS
Lec.  MWF 9:00-9:50
Sec. 01 T 8:30-9:30
Sec. 02 T 8:30-9:30
Sec. 03 T 8:30-9:30
Sec. 04 T 8:30-9:30
Sec. 05 T 8:30-9:30
Sec. 06 T 8:30-9:30
Sec. 07 T 8:30-9:30
Sec. 08 T 8:30-9:30
Sec. 09 T 8:30-9:30
Sec. 10 T 8:30-9:30
Sec. 11 T 8:30-9:30
Sec. 12 T 8:30-9:30
Sec. 13 T 8:30-9:30
Sec. 14 T 8:30-9:30

171.105 (EN)  CLASSICAL MECHANICS I (4) Staff
Lec.  MWF 11-11:50
Sec. 01 Th 10:30-11:30

173.111 (N)  GENERAL PHYSICS LAB I (1) Staff
Lec.  M 1:30-2:20
Sec. 01 M 1:30-2:20
Sec. 02 M 1:30-2:20
Sec. 03 M 1:30-2:20
Sec. 04 T 1:30-2:20
Sec. 05 T 1:30-2:20
Sec. 06 T 1:30-2:20
Sec. 07 W 1:30-2:20
Sec. 08 W 1:30-2:20
Sec. 09 W 1:30-2:20
Sec. 10 Th 1:30-2:20
Sec. 11 Th 1:30-2:20
Sec. 12 Th 1:30-2:20
Sec. 13 Th 9-10
Sec. 14 M 6-7
Sec. 15 M 6-7
Sec. 16 T 6-7
Sec. 17 T 6-7
Sec. 18 W 6-7
Sec. 19 W 6-7
Sec. 20 W 6-7
Sec. 21 Th 6-7
Sec. 22 Th 6-7
Sec. 23 Th 6-7
PHYSICS AND ASTRONOMY

173.112 (N) INTRO PHYSICS LAB II (1) Staff
Limit 24 per section
Sec. 01 W 1:30-4:30
Sec. 02 W 6-9pm
Sec. 03 Th 1:30-4:30
Sec. 04 Th 6-9pm
Sec. 05 T 6-9pm

Prereq: 173.111 Coreq: 171.102; 171.104; or 171.106
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.

171.113 (N) SUBATOMIC WORLD (3) Staff
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 non-science majors
Sec. 01 MWF 11-11:50

172.113 (N) INTRODUCTION TO FRONTIER PHYSICS (1) Staff
Limit 45 Explores modern experimental methods and theoretical ideas in physics.
Sec. 01 M 1:30-2:20

173.115 (N) CLASSICAL MECHANICS LABORATORY (1) Staff
Limit 30 Coreq: 171.105 Experiments chosen to complement the lecture course Classical Mechanics I, II 171.105-106 and introduce students to experimental techniques and statistical analysis.
Sec. 01 M 6-9pm

171.201 (E,N) SPECIAL RELATIVITY AND WAVES (4) Staff
Limit 30
Prereq: 171.105-106 (preferred) or 171.101-102 or 171.103-104; 110.108-109; Coreq: Calculus 110.202 or 110.211-212 Course continues introductory physics sequence (begins with 171.105-106). Special theory of relativity, mathematics of waves, harmonic oscillation, forced and damped oscillators, electromagnetic waves, diffraction, and interference.
Sec. 01 MWF 11-11:50, Th 1:30-2:20

172.203 (N) CONTEMPORARY PHYSICS SEMINAR (1) Staff
Limit 30
Prereq: 171.101-102, 171.103-104, or 171.105-106 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.
Sec. 01 T 1:30-2:20

171.209 (N) WAVE PHENOMENA WITH BIOPHYSICAL APPLICATIONS (4) Staff
Limit 30
Prereq: 171.101-102 or 171.103-104 or 171.105-106 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.
Sec. 01 MWF 9-9:50

171.301 (N) ELECTROMAGNETIC THEORY II (4) Staff
Limit 30
Prereq: 171.101-102 or 171.105-106; 110.201-202; Coreq: 110.302 or 110.416 Static electric and magnetic fields in free space and matter; Boundary value problems; electromagnetic induction; Maxwell's equations; and an introduction to electrodynamics.
### PHYSICS AND ASTRONOMY

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<tr>
<th>Course Code</th>
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<tr>
<td>171.303 (N)</td>
<td>QUANTUM MECHANICS I (4)</td>
<td>Staff</td>
<td>30</td>
<td>171.202, 171.204, 110.113 Fundamental aspects of quantum mechanics. Uncertainty relations, Schrödinger 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.</td>
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<td>171.312 (N)</td>
<td>STATISTICAL PHYSICS AND THERMODYNAMICS (4)</td>
<td>Staff</td>
<td>25</td>
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<td>Undergraduate course that develops the laws and general theorems of thermodynamics from a statistical framework.</td>
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<tr>
<td>171.313 (N)</td>
<td>INTRODUCTION TO STELLAR PHYSICS (3)</td>
<td>Staff</td>
<td>25</td>
<td>110.108-109, 171.202 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>
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<tr>
<td>171.405 (N)</td>
<td>CONDENSED MATTER PHYSICS (3)</td>
<td>Staff</td>
<td>10</td>
<td>171.304, 110.201-202 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>
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<tr>
<td>171.415 (N)</td>
<td>MATHEMATICAL METHODS FOR PHYSICISTS (4)</td>
<td>Staff</td>
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<td>110.201-202 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>
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<td>171.501</td>
<td>INDEPENDENT RESEARCH: UNDERGRADUATES</td>
<td>Staff</td>
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<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>
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<td>171.503 (W)</td>
<td>SENIOR THESIS</td>
<td>Staff</td>
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<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>
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<tr>
<td>171.601</td>
<td>THEORETICAL MECHANICS</td>
<td>Staff</td>
<td>15</td>
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<td>The Lagrangian, Hamiltonian, and Hamilton-Jacobi methods of mechanics, with applications to some vibrational and rotational problems. A discussion of classical perturbation theory is included.</td>
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<td>Sec. 01</td>
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<td>171.303 (N)</td>
<td>QUANTUM MECHANICS I (4)</td>
<td>Staff</td>
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<td>Sec. 01</td>
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<td>171.312 (N)</td>
<td>STATISTICAL PHYSICS AND THERMODYNAMICS (4)</td>
<td>Staff</td>
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<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
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<td>171.313 (N)</td>
<td>INTRODUCTION TO STELLAR PHYSICS (3)</td>
<td>Staff</td>
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<td>Sec. 01</td>
<td>MW 3-4:15</td>
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<td>171.405 (N)</td>
<td>CONDENSED MATTER PHYSICS (3)</td>
<td>Staff</td>
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<td>Sec. 01</td>
<td>MWF 10-10:50</td>
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<td>171.415 (N)</td>
<td>MATHEMATICAL METHODS FOR PHYSICISTS (4)</td>
<td>Staff</td>
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<td>Sec. 01</td>
<td>MWF 9:9:50</td>
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<td>171.601</td>
<td>THEORETICAL MECHANICS</td>
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<td>Lec.</td>
<td>MF 1:30-2:45</td>
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<td>STATISTICAL PHYSICS AND THERMODYNAMICS (4)</td>
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<td>W 1:30-2:20</td>
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<td>171.313 (N)</td>
<td>INTRODUCTION TO STELLAR PHYSICS (3)</td>
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<td>Sec. 01</td>
<td>T 3-3:50</td>
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<td>171.405 (N)</td>
<td>CONDENSED MATTER PHYSICS (3)</td>
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<td>Sec. 01</td>
<td>TTh 10:30-11:45</td>
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<td>171.415 (N)</td>
<td>MATHEMATICAL METHODS FOR PHYSICISTS (4)</td>
<td>Staff</td>
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<td>Lec.</td>
<td>MWF 10-10:50</td>
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<td>171.405 (N)</td>
<td>CONDENSED MATTER PHYSICS (3)</td>
<td>Staff</td>
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<td>Sec. 01</td>
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<td>171.415 (N)</td>
<td>MATHEMATICAL METHODS FOR PHYSICISTS (4)</td>
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<td>Lec.</td>
<td>MWF 9-9:50</td>
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<td>171.601</td>
<td>THEORETICAL MECHANICS</td>
<td>Staff</td>
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<tr>
<td>Sec. 01</td>
<td>MWF 3-4:15</td>
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<td>171.601</td>
<td>THEORETICAL MECHANICS</td>
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<td>Course Code</td>
<td>Course Title</td>
<td>Staff</td>
<td>Limit</td>
<td>Prerequisites</td>
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<tr>
<td>171.603</td>
<td><strong>ELECTROMAGNETIC THEORY</strong></td>
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<td></td>
<td>Theory of the Maxwell equations, with static and dynamic applications, boundary-value problems, guided and free wave, diffraction, scattering, special relativity, electron theory.</td>
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<tr>
<td>171.605</td>
<td><strong>QUANTUM MECHANICS</strong></td>
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<td>Review of wave mechanics and the Schrödinger 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>
</tr>
<tr>
<td>171.612</td>
<td><strong>INTERSTELLAR MEDIUM</strong></td>
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<td>Basic physics of stellar structure and evolution will be discussed with emphasis on current research.</td>
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<tr>
<td>171.613</td>
<td><strong>RADIATIVE ASTROPHYSICS</strong></td>
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<td>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.</td>
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<tr>
<td>171.621</td>
<td><strong>CONDENSED MATTER PHYSICS</strong></td>
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<td>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.</td>
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<tr>
<td>172.631</td>
<td><strong>PHYSICS SEMINAR</strong></td>
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<td>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.</td>
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<tr>
<td>172.633</td>
<td><strong>LANGUAGE OF ASTROPHYSICS</strong></td>
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<td></td>
<td>Survey of the basic concepts, ideas, and areas of research in astrophysics, discussing general astrophysical topics while highlighting specialized terms often used compared to physics.</td>
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</table>
PHYSICS AND ASTRONOMY

171.703 ADVANCED STATISTICAL MECHANICS Staff
Limit 15
Prereqs: 171.303-304, 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.

172.711 INTERMEDIATE SEMINAR Staff
Limit 25
Nonsepecialist 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 Staff
Limit 20

172.731 CAS RESEARCH SEMINAR Staff
Limit 20

172.735 STARBURST JOURNAL CLUB SEMINAR Staff
Limit 20

172.751 ELEMENTARY PARTICLE PHYSICS SEMINAR Staff
Limit 20

172.753 ADVANCED PARTICLE THEORY SEMINAR Staff
Limit 20

172.763 CONDENSED MATTER PHYSICS SEMINAR Staff
Limit 20

171.801 INDEPENDENT RESEARCH - GRADUATES

POLITICAL SCIENCE

190.101 (S) INTRODUCTION TO AMERICAN POLITICS (AP) (3) Ginsberg
Limit 200
This course is an introduction to
government and politics through the study of the
government and politics of the
United States. All governments combine
crison and legitimacy. In a stable and
legitimate system of government, coercion
is hardly noticed by decent 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.
POLITICAL SCIENCE

190.213 (S) INTERNATIONAL POLITICS (IR) (3) Deudney
Limit 20 per section
Intensive analysis of major approaches to international politics (realism, liberalism, Marxism). Topics include: anarchy, geopolitics, states, nations, balance of power, hegemony, empire, democratic peace, regimes, nuclear weapons, European Union.

Sec. 01 Lec. MW 1:30-2:20
Sec. 02 Lec. F 1:30-2:20
Sec. 03 Lec. Th 1:30-2:20
Sec. 04 Lec. Th 1:30-2:20
Sec. 05 Lec. Th 3:30-5:50
Sec. 06 Lec. Th 3:30-5:50
Sec. 07 Lec. F 1:30-2:20
Sec. 08 Lec. F 3:30-5:50
Sec. 09 Lec. F 1:30-2:20
Sec. 10 Lec. W 3:30-5:50

190.214 (S) INTRODUCTION TO RACIAL AND ETHNIC POLITICS (AP) (3) Spence
Limit 20 What do scholars mean when they use concepts of race and ethnicity, and what are the political implications of these concepts in everyday life? One aim of this course is to answer this question. The second aim of this course is to help first-year college students develop familiarity with these concepts and an understanding of how ideas about racial and ethnic difference have impacted the formation of societies, governments, laws, policies and individuals, even themselves. Comparative in scope, this course will lead students through readings about racial and ethnic relations in countries like Brazil, England, Northern Ireland and China, often utilizing the United States as a referent. Cross-listed with Africana Studies

Sec. 01 Lec. Th 1:30-4

190.221 (S) POLITICAL THEORY OF GENDER AND SEXUALITY (PT) (3) Chambers
Limit 30 Feminist theory and queer theory have been important resources for contemporary political thought, at the same time that key issues concerning gender and sexuality have proved central to both political theory and contemporary politics. This course focuses on theories of gender and sexuality through a selective encounter with feminist and queer theories, and it examines political theories that draw from and speak to those other fields. Texts may include: Beauvoir, Sedgwick, Butler, Scott, Warner, Halperin, and Edelman.

Sec. 01 Lec. TTh 10:30-11:45

190.225 (S) PRESIDENTIAL ELECTIONS (AP) (3) Saldin
Limit 15 This course will examine the historic development of the presidential selection process as well as the features of contemporary campaigns and elections

Sec. 01 Lec. MWF 11-11:50

190.301 (S) GLOBAL POLITICAL ECONOMY (IR) (3) Marlin-Bennett
Limit 35 Prereq. CIP (190.309) or introductory IR course Examines the intersection of politics and economics in global affairs. Focuses on theoretical approaches to global political economy; institutions of governance of the global political economy; flows of goods, services, capital, and information; and transborder problems.

Sec. 01 Lec. MWF 11-11:50

191.317 (S) INTERNATIONAL INSTITUTIONS AND ORGANIZATIONS (IR) (3) Gould
Limit 30 This course will introduce the major theorists informing the study of international organizations and institutions in political science, and then focus on the major international organizations, from the League of Nations to the WTO. For each organization, we will consider not only how the organization works and what it does, but also the conceptual puzzles raised by its activities. Cross-listed with Public Health Studies

Sec. 01 Lec. TTh 12-1:15

190.325 (S) FINDING DEMOCRACY (PT) (3) Chambers
Limit 15 Democracy frequently stands for, equates with, or reduces to, an array of other concepts: majoritarianism, proceduralism, and liberalism; representation, institutions, and rights. This seminar will explore writings in contemporary political theory

Sec. 01 Lec. Th 1:30-4
that seek distinct understandings of democracy and thereby offer alternative approaches to politics and political theory. Texts may include: Rancière, Zizek, Agamben, Honig, Brown, and Mouffe.

190.326 (S)
DEMO CRACY AND ELECTIONS  (CP/PT)  Of Katz  Limit 20 per section
An examination of most aspects of democratic elections with the exception of the behavior of voters. Topics include the impact of various electoral systems and administrative reforms on the outcome of elections, standards for evaluations of electoral systems, and the impact of the Arrow problem on normative theories of democratic elections.

190.329 (S)
NATIONAL SECURITY IN THE NUCLEAR AGE (IR)  (3)  David
Limit 20  This course examines the impact of weapons of mass destruction on international politics with an emphasis on security issues. The first half of the course focuses on the history of nuclear weapons development during the Cold War and theories of deterrence. The second half of the class considers contemporary issues including terrorism, chemical and biological weapons, ballistic missile defense and proliferation. Requirements include a midterm, final and a ten page paper.

191.329 (S)
THE POLITICS, HISTORY AND CULTURE OF THE MAGHREB (IR)  (3)  Lawrence
Limit 25  This lecture-seminar seeks to describe and analyze patterns of domestic and international politics in the Maghreb, or "Arab West," including Morocco, Algeria, Tunisia, Mauritania, and Libya, and focusing on how political construction, social change, and the dynamic political culture of each country affect the region and the globe. Topics and approaches include those of social history, nationalism and complex colonial and post-colonial relationships, Islamism, the politics of identity and the "hybrid" identities of youth, political economy and efforts at integration, and the challenges of democratization and globalizations. Core and primary source material will feature Maghrebi perspectives and debates and local cultural production. Cross-listed with Africana Studies

190.330 (S)
JAPANESE POLITICS (CP)  (3)  Chung
Limit 20  This course introduces students to the major debates and issues of postwar Japanese politics. Topics include nationalism, electoral politics, civil society, and immigration.

190.331 (S)
RACE AND RACISM IN COMPARATIVE PERSPECTIVE (AP/CP)  (3)  Hanshard  Limit 40
(formerly "Comparative Racial Politics")  Students will learn to utilize qualitative, interpretive methods of comparative politics to examine dynamics of racial and/or ethnic tension in the nation-states of Brazil, Britain, France, Germany, and the United States. Readings will emphasize the role of the state, political economy, national culture, racist ideologies and anti-racist politics in the formation, maintenance and transformation of conditions of race-based inequalities. Students will also become familiar with theories and concepts of race and ethnicity, and their relationship to issues of state power, national identity and social policy. Cross-listed with Public Health Studies

190.333 (S)
AMERICAN CONSTITUTIONAL LAW (AP/LP) (3)  Grossman  Limit 73
A two semester exploration of the Supreme Court’s interpretation of the Constitution
POLITICAL SCIENCE

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.

191.335 (S) ARAB-ISRAELI CONFLICT (IR) (3)
Freedman  Limit 35
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 (1947-1949). 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 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.

190.336 (S) PUBLIC OPINION (AP) (3)
Spence  Limit 20  (formerly 'Racial Politics and Public Opinion')

190.338 (S) COURTS, JUDGES, AND LAWYERS (AP/LP) (3)
Grossman  Limit 25  (formerly 'The American Judiciary')
An exploration of the changing role and function of courts, judges, and lawyers in the American legal system, and of our increasingly litigious, rights conscious and adversarial culture. It will address how and why people use the courts to resolve civil disputes, how the courts handle those disputes, and the increasing reliance on alternative and less formal dispute processing forums. It will also examine the role of courts in the criminal justice system.

191.345 (S) RUSSIAN FOREIGN POLICY (IR) (3)
Freedman  Limit 35
This course will explore the evolution of Russian Foreign Policy from Czarist times to the present. The main theme will be the question of continuity and change, as the course will seek to determine to what degree current Russian Foreign Policy is rooted in the Czarist(1613-1917) and Soviet(1917-1991) periods, and to what degree it has operated since 1991 on a new basis. The main emphasis of the course will be on Russia's relations with the United States and Europe, China, the Middle East and the countries of the former Soviet Union—especially Ukraine, the Baltic States, Transcaucasia and Central Asia.

190.346 (S) U.S. IN THE MIDDLE EAST (IR) (3)
Hazbun  Limit 40  Prereq: IR course or instructor's consent
A critical survey of US policy and interests in the Middle East set against the context of national struggles for self-determination, regional geopolitical conflicts, and ideological challenges to US influence in the region.

190.348 (S) DOMESTIC POLITICS OF CONTEMPORARY CHINA (CP) (3)
Tsai  Limit 40  This course examines key issues in contemporary Chinese politics, spanning the period from the Communist Revolution (1949) through the Maoist (1949-1976) and reform era (1978 to present). Particular emphasis will be placed on contemporary challenges, including the emergence of mass
unemployment, gaps in urban-rural incomes, and alternative means of political expression.

191.351 (S) FILM, MEDIA AND POLITICS (3)
Shogan  Limit 15
Aitchison Fellowship students only Taught in Washington D.C.

Sec. 01  T 1-2:50

191.357 (S) AMERICAN POLITICAL THOUGHT
(D) Wolfman Limit 15
Aitchison Fellowship students only Taught in Washington D.C.

Sec. 01  T 3:15-5:05

190.380 (S) LAW MORALITY AND THE STATE
(P/T/LP) (3) Cuthbert Limit 25
What is law? How is law related to the state? Does the state have a relationship to morality or a sense of justice? Does law? This course examines how these questions have been posed by various schools of legal thought. Readings will include texts by Austin, Hart, Dworkin, Unger, Fish, MacKinnon, and Cover.

Sec. 01  TTb 12-1:15

190.389 (S) SEMINAR ON THE HISTORICAL DEVELOPMENT OF THE CONGRESS AND PRESIDENCY (AP)
(S) Cooper 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.

Sec. 01  T 3:30-5:00

190.398 (S) THE POLITICS OF GOOD AND EVIL
(PT) (3) Connolly Limit 16
Prereq: Previous course in political theory or permission of professor

Sec. 01  M 1:30-4

190.402 (S) WASHINGTON INTERNSHIP PROGRAM (3)
Ginsberg
Coreq: 190.403
Taught in Washington D.C.

Sec. 01  TBA

190.403 (S) WASHINGTON SEMINAR (3)
Ginsberg Coreq: 190.402
Taught in Washington D.C.

Sec. 01  T 10-11:50

190.405 (S) FOOD POLITICS (AP/CP) (3)
Sheingate Limit 15 Juniors, Seniors, and Graduate Students Only
This course examines the politics of food at the local, national, and global level. Topics include the politics of agricultural subsidies, struggles over genetically modified foods, government efforts at improving food safety, and issues surrounding obesity and nutrition policy. Cross-listed with Public Health Studies

Sec. 01  W 1:30-4

190.409 (S) COMPARATIVE POLITICS OF SOCIAL MOVEMENTS (CP) (3) Keck Limit 20
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.

Sec. 01  W 1:30-4

190.412 (S) POLITICAL VIOLENCE (IR) (3) David Limit 20
An examination of the ways in which violence has been used to secure political ends. Topics include terrorism, assassination, genocidal, coups, rebellions and war itself. Students examine what makes types of political violence unique and what unites them. (Formerly 190.372)

Sec. 01  T 1:30-4

190.422 (S) REPUBLICANISM (IR) (3) Deudney Limit 60
Readings in classical and

Sec. 01  Th 5-7:30pm
POLITICAL SCIENCE

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.

190.426 (S) TOURISM AND POLITICS IN THE MIDDLE EAST (IR) (3) Hazbun
Limit 15 (formerly Geographies of Global Tourism) Prereq: 190.311, 191.335, or other course on Middle East Politics or instructor’s permission This reading seminar explores the history, political economy, and international relations of travel and tourism with a focus on the region of the Arab Mediterranean and the Middle East. Topics include the geo and cultural politics of leisure travel and transborder mobility, efforts to promote peace, development, and environmentalism through tourism, and issues related to travel, power, and national identity.

190.471 (S) SENIOR THESIS SEMINAR: INTERNATIONAL RELATIONS AND POLITICAL SCIENCE (3) Katz
Limit 50 Seminar designed to familiarize majors in political science and international studies with the requirements of writing a senior thesis. Lectures, group work, and writing assignments help students formulate a topic, research the relevant literature, and write the first chapter. Participation in the seminar is required for students writing a senior honors thesis.

300.344 (H) GENOCIDE AS A PHILOSOPHICAL PROBLEM (3) Shuster
Limit 30 Cross-listed with Anthropology, Jewish Studies, History, Philosophy and Humanities Dean’s Teaching Fellowship Course

230.321 (S) REVOLUTION, REFORM, AND SOCIAL INEQUALITY IN CHINA (3) Andreas
Limit 30 Cross-listed with East Asian Studies, Public Health Studies, and Sociology

230.345 (S) HISTORICAL SOCIOLOGY OF AFRICA (3) Arrighi
Limit 30 Cross-listed with Africana Studies, Public Health Studies, and Sociology

195.477 (S) INTRODUCTION TO URBAN POLICY (3) Newman
Limit 15 Perm. Req’d. 195.477 & 195.478 must be taken together by undergraduates Cross-listed with Public Policy, Sociology, Public Health Studies, Geography and Environmental Engineering, and Africana Studies

195.478 (W) URBAN POLICY INTERNSHIP (3) Newman
Limit 15 Perm. Req’d. 195.478 & 195.477 must be taken together by undergraduates Cross-listed with Public Policy, Sociology, Public Health Studies, Geography and Environmental Engineering, and Africana Studies

190.501 POLITICAL SCIENCE INTERNSHIP
Perm. Req’d
Sec. 01 Gilberg
Sec. 02 Chang
Sec. 03 Katz
Sec. 04 Grossman
Sec. 05 Blyth
Sec. 06 Cooper
Sec. 07 Leslie
Sec. 08 Crenson
Sec. 09 Grovogui

190.503 INTERNATIONAL RELATIONS INTERNSHIP
Perm Req’d.
### INTRODUCTION TO QUANTITATIVE POLITICAL SCIENCE

*Sec. 01* Katz  
Limit 15  
Graduate students only  
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.

**Meeting Time:**  
Sec. 01 W 10-12

### COMPARATIVE RACIAL POLITICS

*Sec. 01* Chung  
Limit 15  
Graduate students only  
This course surveys the major trends in the comparative study of race in political science and critically examines the link between race and politics. Topics include the racial state, neo-racism, and immigration politics.

**Meeting Time:**  
Sec. 01 T 10:30-12:20

### AMERICAN POLITICAL DEVELOPMENT (AP)

*Sec. 01* Sheingate  
Limit 15  
Graduate students only  
An examination of state-building and nation-building throughout American political history.

**Meeting Time:**  
Sec. 01 W 3-4:50

### NATIONALISM

*Sec. 01* Hanchard  
Limit 15  
Despite the clamor over globalization and regionalization in the contemporary world, nationalism remains a central preoccupation for both political actors and students of politics. Though motivated by questions resonant within the discipline of political science (and the field of comparative politics in particular), this course is designed to familiarize students with key texts and debates in the literatures on nationalism in political science, sociology, history and anthropology. The objective of this course is to provide students with a comprehensive overview of...
POLITICAL SCIENCE

major themes, scholarly approaches and
forms of nationalist mobilization in
national and cross-spatial perspective.
Some of the questions to be addressed in
this course are a) what are the roots and
routes of nationalism? b) who are
nationalist political actors, and where do
they come from? c) what is nationalism’s
relation to race, racism and ethnicity d) what is the relationship between various
forms of nationalism and contemporary
considerations of regionalism and
globalization?

190.624 POIESIS LIKE POLITICS Bennett/
Culbert  Limit 15  Graduate students
only This course explores three thinkers-
Plato, Heidegger, and Whitman-who
imagine politics as a creative act or artistic
composition.

190.625 THEORIES OF COMPARATIVE
POLITICS Tsai  Limit 15
Graduate students only This seminar is
intended for graduate students planning to
take the comprehensive exam in
comparative politics, either as a major or
as a minor. In addition to exploring central
methodological debates and analytic
approaches, the seminar reviews the
literature on state-society relations,
political and economic development, social
movements, nationalism, revolutions,
formal and informal political institutions,
and regime durability vs. transition.

190.637 WORLD GOVERNMENT Deudney
Limit 20  Graduate students only
An intensive analysis of large-scale post-
anarchic arrangements in theoretical and
historical perspective. The course begins
with historical ‘universal’ empires and
cosmopolitanism, and extends to late
modern concepts of international
organizations, world confederations and
federations and world states, and their
relationship with ‘sovereign’ states and
political plurality and freedom.

190.641 INTERNATIONAL RELATIONS
THEORY Marlio-rossi  Limit 15
Prereq. Graduate students, BA/MA
students and interested seniors with
instructor’s permission.
Seminar on theories of international
relations. Surveys schools of thought
through critical reading of seminal texts.
Focuses on key concepts such as
order/disorder, agents/structures, power,
causality, sovereignty and the nature of the
state, and differing epistemologies.

190.673 SEMINAR ON INSTITUTIONAL
ANALYSIS (AP) Cooper  Limit 15
Graduate students only
This seminar focuses on the major variants
of institutional analysis in the political
science literature. Agency approaches are
distinguished from structural approaches
and the premises, claims, and problems of
leading examples of each examined.
Emphasis is placed on the manner and
success of these various forms of “new
institutionalism” in explaining the
processes and politics of democratic
regimes.

190.674 WORKSHOP IN RESEARCH AND
WRITING IN POLITICAL SCIENCE
Keck  Limit 10

190.691 COMPLEXITY THEORY AND
POLITICS Blyth/Connolly  Limit 15
Graduate standing or instructor’s
consent A study of complexity theory as
used in biology, comparative politics and
political theory. Approach will be
compared to other traditions in political
science. Involves rethinking causality,
exploration, time materiality and political
POLITICAL SCIENCE

culture. Texts to be decided.

ANTHROPOLOGY OF “THE EVERYDAY” Khan  Limit 15
Cross-listed with Anthropology, German and Romance Languages and Literatures, the Humanities Center, and Geography and Environmental Engineering

Sec. 01  F 10-12

ETERNAL RETURN Pahl  Limit 15
Cross-listed with German and Romance Languages and Literatures

Sec. 01  T 5-7pm

190.800  INDEPENDENT STUDY
Sec. 01 Staff
Sec. 02 Keck
Sec. 03 Connolly
Sec. 04 Grossman
Sec. 05 Katz
Sec. 06 Cooper
Sec. 07 Hanchard
Sec. 08 Creton
Sec. 09 David
Sec. 10 Douthwaite
Sec. 11 Chambers
Sec. 12 Tsai
Sec. 13 Sheingate
Sec. 14 Grovogui
Sec. 15 Spence

190.840  DISSERTATION RESEARCH
Sec. 01 Marlin-Bennett
Sec. 02 Keck
Sec. 03 Connolly
Sec. 04 Grossman
Sec. 05 Katz
Sec. 06 Cooper
Sec. 07 Hanchard
Sec. 08 Creton
Sec. 09 David
Sec. 10 Douthwaite
Sec. 11 Chambers
Sec. 12 Tsai
Sec. 13 Sheingate
Sec. 14 Grovogui
Sec. 15 Spence

PSYCHOLOGICAL & BRAIN SCIENCES

INTRODUCTION TO PSYCHOLOGY (3) Drigotas  Limit 250
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  MWF 11-11:50

INTRODUCTION TO COGNITIVE PSYCHOLOGY (3) Shelton  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  MW 1:30-3

INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3) Ferguson  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  MWF 1:30-2:20

INTRODUCTION TO PHYSIOLOGICAL PSYCHOLOGY (3) Gorman  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  TTh 9-10:15

FRESHMAN SEMINAR: EVOLUTIONARY PSYCHOLOGY (1) Jorg  Limit 15
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 2-2:50
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Instructor</th>
<th>Prerequisites</th>
<th>Section(s)</th>
<th>Days/Time</th>
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<tr>
<td>200.204 (S)</td>
<td><strong>HUMAN SEXUALITY</strong> (3) Kraft Limit 25</td>
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<td>Junior &amp; Senior Psychology, Behavioral Biology</td>
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<td>majors, and WGS minors only</td>
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<td><a href="http://www.psy.jhu.edu">www.psy.jhu.edu</a></td>
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<td>Course focuses on sexual development, sexuality</td>
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<td>across the lifespan, gender identity, sexual</td>
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<td>attraction and arousal, sexually transmitted</td>
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<td>disease, and the history of commercial sex</td>
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<td>workers and pornography.</td>
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<td>200.207 (Q,S)</td>
<td><strong>LAB IN ANALYSIS OF PSYCHOLOGICAL DATA</strong> (3)</td>
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<td>Egeth</td>
<td></td>
<td>Sec. 01</td>
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<td>and analysis in experimental and differential</td>
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<td>psychology. Formerly 200.114</td>
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<td>200.209 (S)</td>
<td><strong>INTRODUCTION TO PERSONALITY THEORY</strong> (3) Piferi</td>
<td>3</td>
<td>Piferi</td>
<td></td>
<td>Sec. 01</td>
<td>MW 2-4:30</td>
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<td>An overview of the major theories of personality</td>
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<td>with their empirical bases and applications.</td>
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<td>200.212 (S)</td>
<td><strong>INTRODUCTION TO ABNORMAL PSYCHOLOGY</strong> (3)</td>
<td>3</td>
<td>Voonberg</td>
<td>Limit 125</td>
<td>Sec. 01</td>
<td>TTh 1:30-2:45</td>
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<td>A survey of the major syndromes of psychological</td>
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<td>mechanisms, development, and diagnosis of</td>
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<td>psychopathology are emphasized.</td>
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<td><strong>EVOLUTIONARY MECHANISMS OF HUMAN BEHAVIOR</strong> (3)</td>
<td>3</td>
<td>Petri</td>
<td>Limit 25</td>
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<td>Perreq. 200.101 Intro. to Psychology This course</td>
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<td>examines the evolution of human adaptive behaviors.</td>
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<td>In particular it examines evolutionary</td>
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<td>contributions to behaviors concerned with</td>
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<td>problems of survival such as mating strategies,</td>
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<td>parenting, and group living.</td>
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<td>200.312 (N,S)</td>
<td><strong>IMAGING THE HUMAN MIND</strong> (3) Courtney</td>
<td>3</td>
<td>Courtney</td>
<td>Limit 20</td>
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<td>and Cognitive Neuroscience (080.205) or Cognitive</td>
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<td>Neuroscience: Exploring the Human Brain (050.203)</td>
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<td>or equivalent</td>
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<td>200.314 (Q,S)</td>
<td><strong>ADVANCED STATISTICAL METHODS</strong> (3)</td>
<td>3</td>
<td>Yantis</td>
<td>Limit 18</td>
<td>Sec. 01</td>
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<td>Janice Perreq. One statistics course Limit 18</td>
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<td>Topics in applied probability and statistical</td>
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<td>inference; analysis of variance; experimental</td>
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<td>design. Intended for graduate students in</td>
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<td>psychology.</td>
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<td>200.326 (S)</td>
<td><strong>LAW, PSYCHOLOGY AND PUBLIC POLICY</strong> (3)</td>
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<td>Aet镌</td>
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<td>Atoye Perreq. An introduction to applications of</td>
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<td>psychological research in policy analysis. Special</td>
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<td>emphasis is given to the use and misuse of</td>
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<td>psychology in Supreme Court advocacy and decision</td>
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<td>making in the areas of children’s rights, adult</td>
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<td>sexuality, and educational and employment</td>
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<td>opportunity. In addition, research into the trial</td>
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<td>process and jury decision making is reviewed,</td>
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<td>with the aim of identifying possible reforms to</td>
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<td>improve the truth-seeking function of the courts.</td>
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<td>Cross-listed with Public Health Studies</td>
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<td>200.328 (S)</td>
<td><strong>THEORY &amp; METHODS IN CLINICAL PSYCHOLOGY</strong> (3)</td>
<td>3</td>
<td>Edwin</td>
<td>Limit 25</td>
<td>Sec. 01</td>
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<td>Edwin Perreq. Abnormal Psychology (200.212)</td>
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<td>Senior Psychology Majors Only A critical</td>
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<td>examination of the methods of observation,</td>
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<td>description, reasoning, and inference that</td>
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<td>underlie the clinical practice of psychology and</td>
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<td>psychiatry. Cross listed with Behavioral Biology</td>
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<td>200.333 (S)</td>
<td><strong>ADVANCED READING IN SOCIAL PSYCHOLOGY</strong> (3)</td>
<td>3</td>
<td>Zagonas</td>
<td>Limit 18</td>
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<td>Zagonas Perreq. Junior &amp; Senior Psychology</td>
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<td>majors only The class is designed as a seminar</td>
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<td>including discussion of primary readings of social</td>
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<td>psychology articles ranging in topics from</td>
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<td>interpersonal relationship to behavior in large</td>
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<td>groups.</td>
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## PSYCHOLOGICAL & BRAIN SCIENCES

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Priority</th>
<th>Corequisites</th>
<th>Sections</th>
<th>Days, Time</th>
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<tbody>
<tr>
<td>200.339 (S)</td>
<td>ISSUES IN COUNSELING AND MENTAL HEALTH CARE (3)</td>
<td>McComb</td>
<td>3</td>
<td>Priority</td>
<td>Psychology Majors</td>
<td>01</td>
<td>Th 1:30-4</td>
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<tr>
<td></td>
<td>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.</td>
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<td>200.344 (N,S)</td>
<td>BEHAVIORAL ENDOCRINOLOGY (3)</td>
<td>Ball</td>
<td>3</td>
<td>Limit</td>
<td>Psychology Majors</td>
<td>01</td>
<td>TTh 1:30-2:45</td>
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<td></td>
<td>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</td>
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<td>200.355 (S)</td>
<td>PSYCHOLOGY OF DECISION MAKING: BEHAVIORAL FINANCE (3)</td>
<td>Raifman</td>
<td>3</td>
<td>Juniors</td>
<td>Psychology Majors</td>
<td>01</td>
<td>T 3-5:30pm</td>
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<td></td>
<td>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.</td>
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<td>and Seniors only</td>
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<tr>
<td>230.302 (S)</td>
<td>CLASS, STRATIFICATION, AND PERSONALITY (3)</td>
<td>Kohn</td>
<td>3</td>
<td>Limit</td>
<td>Psychology Majors</td>
<td>01</td>
<td>TTh 9-10:15</td>
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<td></td>
<td>Cross-listed with Sociology and Public Health Studies</td>
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<td>050.105 (N,S)</td>
<td>INTRODUCTION TO COGNITIVE NEUROPSYCHOLOGY (3)</td>
<td>McCluskey</td>
<td>3</td>
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<td>Psychology Majors</td>
<td>01</td>
<td>TTh 1:30-2:45</td>
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<td></td>
<td>This course will examine relations between brain, mind, and behavior in nonhuman animals, focusing on topics such as learning, memory, attention, decision making, navigation, communication, and awareness. We will take a variety of approaches, including behavioral, computational, Evolutionary, neurobiological, and psychological perspectives. Although mostly we will be considering birds and mammals, the occasional insect or person will creep in. Suggested prerequisite: a course in animal behavior, cognitive psychology, or systems neuroscience. Cross-listed with Cognitive Science and Neuroscience</td>
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<td>050.339 (N,S)</td>
<td>INTRODUCTION TO COGNITIVE DEVELOPMENT (3)</td>
<td>London</td>
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<td>Limit</td>
<td>Psychology Majors</td>
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<td>MW 1:30-2:45</td>
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<td></td>
<td>This course will examine relations between brain, mind, and behavior in nonhuman animals, focusing on topics such as learning, memory, attention, decision making, navigation, communication, and awareness. We will take a variety of approaches, including behavioral, computational, Evolutionary, neurobiological, and psychological perspectives. Although mostly we will be considering birds and mammals, the occasional insect or person will creep in. Suggested prerequisite: a course in animal behavior, cognitive psychology, or systems neuroscience. Cross-listed with Cognitive Science and Neuroscience</td>
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<td>080.330 (N)</td>
<td>BRAIN INJURY AND RECOVERY OF FUNCTION (CM) (ST) (3)</td>
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<td>Cross-listed with Cognitive Science and Neuroscience</td>
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<td>This course examines the recovery of brain function following injury, with a focus on neuroplasticity and neuroregenerative processes.</td>
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<td>080.352 (N)</td>
<td>PRIMATE BRAIN FUNCTIONS (3) (ST)</td>
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<td>Limit</td>
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<td>Cross-listed with Cognitive Science and Neuroscience</td>
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<td>This course examines the anatomy, physiology, and functional organization of the primate brain, with a focus on regions involved in sensory, motor, and cognitive processes.</td>
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<td>290.420 (S)</td>
<td>ORIGINS OF HUMAN SEXUAL ORIENTATION AND VARIATION (3)</td>
<td>Kraft</td>
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<td>Limit</td>
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<td>01</td>
<td>T 3-5:30 pm</td>
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<td>Cross-listed with Behavioral Biology and Studies of Women, Gender and Sexuality</td>
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<td>This course examines the biological and psychological factors that influence human sexual orientation and variation, with a focus on evolutionary, neurobiological, and psychological perspectives.</td>
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<td>200.501</td>
<td>PSYCHOLOGY RESEARCH – FRESHMEN</td>
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<td>S/U grading only</td>
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<td>The student chooses some research problem with the advice and approval of a faculty member.</td>
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<td>200.503</td>
<td>PSYCHOLOGY RESEARCH – SOPHOMORES</td>
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### PSYCHOLOGICAL & BRAIN SCIENCES

#### PSYCHOLOGY READINGS - FRESHMEN

200.505 **PSYCHOLOGY READINGS - FRESHMEN**

#### PSYCHOLOGY READINGS – SOPHOMORES

200.507 **PSYCHOLOGY READINGS – SOPHOMORES** With approval of a faculty member, a student may make arrangements to undertake a program of independent reading on topics not covered in courses.

#### PSYCHOLOGY INTERNESHIP

SU grading only

200.509 **PSYCHOLOGY INTERNESHIP**

#### PSYCHOLOGY READINGS – SENIORS

200.507 **PSYCHOLOGY READINGS – SENIORS** SU grading only The student chooses some research problem with the advice and approval of a faculty member.

#### PSYCHOLOGY READINGS - SENIORS

200.509 **PSYCHOLOGY READINGS - SENIORS** With approval of a faculty member, a student may make arrangements to undertake a program of independent reading on topics not covered in courses.

#### SENIOR HONORS RESEARCH

Seniors working on the honors thesis enroll with the approval of the undergraduate coordinator.

#### INDEPENDENT STUDY - SOPHOMORES

200.538 **INDEPENDENT STUDY - SOPHOMORES**

#### INDEPENDENT STUDY - JUNIORS

200.539 **INDEPENDENT STUDY - JUNIORS**

#### INDEPENDENT STUDY - SENIORS

200.540 **INDEPENDENT STUDY - SENIORS**

#### THE FOLLOWING COURSES ARE FOR GRADUATE STUDENTS ONLY

200.615 **GRADUATE SEMINAR IN FUNCTIONAL NEUROMAGING** General: Limit 30 Perm. Req’d

200.627 **GRADUATE SEMINAR: MEMORY** Shelton

200.631 **TOPICS IN SPATIAL COGNITION** Shelton

200.642 **NEURAL CIRCUITS BEHAVIOR** Fortune, Ball Perm. Req’d This course will consider defined multisynaptic pathways in the vertebrate nervous system that mediate behaviors such as reproductive behavior and communication.

200.648 **AGING, COGNITION, NEURODEGENERATIVE DISORDERS I** Albert

200.661 **PROFESSIONAL PSYCHOLOGY** Yamits Limit 30 An introduction to postdoctoral activities (e.g., grant applications, journal article submission, meeting presentations, the politics of psychology and American science) for Ph.D. candidates in psychology.

200.670 **ADVANCED SEMINAR: VISION** Egeth/Yamits This seminar will cover advanced topics in vision from the perspectives of several disciplines. Topics include human visual psychophysics, perception and cognition, and computational vision.

050.639 **INTRODUCTION TO COGNITIVE DEVELOPMENT** Landau Limit 25 Meets with 050.339 Cross-listed with Cognitive Science and Neuroscience

200.810 **RESEARCH IN PSYCHOLOGY** Staff Students plan and execute original research under guidance of advisors. Results are usually prepared in a form suitable for publication.

200.811 **RESEARCH SEMINAR: HUMAN PERFORMANCE** Egeth

200.813 **RESEARCH SEMINAR: COGNITIVE DEVELOPMENT** Feigenson

200.815 **RESEARCH SEMINAR: LEARNING** Holland

200.818 **NEUROSCIENCE DECISION MAKING** Stephan

200.820 **DIRECTED READINGS AND RESEARCH** Staff Guided independent readings and research in special fields.

200.821 **RESEARCH SEMINAR: BEHAVIORAL NEUROSCIENCE** Bull

200.823 **RESEARCH SEMINAR: NEUROETHOLOGY** Fortune
PSYCHOLOGICAL & BRAIN SCIENCES

200.825 RESEARCH SEMINAR: PSYCHOBIOLOGY Gallagher Sec. 01 TBA

200.828 RESEARCH SEMINAR: PERCEPTION Fantzl Sec. 01 Th 1:30-3

200.841 RESEARCH SEMINAR: NEURAL SYSTEMS OF MEMORY AND ATTENTION Courtney Sec. 01 Th 10-12

200.849 TEACHING PRACTICUM Staff Sec. 01 TBA

PUBLIC HEALTH STUDIES

280.222 (H,S) SOCIAL HISTORY OF HIV/AIDS IN BALTIMORE (3) Goodyear Sec. 01 W 3-5:30

280.345 (Q,S) BIOSTATISTICS IN PUBLIC HEALTH (4) Cope Sec. 01 M 2-2:50

280.380 (S) INTRODUCTION TO GLOBAL HEALTH (3) Tielsch Sec. 01 TTh 9-10:15

280.399 (S) PRACTICUM IN COMMUNITY HEALTH (3) Goodyear/Gebo Sec. 01 M 4:30-6pm

280.495 (S) HONORS IN PUBLIC HEALTH-SEMINAR (3) Gebo Sec. 01 TTh 12-1:15

070.373 (H,S) ANTHROPOLOGY OF MENTAL ILLNESS (3) Han Sec. 01 TTh 10:30-11:50

070.391 (H,S) RELIGION AND THE PROBLEM OF SUFFERING (3) Singh Sec. 01 M 4:30-7

100.202 (H,S) CHILDREN WITHOUT PARENTS: ORPHANED, ABANDONED AND STOLEN CHILDREN IN AMERICAN HISTORY (3) Adelman Sec. 01 TTh 3-4:15
<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Instructor</th>
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<th>Prerequisites</th>
<th>Cross-listed with</th>
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<tr>
<td>100.333 (H,S)</td>
<td>GLOBAL PUBLIC HEALTH SINCE WORLD WAR II (3) Galambos/Morgan</td>
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<td>3</td>
<td>Limit 15 per section</td>
<td>Cross-listed with History</td>
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<tr>
<td>100.343 (H,S)</td>
<td>THE POWER OF PLACE: RACE AND COMMUNITY IN EAST BALTIMORE</td>
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<td>3</td>
<td>Cross-listed with Africana Studies, History, and Anthropology</td>
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<td>140.105 (H,S)</td>
<td>HISTORY OF MEDICINE: ANTIQUITY TO SCIENTIFIC REVOLUTION (3) Pomata</td>
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<td>3</td>
<td>Limit 20 per section</td>
<td>Cross-listed with History of Science and Technology</td>
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<td>140.143 (H,S)</td>
<td>GENETICS IN MEDICINE AND SOCIETY (3) Comfort</td>
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<td>Cross-listed with History of Science and Technology</td>
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<td>150.219 (H)</td>
<td>BIOETHICS (3) Rod. Limit 20 per Cross-listed with Philosophy</td>
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<td>Cross-listed with History of Science and Technology</td>
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<tr>
<td>180.289 (S)</td>
<td>ECONOMICS OF HEALTH (3) Bishai</td>
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<td>3</td>
<td>Limit 75</td>
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<tr>
<td>190.331 (S)</td>
<td>RACE AND RACISM IN COMPARATIVE PERSPECTIVE (3) Hanchard</td>
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<td>3</td>
<td>Limit 40 (formerly ‘Comparative Racial Politics’)</td>
<td>Cross-listed with Political Science</td>
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<td>190.405 (S)</td>
<td>FOOD POLITICS (3) Sheingate</td>
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<td>3</td>
<td>Limit 15 Jr., Sr., and Graduate Students Only</td>
<td>Cross-listed with Political Science</td>
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<tr>
<td>195.477 (S)</td>
<td>INTRODUCTION TO URBAN POLICY (3) Newman</td>
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<td>3</td>
<td>Limit 15 Perm. Req’d</td>
<td>Cross-listed with Political Science, Sociology, Public Policy, Geography and Environmental Engineering, and Africana Studies</td>
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<td>195.478 (W)</td>
<td>URBAN POLICY INTERNSHIP (3) Newman</td>
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<td>Limit 15 Perm. Req’d</td>
<td>Cross-listed with Political Science, Sociology, Public Policy, Geography and Environmental Engineering, and Africana Studies</td>
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<td>200.326 (S)</td>
<td>LAW, PSYCHOLOGY AND PUBLIC POLICY (3) Hofer</td>
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<td>Limit 20 Perm. Req’d</td>
<td>Cross-listed with Psychological and Brain Sciences</td>
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<tr>
<td>230.112 (S)</td>
<td>FRESHMAN SEMINAR ON RACE AND EDUCATION IN THE U.S. (3) Bonney</td>
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<td>3</td>
<td>Limit 15 Freshmen only</td>
<td>Cross-listed with Africana Studies and Sociology</td>
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<tr>
<td>230.203 (S)</td>
<td>INTRODUCTION TO LATIN AMERICAN SOCIETIES (3) Van Der Heydt</td>
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<td>3</td>
<td>Limit 30 Cross-listed with Sociology and Program in Latin American Studies</td>
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<td>230.302 (S)</td>
<td>CLASS, STRATIFICATION, AND PERSONALITY (3)</td>
<td>Kohn</td>
<td>01</td>
<td>TTh 9-10:15</td>
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<td>230.321 (W)</td>
<td>REVOLUTION, REFORM, AND SOCIAL INEQUALITY IN CHINA (3)</td>
<td>Andreas</td>
<td>01</td>
<td>W 3-5:30</td>
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<td>230.333 (W)</td>
<td>QUALITY AND INEQUALITY IN AMERICAN EDUCATION (3)</td>
<td>Alexander</td>
<td>01</td>
<td>TTh 1:30-2:45</td>
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<td>230.345 (S)</td>
<td>HISTORICAL SOCIOLOGY OF AFRICA (3)</td>
<td>Arrighi</td>
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<tr>
<td>270.320 (N)</td>
<td>THE ENVIRONMENT AND YOUR HEALTH (3)</td>
<td>Kensler</td>
<td>01</td>
<td>TTh 4:30-5:45</td>
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<td>570.108 (E)</td>
<td>INTRODUCTION TO ENVIRONMENTAL ENGINEERING (3)</td>
<td>Alavi</td>
<td>01</td>
<td>TTh 12-1:15</td>
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<td>570.109 (H)</td>
<td>ENVIRONMENT &amp; SOCIETY: TOWARDS SUSTAINABILITY (3)</td>
<td>Norman</td>
<td>01</td>
<td>MWF 9-9:50</td>
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<td>570.465 (H)</td>
<td>WATER RESOURCE DEVELOPMENT: HISTORY AND PRINCIPLES (3)</td>
<td>Wolman</td>
<td>01</td>
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<td>280.501</td>
<td>INTERNSHIP IN PUBLIC HEALTH</td>
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<td>280.505</td>
<td>INDEPENDENT RESEARCH - FRESHMEN/SOPHOMORES</td>
<td>Goodyear</td>
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<td>280.507</td>
<td>INDEPENDENT STUDY IN PUBLIC HEALTH</td>
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<td>280.511</td>
<td>INDEPENDENT RESEARCH - JUNIORS/SENIORS</td>
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<td>280.519</td>
<td>PUBLIC HEALTH PRACTICE (2)</td>
<td>Gwinn</td>
<td>01</td>
<td>S/U Only</td>
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For specific course descriptions and details, please refer to the course listings provided.
PUBLIC HEALTH STUDIES
including: health promotion theory, body image, sexual health, alcohol and other drugs, and stress management. Skills include program planning, listening, communication, assertiveness, facilitation, and presentation. Application includes outreach presentations, awareness events, community building, and social action. Open to all majors but students must complete all course requirements to remain a member of PEEPs.

PUBLIC POLICY

195.477 (S) 195.478 (W) INTRODUCTION TO URBAN POLICY (3) Newman Limit 15 Perm. Req’d. 195.477 & 195.478 must be taken together by undergraduates This seminar surveys key urban policy challenges and opportunities faced by U.S. cities. Course topics include a critical analysis of the continuing viability of cities in the context of current economic and demographic dynamics, fiscal stress, governance, economic development, poverty and race, drugs, homelessness, federal urban policy, and survival strategies for declining cities. Cross-listed with Political Science, Sociology, Public Health Studies, Geography and Environmental Engineering, and Africana Studies Sec. 01 T 5-7pm

195.603 APPLIED MICROECONOMICS FOR POLICY MAKING (3) Rocha Limit 40 Perm. Req’d. The goal of this course is to communicate the basic principles of microeconomics by emphasizing applications to the solution of public problems. Students examine how markets operate and how they fail. This includes an analysis of the reasons for government intervention. Public vs. private goods, the problem of externalities, the pricing of public goods, and related issues will be addressed. The course provides the student with elements of a theoretical framework useful in addressing policy problems. Sec. 01 W 12-2:20

195.605 STATISTICAL AND DATA ANALYSIS FOR POLICYMAKING I (3) Grandea Limit 40 This course sequence over two semesters teaches the application of statistical techniques commonly used in policy analysis and decision analysis including measures of central tendency, correlation, analysis of variance, and multivariate analysis. The course uses actual policy problems to demonstrate applications of techniques. Sec. 01 Th 5:15-7:45pm

195.607 THE POLICY PROCESS Staff Limit 40 This course examines the influence of political and organizational factors on the various stages of the policy process including problem identification, developing alternative responses, assessing the political feasibility of alternative responses, generating political support, budgeting and resource allocation, and implementing policy decisions through both public and private institutions. Sec. 01 M 6-8pm

195.609 POLICY ANALYSIS FOR THE REAL WORLD Newman Limit 50 Perm. Req’d. This course teaches students to think analytically and to apply analytic thinking to policy Sec. 01 T 9:30-1
PUBLIC POLICY

problems. Students work through several real-world problems primarily in social, urban, and health policy, to master the essential steps of any policy analysis: identifying the problem, assessing the available evidence, specifying goals and constraints, and examining policy alternatives. Course goals also include understanding some of the major policy debates of the day, and communicating in a simple, clear, and direct way.

195.610 VALUE, ETHICS, AND PUBLIC POLICY

Ventriss

Limit 35 Including the philosophical bases of public action, notions of responsibility of individuals to society, and alternative forms of citizen action, from political participation to voluntary service.

195.611 PROGRAM EVALUATION

Barnow

Limit 40. This course provides the student with an introduction to the use of qualitative and quantitative evaluations for social programs. The course reviews rationale for evaluation and its use in budgeting, policy assessments, research and development, and program improvement. The course addresses cost-benefit analysis, experimental and quasi-experimental designs, selection bias, and methods of overcoming problems. The course includes an introduction to use of cost-benefit analysis. Students undertake a critical review and reanalyze data from existing evaluations.

195.621 INTERNSHIP

Staff

Limit 40. The internship usually takes place during the summer between the two years of the program. It involves placement in a public or private agency in the U.S. or another country, and preparation of a paper that takes a critical look at the relationship between on-the-job experience and concepts learned in class, and an example of a written product produced on the job.

195.687 MANAGEMENT SYSTEMS FOR NONPROFIT ORGANIZATIONS

Hall

This course provides an overview of the key management systems nonprofit leaders use to run their organization. A substantial portion of the course focuses on financial management. Additional topics include data collection, human resource management systems, and IT systems.

195.825 INDEPENDENT STUDY

Staff

Special readings course for master’s students in policy studies only. This course may also be taken in conjunction with an undergraduate course in another department to enhance or supplement existing courses in a student’s field of concentration. This course requires the consent of the student’s advisor.

195.827 GRADUATE SEMINAR LECTURES

Staff

Sec. 01 TBA

SOCIOLOGY

230.101 (S) INTRODUCTORY SOCIOLOGY (3)

Bennett/Cherlin

Limit 55 per section

This course covers the basic concepts of Sociology and applies these concepts to the analysis of human societies.

Sec. 01

Lec. MW 11-11:50

02 F 10-10:50

03 F 11-11:50

04 F 11-11:50

05 F 11-11:50

06 F 12-12:50

07 F 12-12:50

08 F 1-1:50

230.112 (S) FRESHMAN SEMINAR ON RACE AND EDUCATION IN THE U.S. (3)

Bennett

Limit 15 Freshmen only

The goal of this course is to explore issues of race and ethnicity in American education. Through lectures, films, and discussions, students will become familiar with the various sociological lenses through

Sec. 01 Th 3-5:30
SOCIOLOGY

which the educational issues facing Blacks, Asians, Latinos, and American Indians are analyzed.

Cross-listed with Africana Studies and Public Health Studies

230.203 (S) 
INTRODUCTION TO LATIN AMERICAN SOCIETIES (3) 
Von Der Heydt, Limit 30 
This course is designed as an introduction to Latin America’s societies for beginners, providing a survey of Latin America through its historical, economic, social, and political dimensions. We will analyze the pre-Columbian civilizations and the legacy of colonialism to understand the origins of the multiethnic societies and then focus on the contemporary development. For the first part of the semester we are going to analyze the process chronologically, the second part the course is organized thematically. We focus on class structure, race, ethnicity and social movements. This course will offer background information to build a solid foundation for further specialization in a region or a theme. 

Cross-listed with Public Health Studies and Program in Latin American Studies

230.205 (Q,S) 
INTRODUCTION TO SOCIAL STATISTICS (4) 
McDonald, Limit 15 students per section 
This course will introduce students to the application of statistical techniques commonly used in sociological analysis. Topics include measures of central tendency and dispersion, probability theory, confidence intervals, chi-square, anova, and regression analysis. Hands-on computer experience with statistical software and analysis of data from various fields of social research.

230.302 (S) 
CLASS, STRATIFICATION, AND PERSONALITY (3) Kohn, Limit 30 
An intensive examination of the research literature, much of it based on survey research carried out by the instructor and his international collaborators, on the relationships of social class and social stratification with personality. The course will examine the links between people’s positions in the class structure and the stratification hierarchy of their society and their more proximate conditions of life, particularly their job conditions, and how these conditions, in turn, affect (and are affected by) such basic dimensions of personality as intellectual flexibility, self-directedness of orientation, and feelings of well-being or distress. The research has been conducted principally in the United States, Japan, Poland when it was socialist, Poland and Ukraine during their transitions from socialism to nascent capitalism, and (in the instructor’s current research) China during its very different transformation. 

Cross-listed with Psychological & Brain Sciences and Public Health Studies

230.310 (S) 
BECOMING AN ADULT: LIFE COURSE PERSPECTIVES ON SCHOOL, WORK AND FAMILY TRANSITION (3) Deluca, Limit 30 
While students may already be personally familiar with the subject matter, the course examines the sociological and psychological dimensions of this demographically dense period known as the transition to adulthood. Emphasizes life course theories of human development through readings of empirical work on adolescence, the transition to college, early employment, and early family formation. Attention is paid to the ways class, gender, race, and nationality influence the pathways, choices, and outcomes of young people. A statistics/sociology background is helpful but not required.
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<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
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<th>Time</th>
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<tr>
<td>230.316</td>
<td>THE AFRICAN-AMERICAN FAMILY</td>
<td>McDonald</td>
<td>3</td>
<td>30</td>
<td>T 3-5:30</td>
<td>Cross-listed with Africana Studies and Studies of Women, Gender, and Sexuality</td>
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<td>230.321</td>
<td>REVOLUTION, REFORM, AND SOCIAL INEQUALITY IN CHINA</td>
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<td>Cross-listed with East Asian Studies, Political Science, and Public Health Studies</td>
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<td>230.333</td>
<td>QUALITY AND INEQUALITY IN AMERICAN EDUCATION</td>
<td>Alexander</td>
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<td>TTh 1:30-2:45</td>
<td>Cross-listed with Africana Studies and Public Health Studies</td>
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<td>230.334</td>
<td>THE CITY IN TIME AND SPACE; HISTORICAL SOCIOLOGY OF THE URBAN WORLD</td>
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<td>TTh 1:30-2:45</td>
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<td>362.111</td>
<td>INTRODUCTION TO AFRICAN AMERICAN STUDIES</td>
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<td>Cross-listed with African Studies</td>
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<td>195.477</td>
<td>INTRODUCTION TO URBAN POLICY</td>
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<td>T 5-7pm</td>
<td>Perm. Req'd, 195.477 &amp; 195.478 must be taken together by undergraduates Cross-listed with Political Science, Public Policy, Public Health Studies, Geography and Environmental Engineering, and Africana Studies</td>
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The requirement for the seminar is an honors thesis, due at the end of the second semester. The thesis may be a piece of research that the student does independently, or it may be a thoughtful and critical review of the work in a selected area.

230.600 INTRODUCTION TO SOCIAL STATISTICS
McDonald  Limit 15
This course will introduce students to the application of statistical techniques commonly used in sociological analysis. Lecture meets with 230.205.

230.608 PROSEMINAR IN SOCIOLOGY
Alexander  Limit 15
Individual one-hour presentations by faculty members will introduce students to the faculty’s substantive interests and research styles.

230.612 SEMINAR IN SOCIAL INEQUALITY
Cherlin  Limit 15
This seminar attempts a broad survey of sociological theorizing and research on social stratification and the role of social institutions in generating and mitigating inequality.

230.615 SEMINAR ON PANEL DATA ANALYSIS
Hao  Limit 15
The course covers advanced methods for panel data analysis, including discrete time models for continuous vs. categorical dependent variables, random vs. fixed effects, and static vs. dynamic processes. Applications of these models to sociological research will be illustrated.

230.645 SOCIOLOGICAL ANALYSIS
Kohn  Limit 15
An intensive analysis of a wide range of sociological studies, designed to acquaint the student with how sociologists deal with important theoretical issues, using a variety of methods and sources of data. Particular attention will be paid to the logical coherence of the studies and to the fit between data and interpretation.

230.650 MACRO-COMPARATIVE RESEARCH METHODS
Silver  Limit 15
The course examines methods of studying long-term, large-scale social change. Both qualitative and quantitative methods are covered.

230.651 POLITICS AND SOCIETY
Andreas  Limit 15
This seminar surveys important texts that treat key problems of political sociology including the rise of the modern state, the origins and nature of liberal democracy, the relationship between political and economic power, the nation-state model and nationalism, gender and the state, ideology, political contention, collective identity, and collective action.

230.800 INDEPENDENT STUDY
Students may request instructors to arrange reading or research courses fitting particular needs and interests.

230.801 RESEARCH ASSISTANTSHIP

230.802 DISSERTATION RESEARCH

230.804 RESEARCH APPRENTICESHIP

230.811 TEACHING ASSISTANTSHIP

230.815 RESEARCH PAPER I
Staff

230.816 RESEARCH PAPER II
Staff

THE THEATRE ARTS & STUDIES PROGRAM

225.300 (H) CONTEMPORARY THEATRE AND FILM: AN INSIDER’S VIEW
Clain  Limit 50
An introduction to the Performing
# Theatre Arts & Studies Program

**Arts, including an overview of theatre history, acting styles, and the interaction of art and society. A personal view from inside.**

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<th>Course Code</th>
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<th>Credits</th>
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<tr>
<td>225.301(H)</td>
<td>ACTING AND DIRECTING WORKSHOP I (3)</td>
<td>Astin</td>
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<td>Audition Req'd</td>
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<td>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, Clarrian and Uta Hagen. Emphasis on playing of actions.</td>
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<tr>
<td>225.302(H)</td>
<td>ACTING AND DIRECTING WORKSHOP II (3)</td>
<td>Astin</td>
<td>3</td>
<td>15</td>
<td>Prereq: 225.301 or 225.306 or Perm. Req'd</td>
<td>TTh 10:30-11:45</td>
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<td></td>
<td>The 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>
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<tr>
<td>225.307(H)</td>
<td>DIRECTING SEMINAR (3)</td>
<td>Glossman</td>
<td>3</td>
<td>14</td>
<td></td>
<td>M 6-8:30pm</td>
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<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>
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<tr>
<td>225.314(H)</td>
<td>TECHNICAL DIRECTION FOR THE THEATRE (3)</td>
<td>Roche</td>
<td>3</td>
<td>8</td>
<td></td>
<td>MF 12-1:15</td>
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<td></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>
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<tr>
<td>225.319(H)</td>
<td>PERFORMANCE II (4)</td>
<td>Denithorne</td>
<td>4</td>
<td>20</td>
<td>Prereq: 225.320</td>
<td>Sec. 01 Lab F 2-5:30 TBA</td>
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<td></td>
<td>Auditions will be announced in March for April or May, or call the instructor at x6-0618.</td>
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<tr>
<td>225.320(H)</td>
<td>PERFORMANCE (4)</td>
<td>Denithorne</td>
<td>4</td>
<td>20</td>
<td>Perm. Req'd</td>
<td>F 2-5:30 TBA</td>
</tr>
<tr>
<td></td>
<td>Auditions will be announced in March for April or May, or call the instructor at x6-0618. The student is given specific acting assignments, and develops them as special projects for public performance under the direct supervision of the instructor. The goal is performance on a professional level.</td>
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<tr>
<td>225.323(H)</td>
<td>DESIGN FOR THE STAGE (3)</td>
<td>Coberg</td>
<td>3</td>
<td>12</td>
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<td>T 1:30-4</td>
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<tr>
<td></td>
<td>The class will focus on production techniques, dramatic styles, script analysis, research, development of ground plans and elevations, basic model making techniques, and the transformation of information into dramatic space. Elements surveyed will be illuminated with field trips, film, and guest lecturers.</td>
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<tr>
<td>225.327(H)</td>
<td>THE BONES OF THE THEATRE: DRAMATIC</td>
<td>Martin</td>
<td>3</td>
<td>15</td>
<td></td>
<td>F 1:30-4</td>
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<tr>
<td></td>
<td>STRUCTURES (3)</td>
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<td>Structures of shamanistic theatre, classical comedy, and medieval theatre are discovered in works by Beckett, Foi, Brecht, Churchill, Mee and Weizenbaker. Sanskrit Drama and “rasa” methods are examined against modern artists, Chinese Yuan Drama and Noh</td>
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</table>
THE THEATRE ARTS & STUDIES PROGRAM

225.328 (H) **THE EXISTENTIAL THEATRE: PHILOSOPHY AND THEATRE OF THE ABSURD (3)** Martin
Limit 15
Existentialism, a powerful movement in modern drama and theatre, has had a profound influence on contemporary political thought, ethics, and psychology, and has transformed our very notion of how to stage a play. Selected readings and lectures on the philosophy of Kierkegaard, Nietzsche, Camus and Sartre -- and discussion of works for the stage by Sartre, Ionesco, Genet, Beckett, Albee, Pinter, Athol Fugard (with Nkau & Nshone), Heiner Müller and the late plays of Caryl Churchill. Opportunities for projects on Dürrenmatt, Finch, Havel, Witkiewicz, and Mrozek.

Sec. 01 MW 1:30-2:45

225.345 (H) **HISTORY OF MODERN THEATRE & DRAMA (3)** Denithorne
Limit 25
Designed to impart a deepened appreciation and understanding of today's theatre by surveying the major playwrights, historical movements, and theatre practices of the 20th century. The course also seeks to help students understand theatre's relationship to the societal and political power structure of each era and to introduce students to great dramatic literature in its intended form, which is performance.

Sec. 01 Th 3:30-6pm

225.520 **PROJECTS IN THEATRE** Astín
Perm. Req’d.
Special projects created for and tailored to the individual theatre student. Enrollment limited.

Sec. 01 TBA

STUDIES OF WOMEN, GENDER & SEXUALITY

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

ANTHROPOLOGY

070.373 **ANTHROPOLOGY OF MENTAL ILLNESS** Han

BEHAVIORAL BIOLOGY

290.420 **ORIGINS OF HUMAN SEXUAL ORIENTATION AND VARIATION** Kraft

ENGLISH

060.250 **A SURVEY OF EIGHTEENTH-CENTURY AND ROMANTIC LITERATURE** Ferguson

FILM AND MEDIA STUDIES

061.339 **A CINEMA OF ANXIETY: FILM NOIR** Bucknell

GERMAN AND ROMANCE LANGUAGES AND LITERATURES

214.379 **MAGIC AND MARVEL IN THE RENAISSANCE** Stephens
212.414 **FRENCH MASculinities: FOPS, Dandies, and Reactionaries** Russo
215.451 **EL CINE DE PEDRO ALMODOVAR** Gonzalez
214.650 **THE COSMETIC GAZE: BODY MODIFICATION AND THE CONSTRUCTION OF BEAUTY IN THE 21ST CENTURY** Wogenstein
214.678 **ARIOSTO** Stephens

HISTORY

100.202 **CHILDREN WITHOUT PARENTS: ABANDONED AND STOLEN CHILDREN IN AMERICAN HISTORY** Adelman
100.372 **THE VICTORIANS** Walkowtiz
100.424 **WOMEN AND MODERN CHINESE** Meyer Fung
100.767 **LONDON WORLD CITY** Walkowtiz/Moore

HISTORY OF SCIENCE AND TECHNOLOGY

140.383 **THINKING AND LIVING WITH ANIMALS: HUMAN-ANIMAL RELATIONSHIPS IN HISTORY** Parrozzi
STUDIES OF WOMEN, GENDER & SEXUALITY
Please refer to the departmental listings for complete information regarding these courses.

HUMANITIES CENTER
300.363  READING JUDITH SHAKESPEARE WOMEN
PLAYWRIGHTS OF EARLY MODERN ENGLAND Patton

INTERDEPARTMENTAL
360.223  INTRODUCTION TO FEMINIST FILM THEORY Gerrits
360.233  FEMINIST AND QUEER THEORY Goodfellow
360.533  DIRECTED READINGS – WGS

NEAR EASTERN STUDIES
130.330  SEX AND THE GARDEN Robbins

SOCIOCY
230.316  THE AFRICAN-AMERICAN FAMILY (J) McDonald  Limit 30

WRITING SEMINARS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Seats</th>
<th>Days</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>220.105 (H)</td>
<td>INTRODUCTION TO FICTION AND POETRY WRITING I</td>
<td>Staff</td>
<td>01</td>
<td>MWF</td>
<td>9:45-10:50</td>
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<tr>
<td></td>
<td>TELLING IT STRAIGHT (O)</td>
<td>Staff</td>
<td>02</td>
<td>MWF</td>
<td>9:45-10:50</td>
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<td></td>
<td>Limit 17 per section</td>
<td>Staff</td>
<td>03</td>
<td>MWF</td>
<td>9:45-10:50</td>
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<tr>
<td></td>
<td>This course is a prerequisite for most</td>
<td>Staff</td>
<td>04</td>
<td>MWF</td>
<td>9:45-10:50</td>
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<td></td>
<td>upper level courses</td>
<td>Staff</td>
<td>05</td>
<td>MWF</td>
<td>9:45-10:50</td>
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<tr>
<td></td>
<td>A course in realistic fiction and</td>
<td>Staff</td>
<td>06</td>
<td>MWF</td>
<td>10:00-11:05</td>
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<td></td>
<td>traditional verse, with readings in</td>
<td>Staff</td>
<td>07</td>
<td>MWF</td>
<td>10:00-11:05</td>
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<tr>
<td></td>
<td>Eudora Welty, Vladimir Nabokov,</td>
<td>Staff</td>
<td>08</td>
<td>MWF</td>
<td>11:00-12:05</td>
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<tr>
<td></td>
<td>Henry James, Robert Frost, Paul</td>
<td>Staff</td>
<td>09</td>
<td>MWF</td>
<td>11:00-12:05</td>
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<tr>
<td></td>
<td>Fassett, John Gardner, Susannah Heane,</td>
<td>Staff</td>
<td>10</td>
<td>MWF</td>
<td>11:00-12:05</td>
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<td></td>
<td>and Gwendolyn Brooks. This first</td>
<td>Staff</td>
<td>11</td>
<td>MWF</td>
<td>11:00-12:05</td>
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<td></td>
<td>course for writers is a study of forms of</td>
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<td>12</td>
<td>MWF</td>
<td>12:15-1:20</td>
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<td></td>
<td>short fiction and metered verse</td>
<td>Staff</td>
<td>13</td>
<td>MWF</td>
<td>12:15-1:20</td>
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<td></td>
<td>Students compose short stories and</td>
<td>Staff</td>
<td>14</td>
<td>MWF</td>
<td>12:15-1:20</td>
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<td></td>
<td>poems; includes practice of critical</td>
<td>Staff</td>
<td>15</td>
<td>MWF</td>
<td>12:15-1:20</td>
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<td></td>
<td>attention to literary models and</td>
<td>Staff</td>
<td>16</td>
<td>MWF</td>
<td>12:15-1:20</td>
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<td></td>
<td>workshop of student writing.</td>
<td>Staff</td>
<td>17</td>
<td>TTh</td>
<td>9:30-10:35</td>
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<td>*Note: Sections 12, 13, 19, and 24 are limited</td>
<td>Staff</td>
<td>18</td>
<td>TTh</td>
<td>9:30-10:35</td>
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<td></td>
<td>to those intending major/minor in The Writing</td>
<td>Staff</td>
<td>*19</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>Seminars and are Permission Required. Students</td>
<td>Staff</td>
<td>20</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td>wishing to register for these sections should</td>
<td>Staff</td>
<td>21</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<tr>
<td></td>
<td>email <a href="mailto:dbasford@jhu.edu">dbasford@jhu.edu</a></td>
<td>Staff</td>
<td>22</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td>Staff</td>
<td>23</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>Staff</td>
<td>*24</td>
<td>TTh</td>
<td>12:15-1:15</td>
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<td>Staff</td>
<td>25</td>
<td>TTh</td>
<td>12:15-1:15</td>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Seats</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>220.106 (H)</td>
<td>INTRODUCTION TO FICTION AND POETRY WRITING II</td>
<td>Staff</td>
<td>01</td>
<td>MWF</td>
<td>11:00-12:05</td>
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<td>TELLING IT SLANT (O)</td>
<td>Staff</td>
<td>02</td>
<td>MWF</td>
<td>12:15-1:20</td>
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<td>Limit 17 per section</td>
<td>Staff</td>
<td>03</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td>This course is a prerequisite for most</td>
<td>Staff</td>
<td>04</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>upper level courses</td>
<td>Staff</td>
<td>05</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>The second half of IFP, a course in</td>
<td>Staff</td>
<td>06</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>counter-traditional antirealist fiction and</td>
<td>Staff</td>
<td>07</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>free verse (Emily Dickinson, Virginia Woolf,</td>
<td>Staff</td>
<td>08</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>Elizabeth Bishop, Franz Kafka, Italo Calvino,</td>
<td>Staff</td>
<td>09</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td></td>
<td>and William Carlos Williams).</td>
<td>Staff</td>
<td>10</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<tr>
<th>Course Code</th>
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<th>Seats</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>220.108 (H)</td>
<td>INTRODUCTION TO FICTION AND NON-FICTION (3)</td>
<td>Simpson</td>
<td>01</td>
<td>Th</td>
<td>6:30-9pm</td>
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<td>IFN I can be substituted for IFP I. Permission</td>
<td>Simpson</td>
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<td>not required. Limit 17. A course in realistic</td>
<td>Simpson</td>
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<td>fiction and nonfiction, with readings by</td>
<td>Simpson</td>
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<td>Eudora Welty, Vladimir Nabokov, Henry</td>
<td>Simpson</td>
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<td>James, George Orwell, Beryl Markham,</td>
<td>Simpson</td>
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<td>Truman Capote. Students compose short stories</td>
<td>Simpson</td>
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<td>and essays with attention to literary</td>
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<td>models.</td>
<td>Simpson</td>
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<tr>
<th>Course Code</th>
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<th>Instructor</th>
<th>Seats</th>
<th>Days</th>
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<tbody>
<tr>
<td>220.146 (H)</td>
<td>INTRODUCTION TO SCIENCE WRITING (O)</td>
<td>Staff</td>
<td>01</td>
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<td>Limit 15. Science writing translates science to</td>
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<td>nonscientists. Students read, interview</td>
<td>Staff</td>
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<td>scientists, organize, write initial drafts,</td>
<td>Staff</td>
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<td>then revise, with practice under journalistic</td>
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<td>pressures of deadlines and verification.</td>
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<td>Background in science is useful but not essential.</td>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Seats</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>220.200 (H)</td>
<td>INTRODUCTION TO FICTION (O)</td>
<td>Davies/Roper</td>
<td>01</td>
<td>M</td>
<td>3:30-5:30</td>
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<td></td>
<td>Faux/Reef. Limit 15 per section</td>
<td>Davies/Roper</td>
<td>02</td>
<td>T</td>
<td>3:30-5:30</td>
</tr>
</tbody>
</table>
WRITING SEMINARS

- **Reading and writing of short narrative with focus on basic technique: subject, narrative voice, character, sense of an ending, etc. Students will write weekly sketches, present story analyses in class, and workshop one finished story. Selected parallel readings from such models of the form as Henry James, Anton Chekov, James Joyce, John Cheever, Alice Munro, and others. IPF I and II required for admission. (Formerly 220.191)**

220.201 (H) **INTRODUCTION TO POETRY (3)**
- Williams
- Limit 15
- Perm. Req’d.
- A study of the fundamentals and strategies of poetry writing. This course combines analysis and discussion of traditional models of poetry with workshop critiques of student poems and student conferences with the instructor. (Formerly 220.141)

220.202 (H) **INTRODUCTION TO NONFICTION: MATTERS OF FACT (3)**
- Biddle
- Limit 10
- A first course in nonfiction writing, emphasizing how facts can be woven into narrative forms to portray verifiable, rather than imagined, people and events. Students read and discuss model works, then write frequent papers to refine their own style. (Formerly 220.145)

220.204 (H) **INTRODUCTION TO DRAMATIC WRITING: FILM (3)**
- Lapadula
- Limit 15
- Perm. Req’d.
- An examination of the screenplay as a literary text and blueprint for production. Professional screenplays will be critically analyzed, with focus on character, dialogue, plot development, conflict, pacing, dramatic foreshadowing, the element of surprise, text and subtext, and visual story-telling. Students write one complete script.

220.205 (H) **INTRODUCTION TO DRAMATIC WRITING: PLAYS (3)**
- Lapadula
- Limit 15
- Perm. Req’d.
- Students study conventions and strategies of writing for the stage through examination of the basic principles of dramatic action, character, and language. Analysis of works by dramatic masters (e.g., Shakespeare, Molière, Ibsen), as well as contemporaries such as Vogel, Churchill, and Guare, with writing assignments and critiques of student writing. (Formerly 220.139)

220.316 (H) **SEMINAR: OPINION WRITING (3)**
- Kane
- Limit 20
- The study of exposition and argument in literary prose, with exposure to journalistic practices. Instructor will assign topics on which students write essays subsequently discussed in class and critiqued for style, grammar, coherence, and effectiveness.

220.319 (H) **INTERMEDIATE: NON-FICTION AND NON-FACT (3)**
- Biddle
- Limit 15
- A study of the differences between accuracy and truth in nonfiction writing. Students discuss mutually correct but incongruent biographies, incompatible news reports, hoaxes, fictitious memoir, and class writing assignments chosen to elicit disparate statements of fact.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Sections</th>
<th>Days/Time</th>
</tr>
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<tbody>
<tr>
<td>220.324 (H)</td>
<td>INTERMEDIATE FICTION: LANDSCAPE AND SETTING (3)</td>
<td>McGarry</td>
<td>Sec. 01</td>
<td>T 3-5:30</td>
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<tr>
<td></td>
<td>Students will write sketches and stories.</td>
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<tr>
<td>220.331 (H)</td>
<td>INTERMEDIATE: FORMS OF FICTION (3) Leithauser</td>
<td></td>
<td>Sec. 01</td>
<td>M 1:30-4</td>
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<td>Limit 15   Perm. Req’d. A course in such forms of fiction as</td>
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<tr>
<td>220.339 (H)</td>
<td>SEMINAR: SCIENCE STORIES (3) McGarry</td>
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<td>Sec. 01</td>
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<td>Limit 15   Perm. Req’d. The course’s model is the scientific</td>
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<tr>
<td>220.377 (H)</td>
<td>INTERMEDIATE POETRY: POETIC FORMS (3) Williamson</td>
<td></td>
<td>Sec. 01</td>
<td>Th 1:30-4</td>
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<tr>
<td></td>
<td>Limit 15   Perm. Req’d. A study of the lyric form from image to</td>
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<tr>
<td>220.397 (H)</td>
<td>INTERMEDIATE POETRY: THE LYRIC (3) Scafidi</td>
<td></td>
<td>Sec. 01</td>
<td>M 1:30-4</td>
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<td>Limit 15   Perm. Req’d. A study of the lyric form from image to</td>
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<tr>
<td>220.400 (H)</td>
<td>ADVANCED POETRY (3) Salter</td>
<td></td>
<td>Sec. 01</td>
<td>M 1:30-4</td>
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<tr>
<td></td>
<td>The capstone course in poetry writing. Consideration of various</td>
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<tr>
<td>220.401 (H)</td>
<td>ADVANCED FICTION (3) McDermott</td>
<td></td>
<td>Sec. 01</td>
<td>T 2-4:30</td>
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<td></td>
<td>Limit 15   Perm. Req’d. The capstone course in writing fiction,</td>
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<td>220.411 (H)</td>
<td>READINGS IN POETRY: CONTEMPORARY AMERICAN</td>
<td></td>
<td>Sec. 01</td>
<td>F 1:30-4</td>
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<td></td>
<td>POETRY (3) Scafidi</td>
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<td></td>
<td>Limit 15   This course will have readings in contemporary</td>
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<tr>
<td>220.413 (H)</td>
<td>READINGS IN POETRY: CONTEMPORARY AMERICAN</td>
<td></td>
<td>Sec. 01</td>
<td>Th 1:30-4</td>
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<tr>
<td></td>
<td>FICTION (3) Blake</td>
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<td></td>
<td>Limit 20   Perm. Req’d. A survey study of novels, novellas, and</td>
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<td>300.333 (H)</td>
<td>MODELS OF NARRATIVE SHAPING THE STORY (3)</td>
<td></td>
<td>Sec. 01</td>
<td>F 2-4:30</td>
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<td>Macksey</td>
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<td>Limit 15   Seminar meets at instructor’s home.</td>
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<td>Cross-listed with Humanities</td>
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<td>Course Code</td>
<td>Course Title</td>
<td>Instructor</td>
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<tr>
<td>213.343 (H)</td>
<td>WRITING SEMINARS: THE HOLOCAUST IN MODERN LITERATURE: THE LIMITS OF REPRESENTATION</td>
<td>Caplan, M.</td>
<td>Sec. 01</td>
<td>TTh</td>
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<tr>
<td>220.501</td>
<td>INDEPENDENT STUDY</td>
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<td>Ordinarily no more than one independent study course may be counted among the eight Writing Seminars courses presented for graduation.</td>
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<tr>
<td>220.507</td>
<td>HONORS THESIS</td>
<td>Perm. Req'd</td>
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<tr>
<td>220.509</td>
<td>PRACTICING JOURNALISM INTERNSHIP</td>
<td>Perm. Req'd</td>
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<td>Satisfactory/Unsatisfactory only This internship is given in conjunction with local media and must be taken on a satisfactory/unsatisfactory basis. It covers many aspects of the operation of a metropolitan newspaper or magazine or TV station.</td>
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<tr>
<td>220.610</td>
<td>READINGS IN FICTION: ALTERNATIVES TO REALISM</td>
<td>Leithauser</td>
<td>Sec. 01</td>
<td>W</td>
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<td></td>
<td>Limit 10 We will look at three strains of non-realistic fiction: surreal fiction (readings to include Franz Kafka and Kobo Abe), supernatural fiction (Henry James, M. R. James, Edith Wharton, Sylvia Townsend Warner), and early science fiction (H. G. Wells, Robert Louis Stevenson)</td>
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<tr>
<td>220.613</td>
<td>WRITING ABOUT SCIENCE</td>
<td>Fieldhouse</td>
<td>Sec. 01</td>
<td>M</td>
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<td></td>
<td>Limit 8 A seminar in the writing of factual prose about scientific matters, whether for the general reader or for professional scientists as audience. Weekly writing, editing, and reading assignments.</td>
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<tr>
<td>220.623</td>
<td>FICTION WORKSHOP</td>
<td>McGuirey</td>
<td>Sec. 01</td>
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<td>Limit 12 Discussion and critique of fiction manuscripts by students enrolled in the M.F.A. program. Some assignments possible.</td>
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<tr>
<td>220.625</td>
<td>POETRY WORKSHOP</td>
<td>Smith</td>
<td>Sec. 01</td>
<td>M</td>
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<tr>
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<td>Limit 12 Discussion and critique of poetry manuscripts by students enrolled in the M.F.A. program. Some assignments possible.</td>
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<tr>
<td>220.631</td>
<td>READINGS IN FICTION: THE MODERN SONNET</td>
<td>Salter</td>
<td>Sec. 01</td>
<td>TBA</td>
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<td>Limit 15 Perm. Req'd A study of some of the masters of the sonnet, in both its traditional and more innovative incarnations, in the 20th and 21st century. Poems discussed may include Robinson, Frost, Wiley, Auden, Millay, Cummings, Owen, Higgin, Bishop, Lowell, Merrill, Heaney, Maddox, others. Students will write imitations as well as their own sonnets or sonnet sequence.</td>
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<td>220.800</td>
<td>INDEPENDENT STUDY</td>
<td>Staff</td>
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</table>
G.W.C. WHITING SCHOOL OF ENGINEERING COURSES

APPLIED MATHEMATICS & STATISTICS

550.103 (Q,S)  MATHEMATICS AND POLITICS (4)
Scheinerman  Limit 60
Examining interesting problems from the world of politics including apportionment, resource allocation, voting, and conflict, this course is designed for humanities and social science students who enjoy solving logic puzzles.

Sec. 01  MWF 10-10:50

550.111 (E,Q)  STATISTICAL ANALYSIS I (4)
Torcaso  Limit 45 per section
Prereq: Four years of high school mathematics. Students who may wish to undertake more than two semesters of probability and statistics should consider 550.420-430. First semester of a general survey of statistical methodology. Topics include descriptive statistics, probability models, random variables, expectation, sampling, and 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.

Sec. 01  M 3-3:50
Sec. 02  W 4:30-5:20
Sec. 03  Th 9:20
Sec. 04  Th 12-12:50
Sec. 05  Th 10:30-11:20
Sec. 06  Th 1:30-2:20
Sec. 07  Th 3:30-4:20

550.112 (E,Q)  STATISTICAL ANALYSIS II (4)
Staff  Limit 35 per section
Prereq: 550.111
Second semester of a general survey of statistical methodology. Topics include least squares and regression analysis, correlation, further nonparametric methods, chi-square tests, the likelihood concept, decision theory, Bayesian inference, time series, simultaneous equations, sample survey design. Students who may wish to undertake more than two semesters of probability and statistics should consider 550.420-430.

Sec. 01  M 3-3:50
Sec. 02  W 4:30-5:20
Sec. 03  Th 9:20
Sec. 04  Th 10:30-11:20
Sec. 05  Th 12-12:50
Sec. 06  Th 1:30-2:20
Sec. 07  Th 3:30-4:20

550.171 (Q)  DISCRETE MATHEMATICS (4)
Godbole  Limit 35 per section
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.

Sec. 01  MWF 10-10:50
Sec. 02  MWF 1:30-2:20
Sec. 03  Th 9:20-10:10
Sec. 04  Th 10:30-11:20

550.252 (E,Q)  MATHEMATICAL MODELS FOR DECISION MAKING: STOCHASTIC MODELS (4)
Castello  Limit 40
This course is an introduction to management science and the quantitative approach to decision making. Our focus will be on the formulation and analysis of stochastic models, where some problem data may be uncertain. The covered topics may include Project Scheduling, Decision Analysis, Time Series Forecasting, Inventory Models with Stationary or Nonstationary Demand, Queuing Models, Discrete-Event Simulation, and Quality Management. We emphasize model development and case studies, using spreadsheets and other computer software. The applications we study occur in a variety of applications.

Sec. 01  MWF 1:30-2:20
APPLIED MATHEMATICS & STATISTICS

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.
Lec.  Sec. 01  MWF 9-9:50
02  T 1:30-2:30

550.310 (E,Q) PROBABILITY & STATISTICS FOR THE PHYSICAL SCIENCES AND ENGINEERING (4)
Jedynak Limit 35 per section  Prereq: One year of calculus. Recommended corequisite: multivariable calculus. Students cannot receive credit for both 550.310 and 550.311
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.
Lec.  Sec. 01  MWF 11-11:50
02  T 9-9:50
03  T 4:30-5:20

550.311 (E,Q) PROBABILITY AND STATISTICS FOR BIOLOGICAL SCIENCES AND ENGINEERING (4)
Torcaso  Limit 35 per section  Prereq: One year of calculus; Corequisite: 110.202 recommended. Students cannot receive credit for both 550.310 and 550.311
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.
Lec.  Sec. 01  MWF 10-10:50
02  T 9-9:50

550.361 (E,Q) INTRODUCTION TO OPTIMIZATION (4)
Castello  Limit 35 per section
Prereq: One year of calculus, linear algebra, computing experience. Appropriate for undergraduate and graduate students without the mathematical background required for 550.661. 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 varied optimization techniques including linear programming, network-problem methods, dynamic programming, integer programming, and nonlinear programming.
Lec.  Sec. 01  MWF 12-12:50
02  Th 1:30-2:30

550.385 (E,Q) SCIENTIFIC COMPUTING: LINEAR ALGEBRA (4)
Hur  Limit 30
Prereq: Calculus III, and 550.291 or approved alternative (e.g., 110.311)
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
Lec.  Sec. 01  MWF 9-9:50
APPLIED MATHEMATICS & STATISTICS

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: Multivariable calculus, linear algebra, computing experience. Mathematical concepts and methods for describing and analyzing linear and nonlinear systems that evolve over time. Topics include boundedness, stability of fixed points and attractors, feedback, optimality, Lyapounov functions, bifurcation, chaos, and catastrophes. Examples drawn from population growth, economic behavior, physical and engineering systems. The main mathematical tools are linear algebra and basic differential equations.

550.420 (Q)  INTRODUCTION TO PROBABILITY (4)  Godbole
Limit 50 per section  Prereq: One year of calculus. Recommended corequisite: multivariable calculus. Probability and its applications, at the calculus level. Emphasis on techniques of application rather than on rigorous mathematical demonstration. Probability, combinatorial probability, random variables, distribution functions, important probability distributions, independence, conditional probability, moments, covariance and correlation, limit theorems. Students initiating graduate work in probability or statistics should enroll in 550.620.

550.433 (E,Q)  MONTE CARLO SIMULATION AND RELIABILITY (4)  Nairnas
Limit 45  Prereq: 550.430, computing experience. Applications of numerical analysis to statistics. 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.
DATA MINING (4)  Jedynak  Limit 40
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.

STATISTICAL LEARNING WITH APPLICATIONS (3) Geman  Limit 35
Prereqs: 550.310 or 550.311 as well as some additional exposure to probability and statistics, e.g., 550.420 and/or 550.430
Statistical modeling and inference, inductive learning and information theory together provide a cohesive framework for machine perception, which amounts to building a data-description machine converting physical measurements (images, molecular counts, etc.) to interpretations or descriptions. Recurring themes include quantifying uncertainty, estimating generalization error, Occam’s razor, the bias/variance dilemma and small-sample learning. Various problems in computational vision and computational biology will be analyzed in this context, including visual tracking, object recognition, cancer diagnosis, neural decoding and learning molecular networks.

INVESTMENT SCIENCE (4) Tzitzouris  Limit 50
Prereqs: One year of calculus, an introductory course in probability and statistics (such as 550.310, 550.311 or its equivalent)  
Some familiarity with optimization is desirable but not necessary. Intended for upper-level undergraduate and graduate students, this course offers a rigorous treatment of the subject of investment as a scientific discipline. Mathematics is employed as the main tool to convey the principles of investment science and their use to make investment calculations for good decision-making. Topics covered in the course include the basic theory of interest and its application to fixed-income securities, cash flow analysis and capital budgeting, mean-variance portfolio theory, and the associated capital asset pricing model, utility function theory and risk analysis, derivative securities and basic option theory, portfolio evaluation. The student is expected to be comfortable with the use of mathematics as a method of deduction and problem solving.

MODELING AND ANALYSIS OF SECURITIES AND FINANCIAL MARKETS (4) Audley  Limit 30
Prereqs: 110.302 and 550.420
This course will develop the mathematical concepts and techniques for modeling cash instruments and their hybrids and derivatives.
APPLIED MATHEMATICS & STATISTICS

550.446 (E,Q)  RISK MANAGEMENT ANALYSIS AND HEDGING (4)  Audley  Limit 35  
Prereq. 550.444  This course applies advanced mathematical techniques to the measurement, analysis, and management of risk. The focus is on financial risk. Sources of risk for financial instruments (e.g., market risk, interest rate risk, credit risk) are analyzed; models for these risk factors are studied and the limitation, shortcomings and compensatory techniques are addressed.

550.447 (E)  TOPOLOGICAL TOPOLOGY (1)  Goldman  Limit 40  
Prereq. Linear programming, general mathematical maturity. Topology provides interesting topics for a variety of mathematical analyses (optimization, statistical, etc.) The course will discuss a number of these applications.

550.463 (E,Q)  NETWORK MODELS IN OPERATIONS RESEARCH (4)  Fishkind  Limit 35  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.


550.493 (E,Q)  MATHEMATICAL IMAGE ANALYSIS (3)  Younes  Limit 35  Prereq. Calculus III (110.202) and Linear Algebra (110.201 or equivalent)  
The course introduces a few of the basic concepts of functional analysis and of the calculus of variations, and describes how they apply to low level image processing (denoising, deblurring, contour extraction, image transforms). We will define Hilbert and Banach spaces, orthogonal bases, the notion of duality, and discuss the choice of an appropriate space for images. This will induce linear and nonlinear image smoothing methods, and the Chan-Vese’s segmentation algorithm. We will also discuss the extraction of local information from images, including the SIFT and other feature extractors, windowed Fourier and continuous wavelet transforms, and an introduction to orthogonal wavelet transforms.

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.

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.

550.553  INTERNSHIP

550.600  DEPARTMENT SEMINAR  
Staff  Limit 50  
A variety of topics discussed by speakers from within and outside the university. Required of all resident
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Limit</th>
<th>Prerequisites</th>
<th>Description</th>
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<tbody>
<tr>
<td>550.620</td>
<td><strong>PROBABILITY THEORY I</strong> Full</td>
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<td>限45</td>
<td>Prereq: 110.405 and 550.420 or equivalents</td>
<td>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.</td>
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<tr>
<td>550.630</td>
<td><strong>STATISTICAL THEORY</strong> Pruebe</td>
<td>Limit 25</td>
<td>限25</td>
<td>Prereq: 550.420 or 550.620</td>
<td>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.</td>
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<td>550.635</td>
<td><strong>TOPICS IN BIOINFORMATICS</strong> Geman</td>
<td>Limit 20</td>
<td>限20</td>
<td>Prior exposure to machine learning or pattern recognition is recommended.</td>
<td>A &quot;readings&quot; course organized around research articles in the recent bioinformatics and computational biology literatures. This term, the choice of papers will favor work on inferring phenotype from genotype, and modeling signaling networks, based on gene microarrays bearing the expression levels of thousands of transcripts, and on properties of proteins, such as predicting active sites and detecting harmful mutations. One major objective is to prepare students to comfortably read articles which involve extensive mathematical and statistical modeling as well as techniques from pattern recognition and machine learning. Most papers will be presented by the students. In addition, student expositions will be preceded by &quot;tutorials&quot; by the instructor on various aspects of statistical learning, modeling and prediction, such as properly estimating generalization error in cancer classification and avoiding over-fitting in learning networks of molecular interactions.</td>
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<td>550.661</td>
<td><strong>FOUNDATIONS OF OPTIMIZATION</strong> Han</td>
<td>Limit 40</td>
<td>限40</td>
<td>Prereq: Multivariable Calculus, Linear Algebra; Coreq: 110.405</td>
<td>Study of the fundamental theory underlying linear and nonlinear optimization. Unconstrained optimization, constrained optimization, saddlepoint conditions, Kuhn-Tucker conditions, linear programming, the simplex algorithm, post-optimality, duality, convexity, quadratic programming.</td>
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<td>550.671</td>
<td><strong>COMBINATORIAL ANALYSIS</strong> Fishkind</td>
<td>Limit 30</td>
<td>限30</td>
<td>Prereq: One year of Calculus and Linear Algebra</td>
<td>An introduction to combinatorial analysis at the graduate level. Meets concurrently with 550.471 (see 550.471 for course description).</td>
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<td>550.692</td>
<td><strong>MATRIX ANALYSIS AND LINEAR ALGEBRA</strong> Fishkind</td>
<td>Limit 45</td>
<td>限45</td>
<td>Prereq: 110.405, Linear Algebra, multivariable calculus.</td>
<td>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.</td>
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### Applied Mathematics & Statistics

**550.700 Master's Research**

- **Staff**
- Reading, research, or project work for Master’s level students. Arranged individually between students and faculty.

**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**
- **Sec. 07 – Naiman**
- **Sec. 08 – Priebe**
- **Sec. 09 – Scheirerman**
- **Sec. 10 – Wierman**
- **Sec. 11 - Younes**

**550.810 Probability and Statistics Seminar**

- **Staff**
- Limit 10

- **Sec. 01**
  - TBA

**550.865 Discrete Mathematics and Optimization Research Seminar**

- **Staff**
- Limit 10

- **Sec. 01**
  - TBA

### Biomedical Engineering

**580.111 (E,N) BME Modeling & Design (2)**

- **Haase**, Limit 5 per section

- **Lec.**
  - Th 12:12-12:50

- **Lab 01**
  - Th 8:30-10:20

- **BME Freshmen only**
  - 02 Th 8:30-10:20
  - 03 Th 8:30-10:20
  - 04 Th 8:30-10:30
  - 05 Th 8:30-10:50

- (Formerly BME Design Group) Working in teams with upperclassmen this course (1) introduces biomedical engineering fundamentals to an orderly method for analyzing and modeling biological systems and (2) introduces 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.

- **Sec. 01**
  - T 6-6:50pm

**580.211 (E,N) BME Design Group (3)**

- **Allen**, Limit 30, Sophomore-level version of 580.311-312 or Perm. Req’d.

- **Sec. 01**
  - T 6-6:50pm

**580.221 (N) Molecules and Cells (4)**

- **Haase**, Limit 30, Prereq 030.101, 030.104

- **Lec.**
  - MW 1:30-2:45

- **Sec. 01**
  - F 9-9:50

- 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.

- **Sec. 01**
  - T 6-6:50pm

**580.311 (E,N) BME Design Group (3)**

- **Allen**, Limit 30, Perm. Req’d.

- A two-semester course sequence where sophomores, 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.

- **Sec. 01**
  - T 6-6:50pm
BIOMEDICAL ENGINEERING

580.321 (E,N) STATISTICAL MECHANICS AND THERMODYNAMICS (3) Beer
Basic principles of statistical physics and thermodynamics with application to biological systems. Topics include fundamental principles of thermodynamics, chemical equilibrium and thermodynamics of reactions in solutions, and elementary statistical mechanics.

Lec. MWF 11-11:50
Sec. 01 T 11-11:50
Sec. 02 T 12-12:50
Sec. 03 T 1:30-2:20
Sec. 04 T 3:30-4:20

580.410 BME TEACHING PRACTICUM (2)
House Limit 20. Senior biomedical engineering students will assist the BME Modeling & Design course instructor in managing the laboratory component of the course.

Sec. 01 TBA

580.411 (E) BME DESIGN GROUP (3) Allen

Sec. 01 T 6-6:50pm

580.413 (E) DESIGN TEAM - TEAM LEADER (4) Allen
Limit 30. Perm. Req’d. A two-semester 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.

Sec. 01 T 6-6:50pm

580.420 (N) BUILD-A-GENOME (4) Bader
Limit 8. Must understand fundamentals of DNA structure, DNA electrophoresis and analysis, Polymerase Chain Reaction (PCR) and must be either a) Experienced with molecular biology lab work or b) Adapt at programming with a biological twist. In this combination lecture/laboratory "Synthetic Biology" course students will learn how to make DNA building blocks used in an int’l project to build the world’s first synthetic eukaryotic genome, Saccharomyces cerevisiae v. 2.0. Please study the wiki www.syntheticyeast.org for more details about the project. Following a biotechnology boot-camp, students will have 24/7 access to computational and wet-lab resources and will be expected to spend 15-20 hours per week on this course. Advanced students will be expected to contribute to the computational and biotech infrastructure. Successful completion of this course provides 3 credit hours toward the supervised research requirement for Molecular and Cellular Biology majors, or 2 credit hours toward the upper level elective requirement for Biology or Molecular and Cellular Biology majors.

Sec. 01 MWF 5-6:30pm

580.421 (E,N) SYSTEMS BIOENGINEERING I (4) Trayanova
Prereq. 580.221 & 580.222. Limit 28 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 MW 3:30-4:15
Sec. 02 F 11-11:50
Sec. 03 F 1:30-2:20
Sec. 04 F 3:30-4:20
Sec. 05 F 3:30-4:20
Sec. 06 F 3:30-4:20
### BIOMEDICAL ENGINEERING

**580.423**  
SYSTEMS BIOENGINEERING LAB I  
(2) Haase  
Limit 38 per section  
Coreq. 580.421  
Priority to Junior BME majors  
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 Th 4:30-5:20  
Lab Th 9-12:50  
Sec. 02 Th 4:30-5:20  
Lab Th 1-4:50  
Sec. 03 F 9-12:50  
Lab F 1-4:50  
Sec. 04 F 9-12:50  
Lab F 1-4:50

**580.429 (E,N)**  
SYSTEMS BIOENGINEERING III (4)  
Bader  
Limit 38 per section  
Prereq. 580.221 & 580.222 or Perm.  
Req. Computational and theoretical systems biology at the cellular and molecular level. Topics include organizational patterns of biological networks; analysis of metabolic networks, gene regulatory networks, and signal transduction networks; inference of pathway structure; and behavior of cellular and molecular circuits.  
Sec. 01 MW 12-1:15  
Sec. 02 F 3-4:15

**580.439 (E,N)**  
MODELS OF THE NEURON (4)  
Young  
Limit 40  
Prereq. 110.301, 580.421-422 or equivalent  
Single-neuron modeling, emphasizing the use 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, ion channel dynamics as a way of studying the collective properties of channels in a membrane, synaptic transmission, integration of electrical activity in multi-compartment dendritic 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. Meets with 580.639  
Sec. 01 MTWF 9-9:50

**580.440**  
CELLULAR AND TISSUE ENGINEERING (3)  
Elisseef/Yarema  
Limit 40  
Prereq. 580.421-422 Junior, Senior, Graduate students only  
Lectures provide an overview of molecular biology fundamentals, an extensive view 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 therapy will also be incorporated into the course.  
Sec. 01 TTh 9-10:15

**580.445 (E)**  
INTRODUCTION TO SPEECH AND AUDIO PROCESSING (3)  
Elhilali  
Limit 30  
Prereq. 520.214 or equiv. (580.222)  
This course gives a foundation in current audio and speech technologies, and covers techniques for sound processing and pattern recognition, acoustics, auditory perception, speech production and synthesis, speech estimation. The course will explore applications of speech and audio processing in human computer interfaces such as speech recognition, speaker identification, coding schemes (e.g. MP3), music analysis, noise reduction.  
Sec. 01 TTh 10:30-11:45
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Section</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>580.451 (E,N)</td>
<td>CELLULAR AND TISSUE ENGINEERING LAB  (2) Haase</td>
<td>Sec. 01</td>
<td>TF</td>
<td>12-1:50</td>
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<td>Limit 4 per section</td>
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<td>Senior and Graduate students only; others Perm. Req'd.</td>
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<td>Lab Fee: $100</td>
<td>Sec. 02</td>
<td>TF</td>
<td>2-3:50</td>
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<td>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</td>
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<tr>
<td>580.471 (E,N)</td>
<td>PRINCIPLES OF DESIGN OF BIOMEDICAL INSTRUMENTATION (4) Thakor</td>
<td>Lec.</td>
<td>Th</td>
<td>4-5:50pm</td>
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<td>Limit 16 per section</td>
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<tr>
<td></td>
<td>Prereq: 520.213-214, electronics lab or 580.470</td>
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<td>Th</td>
<td>9-12:50</td>
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<td>Lab Fee: $125</td>
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<td>F 1-4:50</td>
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<td>Students satisfying the design requirement must also register for 580.571</td>
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<td>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, bio potentials and ECG amplifier design, recording from heart, muscle, brain, etc., diagnostic and therapeutic devices (including pacemakers and defibrillators), applications in prosthetics and rehabilitation, and safety. The course includes extensive laboratory work involving circuits, electronics, sensor design and interface, and building complete biomedical instrumentation. The students will also carry out design challenge projects, individually or in teams (examples include “smart cane for blind,” “computer interface for quadriplegic”). Co-listed with 530.451</td>
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<tr>
<td>580.472 (E)</td>
<td>MEDICAL IMAGING SYSTEMS (3) Prince</td>
<td>Sec. 01</td>
<td>MWF</td>
<td>10-10:50</td>
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<td>Limit 30 Prereq: 520-214</td>
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<td>An introduction to the physics, instrumentation, and signal processing methods used in general radiography, X-ray computed tomography, ultrasound imaging, magnetic resonance imaging, and nuclear medicine. The primary focus is on the methods required to reconstruct images within each modality, with emphasis on the resolution, contrast, and signal-to-noise ratio of the resulting images. (Note: Beginning Fall ’08 this course will permanently move to the fall semester.) Co-listed as 520.432</td>
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<tr>
<td>580.474 (E)</td>
<td>MOLECULAR AND CELLULAR IMAGING (3) Bulte/McVeigh</td>
<td>Sec. 01</td>
<td>TTh</td>
<td>10:30-11:45</td>
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<td>Limit 20 Prereq: 520/580.472</td>
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<td>Introduction to non-invasive imaging techniques as applied to an early diagnosis of disease, altered gene expression, cellular therapeutics, and fundamental molecular or metabolic changes. Includes magnetic resonance imaging, radionuclide imaging, and optical imaging techniques. Covered will be: principles of specific targeting and non-specific uptake of diagnostic contrast agents; NMR spectroscopy of metabolic changes in cancer; use of cell tracking using exogenous tags; imaging of stem cells, imaging using reporter genes, theranostics (combined therapeutics and diagnostics), imaging cancer, imaging of neuropeptide/peptide disease, and imaging of cardiovascular disease. The emphasis of the overall course is to learn how</td>
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molecular/cellular imaging will change the way future diagnostic radiology and drug development will be practiced. Meets with 580.774

580.492 (E,N) BUILD-A-GENOME MENTOR (4) Bader Perm. Req’d. Limit 8. In addition to producing and sequencing DNA segments like regular B-a-G students, mentors will help prepare and distribute reagents, and maintain a Moddle site to track student reagent use and productivity. Mentors will also be expected to mentor specific students who are learning new techniques for the first time, contribute to the computational and biotech infrastructure associated with Build-a-Genome, and pursue at least one independent research project. Successful completion of this course provides 3 credit hours toward the supervised research requirement for Molecular and Cellular Biology majors.

580.495 MICROFABRICATION LAB (4) Andreou/Wang Limit 4 per section Seniors only or Perm. Req’d. This laboratory course introduces the principles used in the construction of microelectronic devices, sensors, and micromechanical structures. Students will work in the laboratory on the fabrication and testing of a device. Accompanying lecture material covers basic processing steps, design and analysis CAD tools, and national foundry services. Co-listed with 530.495 and 520.495

580.501 FRESHMAN-SOPHOMORE RESEARCH OR PRACTICUM IN BIOMEDICAL ENGINEERING Research projects or engineering design projects under the supervision of any member of the BME faculty.

580.511 FRESHMAN-SOPHOMORE INDEPENDENT STUDY IN BIOMEDICAL ENGINEERING Directed readings or other literature research under the direction of any member of the BME faculty.

580.531 JUNIOR-SENIOR RESEARCH OR PRACTICUM IN BIOMEDICAL ENGINEERING Research projects or engineering design projects under the supervision of any member of the BME faculty. Prerequisite: junior or senior standing.

580.541 JUNIOR-SENIOR INDEPENDENT STUDY IN BIOMEDICAL ENGINEERING Directed readings or other literature research under the direction of any BME faculty member. Prereq: Junior or Senior standing.

580.571 HONORS INSTRUMENTATION Thakor Coreq: 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.

580.492 (E,N) BUILD-A-GENOME MENTOR (4) Bader Perm. Req’d. Limit 8. In addition to producing and sequencing DNA segments like regular B-a-G students, mentors will help prepare and distribute reagents, and maintain a Moddle site to track student reagent use and productivity. Mentors will also be expected to mentor specific students who are learning new techniques for the first time, contribute to the computational and biotech infrastructure associated with Build-a-Genome, and pursue at least one independent research project. Successful completion of this course provides 3 credit hours toward the supervised research requirement for Molecular and Cellular Biology majors.

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580.501 FRESHMAN-SOPHOMORE RESEARCH OR PRACTICUM IN BIOMEDICAL ENGINEERING Research projects or engineering design projects under the supervision of any member of the BME faculty.

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580.580  
**BIOMEDICAL ENGINEERING**  
**SENIOR DESIGN PROJECT**  
*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.  
Sec. 01  
TBA

580.611  
**BIOMEDICAL DEVICE, DESIGN AND INNOVATION**  
*Allen*  
Limit 8  
MSE students with instructor’s consent  
Graduate-level version 580.311-312. Teams consist of MSE students only.  
Sec. 01  
T 6-6:50pm

580.625  
**STRUCTURE AND FUNCTION OF THE AUDITORY AND VESTIBULAR SYSTEMS**  
*May*  
Limit 10  
Prereq: 580.421-422 or equivalent  
Recommended: 580.222  
Physiological mechanisms of hearing and balance. Topics include transmission of sound in the ear, transduction of sound and head orientation by hair cells, biophysics and biochemistry of hair cells, representation of sound and balance in eighth-nerve discharge patterns, anatomy of the central auditory and vestibular systems, and synaptic transmission and signal processing in central neurons. Aspects of hearing and balance such as speech perception, sound localization, vestibular reflexes and vestibular compensation are discussed with an integrated perspective covering perceptual, physiological, and mechanistic data. This course is taught at the School of Medicine.  
Sec. 01  
TTB 9-10:15

580.628  
**TOPICS IN SYSTEM NEUROSCIENCE**  
*Wang/Zhang*  
Limit 10  
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.  
Sec. 01  
T 4:30-5:20

580.635  
**PROJECT IN BIOELECTROMAGNETIC PHENOMENA**  
*Staff*  
Limit 10  
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. Paper presentations and advanced assignments are added to the core curriculum.  
Sec. 01  
TBA

580.659  
**MODELS OF THE NEURON**  
*Young*  
Limit 20  
Prereq: 110.301-302, 580.421-422 or equivalent. See description for 580.439. Graduate version of 580.439. Differs in that an advanced modeling project using data from the literature is required. Same prerequisites.  
Sec. 01  
MTWF 9-9:50

580.640  
**CELLULAR AND TISSUE ENGINEERING**  
*Tavona*  
Lectures provide an overview of molecular biology fundamentals, an extensive 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 therapy will also be incorporated into the course.

580.681 ADVANCED TOPICS IN COMPUTER VISION (formerly 580.464) Staff Limit 10 Prereq: 10.202 and 600.461 or instructor's permission State-of-the-art methods in dynamic vision, with an emphasis on segmentation, reconstruction, and recognition of static and dynamic scenes. Topics include reconstruction of static scenes (tracking and correspondence, multiple view geometry, self-calibration), reconstruction of dynamic scenes (2-D and 3-D motion sementation, nonrigid motion analysis), recognition of visual dynamics (dynamic textures, face and hand gestures, human gait, crowd motion analysis), as well as geometric and statistical methods for clustering and unsupervised learning, such as K-means, Expectation Maximization, and Generalized Principal Component Analysis. Applications in robotics and biomedical imaging are also included.

580.701 SENSORIMOTOR SYSTEMS Shadmehr Limit 20 This course introduces current research in sensorimotor systems, with particular emphasis on the functions of the human brain as inferred from patient work, psychophysics, and computational studies. Students are expected to present two papers per semester and actively engage in discussion of weekly research papers.

580.771 PRINCIPLES OF BME INSTRUMENTATION Thakor Limit 16 Graduate students only This course is designed for graduate students interested in learning basic biomedical instrumentation design concepts and translating these into advanced projects based on their research on current state-of-the-art. They will first gain the basic knowledge of instrumentation design, explore various applications, and critically gain hands-on experience through laboratory and projects. At the end of the course, students would get an excellent awareness of biological or clinical measurement techniques, design of sensors and electronics (or electromechanical/chemical, microprocessor system and their use). They will systematically learn to design instrumentation with a focus on the use of sensors, electronics to design a core instrumentation system such as an ECG amplifier. Armed with that knowledge and lab skills, students will be encouraged to discuss various advanced instrumentation applications, such as brain monitor, pacemaker/defibrillator, or prosthetics. Further, they will be "challenged" to come up with some novel design ideas and implement them in a semester-long design project. Students will take part in reading the literature, learning about the state-of-the-art through journal papers and patents, and discussing, critiquing, and improving on these ideas. Finally, they will be implementing a selected idea into a semester-long advanced group project. Meets with 580.471

580.774 MOLECULAR AND CELLULAR IMAGING (3) Bulte/McVeigh Limit 20 Introduction to non-invasive imaging techniques as applied to an early diagnosis of disease, altered gene expression, cellular therapeutics, and fundamental molecular or metabolic changes. Includes magnetic resonance imaging, radionuclide imaging, and
optical imaging techniques. Covered will be: principles of specific targeting and non-specific uptake of diagnostic contrast agents; NMR spectroscopy of metabolic changes in cancer; use of cell tracking using exogenous tags; imaging of stem cells, imaging using reporter genes, theranostics (combined therapeutics and diagnostics), imaging cancer, imaging of neurodegenerative disease, and imaging of cardiovascular disease. The emphasis of the overall course is to learn how molecular/ cellular imaging will change the way future diagnostic radiology and drug development will be practiced.

Meets with 580.474

580.801 RESEARCH IN BIOMEDICAL ENGINEERING Graduate Students only

CHEMICAL & BIOMOLECULAR ENGINEERING

540.101 (E) CHEMICAL AND BIOMOLECULAR ENGINEERING TODAY (1) Betenbaugh Freshmen Only. Limit 150
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) Dahuron Limit 100
Prereq: 030.101, 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) Gracar Prereq: 540.203 Limit 90
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 equilibria. Basic thermodynamic relationships to describe chemical equilibria, the physical chemistry of liquid-liquid and liquid-solid interfaces, and the conformation of biological macro-molecules are also presented.

540.304 (E,N) TRANSPORT PHENOMENA II (4) Deacre Prereq: 540.303 Limit 90
Dimensional analysis and dimensionless groups. Laminar boundary layers, introduction to turbulent flow. Definition of

540.311 (E) CHEMICAL ENGINEERING LAB I (6) Katz/Dahuron Limit 3 per section 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, carryout, 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 T 1-6pm
Sec. 02 Th 1-6pm
Sec. 03 M 1-6pm

540.313 (E) CHEMICAL AND BIOMOLECULAR ENGINEERING LAB I (6) Katz/Staff Limit 16 per section 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, carryout, 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 T 1-6pm
Sec. 02 Th 1-6pm
Sec. 03 F 1-6pm
Sec. 04 M 1-6pm

540.490 CHEMICAL AND LABORATORY SAFETY (1) Katz, Per. Req’d. Limit 100 per section 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

Sec. 01 TBA
Sec. 02 TBA
CHEMICAL & BIOMOLECULAR ENGINEERING

540.501 INDEPENDENT STUDY
Students do a reading course in specialized areas not directly available by lecture courses. Assignments and problems are prescribed by a faculty member. 1-3 credits

540.521 INDEPENDENT RESEARCH
Students do individual projects (or in collaboration with faculty and/or graduate students) in areas basic to chemical engineering. 1-3 credits

540.600 CHEMICAL ENGINEERING SEMINAR
Drazer  Limit 100  Lectures are presented on current subjects relevant to chemical engineering.

540.645 MICRO AND NANOTECHNOLOGY: A RESEARCH PERSPECTIVE
Gracias  Limit 12

540.652 FUNDAMENTAL BIOTRANSPORT PHENOMENA
Konstantopoulos/Stebe  Limit 30  This lecture course introduces students to the application of engineering fundamentals from transport and kinetic processes to vascular biology and medicine. The first half of the course addresses the derivation of the governing equations for Newtonian fluids, their solution in the creeping flow limit. The second half of the course considers how these concepts can be used to understand the behavior of a deformable cell near planar surfaces.

540.801 GRADUATE RESEARCH
540.803 INDEPENDENT STUDY

CIVIL ENGINEERING

560.201 (E,N) STATICS AND MECHANICS OF MATERIALS (4) Graham-Brady  Limit 8 per section. Prereq: 171.101
Freshmen by permission only
Basic principles of classical mechanics applied to the equilibrium of particles and rigid bodies at rest, under the influence of various force systems. In addition, the following topics are studied: free body concept, analysis of simple structures, friction, centroids and centers of gravity, and moments of inertia. includes laboratory experience.

560.220 (E) CIVIL ENGINEERING ANALYSIS (3) Dalrymple  Limit 25
Prereq: Calculus I, II. Civil engineering problems are formulated and then solved by numerical methods. Matrix inversion, data fitting and interpolation, root-finding, and solutions of ordinary and partial differential equations are presented. Matlab programming will be introduced to facilitate the solutions.

560.305 (E) SOIL MECHANICS (4) Anandarajah  Limit 30
Prereq: 560.206 Coreq: 570.351

560.325 (E) CONCRETE STRUCTURES (3) Herman  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...
CIVIL ENGINEERING

560.349 (E)  Design and Synthesis I (2)  Russo-Vigener  Limit 60
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. Course consists of lecture and design session each week.

560.351 (E)  Introduction to Fluid Mechanics (3)  Wilcock  Limit 20
Prereq: Statics, 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, form and surface resistance with applications to fluid measurement, flow in conduits and channels, pumps and turbines. Selected laboratory exercises are included. Co-listed as 570.351

560.445 (E)  Advanced Structural Analysis (3)  Guest  Limit 60
Pre req: 560.206  Matrix methods for the analysis of statistically indeterminate structures such as beams, plane and space trusses, and plane and space frames. Stiffness and flexibility methods. Linear elastic analysis and introduction to nonlinear analysis.

560.491 (E)  Civil Engineering Seminar I (0.5)  Herman  Limit 75
Seminar series of speakers on various aspects of civil engineering. Juniors and seniors in Civil Engineering are expected to enroll in this sequence; juniors and seniors receive one-half credit. Different speakers are invited each semester. Satisfactory/Unsatisfactory only

560.492 (E)  Civil Engineering Seminar II (0.5)  Herman  Limit 75
Prereq: 560.491  Seminar series of speakers on various aspects of civil engineering. Juniors and seniors in Civil Engineering are expected to enroll in this sequence; juniors and seniors receive one-half credit. Different speakers are invited each semester. Satisfactory/Unsatisfactory only

560.493 (E)  Civil Engineering Seminar III (0.5)  Herman  Limit 75  Pre req: 560.492
Seminar series of speakers on various aspects of civil engineering. Juniors and seniors in Civil Engineering are expected to enroll in this sequence; juniors and seniors receive one-half credit. Different speakers are invited each semester. Satisfactory/Unsatisfactory only

560.494 (E)  Civil Engineering Seminar IV (0.5)  Herman  Limit 75
Prereq: 560.493  Seminar series of speakers on various aspects of civil engineering. Juniors and seniors in Civil Engineering are expected to enroll in this sequence; juniors and seniors receive one-half credit. Different speakers are invited each semester. Satisfactory/Unsatisfactory only

560.525  Independent Study  Igusa  Perm. Req’d.

560.535  Research in Civil Eng  Perm. Req’d.

560.620  Advanced Steel Design (3)  Herman  Limit 40  Prereq: 560.320 Steel Structures or comparable introductory steel design course. This course examines
CIVIL ENGINEERING

advanced design of structural steel buildings using the load and resistance factor design approach. Topics include plastic analysis of indeterminate structures, design of plate girders, and design of composite beams. Co-listed with 565.620

560.691 GRADUATE SEMINAR Herman
Limit 30 Graduate students are expected to register for this course each semester. Both internal and outside speakers are included.

560.729 STRUCTURAL MECHANICS Igusa Limit 30 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.

560.730 FINITE ELEMENTS METHODS Nakagawa Limit 10 Introduction to the finite element methods for approximate numerical solutions to engineering problems. The basic theories are presented. Topics will include the principle of virtual work, variational method, and weighted residual method to obtain finite element formulations.

560.734 ADVANCED PROBABILITY AND STATISTICS FOR ENGINEERS Igusa Limit 25 Please 560.453 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.

560.738 COASTAL ENGINEERING Dalrymple Limit 10 Coastal processes and their influence on engineering at the shoreline. Waves and currents, equilibrium beach profiles, littoral transport, shoreline modeling and the behavior of tidal inlets. The impact of structures on the shoreline.

560.783 HYDRAULIC LOADS ON STRUCTURES AND SHIPS Shen Limit 10 Hydrodynamics with applications in surface ships, coastal and offshore structures, and aquatic animal propulsion. Waves, winds and currents in sea environment. Interactions between surface waves and floating bodies. Sea loads on offshore structures. Ship hydrodynamics and seakeeping.

560.835 GRADUATE RESEARCH Sec 01 – Staff Sec 02 – Dalrymple Sec 08 – Schaefer Sec 09 – Anandarajah Sec 10 – Brady Sec 11 – Igusa Sec 15 – Krause Sec 14 – Shen Sec 15 – Guest Sec 16 – Galatsi Sec 17 – Herman

COMPUTER SCIENCE

600.105 M & Ms: FRESHMEN EXPERIENCE (Houlahan – Limit 20)
Satisfactory/Unsatisfactory only
This course is required for all freshmen.
Computer Science majors. Transfers into
COMPUTER SCIENCE

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) 
Houlahan 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, 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.

Sec. 01 MW 3-4:15

600.107 (E) INTRODUCTION TO PROGRAMMING IN JAVA (3) 
Houlahan 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, 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.

Sec. 01 MW 3-4:15

600.108 (E) INTRO PROGRAMMING LAB (1) 
Houlahan Limit 12/section 
Co-req: 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. 
Satisfactory/Unsatisfactory only 

Sec. 01 W 6-9pm
Sec. 02 Th 4:30-7:30pm
Sec. 03 F 3-6pm

600.120 (E) INTERMEDIATE PROGRAMMING (4) 
Froehlich 
Limit: Sec. 01 – 10 
Sec. 02 – 20 
Prereq: 600.107 or AP CS 
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.

Lec. Sec. 01 MWF 3-3:50 
Sec. 02 T 3-3:50 Th 3-3:50

600.226 (E,Q) DATA STRUCTURES (3) 
Houlahan Limit 60 
Prereq: 600.107 or AP CS 
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.

Sec. 01 WF 12-1:15

600.271 (E,Q) AUTOMATA & COMPUTATION THEORY (3) 
Kosaraju 
Limit 60 
Students may receive credit for either 600.271 or 600.471, but not both 
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.

Sec. 01 TTh 1:30-2:45
COMPUTER SCIENCE

600.315 (E) DATABASE SYSTEMS (3) Yarowsky
Limit 40  Prereq: 600.226  Students may receive credit for 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.

Sec. 01  TTh 3:4-15

600.320 (E) PARALLEL PROGRAMMING (3) Burns  Limit 20  Prereq: 600.120 or equiv.  Students may receive credit for 600.320 or 600.420, but not both. This course prepares the programmer to tackle the massive data sets and huge problem size of modern scientific and enterprise computing. Google and IBM have commented that undergraduate CS majors are unable to "break the single server mindset" [http://www.google.com/intl/en/press/20071008_ibm_univ.html]. Students taking this course will abandon the comfort of serial algorithmic thinking and learn to harness the power of cutting-edge software and hardware technologies. The issue of parallelism spans many architectural levels. Even "single server" systems must parallelize computation in order to exploit the inherent parallelism of recent multi-core processors. The course will examine different forms of parallelism in four sections. These are: (1) massive data-parallel computations with Hadoop; (2) programming compute clusters with MPI; (3) thread-level parallelism in Java; and, (4) GPGPU parallel programming with NVIDIA's Cuda. Each section will be approximately 3 weeks and each section will involve a programming project. The course is also suitable for second-year undergraduate CS majors and undergraduate and graduate students from other science and engineering disciplines that have prior programming experience.

Sec. 01  TTh 12-1:15

600.321 (E) OBJECT ORIENTED SOFTWARE ENGINEERING (3) Smith  Limit 30  Prereq: 600.226 and 600.120  Students receive credit for 600.321 or 600.421, but not both. This course offers 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.

Sec. 01  WF 1:30-2:45

600.333 (E) COMPUTER SYSTEM FUNDAMENTALS (4) Mason  Limit 80  Prereq: 600.107 or AP CS  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.

Sec. 01  MWF 10-10:50
INTRODUCTION TO ALGORITHMS

Awerbuch
Limit 30   Prereq: 600.226
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.

SENIOR DESIGN PROJECT

Froehlich
Limit 30 Prereq: 600.120, 600.226; 600.321 recommended. CS senior majors only. This course will give senior CS majors an intensive capstone design project 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.

DATABASE SYSTEMS

Yarowsky
Limit 30 Prereq: 600.226. Students may receive credit for 600.315 or 600.415, but not both. Graduate level version of 600.315

PARALLEL PROGRAMMING

Burns
Graduate level version of 600.320. Student may receive credit for 600.320 or 600.420, but not both.

OBJECT ORIENTED SOFTWARE ENGINEERING

Smith
Limit 30 Prereq: 600.120 or equiv. Students may receive credit for 600.321 or 600.421, but not both. Graduate level version of 600.321.

COMPUTER SYSTEMS

Masson
Limit 50 Students may receive credit for 600.333 or 600.433, but not both. Graduate version of 600.331.

SECURITY AND PRIVACY

Rubin
Limit 50 Prereq: A basic course in operating systems and networking, or permission of instructor. Lecture topics will include computer security, network security, basic cryptography, system design methodology, and privacy. There will be a heavy work load, including written homework, programming assignments, exams and a comprehensive final. The class will also include a semester-long project that will be done in teams and will include a presentation by each group to the class.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.450 (E)</td>
<td>NETWORK EMBEDDED SYSTEMS AND SENSOR NETWORKS (3)</td>
<td>Terzis</td>
<td>3</td>
<td>600.226, 600.120, and 600.344/444</td>
<td>This course replaces 600.349/449. This course is an introduction to fundamental concepts of networked embedded systems and wireless sensor networks. It is intended for juniors, seniors and first year graduate students in Computer Science and other engineering majors with the prerequisite background. Covered topics include: embedded systems programming concepts, low power and power aware design, radio technologies, communication protocols for ubiquitous computing systems, and some of the mathematical foundation of sensor behavior. Laboratory work consists of a set of programming assignments that consider a set of the issues described in class. Cross-listed with Information Security Institute.</td>
</tr>
<tr>
<td>600.463 (E,Q)</td>
<td>ALGORITHMS I (3)</td>
<td>Awerbuch</td>
<td>3</td>
<td>600.226 or Perm. Req'd.</td>
<td>Students may receive credit for 600.463 or 600.363, but not both. Graduate version of 600.363. Cross-listed with Information Security Institute.</td>
</tr>
<tr>
<td>600.465 (E)</td>
<td>NATURAL LANGUAGE PROCESSING (3)</td>
<td>Eisner</td>
<td>3</td>
<td>600.226</td>
<td>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.</td>
</tr>
<tr>
<td>600.471 (E,Q)</td>
<td>THEORY OF COMPUTATION (3)</td>
<td>Hohenberger</td>
<td>3</td>
<td>550.171 or equiv.</td>
<td>This is a graduate-level course studying the theoretical foundations of computer science. Topics covered will be models of computation from automata to Turing machines, computability, complexity theory, randomized algorithms, inapproximability, interactive proof systems and probabilistically checkable proofs. Students may not receive credit for 600.271 and 600.471. Cross-listed with Information Security Institute.</td>
</tr>
<tr>
<td>600.475 (E)</td>
<td>MACHINE LEARNING (3)</td>
<td>Sheppard</td>
<td>3</td>
<td>600.335/435 or permission of instructor.</td>
<td>This course covers current topics in machine learning research. After a brief historical review, the class focuses on a series of different learning models, including memory-based learning, genetic algorithms, and neural net learning algorithms. The class considers the design and methodology of experiments used to test and compare different machine learning systems. Although the main focus is on experimental work, the course also examines theoretical work on distribution-free learning models. Students in the course design their own machine learning system as a final project.</td>
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<tr>
<td>600.491</td>
<td>COMPUTER SCIENCE WORKSHOP I</td>
<td></td>
<td></td>
<td></td>
<td>An applications-oriented, computer science project done under the supervision and with the sponsorship of a faculty member in the Department of Computer Science. Permission of faculty supervisor required</td>
</tr>
</tbody>
</table>
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.

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 (J)  
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.

SEC. 01  TTh 10:30-12

COMPUTER AND NETWORK FORENSICS
Moureze
Limit 18 (Undergrad)
Limit 15 (Grad)
Prereq: Exposure to operating systems concepts and low-level system programming is assumed, or instructor permission. The course exposes students to a myriad of fundamental concepts and techniques for recovering and inferring information in computer systems and networks. Topics include (but are not limited to) file system forensics, kernel-level rootkits and associated challenges, reconstructing malware evolution and dynamics, analysis of anonymization and privacy preserving techniques, advanced network traceback, traffic classification, biometrics and digital evidence, data integrity and audit trails, secure remote logging, and system call introspection. A semester-long course project is required. Students will also be responsible for presenting and discussing selected research papers on topics pertinent to the course. Some familiarity with low-level system programming is assumed. [Applications]

SEC. 01  MW 1:30- 2:45

ADVANCED DISTRIBUTED SYSTEMS AND NETWORKS
Amir
Limit 20
Prereq: 600.337/437 or permission of instructor. This course is focused on the state of the art in distributed systems research, networks, and the Internet. The course is managed as a discussion group where the professor and students present recent research topics, as well as design and implement useful semester-long projects.

SEC. 01  MW 3:30- 4:45

ADVANCED TOPICS IN COMPUTER VISION
Vidal
Limit 20
Prereq: 600.461 & linear algebra or permission. State-of-the-art methods in dynamic vision, with an emphasis on segmentation, reconstruction and recognition of static and dynamic scenes. Topics include: reconstruction of static scenes (tracking and correspondence, multiple view geometry, self-calibration); reconstruction of dynamic scenes (2-D and 3-D motion analysis, nonrigid motion analysis); recognition of visual dynamics (dynamic textures, face and hand gestures, human gait); and motion analysis, as well as geometric and statistical methods for clustering and unsupervised learning, such as K-means, Expectation Maximization, and Generalized Principal Component Analysis. Applications in robotics and biomedical imaging are also included. [Applications] Cross-listed as 580.681, formerly 600.642.

SEC. 01  TTh 10:30- 11:45
COMPUTER SCIENCE

recent developments in the foundations of programming language design and implementation. Topics covered vary from year to year. Students will present papers orally.

600.735 SEMINAR IN MACHINE LEARNING Skapped Limit 50 This seminar course will look at research in machine learning; topics will be selected from those of mutual interest between students and the instructor. Sample topics include reinforcement learning, kernel methods, experimental methods in machine learning, computational learning theory, tary learning, evolutionary computation, and neural networks. Students are expected to select papers and lead discussion.

600.745 SEMINAR IN COMPUTER INTEGRATED SURGERY Etienne-Cummings/Kazanzides Limit 20 This weekly seminar will focus on research issues in computer-integrated surgery, including subjects such as medical image analysis, statistical modeling, visualization, surgical planning, medical robotics, and clinical applications. The purpose of the course is to widen the knowledge and awareness of the participants in current research in these areas, as well as to promote greater awareness and interaction between multiple research groups within the University and beyond. The format of the course is informal presentation by a pre-eminent invited speaker, followed by free discussion. Co-listed as 520.744

600.757 SEMINAR IN COMPUTER GRAPHICS Ekhadon Limit 20 In this course we will review current research in computer graphics. We will meet for an hour once a week and one of the participants will lead the discussion for the week.

600.765 SEMINAR IN NATURAL LANGUAGE PROCESSING Zinner Limit 20 A reading group exploring important current research in the field and potentially relevant material from related fields. Enrolled students are expected to present papers and lead discussion.

600.766 SEMINAR IN MACHINE TRANSLATION Callison-Burch Limit 20 The weekly machine-translation reading group will review current research in statistical machine translation, and well as relevant historical papers. Enrolled students will present papers and lead discussions.

600.801 DISSERTATION RESEARCH

600.803 GRADUATE RESEARCH Permission of faculty supervisor req’d. Independent research for masters or pre-dissertation PhD students. See 600.809 for faculty section numbers

600.809 INDEPENDENT STUDY (Graduate Students) Permission required. Individual study in an area of mutual interest to a graduate student and a faculty member in the department.

01 - Masson
02 - Kosaraju
03 - Awerbuch
04 - Taylor
05 - Smith
06 - Houlahan
07 - Lehmann
08 - Smith
10 - Chirikjian
11 - Khudanpur
12 - Amir
13 - Yarowsky
14 - Cowan
15 - Burns
16 - Eisner
17 - Shapiro
# Electric & 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)**  
**Circuits** (4)  
*Weinert*  
Prereq: 110.108-109, Limit 45 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)  
*Westgate*  
Prereq: 171.101-102, 110.108-109; Coreq: 110.202  
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.

**520.345 (E)**  
**ECE Laboratory** (3)  
*Kang*  
Limit 30 per section  
This course consists of 11 one-week laboratory experiments intended to provide an introduction to analog and digital circuits commonly used in engineering. Topics include phase and frequency response, transistors, operational amplifiers, filters, and other analog circuits. The experiments are done using computer controlled digital oscilloscopes, function generators, and power supplies.

**520.349 (E)**  
**Microprocessor Lab I** (3)  
*Glaser*  
Prereq: 520.142 or equivalent  
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.

**520.355 (E,Q)**  
**Control Systems** (3)  
*Tarraf*  
Limit 65  
Prereq: 520.214 & 110.201 or 550.291  
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)
Etienne-Cummings  Limit 10  Juniors Only  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 VerilogHD/ VLSI CAD tools. After design computer verification, students can fabricate and test their semester-long class projects.

Sec. 01  MW 5:30-7pm

520.401 (E) BASIC COMMUNICATION (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 theorem, pulse code modulation formats (PCM, DPCM, DM), spread-spectrum, signals with additive Gaussian noise, maximum likelihood receiver design, matched filtering, and bit error rate analyses of digital communication systems.

Sec. 01  MWF 11-11:50

520.407 (E) INTRODUCTION TO THE PHYSICS OF ELECTRONIC DEVICES (3)
Khurgin  Limit 20  This course is designed to develop and enhance the understanding of the basic physical processes taking place in the electronic and optical devices and to prepare students for taking classes in semiconductor devices and circuits, optics, lasers, and microwaves devices, as well as graduate courses. Both classical and quantum approaches are used. Specific topics include theory of molecular bonding; basics of solid state theory; mechanical, transport, magnetic, and optical properties of the metals, semiconductors, and dielectrics.

Sec. 01  MW 1:30-2:45

520.414 (E) IMAGE PROCESSING & ANALYSIS (3) Coutts  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 4:30-5:45

520.419 (E,Q) THEORY AND DESIGN OF ITERATIVE ALGORITHMS (3) Meyer  Prereq: 110.201-202  Limit 20  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 schemas without stop rule, the monotonic DI schema, contractive and affine maps, bounded and Cauchy sequences, asymptotically regular sequences, monotonic sequences.

Sec. 01  MWF 9-9:50
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 lab projects, and prior experience with VHDL is not a prerequisite.
ELECTRICAL & COMPUTER ENGINEERING

520.457 (E)  BASIC QUANTUM MECHANICS (3)  Kaplan  Limit 10  Basic principles of quantum mechanics for engineers. Topics include the quantum theory of simple systems, in particular atoms and engineered quantum wells, the interaction of radiation and atomic systems, and examples of application of the quantum theory to lasers and solid-state devices.

520.491 (E)  CAD DESIGN OF DIGITAL VLSI SYSTEMS I (3)  Cummings  Seniors Only  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.

520.495 (E, N)  MICROFABRICATION LAB (4)  Andreou/ Wang  Seniors only or Perm. Req'd.  Limit 4 per section  Course comprises of laboratory work and accompanying lectures that cover silicon oxidation, aluminum evaporation, photoresist deposition, photolithography, plating, etching, packaging, design and analysis CAD tools, and foundry services.

520.498 (E)  SENIOR DESIGN PROJECT (3)  Prince  Limit 10  Capstone design project, in which a team of students engineers a system and evaluates its performance in meeting design criteria and specifications. Example application areas are microelectronic information processing, image processing, speech recognition, control, communications, and biomedical instrumentation. The design needs to demonstrate creative thinking and experimental skills, and needs to draw upon knowledge in basic sciences, mathematics, and engineering sciences. Interdisciplinary participation, such as by biomedical engineering, mechanical engineering, and computer science majors, is strongly encouraged.

520.501  INDEPENDENT STUDY – FRESHMAN AND SOPHOMORES  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.

520.503  INDEPENDENT STUDY – JUNIORS AND SENIORS  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.

520.545  INDEPENDENT RESEARCH  Independent study or research over the summer 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.
IMAGE RECONSTRUCTION AND RESTORATION  Prince  Limit 30
This course covers the principles and methods used to reconstruct images from remotely sensed data and to restore images from blurred and noisy observations. General variational and stochastic regularization methods for ill-posed inverse problems are covered. Those specific methods used in imaging problems, where the amount of data is typically huge, are presented in detail. Synthetic aperture radar and X-ray computed tomography serve as motivating examples throughout the course, and specific details for reconstruction and restoration within these applications are covered.

OPTICAL COMMUNICATIONS  Davidson  Limit 23
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.

FEEDBACK CONTROL IN BIOLOGICAL SIGNALING PATHWAYS  Iglesias  Limit 20
Signal transduction pathways in biological systems need to be precisely regulated. This control is done through feedback regulatory loops. In this course we formulate mathematical models of signaling pathways and analyze their behavior using engineering control theory.

RANDOM SIGNAL ANALYSIS  Khudanpur  Limit 40
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.

SEMINAR IN COMPUTER INTEGRATED SURGERY  Etienne-Cummings/Kazanzides  Limit 10
Co-listed at 600.745
Research seminar devoted to current research in the engineering of large-scale integrated analog systems. Topics include models for vision and auditory processing as well as implementation constraints and limitations.

ADVANCED TOPICS IN FABRICATION AND MICROENGINEERING  Andreou  Limit 12
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.
ENTREPRENEURSHIP & MANAGEMENT

660.102 PERSONAL FINANCE (3) Leps
Limit 35 per section
Wondering how to make your money work while you're out working for your money? This interactive course introduces students to the real-world personal financial decisions they will face throughout life. Working together, students will evaluate various solutions and determine the best way to meet their own financial goals. Topics include prioritizing spending, purchasing a car and home, credit, developing and implementing an investment strategy, insurance options, deciphering taxes, and retirement planning.

Sec. 01 MWF 9-9:50
Sec. 02 MWF 10-10:50

660.105 (S) (W) INTRODUCTION TO BUSINESS (4)
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.

Sec. 01 MWF 12-12:50
Sec. 02 Th 1:30-2:20
Sec. 03 Th 1:30-2:20
Sec. 04 Th 3:30-4:20
Sec. 05 Th 5:30-6:20

660.203 FINANCIAL ACCOUNTING (3)
Limit 35 per section
Sec. 01 Leps
Sec. 02 Kingsley
Sec. 03 Kingsley
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.

Sec. 01 MWF 10-10:50
Sec. 02 M 6:15-8:45
Sec. 03 T 6:15-8:45

660.205 (S) BUSINESS LAW I (3)
Limit 35 per section
Sec. 01 Leps
Sec. 02 Franceschini
Sec. 03 Sandhaus
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 provide a complete, self-contained, well-rounded, in-depth study of Business Law and a foundation for further legal study.

Sec. 01 M 6:15-8:45
Sec. 02 W 6:15-8:45

660.206 (S) BUSINESS LAW II (3)
Limit 35 per section
Sec. 01 Leps
Sec. 02 Goldenberg
Prereq: Business Law I (660.205)
ENTREPRENEURSHIP & MANAGEMENT

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 PRINCIPLES OF MANAGEMENT (3) Limit 35 per section Petrovici
Recommended Prereq: Introduction to Business (660.105) 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 (H) 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 PRINCIPLES OF MARKETING (3) Kendrick
Limit 40 per section Attendance at 1st class is mandatory Explores 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 (S) CORPORATE FINANCE (3) Morris Limit 35 Prereq: Financial Accounting (660.203) Recommended Prereqs: Microeconomics, Macroeconomics 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.

660.304 FINANCIAL STATEMENT ANALYSIS (3) Lepe Limit 35 per section Prereq: Financial Accounting (660.203)
This course is designed to increase a student's ability to read and interpret financial statements and related information. In addition to a review of the basic financial statements and accounting principles, the course will use industry and ratio analysis in addition to benchmarking and modeling techniques to encourage students to think in a more creative way when analyzing historic information and when forecasting pro forma financial statements. Students will assess firm profitability and risk, value assets, prepare pro forma financial statements and use spreadsheet models for financial decision making.

660.306 (S) LAW & THE INTERNET (3) Sandhaus Limit 35 Prereq: Business Law I (660.205) Examines legal issues and concerns involved with operating a business in an Internet environment. Issues include: jurisdiction, resolution of online disputes, copyright law, privacy, and antitrust cases (Microsoft, etc.).

660.330 LEADERSHIP DYNAMICS (3) Friesen Limit 35 Recommended Prereqs: Introduction to Business (660.105) or Principles of Management (660.230) Focuses on the dynamics associated with taking charge in a group or organizational setting. Topics include: visioning, delegation, power, charisma and managing change.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Notes</th>
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<td>660.332 (S)</td>
<td>LEADERSHIP THEORY (3)</td>
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<td>Recommended Prereq: Introduction to Business (660.105) or Principles of Management (660.220)</td>
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<td>Students will be introduced to the history of Leadership Theory from the &quot;Great Man&quot; theory of born leaders to Transformational Leadership theory of non-positional learned leadership. Transformational Leadership theory postulates that leadership can be learned and enhanced. The course will explore the knowledge base and skills necessary to be an effective leader in a variety of settings. Students will assess their personal leadership qualities and develop a plan to enhance their leadership potential.</td>
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<td>660.335 (S)</td>
<td>NEGOTIATION AND CONFLICT MANAGEMENT (3)</td>
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<td>Prereq: Intro. To Business (660.105)</td>
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<td>This class focuses on the nature and practice of managing conflicts in organizational settings. The primary learning format is experiential exercises designed to build negotiating skills.</td>
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<td>660.341 (W)</td>
<td>BUSINESS PROCESS &amp; QUALITY MANAGEMENT (3)</td>
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<td>Prereq: Introduction to Business (660.105) or IT Management (660.241)</td>
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<td>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.</td>
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<td>660.351</td>
<td>SELLING STRATEGIES AND SALES MANAGEMENT (3)</td>
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<td>Prereq: Principles of Marketing (660.250)</td>
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<td>This course will introduce students to key concepts in business-to-business selling, and build upon knowledge gained in Principles of Marketing. Using a blend of didactic and interactive class sessions, students will learn how to identify ethical and legal issues in selling, what the organizational buying process is, and how to implement the selling process in order to build relationships. Students will be exposed to management concepts, including staffing, training, and motivating sales forces. In addition to analyzing cases individually, each student will be part of a team that sells a product or service during the latter half of the semester, by developing a sales presentation and delivering it to the class.</td>
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<td>660.358</td>
<td>INTERNATIONAL MARKETING (3)</td>
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<td>Prereq: Principles of Marketing (660.250)</td>
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<td>This course covers product, pricing,</td>
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<td>organization, and implementation</td>
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<td>and control policies relating to</td>
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<td>international marketing. It also explores</td>
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<td>the economic, cultural, political and legal</td>
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<td>aspects of international marketing.</td>
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<td>660.360</td>
<td>SMALL BUSINESS MANAGEMENT (3)</td>
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<td>Sec. 01 MW 4:30-5:45</td>
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<td>Recommended Prereq: Intro to Business (660.105), Principles of Management (660.220)</td>
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<td>Provides the tools needed to</td>
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<td>successfully launch and manage a small</td>
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<td>business in a competitive, global</td>
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<td>environment. Examines the challenges of</td>
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<td>entrepreneurs, business plans, marketing</td>
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<td>and financial issues, and the hiring and</td>
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<td>managing of employees.</td>
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ENTREPRENEURSHIP & MANAGEMENT

660.460  ENTREPRENEURSHIP (3) Aronhime
Limit 30  Recommended Prereqs: Financial Accounting (660.201), and Principles of Marketing (660.250), Junior or Senior standing. 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.

660.501  PRACTICUM IN ENTREPRENEURSHIP Aronhime
Permission required
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.

GENERAL ENGINEERING

500.101 (E)  WHAT IS ENGINEERING (3) Karweit
Limit 36
Freshmen only or Perm. Req’d
This is a course of lectures, laboratories, and special projects. Its objective is to introduce students not only to different fields of engineering but also to the analytic tools and techniques that the profession uses. Assignments include hands-on and virtual experiments, oral presentations of product design, and design/construction/testing of structures.

500.200 (E,Q)  COMPUTING FOR ENGINEERS AND SCIENTISTS (3) Karweit
Limit 50
Prereq: 110.109
This course introduces a variety of techniques for solving problems in engineering and science on a computer using MATLAB. Topics include structure and operation of a computer, the programming language MATLAB, computational mathematics, and elementary numerical analysis.

500.405 (E,N)  ENERGY ENGINEERING: FUNDAMENTALS AND FUTURE
On Erlebacher/ Katz/ Hemker
Limit 50
Prereq: Undergraduate course in thermodynamics This course examines the science and engineering of contemporary and cutting-edge energy technologies. Materials Science and Mechanical Engineering fundamentals in this area will be complemented by case studies that include fuel cells, solar cells, lighting, thermoelectrics, wind turbines, engines, nuclear power, biofuels, and catalysis. Students will consider various alternative energy systems, and also to research and engineering of traditional energy technologies aimed at increased efficiency, conservation, and sustainability. Cross-listed with Mechanical Engineering and Materials Science

500.410 (E,N)  SURGERY FOR ENGINEERS
Marohn/ Assumpcao
Limit 15
Perm. Req’d
Surgery for Engineers is a laboratory experience that teaches the fundamental skills and operative procedures for general surgery. This hands-on course is designed for engineers tasked with development of computer integrated surgical systems and associated technologies. Students are exposed to both traditional and innovative operating room (OR) environments and are taught basic techniques used during surgery.
## GENERAL ENGINEERING

Contact Cynthia Ramey at cramey@jhu.edu or 410-516-6841.

### 500.602 SEMINAR: ENVIRONMENT & APPLIED FLUID MECHANICS
- Meneveau
- Cross-listed with Geography & Environmental Engineering, Earth & Planetary Sciences, and Mechanical Engineering
- Sec. 01  F 10:30-12:30

### 500.615 HUMAERT JOURNAL CLUB
- Stebe
- Students in the IGERT/HMI training grant programs study and present topics in nanotechnology applied to biology from the scientific literature.
- Sec. 01  M 12-12:50

### 500.619 FUNDAMENTAL PHYSICS AND CHEMISTRY OF NANOMATERIALS
- Searson, Stebe, Witt, Chien
- INBT course
- This course will cover the physics and chemistry relevant to the design, synthesis, and characterization of nanoparticles. Topics include nanoparticle synthesis, functionalization, surface engineering, and applications in diagnostics and therapeutics. The properties of semiconductor quantum dots and magnetic nanoparticles will be reviewed along with techniques for nanoparticle manipulation, particle tracking, and bio-nanotechnology. Patterning tools including soft lithography, optical lithography, e-beam lithography, and template lithography will be discussed. Electron and scanning probe microscopy will be reviewed.
- Cross-listed with Materials Science
- Sec. 01  MTh 1-2:15

## GEOGRAPHY & ENVIRONMENTAL ENGINEERING

### 570.108 (E) INTRODUCTION TO ENVIRONMENTAL ENGINEERING
- Alavi
- Limit 50
- Overview of environmental engineering including water/air quality 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
- Sec. 01  TTh 12-1:15

### 570.109 (H,S) ENVIRONMENT & SOCIETY: TOWARDS SUSTAINABILITY
- Norman
- Limit 15
- Overview of environmental engineering including water/air quality 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 and History
- Sec. 01  MWF 9-9:50

### 360.147 (H,S) ADAM SMITH AND KARL MARX
- Jelavich/Schoenberger
- Limit 20
- Freshmen only
- Smith and Marx are often treated as icons in debates about capitalism and their thinking is reduced to sound bites. In this course we read them closely to see what they really said. You may be surprised.
- Cross-listed with History and Interdepartmental
- Sec. 01  W 1:30-4

### 570.205 (N) ECOLOGY
- Brush
- Limit 30
- 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,
ENVIRONMENTAL ENGINEERING FUNDAMENTALS I (3) Bouwer
Limit 50 Prerequisites: Calculus and one year of chemistry. Corequisite: Fluid mechanics (530.327) or equivalent. Mass and energy transfer, water quality, hazardous substances and risk analysis, water and wastewater treatment, air pollution, and global environmental issues.

ENVIRONMENTAL ENGINEERING SYSTEMS DESIGN (4) Ellis
Limit 20 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.

THE ENVIRONMENT AND YOUR HEALTH (3) Kensler
Cross-listed with Public Health Studies and Earth and Planetary Sciences

ENGINEERING MICROECONOMICS (3) Norman
Limit 20 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.

INTRODUCTION TO FLUID MECHANICS (3) Wilcock
Limit 20 Prereq: Statics, 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. Cross-listed with 560.351

POLITICAL ECOLOGY (3) Schoenberger
Limit 20 The study of how and why people use or abuse their environment in the context of complicated local social and economic histories and how they are situated in a global economic order. Combines analysis of political economic and environmental processes. Themes include rural development, gender relations.

ENVIRONMENTAL MICROBIOLOGY (4) Bouwer
Limit 30 Fundamental aspects of microbiology and biochemistry as related to environmental pollution and water quality control processes, biochemical cycles, microbiological ecology, energetics and kinetics of microbial growth, and biological fate of pollutants.

ENVIRONMENTAL ENGINEERING DESIGN I (2) Hsieh/Ruiz
Limit 20 Through general lectures and case study examples, this course will expose students to some of the non-technical professional issues that they will face as professional engineers and in their second-semester senior design project.

ENVIRONMENTAL ORGANIC CHEMISTRY (3) Roberts
Prereq: 030.104 or Perm. Req’d
Advanced undergraduate/graduate course focusing on examination of processes that affect the behavior and fate of anthropogenic organic contaminants in aquatic environments. Students learn to predict chemical properties influencing transfers between hydrophobic organic chemicals, air, water, sediments, and...
biota, based on a fundamental understanding of intermolecular interactions and thermodynamic principles.

570.443 (E,N) AQUATIC CHEMISTRY (3) Stone
Limit 60 Prereq. One year of both Chemistry and Calculus
Thermodynamics and equilibria applied to processes in natural waters and water and wastewater treatment systems. Chemistry of electrolyte solutions, acids and bases, complex formation, precipitation and dissolution, oxidation and reduction.

Sec. 01 MWF 12-12:50

570.445 (E) PHYSICAL AND CHEMICAL PROCESS IN ENVIRONMENTAL ENGINEERING I (3) Ball
Limit 25 Prereq. 570.301-302 or permission of the instructor
The application of basic physical and chemical concepts to the analysis of environmental engineering problems. 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. Topics addressed include mass balances, hydraulic characteristics of reactors, reaction kinetics and reactor design, gas transfer processes (including both fundamentals of mass transfer and design analysis), and adsorption processes (including both fundamentals of adsorption and design analysis).

Sec. 01 TTh 9-10:15

570.465 (H,S) WATER RESOURCE DEVELOPMENT: HISTORY AND PRINCIPLES (3) Wolman
Limit 20 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. Cross-listed with Public Health Studies

Sec. 01 TTh 12-1:15

570.470 (S) APPLIED ECONOMICS AND FINANCE (3) Hanke
Limit 10 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. Cross-listed with Economics

Sec. 01 TBA

570.487 (S) FUTURES MARKET RESEARCH (3) Hanke
Limit 10 Perm. Req’d.
An investigation of some futures market problems and preparation of a research report. Research is focused on developing and testing hypotheses about price behavior in futures markets. Cross-listed with Economics

Sec. 01 TBA

570.490 (E) SOLID WASTE ENGINEERING AND MANAGEMENT (3) Javvi
Limit 15
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 material.

Sec. 01 W 6-8:48pm

570.492 DEPARTMENT SEMINAR (1) Hilpert
Limit 40 Undergraduates only

Sec. 01 T 3-4:50

570.493 (Q,S) ECONOMIC FOUNDATIONS FOR PUBLIC DECISION MAKING (3) Norman
Limit 20 Prereq. 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

Sec. 01 TTh 9-10:15
include demand, supply, the function and behavior of the market, and introductory welfare economics.

570.495 (E,Q) MATHEMATICAL FOUNDATIONS FOR PUBLIC DECISION MAKING (3) Williams/Hobbs Limit 20 Prereq: Calculus I & 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.

195.477 (S) INTRODUCTION TO URBAN POLICY (3) Newman Limit 15 Perm. Req’d. Coreq: 195.478 Cross-listed with Political Science, Sociology, Public Health Studies, and Public Policy


570.501 UNDERGRADUATE RESEARCH

570.505 INDEPENDENT STUDY

360.528 APPLIED ECONOMICS INTERNSHIP (3) Hanke Limit 10 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

570.613 SEMINAR: GEOMORPHOLOGY Wilcock Limit 20 Analysis and discussion of current research in the field.

570.641 DEPARTMENT SEMINAR Hilpert Limit 50 Visiting speakers, faculty, and students. Reports and research on topics of current interest.

570.647 MASS TRANSFER PROCESSES IN ENVIRONMENTAL ENGINEERING Ball Limit 25 Prereq: 570.445 Principles of adsorption, phase-partitioning, diffusion, and interphase mass transfer are developed and applied to processes of contaminant fate and treatment in aqueous systems. Emphasis is on fundamentals of mass transfer in heterogeneous and complex systems, and as applied in recent environmental engineering research and practice. Examples from the literature are studied in accordance with student interests.

570.661 APPLIED MATH FOR ENGINEERING 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.

570.673 PUBLIC SYSTEMS SEMINAR Williams Limit 20 An advanced seminar in the application of operations research and economics to public systems problems. Guest speakers and seminar research projects.

570.681 ENVIRONMENTAL ENGINEERING SEMINAR Bower Limit 50 Broad coverage of environmental engineering and science problems. Guest speakers,
GEOGRAPHY & ENVIRONMENTAL ENGINEERING

given reading, and critical analysis of journal articles.

ANTHROPOLOGY OF “THE EVERYDAY”

Khan Limit 15

Cross-listed with Political Science, German and Romance Languages and Literatures, the Humanities Center, and Anthropology

SEMINAR: ENVIRONMENT AND APPLIED FLUID MECHANICS

Meneveau

Cross-listed with Interdepartmental, Earth & Planetary Sciences, and Mechanical Engineering

INDEPENDENT STUDY

Sec. 01
Sec. 02 Stone
Sec. 03 Roland
Sec. 04 Beier
Sec. 05 Ellis
Sec. 06 Tress
Sec. 07 Hrist
Sec. 08 Hiltot
Sec. 09 Hekt
Sec. 10 Hicat
Sec. 11 Paragon
Sec. 12 Schoenberger
Sec. 13 Ward

RESEARCH

See 570.800 for faculty sections

Masters Research

Bouwer

Investigation of an environmental engineering and chemistry problem and preparation of project report.

Masters Internship

Ball

Limit 2

INFORMATION SECURITY INSTITUTE

RIGHTS IN THE DIGITAL AGE (3)

Jacobs

Limit 20 Perm. Req'd.

(This course will be taught in Washington, DC and video-cast into Hodson Hall Rm 213.) This course will examine various legal and policy issues presented by the tremendous growth in computer technology, especially the Internet. The rights that various parties have with respect to creating, modifying, using, distributing, storing, and copying digital data will be explored. The concurrent responsibilities, and potential liabilities, of those parties will also be addressed. The course will focus on intellectual property issues, especially copyright law, and other legal and economic considerations related to the use and management of digital data. Copyright law and its role within the framework of intellectual property law will be presented in a historical context with an emphasis on its applicability to emerging-technology issues. Specifically, the treatment of various works, such as music, film, and photography that were traditionally, analog in nature will be analyzed with respect to their treatment in the digital domain; works that are by their nature digital, such as computer software, will also be analyzed. The current state of U.S. copyright law will be presented, as will relevant international treaties and foreign laws. The goal of the course is to provide those involved or interested in digital rights management with a general awareness of the rights and obligations associated with maintaining and distributing digital data.

EMBEDDED COMPUTER SYSTEMS

Kalb

Limit 20 Department Majors Only Course taught On-line

This course provides an understanding of differences in network-based computers, program mobility, current intrusion protection technologies and exploitation methods along with material relating to computer hacking and vulnerability assessment.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor</th>
<th>Section</th>
<th>Credits</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>650.457 (E)</td>
<td>COMPUTER FORENSICS (3) Lavine</td>
<td>Lavine</td>
<td>Sec. 01</td>
<td>M 6:30-8:30pm</td>
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<td></td>
<td>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 aid 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.</td>
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<tr>
<td>650.651</td>
<td>HEALTH INFORMATION PRIVACY LAW AND POLICY Hodge</td>
<td>Hodge</td>
<td>Sec. 01</td>
<td>T 10:30-1:45</td>
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<td></td>
<td>Core health course for MSSI Course meets Oct. 23-December 22 This course pertains to issues relating to protecting health information privacy in the modern era. Theoretical and ethical discussions underlying health information privacy are covered. The primary focus of the course is to provide a modern context through which privacy protections are debated, constructed, implemented, and enforced. The course attempts to instruct students on the legal, policy, and practical issues surrounding the protection of health information privacy. The major federal and state privacy laws and policies and how these laws and policies are implemented in the public and private sectors is considered.</td>
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<tr>
<td>650.736</td>
<td>INFORMATION SECURITY PROJECTS Masson</td>
<td>Masson</td>
<td>Sec. 01</td>
<td>T 3:45-5:50</td>
<td></td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>600.415 (E)</td>
<td>DATABASE SYSTEMS (3) Yarowsky</td>
<td>Yarowsky</td>
<td>Sec. 01</td>
<td>TTh 3:45-5:15</td>
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<td></td>
<td>Limit 30 Prereq: 600.226 Students may receive credit for 600.315 or 600.415, but not both. Graduate level version of 600.315</td>
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<tr>
<td>600.421 (E)</td>
<td>OBJECT ORIENTED SOFTWARE ENGINEERING (3) Smith</td>
<td>Smith</td>
<td>Sec. 01</td>
<td>WF 1:30-2:45</td>
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<tr>
<td></td>
<td>Limit 30 Prereq: 600.226 and 600.120 Students may receive credit for 600.321 or 600.421, but not both. Graduate level version of 600.321.</td>
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<tr>
<td>600.433 (E)</td>
<td>COMPUTER SYSTEMS (4) Masson</td>
<td>Masson</td>
<td>Sec. 01</td>
<td>MWF 10-10:50</td>
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<tr>
<td></td>
<td>Limit 50 Students may receive credit for 600.333 or 600.433, but not both. Graduate version of 600.333.</td>
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<tr>
<td>600.443 (E)</td>
<td>SECURITY AND PRIVACY (3) Rubin</td>
<td>Rubin</td>
<td>Sec. 01</td>
<td>MW 1:30-3:25</td>
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<td></td>
<td>Limit 50 Prereq: A basic course in operating systems and networking, or permission of instructor</td>
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<tr>
<td>600.450 (E)</td>
<td>NETWORK EMBEDDED SYSTEMS AND SENSOR NETWORK (3) Terzis</td>
<td>Terzis</td>
<td>Sec. 01</td>
<td>TTh 1:30-2:45</td>
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<td></td>
<td>Limit 40 Prereq: 600.226, 600.120, and 600.344/444 (This course replaces 600.349/449.)</td>
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<tr>
<td>600.463 (E,Q)</td>
<td>ALGORITHMS I (3) Awerbuch</td>
<td>Awerbuch</td>
<td>Sec. 01</td>
<td>MW 12:15</td>
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<tr>
<td></td>
<td>Limit 30 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.</td>
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<tr>
<td>600.471 (E,Q)</td>
<td>THEORY OF COMPUTATION (3) Hohenberger</td>
<td>Hohenberger</td>
<td>Sec. 01</td>
<td>TTh 1:30-2:45</td>
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<tr>
<td></td>
<td>Limit 40 Prereq: 550.171 or equivalent</td>
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<td>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.</td>
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<tr>
<td>774.717</td>
<td>FINANCIAL ISSUES IN MANAGING A SECURE OPERATION Agresti</td>
<td>Agresti</td>
<td>Sec. 01</td>
<td>W 5:45-7:50</td>
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</table>
|            | Limit 25 This course addresses the risks (financial, reputation, business, and third party), costs,
INFORMATION SECURITY INSTITUTE

ROI, and other business issues concerned in planning and managing a secure operation. Topics include: disaster recovery, outsourcing issues; service level agreements, evaluating external security service providers; assessing security total cost of ownership; audit procedures; financial integrity; cost/benefit analyses; back-up and recovery provisions; insurance protection; contingency and business continuity plans; qualitative and quantitative risk analysis; monitoring the security of the enterprise; information economics; performance reporting, automated metrics reporting; responses to threats; effects of security policies and practices on business and customers; preparing a business case for information security investments; and developing cost effective solutions given constraints in money, assets, and personnel. Case studies and exercises will be used to illustrate financial planning and evaluation of security operations.

NOTE: This course is taught through the Carey Business School. Please fill out interdivisional form.

MATERIALS SCIENCE AND ENGINEERING

510.101 (N) INTRODUCTION TO MATERIALS CHEMISTRY (3) Katz  Limit 75
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).

Sec. 01  MWF 9-9:50

510.107 (N) MODERN ALCHEMY (3) Spicer  Limit 75
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.

Sec. 01  TTh 1:30-2:45

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, and crystal structure, imperfections in crystals, nontoxic crystalline solids, and composite materials. Among the techniques treated are X-ray diffraction, stereographic projection, and optical and electron microscopy.

Sec. 01  MWF 9-9:50

510.312 (E,N) PHYSICAL CHEMISTRY OF MATERIALS I: THERMODYNAMICS (3) Mz  Limit 50  Prereq: Calculus I & II, Freshman/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 fundamental principles of thermodynamics,

Sec. 01  MWF 11-11:50
MATERIALS SCIENCE AND ENGINEERING

equilibrium in homogeneous and heterogeneous systems, and thermodynamics of multicomponent systems, phase diagrams, thermodynamics of defects, and elementary statistical thermodynamics.

510.316 (E,N) BIOMATERIALS I (3) Prereq: Organic Chemistry I & II and Organic Chemistry Lab I & II. 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.

510.403 (N) MATERIALS CHARACTERIZATION (3) This course will describe a variety of techniques used to characterize the structure and composition of engineering materials, including metals, ceramics, polymers, composites and semiconductors. The emphasis will be on microstructural characterization techniques, including optical and electron microscopy, X-ray diffraction, and acoustic microscopy. Surface analytical techniques, including Auger electron spectroscopy, secondary ion mass spectroscopy, X-ray photoelectron spectroscopy, and Rutherford backscattering spectroscopy. Real-world examples of materials characterization will be presented throughout the course, including characterization of thin films, surfaces, interfaces, and single crystals.

510.413 (E,N) STATISTICAL MECHANICS OF MATERIALS (3) This course will present the basic principles of statistical mechanics and apply them to problems concerning the behavior of materials. Topics include: basic principles of statistical mechanics; time averages and ensembles; connection to macroscopic thermodynamics; fluctuations; classical and quantum particle statistics; lattice statistics; statistical thermodynamic models of gases, liquids, crystals, crystalline defects, linear chain polymers, and surfaces; phase transitions and critical phenomena; kinetic and transport phenomena; thermodynamics of irreversible processes.

510.418 (E,N) ELECTRONIC AND PHOTONIC PROCESSES AND DEVICES (3) This course is intended for advanced undergraduates and graduate students and will cover the fundamentals and properties of electronic and optical materials and devices. Subject matter will include a detailed and comprehensive discussion of the physical processes underlying modern electronic and optical devices. Detailed descriptions of modern semiconductor devices such as lasers and detectors used in optical communications and information storage and processing will be presented.

510.419 (E,N) PHYSICAL METALLURGY (3) This course examines the relationship between microstructure and mechanical properties of metals and alloys. Starting from fundamentals (phase diagrams and phase transformation kinetics), we will explore how the structure of metals and
MATERIALS SCIENCE AND ENGINEERING

alloys can be manipulated by thermomechanical processing to achieve desired properties. Detailed examples will be drawn from several alloy systems, including steels, aluminum, and titanium. A theme of the course will be the impact of materials processing and materials selection on the environment, including considerations of lightweight materials and processing techniques for minimizing energy consumption.

510.426 (E,N) BIOMOLECULAR MATERIALS (3) Sec. 01 TTh 3-4:15
Hristova  Limit 50

510.428 (E,N) MATERIALS SCIENCE LAB I (3) Sec. 01 Lab T 12:30-1:15
Weihs  Limit 30  Prereqs: 510.311, 510.313
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) SENIOR DESIGN RESEARCH (3) Sec. 01 MW 3:30-4:45
Hristova  Limit 25  Perm. Req’d
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.

500.405 (E,N) ENERGY ENGINEERING: FUNDAMENTALS AND FUTURE (3) Erlebacher Katz/ Hemker  Limit 50
Prereq: Undergraduate course in thermodynamics
This course examines the science and engineering of contemporary and cutting-edge energy technologies. Materials Science and Mechanical Engineering fundamentals in this area will be complemented by case studies that include fuel cells, solar cells, lighting, thermoelectrics, wind turbines, engines, nuclear power, biofuels, and catalysis. Students will consider various alternative energy systems, and also to research and engineering of traditional energy technologies aimed at increased efficiency, conservation, and sustainability. Cross-listed with Mechanical Engineering and General Engineering

Cross-listed with Mechanical Engineering and General Engineering
MATERIALS SCIENCE AND ENGINEERING

510.501 MATERIAL SCIENCE RESEARCH
Perm. Req’d. 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.

510.503 INDEPENDENT STUDY
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.

510.601 STRUCTURE OF MATERIALS
Hufnagel Limit 50 Prereq: 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.

510.602 THERMODYNAMICS OF MATERIALS
Erlebacher Limit 50 Prereq: Basic Chemistry, Physics and Calculus or Perm. Req’d 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 diagrams); 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.

510.606 CHEMICAL AND BIOLOGICAL PROPERTIES OF MATERIALS
Yu Limit 75 Prereq: Basic Biology and Chemistry 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, biomaterialization, 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.

510.611 SOLID STATE PHYSICS
Pochler Limit 20 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 electronic, optical, and structural materials are discussed.

510.613 STATISTICAL MECHANICS OF MATERIALS
Cammarata Sec. 01 TTh 10:30-11:45

510.602 THERMODYNAMICS OF MATERIALS
Sec. 01 TTh 1:30-2:45

510.606 CHEMICAL AND BIOLOGICAL PROPERTIES OF MATERIALS
Sec. 01 TTh 4:30-5:45pm

510.611 SOLID STATE PHYSICS
Sec. 01 TF 3-4:15

510.613 STATISTICAL MECHANICS OF MATERIALS
Sec. 01 TTh 10:30-11:45
MATERIALS SCIENCE AND ENGINEERING

Limit 10  Prereq: 510.312 or undergraduate course in thermodynamics. This course will present the basic principles of statistical mechanics and apply them to problems concerning the behavior of materials. Topics include: basic principles of statistical mechanics; time averages and ensembles; connection to macroscopic thermodynamics; fluctuations; classical and quantum particles statistics; lattice statistics; statistical thermodynamic models of gases, liquids, crystals, crystalline defects, linear chain polymers, and surfaces; phase transitions and critical phenomena; kinetic and transport phenomena; thermodynamics of irreversible processes. Same as 510.415

510.617  ADVANCED TOPICS IN BIOMATERIALS  Mao  Limit 25
This course reviews recent advances in biomaterials focusing on the design principles in polymeric materials and scaffolds. It will cover topics from molecular designs of polymeric biomaterials, materials surface engineering, processing of polymeric scaffolds, to manipulation of cellular behaviors through materials engineering. Specific examples in cell and tissue engineering, and drug and gene delivery will be discussed.

510.618  ELECTRONIC AND PHOTONIC PROCESSES AND DEVICES  Poehler  Limit 25
This course is intended for advanced undergraduates and graduate students and will cover the fundamentals and properties of electronic and optical materials and devices. Subject matter will include a detailed and comprehensive discussion of the physical processes underlying modern electronic and optical devices. Detailed descriptions of modern semiconductor devices such as lasers and detectors used in optical communications and information storage and processing will be presented. Same as 510.418

510.626  BIOMOLECULAR MATERIALS  Hristova  Limit 25
ADVANCED TOPICS IN THERMODYNAMICS OF MATERIALS

Sec. 01 TTh 9-10:15

Prereq: 510.312 or 510.612 (or similar course covering thermodynamics)
Selected areas of thermodynamics will be examined in depth with the aim of understanding the ideas and assumptions underlying results of importance to materials science. Attempts will be made to be as rigorous as possible without losing sight of the physical meaning. The theories and models obtained will be evaluated critically to determine their validity and limitations. Tentative list of topics to be covered: review of the traditional development of the laws of thermodynamics; alternate formulations (Carathéodory, Truesdell, single axiom approach); equilibrium thermodynamics of Gibbs, thermodynamics of solids, thermodynamics of surfaces; principles of statistical thermodynamics; critical phenomena; third law, nonequilibrium thermodynamics ("rational" thermodynamics, thermodynamics of irreversible processes, absolute reaction rates).

FUNDAMENTAL PHYSICS AND CHEMISTRY OF NANOMATERIALS

Sec. 01 MTh 1-2:15

Searson, Stebe, Wirtz, Chien
INBT course
This course will cover the physics and chemistry relevant to the design, synthesis, and characterization of nanoparticles. Topics include nanoparticle synthesis, functionalization, surface engineering, and applications in diagnostics and therapeutics. The properties of semiconductor quantum dots and magnetic nanoparticles will be reviewed along with techniques for nanoparticle manipulation, particle tracking, and bio-microscopy. Patterning tools including soft lithography, optical lithography, e-beam lithography, and template lithography will be discussed. Electron and scanning probe microscopy will be reviewed. Cross-listed with General Engineering

MATERIALS RESEARCH SEMINAR

Sec. 01 W 2-3:30

Katz
Perm. Req’d.
The Graduate Research Seminar in the Department of Materials Science and Engineering provides a forum for students to present their latest research results in a formal seminar setting. The course encourages discussion between students in varying disciplines in order to establish new collaborations and develop the shared vocabulary required for interdisciplinary materials science research.

MATERIALS SCIENCE SEMINAR

Sec. 01 W 3:30-5

Katz
The Materials Science Seminar exposes students to a wide array of internationally recognized speakers who discuss topics of cutting-edge Materials Science research. Speakers are selected both to overlap research interests within the department and to expose students to broader trends in contemporary Materials Science.

GRADUATE RESEARCH IN MATERIALS SCIENCE

Sec. 01 TBA

Katz
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.
MECHANICAL ENGINEERING

530.101 (E) FRESHMEN EXPERIENCES IN MECHANICAL ENGINEERING I
(2) Okamura  Limit 45
Mechanical Engineering, Engineering Mechanics, Undecided Engineering Majors, and others with permission of instructor
An overview of the field of mechanical engineering along with topics that will be useful throughout the mechanical engineering program. This is the first half of a one-year course that includes applications of mechanics, elementary numerical analysis, programming in MatLab, use of computer data acquisition, analysis, design, and visualization; technical drawing, the design process and creativity, report preparation, teamwork, and engineering ethics.

Sec. 01 MW 11-11:50

530.103 (E) INTRODUCTION TO MECHANICS I (2) Meneveau
Limit 45
Mechanical Engineering, Engineering Mechanics, Undecided Engineering Majors, and others with permission of instructor
This is the first half of a one-year course offering in-depth study of elements of mechanics, including linear statics and dynamics, rotational statics and dynamics, thermodynamics, fluids, continuum mechanics, transport, oscillations, and waves. This is an alternate to 171.101, designed specifically for Mechanical Engineering and Engineering Mechanics students taking 530.101 concurrently.

Sec. 01 MW 1:30-2:20

530.105 (E) MECHANICAL ENGINEERING FRESHMAN LAB I (1)
Okamura
Limit 15 per section
Mechanical Engineering, Engineering Mechanics, Undecided Engineering majors, and others with Permission of instructor Hands-on laboratory complementing 530.101 and 530.103, including experiments, mechanical dissections, and design experiences distributed throughout the year. Experiments are designed to give student background in experimental techniques as well as to reinforce physical principles. Mechanical dissections connect physical principles to practical engineering applications. Design projects allow students to synthesize working systems by combining mechanics knowledge and practical engineering skills.

Sec. 01 TBA
02 TBA
03 TBA

530.201 (E) STATICS AND MECHANICS OF MATERIALS (4) Graham-Brady
Limit 18 per section (Lab)
Freshmen by Permission Only
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.
Co-listed with 560.201

Sec. 01 Lec. TTh 10:30-11:45
01 M 4-6pm
02 T 4-6pm
03 W 4-6pm
04 Th 4-6pm

530.231 (E) MECHANICAL ENGINEERING THERMODYNAMICS (4) Katz
Limit 70  Prereq: 110.109, 171.102

Sec. 01 Lab MWF 1:30-2:20
01 W 4:5
MECHANICAL ENGINEERING

530.327 (E)  INTRODUCTION TO FLUID MECHANICS (4)  Sec. 01  MWF 10-10:50

530.352 (E)  MATERIALS SELECTION (4)  Sec. 01  MWF 11-11:50
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)  ENGINEERING DESIGN PROJECT (4)  Sec. 01  Sec. 02  T 1:30-4:20  Th 1:30-4:20
Staff  Limit 25 per section  Prereq: ME Majors: 530.215, 530.327 EM & BME Majors: 530.215 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 products, 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)  Sec. 01  Sec. 02  F 1:30-4:30  F 4:30-7:30
Stoianovici  Limit 21 per section  Prereq: 530.215 or Perm. Req’d. 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.

530.420 (E)  ROBOT SENSORS AND ACTUATORS (3)  Sec. 01  Sec. 02  Th 3-6
Whitcomb  Limit 20 per section  Prereq: 530.215 or Perm. Req’d. Introduction to modeling and use of actuators and sensors in mechatronic design. Topics include electric motors, solenoids, micro-actuators, position sensors, and proximity sensors.

530.445 (E)  INTRODUCTION TO BIOMECHANICS (3)  Belkoff  Sec. 01  TBA
Limit 50  Prereq: 530.215. An introduction to the mechanics of biological materials and systems. Both soft tissue such as muscle and hard tissue such as bone will be studied as will the way they interact in physiological functions. Special
emphasis will be given to orthopedic biomechanics.

530.451 (EN) CELLULAR AND TISSUE ENGINEERING LAB (2) Haase
Limit 8 per section - Seniors and Graduate Students only others Perm. Req’d Lab Fee: $100
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. Co-listed with 566.451

530.454 (E) MANUFACTURING ENGINEERING (3) Staff
Limit 50 Prereq. 530.215 and 530.352
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) Rothman
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.

530.467 (E) THERMAL DESIGN ISSUES FOR AEROSPACE SYSTEMS (3) Herman
Limit 50 This course deals with processes, systems, instrumentation, and equipment for aerospace systems. Issue of energy conversion and thermal design are emphasized. Topics include thermodynamic concepts and heat transfer processes for aerospace systems (with emphasis on radiation), the space environment, influence of gravity on heat transfer, power generation for space systems (energy sources, solar cell arrays, energy storage), thermal control (analysis techniques, design procedures, active versus passive design, heating and refrigeration), environmental effects.

530.470 (E) SPACE VEHICLE DYNAMICS AND CONTROL (3) Guzman
Limit 50 In this course we study applied spacecraft orbital and attitude dynamics and their impact on other subsystems. In the orbital dynamics part of the course, we discuss some the issues associated with orbital insertion, control and station keeping. Focus is on the two-body problem regime where conic solutions are valid. Orbit perturbations are also considered. For attitude dynamics, different attitude representations such as of direction cosines, quaternions, and angles are introduced. Then we look at the forces and moments acting on space vehicles. Attitude stability and control considerations are introduced.

530.491 SPECIAL TOPICS (1) Staff
Selected topics for third- and fourth-year students in mechanical engineering and other engineering departments. Offered by arrangement with faculty advisor and instructor in charge.

530.495 (EN) MICROFABRICATION LABORATORY (4) Andreou/Wang
Lec. W 1-30-2:20
Lab 01 Th 1-5
MECHANICAL ENGINEERING

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, photolithography, plating, etching, packaging, design and analysis CAD tools, and foundry services.

ENROLLMENT LIMITS:
- 5 per section
- Seniors only or Perm. Req’d
- This course is available for 02, 03, and 04 sections, with class times on Th 5-8pm, F 8-12, and F 1-5.

ENERGY ENGINEERING: FUNDAMENTALS AND FUTURE

500.405 (EN)

Co-listed with 520.495 & 580.495

INDEPENDENT RESEARCH

530.525

INDEPENDENT STUDY

530.527

MECHANICS OF SOLIDS AND MATERIALS I

530.605

STATISTICAL MECHANICS IN BIOLOGICAL SYSTEMS

530.610

INTRODUCTION TO LINEAR SYSTEMS

530.616

FLUID DYNAMICS I

530.621

CONVECTION

530.632
MECHANICAL ENGINEERING

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.

530.637 ENERGY AND THE
ENVIRONMENT Herman Limit 30
Prereq: Thermodynamics The course
focuses on advanced topics related to
energy and thermodynamics. The
objective of this course is to provide a
thorough understanding of the
environmental impacts related to
energy conversion systems. The use of
the second law of thermodynamics is
introduced to quantify the performance
of energy conversion systems. Topics
such as global warming, alternative
energy sources (solar, wind power,
geothermal, tides, etc.) and new
technologies (fuel cells and hydrogen
economy) and resources and
sustainable development are addressed.
A section of the course is devoted to
current trends in nuclear energy
generation and environmental issues
associated with it.

530.646 INTRODUCTION TO ROBOTICS
Whitcomb Limit 30 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
manipulator control.

530.672 BIOSENSING AND BIOMEMS
Wang Limit 30 The course
discusses the principles of biosensing
and introduces micro- and nano-scale
devices for fluidic control and
molecular / cellular manipulation,
measurements of biological
phenomena, and clinical applications.

530.730 FINITE ELEMENT METHODS
Staff Limit 10 The basic concepts of
the FEM are presented for one-, two-, and
three-dimensional boundary value
problems (BVPs). Problems from heat
conduction and solid mechanics are
addressed. The key topics include
relationships between strong, weak,
and variational statements of BVPs,
weighted residual methods with an
emphasis on the Galerkin method,
specialization of Galerkin
approximations of weak statements and
Ritz approximations of variational
statements to obtain finite element
formulations, specific element
formulations, convergence properties,
solutions of linear systems of
equations, and time-dependent
problems.

530.732 FRACTURE OF MATERIALS
Ramesh Limit 25 An advanced
examination of fracture mechanisms in
ductile and brittle materials. Both the
mechanics and the materials aspects
are covered with importance placed on
the synthesis of the two approaches.
Topics include linear elastic fracture
mechanics, ductile fracture, the J-
integral, atomistic aspects of fracture in
polycrystalline materials, fracture in
ceramics and polymers, influence of
the material microstructure on fracture
toughness and ductility in FCC and
BCC materials.

530.759 RESEARCH SEMINAR:
PLASTICITY AND FAILURE
Ramesh Limit 25 A weekly
research seminar featuring ongoing
research as well as reviews of new
papers of interest in the general areas

Sec. 01 T-1-1 MWF 1:30-2:20

Sec. 01 T-1-15

Sec. 01 T 3:30-4:15

Sec. 01 T 9-10:15

Sec. 01 T 10:30-12

Sec. 01 TBA

Sec. 01 TBA

Sec. 01 TBA
MECHANICAL ENGINEERING

of plasticity and failure. The course will have an emphasis on dynamic phenomena, but will consider both engineering materials and biological systems. Students will be expected to make two presentations during the semester.

530.766 NUMERICAL METHODS
Limit 25
Elementary introduction to numerical methods for the solution of fundamental problems in engineering. Computer assignments requiring programming.

590.602 SEMINAR: ENVIRONMENT & APPLIED FLUID MECHANICS
Meneveau
Cross-listed with Geography & Environmental Engineering, Earth & Planetary Sciences, and General Engineering

530.800 INDEPENDENT STUDY
(Refer to 530.801 for registering with faculty)

530.801 GRADUATE RESEARCH
Use the following section when registering with a faculty member:
Sec. 01 Staff
Sec. 02 Meneveau
Sec. 03 Stepanov
Sec. 04 Chan
Sec. 05 Savarese
Sec. 06 Ramam
Sec. 07 Taylor
Sec. 08 Provenzini
Sec. 09 Apte
Sec. 10 Katz
Sec. 11 Beker
Sec. 12 Gidoni
Sec. 13 Matar
Sec. 14 Oikemura
Sec. 15 Xu
Sec. 16 Wang
Sec. 17 Sun
Sec. 18 Yuan
Sec. 19 Wang
Sec. 20 Vital
Sec. 21 Felinger
Sec. 22 Balthoff

530.803 MECHANICAL ENGINEERING SEMINAR
Wang
Limit 100

530.807 GRADUATE RESEARCH
Seminars in Fluid Mechanics
Meneveau
Limit 100

PROFESSIONAL COMMUNICATION PROGRAM

661.110 TECHNICAL COMMUNICATION (3)
Limit 22 per section
Sec. 01 Sheff
Sec. 02 Sheff
Sec. 03 Reiser
Sec. 04 Volk
Sec. 05 Porosky

Students create several different kinds of professional documents, including resumes, application letters, and proposals. They are exposed to research on language and the writing process and further develop communication skills.

661.120 BUSINESS COMMUNICATION (3)
Limit 20 per section
Sec. 01 Rice
Sec. 02 Porosky

Students focus on writing business memos, resumes and cover letters, business proposals, and formal reports. They present work orally using business and professional formats, and enhance their presentations with technology-based media.
## ORAL PRESENTATIONS (3)

Limit 16 per section

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<th>Course</th>
<th>Instructor</th>
<th>Days</th>
<th>Time</th>
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<td>Sec. 01</td>
<td>Dungey</td>
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<td>3-5:30</td>
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<tr>
<td>Sec. 02</td>
<td>Dungey</td>
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<td>Sec. 03</td>
<td>Reiser</td>
<td>Th</td>
<td>1:30-4</td>
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<td>Sec. 04</td>
<td>Kulanko</td>
<td>F</td>
<td>1:30-4</td>
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<tr>
<td>Sec. 05</td>
<td>Kulanko</td>
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<td>3-5:30</td>
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<tr>
<td>Sec. 06</td>
<td>Porosky</td>
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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.

## SCIENTIFIC WRITING (3)

Limit 20

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Sec. 01</td>
<td>Stone</td>
<td>MW</td>
<td>3-4:15</td>
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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.

## RESEARCH WRITING

Limit 20

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<th>Instructor</th>
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<tbody>
<tr>
<td>Sec. 01</td>
<td>Stone</td>
<td>MW</td>
<td>4:30-5:45</td>
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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.