Dietrich College Interdisciplinary Minors

Dietrich College interdepartmental minors are programs whose content and components span two or more academic departments to form coherent patterns of study. A number of interdepartmental minors are offered by Dietrich College and are, in general, available to all Carnegie Mellon undergraduate students. As well, there are numerous other minors offered by other colleges in the university that are generally available to Dietrich College students. The full list of minors available to Carnegie Mellon students is located in the catalog index under “Minors.”

Completion of the requirements for any of these minors is noted on the final transcript. To declare a Dietrich College interdepartmental minor, students should contact the college’s Academic Advisory Center (AAC) and the faculty advisor for that minor. To discuss the possibility of declaring a non-Dietrich College minor, contact the college’s Academic Advisory Center (AAC) and the faculty advisor for that minor. In general, unless noted, no course taken to fulfill requirements for these interdepartmental minors may apply toward any other program’s requirements.

The Minor in African and African American Studies

Professor Edda L. Fields-Black, Faculty Advisor
fieldslashblack@andrew.cmu.edu, Baker Hall 362, 412-268-8012

Dr. Andrew Ramey, Academic Advisor
aramey@andrew.cmu.edu, Baker Hall 240, 412-268-7906

Mission

The African and African American Studies minor introduces students to several large regions of the world: sub-Saharan Africa, the Americas, and the Caribbean. Broad geographic coverage and a comparative framework encourage students to make connections between Africa and the African Diaspora, as well as among different Diasporan communities. The minor offers undergraduates the opportunity to undertake an empirical and theoretical examination of the cultural, political, social, and historical experiences of Africans and people of African descent.

This unique transnational minor brings together several departments and colleges within the university and allows students to develop analytical skills particular to the arts, humanities, social sciences, public policy, and management. The African and African American Studies minor allow students a considerable degree of freedom in their choice of electives and independent research projects, including opportunities to study and conduct research in a relevant foreign language.

Courses taken to fulfill requirements in other major or minor programs may only be applied to this minor with permission of the Faculty Advisor.

Requirements

- The minor is composed of 54 units - two core courses and four elective courses.
- The elective courses must include one course that requires a research paper or project.
- Students may take an additional two core courses as electives, but not more than four total courses.
- Students must take courses in at least two of the four regions (African, African American, Latin American, and the Caribbean) between their core and elective courses.

Core Courses 18 units

Choose two from the History and/or English Department courses listed below:

| 76-226 | African History: Earliest Times to 1780 | 9 |
| 79-227 | Modern Africa: The Slave Trade to the End of Apartheid | 9 |

African American

| 76-232 | Introduction to Black Literature | 9 |

Elective Courses 36 units

| African | 79-225 | West African History in Film | 9 |
| 79-237 | Comparative Slavery | 9 |
| 79-290 | The Slave Passage: From West Africa to the Americas | 6 |
| 79-291 | Globalization in East African History | 6 |
| 79-385 | Out of Africa: The Making of the African Diaspora | 9 |
| 79-386 | Entrepreneurs in Africa, Past, Present and Future | 9 |
| 82-304 | The Francophone World ** | 9 |

African American

| 57-480 | History of Black American Music | 6 |
| 76-238 | What Was the Hip-Hop Generation? | 9 |
| 76-332 | African American Literature: The African American Experience | 9 |
| 76-333 | Race and Controversy in the Arts | 9 |
| 76-432 | Advanced Seminar in African American Studies * | 9 |
| 79-237 | Comparative Slavery * | 9 |
| 79-304 | African Americans in Pittsburgh | 6 |
| 79-371 | African American Urban History | 9 |

Caribbean

| 79-237 | Comparative Slavery * | 9 |
| 79-385 | Out of Africa: The Making of the African Diaspora | 9 |
| 82-304 | The Francophone World ** | 9 |

Latin American

| 79-317 | Art, Anthropology, and Empire | 9 |
| 82-343 | Latin America Language and Culture | 9 |
| 82-451 | Studies in Latin American Literature and Culture | 9 |

Notes:
- * Denotes courses that require a research paper/project.
- ** Denotes courses taught in a foreign language

The Minor in Film and Media Studies

Laura E. Donaldson, Academic Advisor
Jeffrey Hinkelman, Faculty Advisor

Location: Department of English, Baker Hall 259

Film and the electronic media are a crucial part of contemporary culture and society; they constitute an important tool for understanding social arrangements, historical changes, and play an increasingly important role in the development of aesthetic and cultural theory. The Dietrich College minor in Film and Media Studies takes an interdisciplinary approach to the study of film and other electronic media. Courses provide techniques for analyzing and criticizing film and other media, for assessing their value as historical, anthropological and social scientific data, and for understanding the aesthetic and philosophical premises of various media texts.

A maximum of two courses may double count with other programs. The courses listed below are offered with at least general regularity. Participating departments may subsequently develop and offer other courses that, while not listed here, are deemed appropriate for this minor. A faculty advisor for the minor should be consulted (especially when the schedule of courses to be offered for a given semester becomes available) to identify such additional courses.
Required Introductory Course
76-239 Introduction to Film Studies 9 units
(Prerequisite for 76-439)

Required Intermediate Course
76-310 Advanced Studies in Film and Media 9 units

Film and Media Electives
27 units

Complete a minimum of 27 units of course work at the 200-level or above when the primary topic is film and media. Courses may include, but are not limited to, the following:

76-238 What Was the Hip-Hop Generation? 9 units
76-269 Survey of Forms: Screenwriting 9 units
76-312 Crime and Justice in American Film 9 units
76-338 The American Cinema 9 units
76-339 Topics in Film and Media: Hollywood vs. the World 9 units
76-353 Transnational Feminisms: Fiction and Film 9 units
76-367 Fact Into Film: Translating History into Cinema 9 units
76-374 IDEAte - Dietrich College Cuban Interactive Documentary Project 9 units
76-377 Shakespeare and Film 9 units
76-381 Mad-Men, Television, and the History of Advertising 9 units
76-419 Media in a Digital Age 9 units
76-438 The Wire: Crime, Realism, and Long-Form TV 9 units
76-439 Seminar in Film and Media Studies: Class, Race, & Gender in Film 9 units
76-448 Shakespeare on Film 9 units
76-456 Independent Study in Film & Media Studies Var. units
76-469 Screenwriting Workshop: Screenwriting/Television Writing 9 units
76-472 Topics in Journalism: Storytelling in a Digital Age 9 units

Film and Media Electives if topics differ.
May be taken up to three times and counted for additional credit toward the minor.

Complete 5 or more additional courses totaling at least 45 units.

The Minor in Gender Studies
Lisa Tetrault, Professor of History and Faculty Advisor
tetrault@andrew.cmu.edu
Location: English Department, Baker Hall 259

Gender studies is an interdisciplinary field that investigates how gender is embedded in social, cultural, and political relationships. It understands gender as a category of power that intersects with other power relations, including race, class, and sexuality.

Courses allow students to develop a deeper understanding of how gender operates, and to transfer the analytical skills they acquire to other courses as well as to their personal and professional lives. The minor combines coursework in some combination of the following fields: English, history, anthropology, psychology, philosophy, economics, and modern languages.

Courses listed are only examples. Course offerings change regularly, so please consult semester offerings and the minor advisor for other courses.

The courses listed below are offered with at least general regularity. Participating departments may develop and offer other courses that, while not listed here, are appropriate for the study of gender. Consult the minor advisor to confirm the relevance of unlisted, gender-focused courses.

Complete 1 of the following required courses. 9 units
76-241 Introduction to Gender Studies 9 units
79-320 Women, Politics, and Protest 9 units
79-331 Body Politics: Women and Health in America 9 units

Complete 5 or more additional courses totaling at least 45 units. 45 units

See examples below, but other courses may fulfill this requirement.*

76-205 Jane Austen 9 units
76-311 Acting Out in the London Theatre 9 units
76-327 Influential Women Writers 9 units
76-329 Unruly Women in Early Modern Drama 9 units
76-341 Gender and Sexuality in Performance 9 units
76-353 Transnational Feminisms: Fiction and Film 9 units
76-412 Performance and 18th Century Theatrical Culture 9 units
76-422 Gender and Sexuality Studies 4.5 units
76-441 Theorizing Sexuality 9 units
79-244 Women in American History 9 units
79-320 Women, Politics, and Protest ** 9 units
79-323 Family, Gender, and Sexuality in European History, 500-1800 9 units
79-324 #MeToo: Naming and Resisting Gender Violence 6 units
79-325 U.S. Gay and Lesbian History 6 units
79-327 Modern Girlhood: Historical and Contemporary Perspectives 6 units
79-331 Body Politics: Women in Health in America ** 9 units
79-333 Sex, Gender & Anthropology 9 units
80-224 Race, Gender and Science 9 units
82-300 Language & Society in the Arab World 9 units
84-312 Gender and Development in Sub-Saharan Africa 6 units
85-350 Psychology of Prejudice 9 units
85-446 Psychology of Gender 9 units

* Consult with Gender Studies Minor Advisor Professor Lisa Tetrault at tetrault@andrew.cmu.edu.
** If not taken as a requirement.

The Minor in Global Systems and Management
Brandy Wilson, Faculty Advisor
Location: HBH 3029
Graduates across all disciplines are increasingly likely to find themselves working as part of a global development team on a wide variety of business, consumer, and intellectual products and services.

The Global Systems and Management minor (GSM) is intended for students wishing to develop skills essential for participating in emerging opportunities in global business systems, systems development, product development and global project management. GSM exposes students to contemporary issues and practices facing organizations, managers and individuals working on a global scale across political, cultural and temporal boundaries. GSM presents an opportunity for students to learn about being part of an organization that works globally with its employees, business partners, customers and supply chains. Students will learn about global project management, outsourcing and cross-cultural communications from theoretical and practical viewpoints. An organized elective structure enables students to tailor the minor to reflect their specific interests.

**Curriculum**

GSM is offered jointly across the departments and programs of the Dietrich College of Humanities and Social Sciences with participation from the Tepper School of Business. The minor is administered by the Dietrich College Information Systems program. The minor requires students to complete 63 units. Note that the courses listed below may be subject to change:

- one Information Systems course: 67-329 Contemporary Themes in Global Systems (offered annually)
- two courses in Communications
- a combination of 36 units with at least 9 units in each of the categories of:
  - Humanities, Heritage and Culture
  - International Management

**Study Abroad Options**

Students are encouraged to complete a semester of study abroad. With prior approval from the GSM Advisor, study abroad courses may be applied to GSM minor requirements except for prior approval from the GSM Advisor, study abroad courses may be applied to GSM minor requirements except for

**Double Counting of Courses**

Students may double count up to three courses with other major and minor programs.

**Core Course**

Required course:

- 67-329 Contemporary Themes in Global Systems (offered annually)

**Communications**

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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<td>67-329</td>
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Complete two courses:

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<td>83-375</td>
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<td>88-419</td>
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</table>

**Humanities, Heritage and Culture (HHC) & International Management (IM)**

36 units (Complete at least 9 units of HHC or IM)

**Humanities, Heritage and Culture**

Humanities Heritage and Culture consists of:

- History Department courses: 79-200 level or above covering international/regional studies that are outside of U.S. history

**Modern Languages Department courses:** 82-200 level or above, covering international or regional studies but not including elementary or intermediate language courses

**At least 9 units in total**

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<tr>
<th>Course</th>
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**International Management**

- At least 9 units in total

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<td>70-342</td>
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<td>70-364</td>
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</table>

**Dietrich College Interdisciplinary Minors**

Var.
### Minor in Health Care Policy and Management

**Sponsored by:**
- Heinz College of Information Systems and Public Policy
- Dietrich College of Humanities and Social Sciences
- Mellon College of Science

**Faculty Advisors:**
- Jason D’Antonio, Mellon College of Science
- James F. Jordan, H. John Heinz III College

The face of health care is changing. The practice of medicine is being fundamentally altered by the forces of change in public policy, health care organizations and in the industry as a whole. The role of individual professionals in this industry is changing as rapidly as the industry itself. Traditional career paths have disappeared overnight to be replaced by new opportunities that require new skills. New organizations are placing new demands on their professional and medical staffs. The criteria of efficiency and financial stability are entering the domains of diagnosis and treatment.

This minor is designed to provide students considering a career in the health professions with an understanding of how these changes are likely to affect their careers. Students will become familiar with the critical policy and management issues and will begin to learn to operate effectively in the emerging health care environment. The curriculum combines economic, organizational, managerial, historical and psychological perspectives on these issues to provide a foundation for a deepened understanding of the changing structure of health care organizations and policy.

**Required Courses for HCPM Minor**

A total of 54 units are required to complete this minor. Entry into the minor requires completion of 73-102 Principles of Microeconomics or the equivalent by approval.

#### Required Courses

Complete a total of 27 units from the following:

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tr>
<td>79-330</td>
<td>Medicine and Society</td>
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</tr>
<tr>
<td>90-836</td>
<td>Health Systems</td>
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<tr>
<td>90-721</td>
<td>Healthcare Management</td>
<td>6</td>
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<tr>
<td>90-861</td>
<td>Health Policy</td>
<td>6</td>
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</tbody>
</table>

#### Elective Courses

Complete a minimum of 18 units from these two sections:

**Heinz College Courses**
- 90-831 Advanced Financial Management of Health Care 6
- 94-705 Health Economics 12
- 90-832 Health Law 6
- 90-833 Population Health 6
- 90-818 Health Care Quality & Performance Improvement 6
- 90-834 Health Care Geographical Information Systems 12

Other courses as approved

**Humanities and Social Sciences Courses (9 units each)**
- 80-245 Medical Ethics 9
- 76-494 Healthcare Communications 9
- 88-365 Behavioral Economics and Public Policy 9
- 67-476 Innovation in Information Systems: Health Care 9
- 42-444 Medical Devices 9

Other courses as approved

**MINIMUM NUMBER OF UNITS REQUIRED FOR MINOR** 63

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### Elective Focus Areas

Focus areas are suggested groupings of electives based on student interest. Students do not need to take all electives within one focus area; they are free to choose their 18-unit elective minimum from any combination of focus areas.

<table>
<thead>
<tr>
<th>Focus Area</th>
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<tr>
<td>Health Management/Administration Focus</td>
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<tr>
<td>90-831 Advanced Financial Management of Health Care</td>
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<td>90-832 Health Law</td>
<td>6</td>
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<tr>
<td>90-818 Health Care Quality &amp; Performance Improvement</td>
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<tr>
<td>80-245 Medical Ethics</td>
<td>9</td>
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<tr>
<td>76-494 Healthcare Communications</td>
<td>9</td>
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<tr>
<td>Health Policy Focus</td>
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<tr>
<td>94-705 Health Economics</td>
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<tr>
<td>90-832 Health Law</td>
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<td>90-833 Population Health</td>
<td>6</td>
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<tr>
<td>88-365/90-882 Behavioral Economics and Public Policy</td>
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<tr>
<td>Other courses as approved</td>
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</table>

#### Health Analytic & IT Focus

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<tr>
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<th>Course Title</th>
<th>Units</th>
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</thead>
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<tr>
<td>90-834 Health Care Geographical Information Systems</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>67-476 Innovation in Information Systems: Health Care</td>
<td>9</td>
<td></td>
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<tr>
<td>42-444 Medical Devices</td>
<td>9</td>
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</tbody>
</table>

Other courses as approved

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### The Minor in Linguistics

**Tom Werner, Director**

Location: Baker Hall 155F
twerner@andrew.cmu.edu

The Interdepartmental Minor in Linguistics combines courses from the departments of Philosophy, English, Modern Languages, Psychology and the Language Technologies Institute. It synthesizes the linguistics related offerings in these departments and provides students with an academic experience that reflects the interdisciplinary character of the subject.

The Minor in Linguistics requires a total of 6 courses: the introductory linguistics course: two fundamental skills courses; and three additional electives. All courses counted towards the Minor must be taken for a letter grade and passed with a grade of “C” or above.

#### Introductory Course

- 80-180 Nature of Language 9

#### Fundamental Skills

Take one course from two of the following core subject areas:

- **Sounds**
  - 80-282 Phonetics and Phonology I 9

- **Structure**
  - 76-389 Rhetorical Grammar 9
  - 80-280 Linguistic Analysis 9
  - 80-285 Natural Language Syntax 9

- **Meaning**
  - 80-381 Meaning in Language 9
  - 80-383 Language in Use 9
  - 76-385 Introduction to Discourse Analysis or 76-484 Discourse Analysis 9

#### Electives

- Take three additional linguistics courses. These can be additional courses from the Fundamental Skills categories above, or any other course which is approved by the Director as a linguistics elective. For electives taught on a regular basis, see courses listed as Breadth or Electives in the Undergraduate Catalog entry for the Linguistics Major.

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### Neural Computation Minor

**Dr. Tai Sing Lee, Director**

Melissa Stupka, Administrative Coordinator

www.cnbc.cmu.edu/upnc/nc_minor
Neural computation is a scientific enterprise to understand the neural basis of intelligent behaviors from a computational perspective. Study of neural computation includes, among others, decoding neural activities using statistical and machine learning techniques, and developing computational theories and neural models of perception, cognition, motor control, decision-making and learning. The neural computation minor allows students to learn about the brain from multiple perspectives, and to acquire the necessary background for graduate study in neural computation. Students enrolled in the minor will be exposed to, and hopefully participate in, the research effort in neural computation and computational neuroscience at Carnegie Mellon University.

The minor in Neural Computation is an intercollege minor jointly sponsored by the School of Computer Science, the Mellon College of Science, and the Dietrich College of Humanities and Social Sciences, and is coordinated by the Center for the Neural Basis of Cognition (CNBC) (http://www.cnbc.cmu.edu).

The Neural computation minor is open to students in any major of any college at Carnegie Mellon. It seeks to attract undergraduate students from computer science, psychology, engineering, biology, statistics, physics, and mathematics from SCS, CIT, H&SS and MCS.

The Neural Computation minor is open to students in any major of any college at Carnegie Mellon. It seeks to attract undergraduate students from computer science, psychology, engineering, biology, statistics, physics, and mathematics from SCS, CIT, Dietrich College and MCS. The primary objective of the minor is to encourage students in biology and psychology to take computer science, engineering and mathematics courses, to encourage students in computer science, engineering, statistics and physics to take courses in neuroscience and psychology, and to bring students from different disciplines together to form a community. The curriculum and course requirements are designed to maximize the participation of students from diverse academic disciplines. The program seeks to produce students with both basic computational skills and knowledge in cognitive science and neuroscience that are central to computational neuroscience.

APPLICATION

Students must apply for admission no later than November 30th of their senior years; an admission decision will usually be made within one month. Students are encouraged to apply as early as possible in their undergraduate careers to ensure that the director of the Neural Computation minor can provide advice on their curriculum, but should contact the program director any time even after the deadline.

To apply, send email to the director of the Neural Computation minor Dr. Tai Sing Lee (tai@cnbc.cmu.edu) and copy Melissa Supka (mstupka@cnbc.cmu.edu). Include in your email:

- Full name
- Andrew ID
- Preferred email address (if different)
- Your class and College/School at Carnegie Mellon
- Semester you intend to graduate
- All (currently) declared majors and minors
- Statement of purpose (maximum 1 page) – Describes why you want to take this minor and how it fits into your career goals
- Proposed schedule of required courses for the Minor (this is your plan, NOT a commitment)
- Research projects you might be interested in

Curriculum

The Minor in Neural Computation will require a total of five courses: four courses drawn from the four core areas (A: neural computation, B: neuroscience, C: cognitive psychology, D: intelligent system analysis), one from each area, and one additional depth elective chosen from one of the core areas that is outside the student’s major. The depth elective can be replaced by a one-year research project in computational neuroscience. No more than two courses can be double counted toward the student’s major or other minors. However, courses taken for general education requirements of the student’s degree are not considered to be double counted. A course taken to satisfy one core area cannot be used to satisfy the course requirement for another core area. The following listing presents a set of current possible courses in each area. Other computational neuroscience courses are being developed at Carnegie Mellon and University of Pittsburgh that will also satisfy core area A requirement and the requirements will be updated as they come on-line. Substitution is possible but requires approval.

A. Neural Computation

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<thead>
<tr>
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<th>Course Name</th>
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<td>15-387</td>
<td>Computational Perception</td>
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<tr>
<td>15-883</td>
<td>Computational Models of Neural Systems</td>
<td>12</td>
</tr>
<tr>
<td>85-419</td>
<td>Introduction to Parallel Distributed Processing</td>
<td>9</td>
</tr>
<tr>
<td>86-375</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>85-1800</td>
<td>Introduction to Mathematical Neuroscience</td>
<td>9</td>
</tr>
</tbody>
</table>

B. Neuroscience

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-362</td>
<td>Cellular Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>03-363</td>
<td>Systems Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>03-365</td>
<td>Neural Correlates of Learning and Memory</td>
<td>9</td>
</tr>
<tr>
<td>42-630</td>
<td>Introduction to Neuroscience for Engineers (crosslisted with 18-690)</td>
<td>12</td>
</tr>
<tr>
<td>85-765</td>
<td>Cognitive Neuroscience</td>
<td>Var.</td>
</tr>
<tr>
<td>85-765</td>
<td>Cognitive Neuroscience</td>
<td>Var.</td>
</tr>
</tbody>
</table>

C. Cognitive Psychology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-211</td>
<td>Cognitive Psychology</td>
<td>9</td>
</tr>
<tr>
<td>85-213</td>
<td>Human Information Processing and Artificial Intelligence</td>
<td>9</td>
</tr>
<tr>
<td>85-412</td>
<td>Cognitive Modeling</td>
<td>9</td>
</tr>
<tr>
<td>85-419</td>
<td>Introduction to Parallel Distributed Processing</td>
<td>9</td>
</tr>
<tr>
<td>85-426</td>
<td>Learning in Humans and Machines</td>
<td>9</td>
</tr>
<tr>
<td>85-765</td>
<td>Cognitive Neuroscience</td>
<td>Var.</td>
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</tbody>
</table>

D. Intelligent System Analysis

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-301</td>
<td>Introduction to Machine Learning</td>
<td>12</td>
</tr>
<tr>
<td>or 10-315</td>
<td>Introduction to Machine Learning (Undergrad)</td>
<td>12</td>
</tr>
<tr>
<td>15-261</td>
<td>Artificial Intelligence: Representation and Problem Solving</td>
<td>12</td>
</tr>
<tr>
<td>15-386</td>
<td>Neural Computation</td>
<td>9</td>
</tr>
<tr>
<td>15-387</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>15-494</td>
<td>Cognitive Robotics: The Future of Robot Toys</td>
<td>12</td>
</tr>
<tr>
<td>16-299</td>
<td>Introduction to Feedback Control Systems</td>
<td>12</td>
</tr>
<tr>
<td>16-311</td>
<td>Introduction to Robotics</td>
<td>12</td>
</tr>
<tr>
<td>16-385</td>
<td>Computer Vision</td>
<td>12</td>
</tr>
<tr>
<td>18-290</td>
<td>Signals and Systems</td>
<td>12</td>
</tr>
<tr>
<td>24-352</td>
<td>Dynamic Systems and Controls</td>
<td>12</td>
</tr>
<tr>
<td>36-225</td>
<td>Introduction to Probability Theory</td>
<td>9</td>
</tr>
<tr>
<td>36-247</td>
<td>Statistics for Lab Sciences</td>
<td>9</td>
</tr>
<tr>
<td>36-401</td>
<td>Modern Regression</td>
<td>9</td>
</tr>
<tr>
<td>36-410</td>
<td>Introduction to Probability Modeling</td>
<td>9</td>
</tr>
<tr>
<td>36-746</td>
<td>Statistical Methods for Neuroscience and Psychology</td>
<td>12</td>
</tr>
<tr>
<td>42-631</td>
<td>Neural Data Analysis</td>
<td>9</td>
</tr>
<tr>
<td>42-632</td>
<td>Neural Signal Processing</td>
<td>12</td>
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<tr>
<td>86-375</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>86-631</td>
<td>Neural Data Analysis</td>
<td>9</td>
</tr>
</tbody>
</table>

Prerequisites

The required courses in the above four core areas require a number of basic prerequisites: basic programming skills at the level of 15-110 Principles of Computing and basic mathematical skills at the level of 21-122 Integration and Approximation or their equivalents. Some courses in Area D require additional prerequisites. Area B Biology courses require, at minimum, 03-121 Modern Biology, Students might skip the prerequisites if they have the permission of the instructor to take the required courses. Prerequisite courses are typically taken to satisfy the students' major or other requirements. In the event that these basic skill courses are not part of the prerequisites or required courses of a student's major, one of them can potentially count toward the five required courses (e.g. the depth elective), conditional on approval by the director of the minor program.

Research Requirements (Optional)

The minor itself does not require a research project. The student however may replace the depth elective with a year-long research project. In special circumstances, a research project can also be used to replace one of the five courses, as long as (1) the project is not required by the student’s major or other minor, (2) the student has taken a course in each of the four core areas (not necessarily for the purpose of satisfying this minor’s requirements), and (3) has taken at least three courses in this curriculum not counted toward the student’s major or other minors. Students interested in participating in the research project should contact any faculty engaged in computational neuroscience or neural computation research at Carnegie Mellon or in the University of Pittsburgh. A useful webpage that provides
listing of faculty in neural computation is www.cnbc.cmu.edu/computational-neuroscience. The director of the minor program will be happy to discuss with students about their research interest and direct them to the appropriate faculty.

Fellowship Opportunities
The Program in Neural Computation (PNC) administered by the Center for the Neural Basis of Cognition currently provides 3-4 competitive full-year fellowships ($11,000) to Carnegie Mellon undergraduate students to carry out mentored research in neural computation. The fellowship has course requirements similar to the requirements of the minor. Students do not apply to the fellowship program directly. They have to be nominated by the faculty members who are willing to mentor them. Therefore, students interested in the full-year fellowship program should contact and discuss research opportunities with any CNBC faculty at Carnegie Mellon or University of Pittsburgh working in the area of neural computation or computational neuroscience and ask for their nomination by sending email to Dr. Tai Sing Lee, who also administers the undergraduate fellowship program at Carnegie Mellon. See www.cnbc.cmu.edu/training/undergraduate/undergraduate-research-fellowships-in-computational-neuroscience/ for details.

The Program in Neural Computation also offers a summer training program for undergraduate students from any U.S. undergraduate college. The students will engage in a 10-week intense mentored research and attend a series of lectures in neural computation. See www.cnbc.cmu.edu/training/undergraduate/summer-undergraduate-research-program-in-computational-neuroscience/ for application information.

The Minor in Religious Studies
Professor Alyson Creasman, Faculty Advisor
acreasman@cmu.edu, Baker Hall 242D, 412-268-9832

Dr. Andrew Ramey, Academic Advisor
aramey@andrew.cmu.edu, Baker Hall 240, 412-268-7906

The Religious Studies minor offers students a range of intellectual tools for thinking about religious ideas, behaviors and institutions. It also enables students to build a base of knowledge that extends beyond any one particular religious tradition.

Curriculum
54 units

The minor consists of six courses, totaling at least 54 units. Courses taken to fulfill requirements in other major or minor programs may only be applied to this minor with permission of the Faculty Advisor.

Religious Studies minors must satisfy the requirements listed below:

Required Core Course
9 units

All Religious Studies minors are required to take 79-281, Introduction to Religion. This required course introduces several modes of inquiry into religion, such as the philosophy of religion, sociological and behavioral approaches to religion, historical analysis of religious subject, literary and critical analysis of religious texts, theological modes of thought, and anthropological treatments of religion. This course is offered regularly, usually in the Spring semester.

79-281 Introduction to Religion 9

Distribution Requirements
18 units

In addition to the required Core Course, students must complete Distribution Courses totaling 18 units (usually two 9-unit courses). A Distribution Course is one that applies a particular discipline to more than one religion. Some examples of qualifying Distribution Courses that have been offered include:

Historical Approaches
79-208 Witchcraft and Witch-Hunting 9
79-307 Religion and Politics in the Middle East 9
79-352 Christianity Divided: The Protestant and Catholic Reformations, 1450-1650 9

Philosophical Approaches
80-276 Philosophy of Religion 9

Textual Approaches
76-346 Angels and Diplomats -- Renaissance Poetry from Wyatt to Milton 9

In addition to the courses listed above, participating departments often offer other courses that may qualify as Distribution Courses for the minor.

The Faculty Advisor should be consulted to identity qualifying courses (especially after the Schedule of Courses for a given semester becomes available).

Elective Courses
27 units

In addition to the required Core Course and the Distribution Courses, students must complete Elective Courses totaling at least 27 units (usually three 9-unit courses). Unlike Distribution Courses, an Elective Course may focus on the study of only one religion (although courses examining more than one religious tradition can also count as Elective Courses if not otherwise used to fulfill the Distribution Requirement).

Some examples of qualifying Elective Courses that have been offered include:

76-337 Representations of Islam in Early Modern England 9
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-296 Religion in American Politics 6
79-349 United States and the Holocaust 6
79-350 Early Christianity 9
79-375 Science & Religion 6

In addition to the courses listed above, participating departments often offer other courses that may qualify as Elective Courses for the minor. The Faculty Advisor should be consulted to identify qualifying courses (especially after the Schedule of Courses for a given semester becomes available).

In addition to courses offered at CMU, relevant courses taken at the University of Pittsburgh, Duquesne University, or other Pittsburgh institutions may count toward the Elective Requirement with the permission of the Religious Studies minor’s Faculty Advisor. The option to cross-register for relevant courses at other local institutions allows students some flexibility in meeting the minor’s requirements and gives them the opportunity to explore interests in religious subjects that might not otherwise be covered at CMU. Students who wish to cross-register for courses at other institutions should consult with the Faculty Advisor about whether the selected course(s) will meet the minor’s Elective Requirement.

The Minor in Science, Technology and Society
Professor Christopher J. Phillips, Faculty Advisor
cpj1@cmu.edu, Baker Hall 235C, 412-268-1753

Dr. Andrew Ramey, Academic Advisor
aramey@andrew.cmu.edu, Baker Hall 240, 412-268-7906

This minor provides interdisciplinary perspectives on the development and meaning of science and technology in modern society. The core courses enable you to explore the philosophical underpinnings, cultural and historical contexts, and economic and literary assessments of the interplay among science, technology, and society. Elective courses enable you to pursue in greater depth and variety subjects and approaches that build on both the core courses and your primary major.

Courses taken to fulfill requirements in other major or minor programs may only be applied to this minor with permission of the Faculty Advisor.

Curriculum
54 units

Core Courses
27 units

Complete one course from each area. Additional courses from the History of Science Core and the History of Philosophy Core may count as electives for the minor.

Area 1. History of Science Core
Take at least 1 course from the list below.

79-234 Technology and Society 9
79-299 From Newton to the Nuclear Bomb: History of Science, 1750-1950 9
79-305 Moneyball Nation: Data in American Life 9
79-330 Medicine and Society 9
79-342 Introduction to Science and Technology Studies 9
79-380 Hostile Environments: The Politics of Pollution in Global Perspective 9
Area 2. Philosophy of Science Core
Take at least 1 course from the list below.

- 80-220 Philosophy of Science 9
- 80-221 Philosophy of Social Science 9
- 80-226 Revolutions in Science 9
- 80-244 Environmental Ethics 9
- 80-245 Medical Ethics 9
- 80-249 AI, Society, and Humanity 9

Area 3. Science Core
Take at least 1 course (9 units total) from the following departments: 15-xxx Computer Science, 09-xxx Chemistry, 03-xxx Biological Sciences, 33-xxx Physics

Electives 27 units
Complete three courses from the approved list of elective courses. Courses listed in Areas 1 and 2 may also be taken as electives if not already completed for an Area requirement. To petition for a course not listed to be approved as an elective, contact the Faculty Advisor, cjpl@andrew.cmu.edu, directly.

18-482 Telecommunications Technology and Policy for the Internet Age 12
48-448 History of Sustainable Architecture 9
73-427 Sustainability, Energy, and Environmental Economics 9
76-319 Environmental Rhetoric 9
76-395 Science Writing 9
76-425 Science in the Public Sphere 9
76-476 Rhetoric of Science 9
76-492 Rhetoric of Public Policy 9
76-494 Healthcare Communications 9
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-208 Witchcraft and Witch-Hunting 9
79-213 The American Railroad: Decline and Renaissance in the Age of Deregulation 6
79-246 Industrial America 9
79-283 Hungry World: Food and Famine in Global Perspective 9
79-302 Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems 6
79-331 Body Politics: Women and Health in America 9
79-354 Kids and Schools in the 20th Century 6
79-381 Energy and Empire: How Fossil Fuels Changed the World 9
80-110 Nature of Mathematical Reasoning 9
80-150 Nature of Reason 9
80-214 Computing, AI, and Philosophy 9
80-222 Measurement and Methodology 9
80-223 Causality and Probability 9
80-248 Engineering Ethics 9
80-312 Mathematical Revolutions 9
80-321 Causation, Law, and Social Policy 9
80-322 Philosophy of Physics 9
80-323 Philosophy of Biology 9
80-324 Philosophy of Economics 9
84-387 Technology and Policy of Cyber War 9
85-380 In Search of Mind: The History of Psychology 9

The Minor in Sociology
Saurabh Bhargava, Faculty Director
Connie Angermeier, Program Advisor
Location: Porter Hall 208A
cia2@andrew.cmu.edu

The Sociology minor introduces the student to central concepts in sociological theory and methods of empirical inquiry needed to broadly understand social behavior, including its structure, history, and dynamics. Students choose among a range of methodological approaches and substantive topic areas including social psychology, work and organizations, social networks, technology and society, medical sociology, and gender and family. Exposure to these topics will help students understand and appreciate the processes by which families, groups, and organizations form and evolve over time, by which individuals affect and are affected by the society in which they live; and by which technology and institutions shape and influence society. This background in empirical tools and social theory will strengthen the student’s ability to pursue graduate studies in sociology, social history, social science, and organizational theory; to begin professional careers involving social analysis, network analysis, data analysis of teams, groups and organizations, social analysis within journalism, political institutions, the government, and online; and to enter the corporate environment with a thorough understanding of organizational activity.

Curriculum 54 units
In addition to the general education requirements of the student’s college and the requirements of the student’s major, Sociology minors must satisfy the following requirements. The Core courses comprise 18 units of the minor. One course is taken from the Organizations cluster, and one course is taken from the Methodology cluster. The Elective courses comprise 36 units of the minor. Sociology minors should consult with the program advisor to plan a course schedule prior to registration.

NOTE: The core courses are offered regularly; the elective courses are offered with at least general regularity. Participating departments may subsequently develop and offer other courses that, while not listed here, are deemed appropriate for this minor. The program advisor should be consulted (especially when the schedule of courses to be offered for a given semester becomes available) to identify such additional courses.

No more than 9 units in the Sociology minor may be counted to fulfill any other major or minor’s requirements.

Core Courses 18 units

A. Organizations
Complete one course.
70-311 Organizational Behavior 9

B. Methodology
Complete one course.
36-202 Statistics & Data Science Methods 9
70-208 Regression Analysis 9
85-310 Research Methods in Cognitive Psychology 9
85-340 Research Methods in Social Psychology 9
88-251 Empirical Research Methods 9
88-252 Causal Inference in the Field 9

Elective Courses 36 units
Complete four courses (a minimum of 36 units) from the following list. Two courses (18 units) must be taken from one category to complete the depth requirement. One course (9 units) must be taken from the other category. The remaining course (9 units) may be taken from either category. Appropriate courses offered by the Department of Sociology at the University of Pittsburgh (available during the academic year through cross-registration) may also be included as part of this option. Contact the Sociology program advisor for more information.

1. Sociology of Gender, Family, and Culture
70-342 Managing Across Cultures 9
70-385 Consumer Behavior 9
76-241 Introduction to Gender Studies 9
79-244 Women in American History 9
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-308 Crime and Justice in American Film 9
79-320 Women, Politics, and Protest 9
Family, Gender, and Sexuality in European History, 500-1800

Body Politics: Women and Health in America

Education, Democracy, and Civil Rights

Food, Culture, and Power: A History of Eating

Race, Gender and Science

Medical Ethics

Moral Psychology

Modern Moral Philosophy

Choices, Decisions, and Games

Social and Political Philosophy

Health, Human Rights, and International Development

Decision Science for International Relations

Social Psychology

Psychology of Prejudice

Evolutionary Psychology

Pro-Social Behavior

Attitudes and Persuasion

Health Psychology

Psychology of Gender

Human Intelligence and Human Stupidity

Dynamic Decisions

Psychological Models of Decision Making

Business, Society and Ethics

Introduction to Global Studies

Introduction to Science and Technology Studies

Bubbles: Data Science for Human Minds

Computers, Society and Ethics

Strategic Decision Making: Cooperation and Competition in Social Interactions

Team Dynamics and Leadership

Behavioral Economics and Public Policy

Behavioral Economics of Poverty and Development

Modeling Complex Social Systems

Behavioral Economics in Organizations

Behavioral Economics Perspectives on Ethical Issues

Domestic Negotiation

International Negotiation

Decision Science and Policy

Policy Analysis Senior Project

Policy Analysis Senior Project

Note: Some courses have additional prerequisites.