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 undergraduates. 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 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

Faculty Advisor: Professor Edda L. Fields-Black; fieldsblack@andrew.cmu.edu, Baker Hall 240, 412/268-2880

Academic Advisor: Dr. Andrew Ramey; aramey@andrew.cmu.edu, Baker Hall 240, 412/268-8012

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:

African
79-226 African History: Earliest Times to 1780 9
79-227 African History: Height of Trans-Atlantic Slave Trade to the End of Apartheid 9

African American
76-232 Introduction to African American Literature 9
76-332 African American Literature: The African American Crime Novel 9
79-241 African American History: Africa to the Civil War 9
79-242 African American History: Reconstruction to the Present 9

Caribbean
79-235 Caribbean Cultures 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 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
57-480/79-357 History of Black American Music 6
76-238 What Was the Hip-Hop Generation? 9
76-332 African American Literature: The African American Crime Novel 9
76-333 African American Studies 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
79-376 Doing Transnational History: From Western Africa to Gullah/Geechee and Back 9

Caribbean
79-237 Comparative Slavery 9
79-295 Race Relations in the Atlantic World 9
79-385 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 Environmental Studies

Faculty Advisor: Professor Abigail E. Owen; acowen@andrew.cmu.edu, Wean Hall 3709

Academic Advisor: Dr. Andrew Ramey; aramey@andrew.cmu.edu, Baker Hall 240, 412/268-2880

The minor in Environmental Studies draws on the expertise of faculty across several Carnegie Mellon colleges in order to provide students with the interdisciplinary background and skills to understand environmental problems, their origins, and the means to mitigate them. It emphasizes three general areas: (1) natural science and technology, (2) social sciences, and (3) the humanities and arts. Coursework covers key environmental topics related to energy, pollution, and biological diversity.

Note that some courses carry prerequisites and/or reserve seats for primary majors.

Students interested in pursuing the minor should meet with the Faculty Advisor to map out a course of study. Double counting rules follows guidelines set by the Dietrich College.

Students are strongly encouraged to be on the lookout for relevant new course offerings; every effort will be made to find equivalent courses that meet student interest when done in consultation with the Faculty Advisor.

Curriculum 54 units

Foundation of Environmental Sciences 18 units

One course in Biology 18 units

03-121 Modern Biology 9
Dietrich College Interdisciplinary Minors

The Minor in Film and Media Studies

Faculty Co-Advisors: David Shumway (shumway@andrew.cmu.edu) and Jeffrey Hinkelman (jh51@andrew.cmu.edu)

Office to declare minor: Department of English, Baker Hall 259

Film and the electronic media have become 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 H&SS 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. In addition, students may take courses in the processes of film-making, offered through special arrangement with the Pittsburgh Filmmakers (a non-profit media arts center, operating since 1971, that provides workshops, seminars, screenings, exhibitions, and training programs in the media and photographic arts).

Courses taken to fulfill requirements for other major or minor programs may not be applied to the Film and Media Studies Minor requirements.

Curriculum 54 units

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. The minor faculty advisor should be consulted (especially when the schedule of courses to be offered for a given semester becomes available) to identify such additional courses.

Introductory Course 9 units

76-238 What Was the Hip-Hop Generation? 9
76-269 Survey of Forms: Screenwriting 9
76-312 Crime and Justice in American Film 9
76-338 The American Cinema 9
76-308 Crime and Justice in American Film 9
82-278 Japanese Film and Literature: The Art of Storytelling 9
82-296 A Century of Russian Film 9
FM 200 Intermediate Filmmaking (please go to CFA 100 to register for this course)

Perspectives on Environmental Problems (36 units distributed across the three categories listed below)

Humanities

76-319 Environmental Rhetoric 9
79-289 Animal Planet: An Environmental History of People and Animals 6
79-372 Cities, Technology, and the Environment 6
79-374 American Environmental History: Critical Issues 9
80-348 Health Development and Human Rights 9

Economics and Policy

73-148 Environmental Economics 9
88-412 Energy, Climate Change, and Economic Growth in the 21st Century 9
90-798 Environmental Policy & Planning (only open to seniors) 12
90-808 Energy Policy (only open to seniors) 6

Environmental Art, Sciences, and Technology

09-510 Chemistry and Sustainability 9
19-101 Introduction to Engineering and Public Policy 12
19-424 Energy and the Environment 9
60-203 Concept Studio: EcoArt 10

Advanced Courses 9 units

Complete one advanced course that concentrates on film directly or that uses it as a tool of social or cultural analysis. One additional advanced course may be taken in place of an intermediate course.

FM 301 Advanced Filmmaking (please go to CFA 100 to register for this course)

76-439 Seminar in Film and Media Studies 9
76-469 Screenwriting Workshop (prerequisite: 76-239) 9

The Minor in Gender Studies

Faculty Advisor: Lisa Tetrault, Professor of History
tetrault@andrew.cmu.edu

Office to declare minor: 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.

Courses taken to fulfill requirements in other major or minor programs may not be applied to the Gender Studies minor requirements (and vice versa).

Curriculum 54 units

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 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
79-320 Women, Politics, and Protest 9
79-331 Body Politics: Women and Health in America 9

Complete 4 additional courses. 36 units

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

76-205 Jane Austen 9
76-311 Acting Out in the London Theatre 9
76-327 Influential Women Writers 9
76-341 Gender and Sexuality in Performance 9
79-222 Between Revolutions: The Development of Modern Latin America 9
79-244 Women in American History 9
79-320 Women, Politics, and Protest If not taken as a requirement 9
79-323 Family, Gender, and Sexuality in European History, 500-1800 9
79-325 U.S. Gay and Lesbian History 6
79-327 Modern Girlhood: Historical and Contemporary Perspectives 6
Communications 18 units

Minor program toward the GSM minor. Please consult with Gender Studies Minor Advisor Professor Lisa Tetrault at tetrault@andrew.cmu.edu.

Required courses:

- 67-329 Contemporary Themes in Global Systems (offered annually)
- 79-333 Sex, Gender & Anthropology
- 84-375 Crosscultural Psychology

Complete two courses:

- 70-321 Negotiation and Conflict Resolution
- 85-350 Psychology of Prejudice

See examples below, but other courses may fulfill this requirement. 9 units

- 76-412 Performance and 18th Century Theatrical Culture
- 76-441 Theorizing Sexuality
- 82-446 Psychology of Gender

Complete 1 advanced course (9 units).

- 70-342 Managing Across Cultures
- 73-341 Within the Firm: Managing through Incentives
- 76-270 Writing for the Professions
- 76-318 Communicating in the Global Marketplace
- 76-386/786 Language & Culture
- 76-428 Visual Verbal Communication
- 85-375 Crosscultural Psychology
- 88-419 International Negotiation

These courses are generally offered at the advanced junior and senior level. Offerings vary from semester to semester and a list will be made available to minors prior to registration each term. Students may also take more than 9 units from the “Advanced Course” list to count for the 54 unit total.

Curriculum 54 units

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 54 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 27 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 67-329 Contemporary Themes in Global Systems. Please consult with the GSM Advisor before embarking on the semester of study abroad.

Double Counting of Courses

Students may apply one course taken to fulfill a requirement in another major or minor program toward the GSM minor.

Core Course

Required course:

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

Communications 18 units

- 70-321 Negotiation and Conflict Resolution
- 85-350 Psychology of Prejudice

The Minor in Global Systems and Management

Faculty Advisor: Brandy Wilson
Office: BH A57

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.

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

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

- 82-215 Arab Culture Through Film and Literature
- 82-253 Korean Culture Through Film
- 82-273 Introduction to Japanese Language and Culture
- 82-303 Introduction to Chinese Language and Culture
- 82-304 The Francophone World
- 82-305 French in its Social Contexts
- 82-311 Advanced Arabic I
- 82-312 Advanced Arabic II
- 82-320 Contemporary Society in Germany, Austria and Switzerland
- 82-323 Germany, Austria and Switzerland in the 20th Century
- 82-333 Introduction to Chinese Language and Culture
- 82-342 Spain: Language and Culture
- 82-343 Latin America: Language and Culture
- 82-345 Introduction to Hispanic Literary and Cultural Studies
- 82-361 Italian Language and Culture I
- 82-362 Italian Language and Culture II
- 82-399 Special Topics: Russian in Context
- 82-415 Topics in French and Francophone Studies
- 82-425 Topics in German Literature and Culture
- 82-431 China and the West
- 82-433 Topics in Contemporary Culture of China
- 82-441 Studies in Peninsular Literature and Culture
- 82-450 Advanced Research in Hispanic Language & Culture
- 82-456 Topics in Spanish Studies
- 82-473 Topics in Japanese Studies
- 82-474 Topics in Japanese Studies
- 84-275 Comparative Politics
- 84-312 Gender and Development in Sub-Saharan Africa
- 84-315 Contemporary Debates in Human Rights
- 84-389 Terrorism and Insurgency

International Management

- 19-411 Global Competitiveness: Firms, Nations and Technological Change
- 70-318 Managing Effective Work Teams
- 70-364 Business Law
- 67-319/67-331 Global Technology Consulting Groundwork - Technology Consulting in the Global Community
- 70-342 Managing Across Cultures
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 care 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 (42 Unit minimum)

Seven courses (a minimum of 60 units) are required to complete this minor. Entry into the minor requires completion of 88-220 Policy Analysis I or the equivalent by approval.

Required Courses

Students are required to take the following courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-330</td>
<td>Medicine and Society</td>
</tr>
<tr>
<td>94-705</td>
<td>Health Economics</td>
</tr>
<tr>
<td>90-836</td>
<td>Health Systems</td>
</tr>
<tr>
<td>90-861</td>
<td>Health Policy</td>
</tr>
</tbody>
</table>

Elective Courses 24 units

Complete a minimum of 24 units.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-721</td>
<td>Healthcare Management</td>
</tr>
<tr>
<td>90-818</td>
<td>Health Care Quality &amp; Performance Improvement</td>
</tr>
<tr>
<td>90-831</td>
<td>Advanced Financial Management of Health Care</td>
</tr>
<tr>
<td>94-706</td>
<td>Healthcare Information Systems</td>
</tr>
</tbody>
</table>

MINIMUM NUMBER OF UNITS REQUIRED FOR MINOR 54

The Minor in Linguistics

Tom Werner, Director
Office: Baker Hall 155F
Email: 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 or 76-484 Introduction to 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.

The Minor in Neural Computation

Director: Dr. Tai Sing Lee
Administrative Coordinator: Melissa Stupka
Website: http://www.cnbc.cmu.edu/upmc/ne_minor/

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, 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.

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. Substitution is possible but requires approval by the director of the minor program.

A. Neural Computation

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</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>15-383</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>86-370</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</td>
<td>12</td>
</tr>
<tr>
<td>85-765</td>
<td>Cognitive Neuroscience</td>
<td>Var.</td>
</tr>
<tr>
<td>Pittsburgh 1000 Introduction to Neuroscience</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Pittsburgh 1012 Neurophysiology</td>
<td>9</td>
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</table>

C. Cognitive Psychology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
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</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</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Intelligence</td>
<td></td>
</tr>
<tr>
<td>85-412</td>
<td>Cognitive Modeling</td>
<td>9</td>
</tr>
<tr>
<td>85-414</td>
<td>Cognitive Neuropsychology</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>
</tr>
</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>10-601</td>
<td>Introduction to Machine Learning (Master’s)</td>
<td>12</td>
</tr>
<tr>
<td>15-381</td>
<td>Artificial Intelligence: Representation and Problem Solving</td>
<td>9</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>
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<tr>
<td>16-385</td>
<td>Computer Vision</td>
<td>9</td>
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<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>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>
</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>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 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 one-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) the project has 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 http://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 computational neuroscience. 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 http://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 http://www.cnbc.cmu.edu/training/undergraduate/research-fellowships-in-computational-neuroscience/ for application information.

The Minor in Religious Studies

Faculty Advisor: Professor Allyson Creasman; acreasman@cmu.edu (aeowen@cmu.edu), Baker Hall 242D, 412-268-9832
Academic Advisor: Dr. Andrew Ramey; aramey@andrew.cmu.edu, Baker Hall 240, 412/268-2880

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

The minor consists of six courses, totaling at least 54 units. Courses taken to fulfill requirements must be completed within student’s major or other 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-273</td>
<td>Jews and Muslims in History: From the Time of</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Muhammad to the Present</td>
<td></td>
</tr>
</tbody>
</table>

Distribution Requirements

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-273</td>
<td>Jews and Muslims in History: From the Time of</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Muhammad to the Present</td>
<td></td>
</tr>
</tbody>
</table>
Applied to this minor with permission of the Faculty Advisor. Courses taken to fulfill requirements in other major or minor programs may only be build on both the core courses and your primary major.

Courses enable you to pursue in greater depth and variety subjects and approaches that literary assessments of the interplay among science, technology, and society. Elective courses give 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 local institutions should consult with the Faculty Advisor about whether the selected course(s) will meet the minor's Elective Requirement with the permission of the Religious Studies minor's Faculty Advisor. The option to cross-register for relevant courses at other local 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 directly at cjp1@cmu.edu.

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 directly at cjp1@cmu.edu.

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).

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).

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).

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 directly at cjp1@cmu.edu.

Elector 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).

Area 3. Electives

The Minor in Science, Technology and Society

Faculty Advisor: Professor Christopher J. Phillips; cjpl@cmu.edu, Baker Hall 235C, 412-268-1753
Academic Advisor: Dr. Andrew Ramey; aramey@andrew.cmu.edu, Baker Hall 240, 412/268-2880

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 two courses from Area 1 and one course from Area 2.

Area 1. History, Philosophy, and Social Studies of Science and Technology (18 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-234</td>
<td>Technology in American Society</td>
<td>9</td>
</tr>
<tr>
<td>79-299</td>
<td>From Newton to the Nuclear Bomb: History of Science, 1750-1950</td>
<td>9</td>
</tr>
<tr>
<td>79-305</td>
<td>Moneyball Nation: Data in American Life</td>
<td>9</td>
</tr>
<tr>
<td>79-330</td>
<td>Medicine and Society</td>
<td>9</td>
</tr>
<tr>
<td>79-342</td>
<td>Introduction to Science and Technology Studies</td>
<td>9</td>
</tr>
<tr>
<td>80-220</td>
<td>Philosophy of Science</td>
<td>9</td>
</tr>
<tr>
<td>80-226</td>
<td>Revolutions in Science</td>
<td>9</td>
</tr>
<tr>
<td>76-319</td>
<td>Environmental Rhetoric</td>
<td>9</td>
</tr>
<tr>
<td>76-395</td>
<td>Science Writing</td>
<td>9</td>
</tr>
<tr>
<td>76-425</td>
<td>Science in the Public Sphere</td>
<td>9</td>
</tr>
<tr>
<td>76-476</td>
<td>Rhetoric of Science</td>
<td>9</td>
</tr>
<tr>
<td>76-492</td>
<td>Rhetoric of Public Policy</td>
<td>9</td>
</tr>
<tr>
<td>76-494</td>
<td>Healthcare Communications</td>
<td>9</td>
</tr>
</tbody>
</table>

Area 2. Language and Rhetoric in Science and Technology (9 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-326</td>
<td>Photography &amp; Family</td>
<td>9</td>
</tr>
<tr>
<td>73-148</td>
<td>Environmental Economics</td>
<td>9</td>
</tr>
<tr>
<td>79-202</td>
<td>Flesh and Spirit: Early Modern Europe, 1400-1750</td>
<td>9</td>
</tr>
<tr>
<td>79-208</td>
<td>The Early Modern Witch-Hunts, c. 1400-1700</td>
<td>3</td>
</tr>
<tr>
<td>79-296</td>
<td>Religion in American Politics</td>
<td>6</td>
</tr>
<tr>
<td>79-349</td>
<td>The Holocaust in Historical Perspective</td>
<td>9</td>
</tr>
<tr>
<td>79-350</td>
<td>Early Christianity</td>
<td>9</td>
</tr>
<tr>
<td>79-381</td>
<td>Energy and Empire: How Fossil Fuels Changed the World</td>
<td>9</td>
</tr>
<tr>
<td>80-110</td>
<td>Nature of Mathematical Reasoning</td>
<td>9</td>
</tr>
<tr>
<td>80-150</td>
<td>Nature of Reason</td>
<td>9</td>
</tr>
<tr>
<td>80-214</td>
<td>Computing, AI, and Philosphy</td>
<td>9</td>
</tr>
<tr>
<td>80-221</td>
<td>Philosophy of Social Science</td>
<td>9</td>
</tr>
<tr>
<td>80-222</td>
<td>Measurement and Methodology</td>
<td>9</td>
</tr>
<tr>
<td>80-233</td>
<td>Causality and Probability</td>
<td>9</td>
</tr>
<tr>
<td>80-245</td>
<td>Medical Ethics</td>
<td>9</td>
</tr>
<tr>
<td>80-247</td>
<td>Ethics and Global Economics</td>
<td>9</td>
</tr>
<tr>
<td>80-248</td>
<td>Engineering Ethics</td>
<td>9</td>
</tr>
<tr>
<td>80-312</td>
<td>Philosophy of Mathematics</td>
<td>9</td>
</tr>
<tr>
<td>80-322</td>
<td>Philosophy of Physics</td>
<td>9</td>
</tr>
<tr>
<td>80-323</td>
<td>Philosophy of Biology</td>
<td>9</td>
</tr>
<tr>
<td>80-324</td>
<td>Philosophy of Economics</td>
<td>9</td>
</tr>
<tr>
<td>84-387</td>
<td>Technology and Policy of Cyber War</td>
<td>6</td>
</tr>
<tr>
<td>85-380</td>
<td>In Search of Mind: The History of Psychology</td>
<td>9</td>
</tr>
<tr>
<td>88-345</td>
<td>Perspectives on Industrial Research and Development</td>
<td>9</td>
</tr>
<tr>
<td>88-417</td>
<td>Scientific Integrity and Communication</td>
<td>9</td>
</tr>
</tbody>
</table>
The Minor in Sociology

Faculty Director, Saurabh Bhargava
Program Advisor, Connie Angermeier
Office: Porter Hall 208A
Email: cl22@andrew.cmu.edu

The Sociology minor provides the student with a solid introduction to the central concepts in sociological theory and a grounding in the methods of empirical inquiry needed to understand societies, their histories, and how they change over time. Students choose among selected topics 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 students' ability to enter 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 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 Methods for Statistics and Data Science 9
70-208 Regression Analysis 9
85-340 Research Methods in Social Psychology 9
88-251 Empirical Research Methods 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
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
79-323 Family, Gender, and Sexuality in European History, 500-1800 9
79-331 Body Politics: Women and Health in America 9
79-332 Medical Anthropology 9
79-343 History of American Urban Life 9
79-377 Food, Culture, and Power: A History of Eating 9
80-230 Ethical Theory 9

80-245 Medical Ethics 9
80-305 Choices, Decisions, and Games 9
85-241 Social Psychology 9
85-446 Psychology of Gender 9

2. Sociology of Work, Organizations, and Technology

70-332 Business, Society and Ethics 9
70-414 Entrepreneurship for Engineers 9
73-331 Political Economy of Inequality and Redistribution 9
79-342 Introduction to Science and Technology Studies 9
88-275 Bubbles: Big Data for Human Minds 9
80-341 Computers, Society and Ethics 9
88-341 Organizational Communication 9
88-402 Modeling Complex Social Systems 9
88-418 Domestic Negotiation 9
88-419 International Negotiation 9
88-435 Decision Science and Policy 9
88-451 Policy Analysis Senior Project 12
or 88-452 Policy Analysis Senior Project 9

Note: Some courses have additional prerequisites.