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 listed for the minor in question.

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, History Department
fieldsblack@andrew.cmu.edu, Baker Hall 231B, 412-268-8012

Dr. Andrew Ramey, Senior Academic Advisor, History Department
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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-226</td>
<td>African History: Earliest Times to 1780</td>
<td>9</td>
</tr>
<tr>
<td>79-227</td>
<td>Modern Africa: The Slave Trade to the End of Apartheid</td>
<td>9</td>
</tr>
</tbody>
</table>

African American

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-232</td>
<td>Introduction to Black Literature</td>
<td>9</td>
</tr>
<tr>
<td>79-241</td>
<td>African American History: Africa to the Civil War</td>
<td>9</td>
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</tbody>
</table>

Elective Courses 36 units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-242</td>
<td>African American History: Reconstruction to the Present</td>
<td>9</td>
</tr>
</tbody>
</table>

African

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-225</td>
<td>West African History in Film</td>
<td>9</td>
</tr>
<tr>
<td>79-237</td>
<td>Comparative Slavery</td>
<td>9</td>
</tr>
<tr>
<td>79-290</td>
<td>The Slave Passage: From West Africa to the Americas</td>
<td>6</td>
</tr>
<tr>
<td>79-385</td>
<td>Out of Africa: The Making of the African Diaspora</td>
<td>9</td>
</tr>
<tr>
<td>82-303</td>
<td>French &amp; Francophone Cultures</td>
<td>9</td>
</tr>
<tr>
<td>82-304</td>
<td>French &amp; Francophone Sociolinguistics **</td>
<td>9</td>
</tr>
</tbody>
</table>

African American

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-480</td>
<td>History of Black American Music</td>
<td>6</td>
</tr>
<tr>
<td>76-238</td>
<td>What Was the Hip-Hop Generation?</td>
<td>9</td>
</tr>
<tr>
<td>76-333</td>
<td>Race and Controversy in the Arts</td>
<td>9</td>
</tr>
<tr>
<td>76-407</td>
<td>Topics in Literary &amp; Cultural Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-237</td>
<td>Comparative Slavery *</td>
<td>9</td>
</tr>
<tr>
<td>79-247</td>
<td>African Americans, Imprisonment, and the Carceral State</td>
<td>9</td>
</tr>
<tr>
<td>79-252</td>
<td>“Harriet”: Harriet Tubman, Slavery, and the Underground Railroad</td>
<td>6</td>
</tr>
<tr>
<td>79-304</td>
<td>African Americans in Pittsburgh</td>
<td>6</td>
</tr>
<tr>
<td>79-371</td>
<td>African American Urban History</td>
<td>9</td>
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</tbody>
</table>

Caribbean

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-237</td>
<td>Comparative Slavery *</td>
<td>9</td>
</tr>
<tr>
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<td>Out of Africa: The Making of the African Diaspora</td>
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</tr>
<tr>
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</tr>
<tr>
<td>82-304</td>
<td>French &amp; Francophone Sociolinguistics **</td>
<td>9</td>
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</table>

Latin American

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-317</td>
<td>Art, Anthropology, and Empire</td>
<td>9</td>
</tr>
<tr>
<td>82-343</td>
<td>Latin American: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-451</td>
<td>Studies in Latin American Literature and Culture</td>
<td>9</td>
</tr>
</tbody>
</table>

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 offers students the opportunity to engage with film and visual media, from theoretical framing and historical-cultural contextualization to training skills in both creating and analyzing film, as well as the development of a complex blend of creative, professional, and technical competencies.

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.
Dietrich College Interdisciplinary Minors

Required Introductory Course
- 76-239 Introduction to Film Studies (prerequisite for 76-439) 9 units

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

Film and Media Electives
- 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:
  - 54-191 Acting for Non-Majors 9
  - 76-243 Introduction to Television 9
  - 76-259 Film History 9
  - 76-269 Introduction to Screenwriting 9
  - 76-292 Introduction to Film Production 9
  - 76-295 Russian Cinema: From the Bolshevik Revolution to Putin’s Russia 9
  - 76-312 Crime and Justice in American Film 9
  - 76-313 Creative Visual Storytelling in Film Production 9
  - 76-339 Topics in Film and Media 9
  - 76-353 Transnational Feminisms: Fiction and Film 9
  - 76-367 Fact Into Film: Translating History into Cinema 9
  - 76-374 Mediated Narrative 9
  - 76-439 Seminar in Film 9
  - 76-448 Shakespeare on Film 9
  - 76-449 Race and Media 9
  - 76-454 Rise of the Blockbuster 9
  - 76-456 Independent Study in Film & Media Studies (requires prior approval) 9
  - 76-469 Screenwriting Workshop 9
  - 79-220 Screening Mexico: Mexican Cinema, 1898 to Present 6
  - 79-306 Latin America in the Age of Cinema 9
  - 79-316 The Chinese Revolution Through Film (1840-2000) 9
  - 79-319 India Through Film 6
  - 79-341 Football and Fútbol: American & Global Perspectives 9
  - 82-215 Arab Culture Through Dialogues, Film, and Literature 9
  - 82-278 Japanese Film and Literature: The Art of Storytelling 9
  - 82-296 World War I: the View from Paris & St. Petersburg 9
  - 82-362 Italian Language and Culture II (if significant portion of course pertains to film) 9
  - 82-533 Cultural Topics in Chinese Studies (if significant portion of course pertains to film) 9

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

76-449 Race and Media 9
76-456 Independent Study in Film & Media Studies (requires prior approval) Var.
76-467 Crime Fiction and Film 9
76-469 Screenwriting Workshop 9

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.
- 76-241 Introduction to Gender Studies 9
- 79-320 Women, Politics, and Protest 9
- 79-331 Body Politics: Women and Health in America 9

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

See examples below, but other courses may fulfill this requirement.
- 76-353 Transnational Feminisms: Fiction and Film 9
- 76-422 Gender and Sexuality Studies 4.5
- 76-441 Theorizing Sexuality 9
- 79-244 Women in American History 9
- 79-320 Women, Politics, and Protest ** 9
- 79-323 Making Modern Cities 9
- 79-324 #MeToo: Naming and Resisting Gender Violence 9
- 79-325 U.S. Gay and Lesbian History 6
- 79-327 Making America Dry: A History of Prohibition, 1920-1933 6
- 79-331 Body Politics: Women and Health in America ** 9
- 82-300 Language & Society in the Arab World 9
- 84-312 Terrorism in Sub-Saharan Africa 6
- 85-350 Psychology of Prejudice 9
- 85-446 Psychology of Gender 9

* Consult with Gender Studies Minor Advisor Professor Lisa Tetrault at tetrault@andrew.cmu.edu.

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.
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.

### Health Management/Administration Focus

- **Units**
- 94-706 Healthcare Information Systems 12
- 94-705 Health Economics 12
- 90-832 Health Law 6
- 90-833 Population Health 6
- 90-818 Lean Performance Improvement Lab: H C 6
- 90-834 Health Care Geographical Information Systems 12

### Elective Courses

Complete a minimum of 24 units from these two sections:

#### Heinz College Courses

- 94-706 Healthcare Information Systems 12
- 94-705 Health Economics 12
- 90-832 Health Law 6
- 90-833 Population Health 6
- 90-818 Lean Performance Improvement Lab: H C 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
  - 42-444 Medical Devices 9

Please note that some of these courses have prerequisites that will not count toward the completion of the requirements for this minor.

### 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.

#### Health Management/Administration Focus

- **Units**
- 90-832 Health Law 6
- 90-831 Lean Performance Improvement Lab: H C 6
- 80-245 Medical Ethics 9
- 76-494 Healthcare Communications 9

#### Health Policy Focus

- **Units**
- 94-705 Health Economics 12
- 90-832 Health Law 6
- 90-833 Population Health 6
- 88-365/90-882 Behavioral Economics and Public Policy 6
- 79-335 Banned Substances: Drugs and Alcohol in American History 9

Other courses as approved

#### Health Analytics & IT Focus

- **Units**
- 94-706 Healthcare Information Systems 12
- 90-834 Health Care Geographical Information Systems 12
- 42-444 Medical Devices 9

Other courses as approved

The Minor in Linguistics

Linguistics is the scientific study of human language. The central goal of the Linguistics Program is to provide students with the analytical skills and linguistic concepts needed to understand language scientifically, whether formally, as researchers, or informally, as participants in daily linguistic interactions. The foundation of the Linguistics Minor is a set of rigorous core courses, informed by contemporary approaches to the study of linguistic form and meaning. The Core courses cover the principal domains of linguistic analysis: phonetics and phonology, syntax, and meaning. Students then move on to the Extended Core, which includes more advanced courses as well as courses on a wider range of topics, such as intonation and language variation. All courses counted towards the minor must be taken for a letter grade and passed with a grade of "C" or above.

**Core (27 units)**

- **Required**
  - 80-180 Nature of Language 9
  - Select 2 from the following 3 options
    - 80-282 Phonetics and Phonology I 9
    - 80-280 Linguistic Analysis 9
    - or 80-285 Natural Language Syntax 9
  - 80-381 Meaning in Language 9
  - or 80-383 Language in Use 12

**Extended Core: Choose 3 courses (27 units) from the Extended Core and/or additional courses from Core.**

- Extended Core
  - 80-283 It Matters How You Say It 9
  - 80-284 Invented Languages 9
  - 80-286 Words and Word Formation: Introduction to Morphology 9
  - 80-287 Language Variation and Change 9
  - 80-288 Intonation: Transcription and Analysis 9
  - 80-284 Invented Languages 9
  - 80-382 Phonetics and Phonology II 9
  - 80-384 Linguistics of Turkic Languages 9
  - 80-385 Linguistics of Germanic Languages 9
  - 80-388 Linguistic Typology: Diversity and Universals 9
  - 80-488 Acoustics of Human Speech: Theory, Data, and Analysis 9

**The Minor in Logic and Computation**

The Minor in Logic and Computation provides students with general course work in logic, the theory of computation, and philosophy. Students must complete six courses, among them the following three core courses. All courses counted towards the minor must be taken for a letter grade and passed with a grade of "C" or above.

**Logic and Computation Core Courses**

- 80-150 Nature of Reason 9
- 80-211 Logic and Mathematical Inquiry 9
  - or 80-210 Logic and Proofs 9
- 80-310 Formal Logic 9
  - or 80-311 Undecidability and Incompleteness 9

**Logic and Computation Electives**

Students must take two courses in the Philosophy Department at the 300-level or higher, in subjects related to logic and computation. An additional course at the 300-level or higher in an area that uses logical and computational tools, such as philosophy, computer science, linguistics, mathematics, psychology, statistics. The choice of electives must be approved by the Academic Program Manager.

**Neural Computation Minor**

Dr. Tai Sing Lee, Director
Melissa Stupka, Administrative Coordinator

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 Neuroscience Institute (https://www.cmu.edu/ni/) and 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 30 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 so 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 (tais@cnbc.cmu.edu) and copy Melissa Stupka (mstupka@andrew.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. 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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<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>15-883</td>
<td>Computational Models of Neural Systems</td>
<td>12</td>
</tr>
</tbody>
</table>

B. Neuroscience

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</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 Neural Engineering (crosslisted with 18-680)</td>
<td>12</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 Number</th>
<th>Course Title</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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</table>

D. Intelligent System Analysis

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>10-301</td>
<td>Introduction to Machine Learning (Undergrad)</td>
<td>12</td>
</tr>
<tr>
<td>or 10-315</td>
<td>Introduction to Machine Learning (SCS Majors)</td>
<td>12</td>
</tr>
<tr>
<td>15-281</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>
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<tr>
<td>16-299</td>
<td>Introduction to Feedback Control Systems</td>
<td>12</td>
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<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>
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<tr>
<td>18-290</td>
<td>Signals and Systems</td>
<td>12</td>
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<tr>
<td>24-352</td>
<td>Dynamic Systems and Controls</td>
<td>12</td>
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<tr>
<td>36-225</td>
<td>Introduction to Probability Theory</td>
<td>9</td>
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<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>
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<tr>
<td>42-631</td>
<td>Neural Data Analysis</td>
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</tr>
<tr>
<td>42-632</td>
<td>Neural Signal Processing</td>
<td>12</td>
</tr>
<tr>
<td>86-375</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>86-631</td>
<td>Neural Data Analysis</td>
<td>12</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 prerequisite 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 https://
www.cmu.edu/nl/academics/pnc/pnc-training-faculty.html. 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-research-fellowships-in-computational-neuroscience/ (http://www.cnbc.cmu.edu/training/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/ (http://www.cnbc.cmu.edu/training/undergraduate/summer-undergraduate-research-program-in-computational-neuroscience/) for more details.

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
76-331 Dissenters and Believers: Romantics, Revolution, and Religions 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 identify 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:

79-296 Religion in American Politics 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, History Department cjphllps@cmu.edu, Baker Hall 231C, 412-268-1753

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

The Minor in Science, Technology and Society offers students a range of intellectual tools for thinking about science and technology in modern society. The core courses enable you to develop a historical and philosophical understanding 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 Introduction to the History of Science 9
79-305 Moneyball Nation: Data in American Life 9
79-330 Medicine and Society: Health, Healers, and Hospitals 9
79-342 Introduction to Science and Technology Studies 9
79-370 Technology in the United States 9
Area 2. Philosophy of Science Core
Take at least 1 course from the list below.

- 80-220 Philosophy of Science
- 97-421 Philosophy of Social Science
- 97-225 Revolutions in Science
- 97-424 Environmental Ethics
- 80-245 Medical Ethics
- 80-249 AI, Society, and Humanity

Area 3. Science Core
Take at least 1 course (9 units total) from the following departments: 15-xx 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, cjp1@cmu.edu, directly.

- 18-482 Telecommunications Technology and Policy for the Internet Age
- 48-448 History of Sustainable Architecture
- 73-427 Sustainability, Energy, and Environmental Economics
- 76-319 Environmental Rhetoric
- 76-395 Science Writing
- 76-425 Rhetoric, Science, and the Public Sphere
- 76-476 Rhetoric of Science
- 76-492 Rhetoric of Public Policy
- 76-494 Healthcare Communications
- 79-204 American Environmental History
- 79-208 Witchcraft and Witch-Hunting
- 79-246 Industrial America
- 79-283 Hungry World: Food and Famine in Global Perspective
- 79-297 Technology and Work
- 79-302 Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems
- 79-303 Pittsburgh and the Transformation of Modern Urban America
- 79-331 Body Politics: Women and Health in America
- 79-357 Science and the Body
- 79-364 From Midwife to Obstetrician: The Transformation of Modern Childbirth
- 79-368 Un-natural Disasters: Societies and Environmental Hazards in Global Perspective
- 79-372 The Rise and Fall of Pittsburgh Steel
- 79-381 Energy and Empire: How Fossil Fuels Changed the World
- 79-386 A Tale of Two Epidemics: Influenza 1918 and Covid 19
- 79-397 Environmental and Public Health Crises in the City
- 80-101 Dangerous Ideas in Science and Society
- 80-150 Nature of Reason
- 80-312 Mathematical Revolutions
- 80-321 Causation, Law, and Social Policy
- 80-324 Philosophy of Economics
- 84-387 Technology and Policy of Cyber War
- 85-380 In Search of Mind: The History of Psychology

The Minor in Societal & Human Impacts of Future Technologies (SHIFT)

Students pursuing the SHIFT minor will gain the skills, knowledge, and experience to successfully take on roles in integrated, multidisciplinary analyses of current and near-future computational technologies. The SHIFT minor requires eight total courses, with no limit to double-counting with other majors or minors. All courses counted towards the minor must be taken for a letter grade and passed with a grade of “C” or above.

Core Courses (2 courses, 18 units total)
- 80-249 AI, Society, and Humanity
- 80-445 Shift Capstone Experience

Area Courses (6 courses, 54 units total)
Note: Five of the six Area Courses must be taken in different departments

Technology area (18 units)
Courses that build basic technological competence, and teach concepts & frameworks that provide high-level understanding of computational technologies, including their possibilities and limits.

- 05-317 Design of Artificial Intelligence Products
- 05-318 Human AI Interaction
- 05-320 Social Web
- 05-452 Service Design
- 15-110 Principles of Computing
- 15-112 Fundamentals of Programming and Computer Science
- 16-467 Human Robot Interaction
- 17-303 Cryptocurrencies, Blockchains and Applications
- 17-313 Foundations of Software Engineering
- 17-331 Information Security, Privacy, and Policy
- 17-333 Privacy Policy, Law, and Technology
- 17-355 Program Analysis
- 36-201 Statistical Reasoning and Practice
- 36-202 Methods for Statistics & Data Science
- 67-250 The Information Systems Milieux
- 88-300 Programming and Data Analysis for Social Scientists

Social & Behavioral Sciences area (18 units)
Courses that teach the concepts and frameworks of social & behavioral sciences (e.g., economics, psychology, sociology), including methods and analyses such as experimental design and quantitative & qualitative data analysis.

- 05-413 Human Factors
- 17-224 Influence, Persuasion, and Manipulation Online
- 36-200 Reasoning with Data
- 70-311 Organizational Behavior
- 70-321 Negotiation and Conflict Resolution
- 70-341 Team Dynamics and Leadership
- 73-102 Principles of Microeconomics
- 73-103 Principles of Macroeconomics
- 84-265 Political Science Research Methods
- 84-369 Decision Science for International Relations
- 88-406 Behavioral Economics @ Work
- 88-418 Negotiation: Strategies and Behavioral Insights
- 88-419 International Negotiation
- 88-435 Decision Science and Policy

Ethics, Policy & Design Area (18 units)
Courses that teach core concepts and frameworks to address and analyze ethical, policy, and design challenges relevant to current and near-future computational technologies.

- 05-413 Human Factors
- 08-200 Ethics and Policy Issues in Computing
- 16-161 ROB Freshman Seminar: Artificial Intelligence and Humanity
- 17-224 Influence, Persuasion, and Manipulation Online
- 36-200 Reasoning with Data
The Minor in Sociology

Peter Schwardmann, Faculty Director
Connie Angermeier, Senior Academic Program Manager and Advisor
Location: Porter Hall 208H
cia2@andrew.cmu.edu
Schedule an appointment: https://go.oncehub.com/ConnieAngermeier

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

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.

Core Courses 18 units

A. Organizations

Complete one course.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-311</td>
<td>Organizational Behavior</td>
</tr>
</tbody>
</table>

B. Methodology

Complete one course.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-202</td>
<td>Methods for Statistics &amp; Data Science</td>
</tr>
<tr>
<td>70-208</td>
<td>Regression Analysis</td>
</tr>
<tr>
<td>85-310</td>
<td>Research Methods in Cognitive Psychology</td>
</tr>
<tr>
<td>85-340</td>
<td>Research Methods in Social Psychology</td>
</tr>
<tr>
<td>88-251</td>
<td>Empirical Research Methods</td>
</tr>
<tr>
<td>88-252</td>
<td>Causal Inference in the Field</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-342</td>
<td>Managing Across Cultures</td>
</tr>
<tr>
<td>70-385</td>
<td>Consumer Behavior</td>
</tr>
<tr>
<td>76-241</td>
<td>Introduction to Gender Studies</td>
</tr>
<tr>
<td>79-244</td>
<td>Women in American History</td>
</tr>
<tr>
<td>79-261</td>
<td>The Last Emperors: Chinese History and Society, 1600-1900</td>
</tr>
<tr>
<td>79-308</td>
<td>Crime and Justice in American Film</td>
</tr>
<tr>
<td>79-320</td>
<td>Women, Politics, and Protest</td>
</tr>
<tr>
<td>79-323</td>
<td>Making Modern Cities</td>
</tr>
<tr>
<td>79-331</td>
<td>Body Politics: Women and Health in America</td>
</tr>
<tr>
<td>79-343</td>
<td>Education, Democracy, and Civil Rights</td>
</tr>
<tr>
<td>79-377</td>
<td>Food, Culture, and Power: A History of Eating</td>
</tr>
<tr>
<td>80-245</td>
<td>Medical Ethics</td>
</tr>
<tr>
<td>80-246</td>
<td>Moral Psychology</td>
</tr>
<tr>
<td>80-256</td>
<td>Modern Moral Philosophy</td>
</tr>
<tr>
<td>80-305</td>
<td>Decision Theory</td>
</tr>
<tr>
<td>80-335</td>
<td>Social and Political Philosophy</td>
</tr>
<tr>
<td>80-348</td>
<td>Health, Human Rights, and International Development</td>
</tr>
<tr>
<td>84-369</td>
<td>Decision Science for International Relations</td>
</tr>
<tr>
<td>85-241</td>
<td>Social Psychology</td>
</tr>
<tr>
<td>85-350</td>
<td>Psychology of Prejudice</td>
</tr>
<tr>
<td>85-352</td>
<td>Evolutionary Psychology</td>
</tr>
<tr>
<td>85-358</td>
<td>Pro-Social Behavior</td>
</tr>
<tr>
<td>85-377</td>
<td>Attitudes and Persuasion</td>
</tr>
<tr>
<td>85-442</td>
<td>Health Psychology</td>
</tr>
<tr>
<td>85-446</td>
<td>Psychology of Gender</td>
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<tr>
<td>88-230</td>
<td>Human Intelligence and Human Stupidity</td>
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<tr>
<td>88-231</td>
<td>Thinking in Person vs. Thinking Online</td>
</tr>
<tr>
<td>88-380</td>
<td>Dynamic Decisions</td>
</tr>
<tr>
<td>88-388</td>
<td>Psychological Models of Decision Making</td>
</tr>
</tbody>
</table>

2. Sociology of Work, Organizations, and Technology

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-332</td>
<td>Business, Society and Ethics</td>
</tr>
<tr>
<td>73-348</td>
<td>Behavioral Economics</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>79-275</td>
<td>Introduction to Global Studies</td>
</tr>
<tr>
<td>79-342</td>
<td>Introduction to Science and Technology Studies</td>
</tr>
<tr>
<td>88-275</td>
<td>Bubbles: Data Science for Human Minds</td>
</tr>
<tr>
<td>88-255</td>
<td>Strategic Decision Making</td>
</tr>
<tr>
<td>88-341</td>
<td>Team Dynamics and Leadership</td>
</tr>
<tr>
<td>88-344</td>
<td>Systems Analysis: Environmental Policy</td>
</tr>
<tr>
<td>88-365</td>
<td>Behavioral Economics and Public Policy</td>
</tr>
<tr>
<td>88-366</td>
<td>Behavioral Economics of Poverty and Development</td>
</tr>
<tr>
<td>88-406</td>
<td>Behavioral Economics @ Work</td>
</tr>
<tr>
<td>88-418</td>
<td>Negotiation: Strategies and Behavioral Insights</td>
</tr>
<tr>
<td>88-419</td>
<td>International Negotiation</td>
</tr>
<tr>
<td>88-435</td>
<td>Decision Science and Policy</td>
</tr>
<tr>
<td>88-451</td>
<td>Policy Analysis Senior Project</td>
</tr>
<tr>
<td>or 88-452</td>
<td>Policy Analysis Senior Project</td>
</tr>
</tbody>
</table>

Note: Some courses have additional prerequisites.