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

Dr. Andrew Ramey, Senior Academic Advisor, History
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:

African American
76-232 Introduction to Black Literature 9
79-241 African American History: Africa to the Civil War 9

African American History: Reconstruction to the Present 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
79-385 Out of Africa: The Making of the African Diaspora 9
82-303 French & Francophone Cultures 9
82-304 French & Francophone Sociolinguistics ** 9

African American
57-480 History of Black American Music 6
76-238 What Was the Hip-Hop Generation? 9
76-333 Race and Controversy in the Arts 9
79-237 Comparative Slavery * 9
79-247 African Americans, Imprisonment, and the Carceral State 9
79-252 Harriet*: Harriet Tubman, Slavery, and the Underground Railroad 6
79-304 African Americans in Pittsburgh 9
79-371 African American Urban History 9

Caribbean
79-237 Comparative Slavery * 9
79-385 Out of Africa: The Making of the African Diaspora 9
82-303 French & Francophone Cultures 9
82-304 French & Francophone Sociolinguistics ** 9

Latin American
57-317 Art, Anthropology, and Empire 9
82-343 Latin America Language and Culture 9
82-451 Studies in Latin American Literature and Culture 9

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

The Minor in Film and Media Studies

Laura E. Donaldson, Academic Advisor
jeffrey.hinkelman@andrew.cmu.edu, Baker Hall 259

Mission

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

A maximum of two courses may double count with other programs.

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

Required Introductory Course 9 units
76-239 Introduction to Film Studies (prerequisite for 76-439) 9
Complete one 400-level course that concentrates on film/media directly or that uses it as a tool of social or cultural analysis.  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-419</td>
<td>Media in a Digital Age</td>
<td>9</td>
</tr>
<tr>
<td>76-438</td>
<td>The Wire: Crime, Realism, and Long-Form TV</td>
<td>9</td>
</tr>
<tr>
<td>76-439</td>
<td>Film Seminar: The Rise of the Art Film</td>
<td>9</td>
</tr>
<tr>
<td>76-448</td>
<td>Shakespeare on Film</td>
<td>9</td>
</tr>
<tr>
<td>76-454</td>
<td>Screenwriting Workshop</td>
<td>9</td>
</tr>
<tr>
<td>76-467</td>
<td>Crime Fiction and Film</td>
<td>9</td>
</tr>
<tr>
<td>76-469</td>
<td>Screenwriting Workshop</td>
<td>9</td>
</tr>
</tbody>
</table>

### 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.  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-241</td>
<td>Introduction to Gender Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-320</td>
<td>Women, Politics, and Protest</td>
<td>9</td>
</tr>
<tr>
<td>79-331</td>
<td>Body Politics: Women and Health in America</td>
<td>9</td>
</tr>
</tbody>
</table>

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

**45 units**

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-441</td>
<td>Theorizing Sexuality</td>
<td>9</td>
</tr>
<tr>
<td>79-244</td>
<td>Women in American History</td>
<td>9</td>
</tr>
<tr>
<td>79-320</td>
<td>Women, Politics, and Protest **</td>
<td>9</td>
</tr>
<tr>
<td>79-323</td>
<td>Family, Gender, and Sexuality in European History, 500-1800</td>
<td>9</td>
</tr>
<tr>
<td>79-324</td>
<td>#MeToo: Naming and Resisting Gender Violence</td>
<td>6</td>
</tr>
<tr>
<td>79-325</td>
<td>U.S. Gay and Lesbian History</td>
<td>6</td>
</tr>
<tr>
<td>79-327</td>
<td>Modern Girlhood: Historical and Contemporary Perspectives</td>
<td>6</td>
</tr>
<tr>
<td>79-331</td>
<td>Body Politics: Women and Health in America **</td>
<td>9</td>
</tr>
<tr>
<td>80-224</td>
<td>Race, Gender and Science</td>
<td>9</td>
</tr>
<tr>
<td>82-300</td>
<td>Language &amp; Society in the Arab World</td>
<td>9</td>
</tr>
<tr>
<td>84-312</td>
<td>Terrorism in Sub-Saharan Africa</td>
<td>6</td>
</tr>
<tr>
<td>85-350</td>
<td>Psychology of Prejudice</td>
<td>9</td>
</tr>
<tr>
<td>85-446</td>
<td>Psychology of Gender</td>
<td>9</td>
</tr>
</tbody>
</table>

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

**If not taken as a requirement.**

### The Minor in Global Systems and Management

**Correy Dandoy, Academic Advisor**  
**Location:** HBH 3051

Graduates across all disciplines are increasingly likely to find themselves working as part of a global development team on a wide variety of business, consumer, and intellectual products and services. The Global Systems and Management minor (GSM) is intended for students wishing to develop skills essential for participating in emerging opportunities in global business systems, systems development, product development and global project management. GSM exposes students to
contemporary issues and practices facing organizations, managers and individuals working on a global scale across political, cultural and temporal boundaries. GSM presents an opportunity for students to learn about being part of an organization that works globally with its employees, business partners, customers and supply chains.

Students will learn about global project management, outsourcing and cross-cultural communications from theoretical and practical viewpoints. An organized elective structure enables students to tailor the minor to reflect their specific interests.

**Curriculum**

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

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

**Study Abroad Options**

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

At least four of the courses counting toward the GSM minor must be unique to the minor.

**Core Course**

This course introduces the effective fundamentals of global project management and the mechanics of sourcing arrangements including offshore outsourcing.

Required course:

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

**Communications**

18 units

Courses from this category focus on expanding students' communication skills, particularly those necessary to be successful in a professional environment. These skills may include written, oral, and interpersonal communication, as well as presentation, teamwork, and public speaking skills.

Complete two courses:

- 05-341 Organizational Communication 9
- 70-321 Negotiation and Conflict Resolution 9
- 70-340 Business Communications 9
- 70/85/88-341 Team Dynamics and Leadership 9
- 70-342 Managing Across Cultures 9
- 70-350 Acting for Business 9
- 70-483 Advertising and Marketing Communications 9
- 73-341 Managing through Incentives 9
- 76-270 Writing for the Professions 9
- 76-318 Communicating in the Global Marketplace 9
- 76-386/786 Language & Culture 9
- 76-428 Visual Verbal Communication 9
- 85-375 Crosscultural Psychology 9
- 88-418 Negotiation: Strategies and Behavioral Insights 9
- 88-419 International Negotiation 9

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

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

**Humanities, Heritage and Culture**

Courses from this category focus on expanding students' knowledge and understanding of societies and cultures outside of the United States.

- At least 9 units in total

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

- 82-215 Arab Culture Through Dialogues, Film, and Literature 9
- 82-238 Topics in Chinese Culture 9
- 82-253 Korean Culture Through Film 9
- 82-254 World of Korea, Then and Now 9
- 82-273 Introduction to Japanese Language and Culture 9
- 82-278 Japanese Film and Literature: The Art of Storytelling 9
- 82-293 Russian Cinema: From the Bolshevik Revolution to Putin's Russia 9
- 82-303 French & Francophone Cultures 9
- 82-304 French & Francophone Sociolinguistics 9
- 82-305 French in its Social Contexts 9
- 82-311 Advanced Arabic I 9
- 82-312 Advanced Arabic II 9
- 82-320 Contemporary Society in Germany, Austria and Switzerland 9
- 82-323 Germany, Austria and Switzerland in the 20th Century 9
- 82-333 Introduction to Chinese Language and Culture Var. 9
- 82-342 Spain: Language and Culture 9
- 82-343 Latin America Language and Culture 9
- 82-345 Introduction to Hispanic Literary & Cultural Studies 9
- 82-361 Italian Language and Culture I 9
- 82-362 Italian Language and Culture II 9
- 82-399 Special Topics: Russian in Context Var. 9
- 82-400 Russian Studies Topics 9
- 82-415 Topics in French and Francophone Studies 9
- 82-416 Topics in French and Francophone Studies 9
- 82-425 Topics in German Language and Culture 9
- 82-433 Topics in Contemporary Culture of China 9
- 82-441 Studies in Peninsular Literature and Culture 9
- 82-450 Advanced Research in Hispanic Language & Culture 9
- 82-456 Topics in Hispanic Studies 9
- 82-473 Topics in Japanese Studies 9
- 82-474 Topics in Japanese Studies 9
- 84-275 Comparative Politics 9
- 84-312 Terrorism in Sub-Saharan Africa 9
- 84-389 Terrorism and Insurgency 9

**International Management**

Courses from this category focus on expanding students' ability to effectively manage and make decisions that are important in operating and navigating a global businesses. Students are expected to gain an understanding of how to be an effective part of an organization that works globally with its employees, business partners, customers and supply chains.

- At least 9 units in total

**Double Counting of Courses**

- Science and Innovation Leadership for the 21st Century: Firms, Nations, and Tech 9
- Global Technology Consulting Groundwork - Century: Firms, Nations, and Tech 6
- Technology Consulting in the Global Community (these two courses are taken sequentially) 9
- Technology Consulting in the Global Community 3
- Managing Across Cultures 9
- Business Law 9
- International Trade and International Law 9
- International Management 9
- International Marketing 9
- Managing through Incentives 9
- International Political Economy 9
- International Development: Theory and Praxis 9
Complete a minimum of 18 units from these sections:

Elective Courses
Required Courses

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 profession or in the health care industry with the knowledge and skills necessary for success in their careers. Students will become familiar with the critical policy and management issues and will begin to learn to operate effectively in the emerging health care environment. The curriculum combines economic, organizational, managerial, historical and psychological perspectives on these issues to provide a foundation for a deepened understanding of the changing structure of health care organizations and policy.

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

Required Courses
Complete a total of 27 units from the following:
79-330 Medicine and Society: Health, Healers, and Hospitals 9
90-836 Health Systems 6
90-721 Healthcare Management 6
90-861 Health Policy 6

Elective Courses
Complete a minimum of 18 units from these two sections:

Heinz College Courses
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

Healthcare Communications 9
Behavioral Economics and Public Policy 9

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 9

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

Other courses as approved

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
90-832 Health Law 6
90-818 Lean Performance Improvement Lab: H C 6
80-245 Medical Ethics 9
76-494 Healthcare Communications 9

Health Policy Focus
94-705 Health Economics 12
90-832 Health Law 6
90-833 Population Health 6
88-365/90-882 Behavioral Economics and Public Policy 9

Other courses as approved

Health Analytics & IT Focus
90-834 Health Care Geographical Information Systems 12
42-444 Medical Devices 9
Other courses as approved
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.

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

Logic and Computation Electives

Students must take two courses in the Philosophy Department at the 300-level or higher in an area that uses logical and computational tools, such as philosophy, computer science, linguistics, mathematics, psychology, or 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, Dietrich College and MCS. The primary objective of the minor is to encourage students in biology and psychology to take courses in neuroscience and computer science, 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 advise on their curriculum, but should contact the program director any time even after the deadline.

To apply, send email to the director of the Neural Computation minor Dr. Tai Sing Lee (tai@cnbc.cmu.edu) and copy Melissa 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. No more than two courses can be double counted toward the student’s major or other minors. However, courses taken for general education requirements of the student’s degree are not considered to be double counted. A course taken to satisfy one core area cannot be used to satisfy the course requirement for another core area. The following listing presents a set of current possible courses in each area. Other computational neuroscience courses are being developed at Carnegie Mellon and University of Pittsburgh that will also satisfy core area A requirement and the requirements will be updated as they come on-line. Substitution is possible but requires approval.

A. Neural Computation

<table>
<thead>
<tr>
<th>Course Code</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>
<tr>
<td>85-419</td>
<td>Introduction to Parallel Distributed Processing</td>
<td>9</td>
</tr>
<tr>
<td>86-375</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>85-765</td>
<td>Cognitive Neuroscience</td>
<td>Var.</td>
</tr>
<tr>
<td>85-1000</td>
<td>1000 Introduction to Neuroscience</td>
<td>9</td>
</tr>
</tbody>
</table>

B. Neuroscience

<table>
<thead>
<tr>
<th>Course Code</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</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>(crosslisted with 18-690)</td>
<td></td>
</tr>
<tr>
<td>85-765</td>
<td>Cognitive Neuroscience</td>
<td>Var.</td>
</tr>
</tbody>
</table>

C. Cognitive Psychology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course 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</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>85-419</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 Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-301</td>
<td>Introduction to Machine Learning</td>
<td>12</td>
</tr>
<tr>
<td>or 10-315</td>
<td>Introduction to Machine Learning (SCS Majors)</td>
<td>12</td>
</tr>
<tr>
<td>15-281</td>
<td>Artificial Intelligence: Representation and</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Problem Solving</td>
<td></td>
</tr>
<tr>
<td>15-386</td>
<td>Neural Computation</td>
<td>9</td>
</tr>
<tr>
<td>15-387</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>15-494</td>
<td>Cognitive Robotics: The Future of Robot Toys</td>
<td>12</td>
</tr>
<tr>
<td>16-299</td>
<td>Introduction to Feedback Control Systems</td>
<td>12</td>
</tr>
<tr>
<td>16-311</td>
<td>Introduction to Robotics</td>
<td>12</td>
</tr>
<tr>
<td>16-385</td>
<td>Computer Vision</td>
<td>12</td>
</tr>
<tr>
<td>18-290</td>
<td>Signals and Systems</td>
<td>12</td>
</tr>
<tr>
<td>24-352</td>
<td>Dynamic Systems and Controls</td>
<td>12</td>
</tr>
<tr>
<td>36-225</td>
<td>Introduction to Probability Theory</td>
<td>9</td>
</tr>
<tr>
<td>36-247</td>
<td>Statistics for Lab Sciences</td>
<td>9</td>
</tr>
<tr>
<td>36-401</td>
<td>Modern Regression</td>
<td>9</td>
</tr>
<tr>
<td>36-410</td>
<td>Introduction to Probability Modeling</td>
<td>9</td>
</tr>
<tr>
<td>36-746</td>
<td>Statistical Methods for Neuroscience and</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Psychology</td>
<td></td>
</tr>
</tbody>
</table>
The Minor in Religious Studies

Professor Allyson Creasman, Faculty Advisor
acreasman@cmu.edu (aeowen@cmu.edu), Baker Hall 2420, 412-268-9832

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

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

**Curriculum**

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 multiple religions as well as Elective Courses if not otherwise used to fulfill the Distribution Requirement).

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

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

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

In addition to courses offered at CMU, relevant courses taken at the University of Pittsburgh, Duquesne University, or other Pittsburgh universities may also be considered for the Religious Studies minor.

---

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

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

---

42-631 Neural Data Analysis 9
42-632 Neural Signal Processing 12
86-375 Computational Perception 9
86-631 Neural Data Analysis 9

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

The Minor in Science, Technology and Society

Professor Christopher J. Phillips, Faculty Advisor
cpj1@cmu.edu, Baker Hall 231C, 412-268-1753

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

This minor provides interdisciplinary perspectives on the development and meaning of science and technology in modern society. The core courses enable you to 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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-234</td>
<td>Technology and 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: Health, Healers, and Hospitals</td>
<td>9</td>
</tr>
<tr>
<td>79-342</td>
<td>Introduction to Science and Technology Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-370</td>
<td>Technology in the United States</td>
<td>9</td>
</tr>
<tr>
<td>79-380</td>
<td>Hostile Environments: The Politics of Pollution in Global Perspective</td>
<td>9</td>
</tr>
</tbody>
</table>

Area 2. Philosophy of Science Core

Take at least 1 course from the list below.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-220</td>
<td>Philosophy of Science</td>
<td>9</td>
</tr>
<tr>
<td>80-221</td>
<td>Philosophy of Social Science</td>
<td>9</td>
</tr>
<tr>
<td>80-226</td>
<td>Revolutions in Science</td>
<td>9</td>
</tr>
<tr>
<td>80-244</td>
<td>Environmental Ethics</td>
<td>9</td>
</tr>
<tr>
<td>80-245</td>
<td>Medical Ethics</td>
<td>9</td>
</tr>
<tr>
<td>80-249</td>
<td>AI, Society, and Humanity</td>
<td>9</td>
</tr>
</tbody>
</table>

Area 3. Science Core

Take at least 1 course (9 units total) from the following departments: 15-xxx Computer Science, 09-xxx Chemistry, 03-xxx Biological Sciences, 35-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, cpj1@cmu.edu, directly.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-482</td>
<td>Telecommunications Technology and Policy for the Internet Age</td>
<td>12</td>
</tr>
<tr>
<td>48-448</td>
<td>History of Sustainable Architecture</td>
<td>9</td>
</tr>
<tr>
<td>73-427</td>
<td>Sustainability, Energy, and Environmental Economics</td>
<td>9</td>
</tr>
</tbody>
</table>

76-319 Environmental Rhetoric 9
76-395 Science Writing 9
76-425 Rhetoric, Science, and the Public Sphere 9
76-476 Rhetoric of Science 9
76-492 Rhetoric of Public Policy 9
76-494 Healthcare Communications 9
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-204 American Environmental History 9
79-208 Witchcraft and Witch-Hunting 9
79-213 The American Railroad: Decline and Renaissance in the Age of Deregulation 6
79-221 From the Atom Bomb to 9/11: United States History 1945-2001 9
79-246 Industrial America 9
79-283 Hungry World: Food and Famine in Global Perspective 9
79-297 Technology and Work 9
79-302 Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems 6
79-303 Pittsburgh and the Transformation of Modern Urban America 6
79-331 Body Politics: Women and Health in America 9
79-357 Science and the Body 6
79-364 From Midwife to Obstetrician: The Transformation of Modern Childbirth 6
79-368 Un-natural Disasters: Societies and Environmental Hazards in Global Perspective 6
79-372 The Rise and Fall of Pittsburgh Steel 9
79-381 Energy and Empire: How Fossil Fuels Changed the World 9
79-386 A Tale of Two Epidemics: Influenza 1918 and Covid 19 9
79-390 History of Computing and Computer Science: Perspectives on the Digital Age 6
79-397 Environmental and Public Health Crises in the City 6
80-101 Dangerous Ideas in Science and Society 9
80-110 Nature of Mathematical Reasoning 9
80-150 Nature of Reason 9
80-214 Computing, AI, and Philosophy 9
80-222 Measurement and Methodology 9
80-223 Causality and Probability 9
80-248 Engineering Ethics 9
80-312 Mathematical Revolutions 9
80-321 Causation, Law, and Social Policy 9
80-322 Philosophy of Physics 9
80-323 Philosophy of Biology 9
80-324 Philosophy of Economics 9
84-387 Technology and Policy of Cyber War 9
85-380 In Search of Mind: The History of Psychology 9

The Minor in 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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-249</td>
<td>AI, Society, and Humanity</td>
<td>9</td>
</tr>
<tr>
<td>80-445</td>
<td>Shift Capstone Experience</td>
<td>Var.</td>
</tr>
</tbody>
</table>

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.

**Technology area**
- 05-317 Design of Artificial Intelligence Products 12
- 05-318 Human AI Interaction 12
- 05-320 Social Web 12
- 05-452 Service Design 12
- 15-110 Principles of Computing 10
- 15-112 Fundamentals of Programming and Computer Science 12
- 16-467 Human Robot Interaction 12
- 17-303 Cryptocurrencies, Blockchains and Applications Var.
- 17-313 Foundations of Software Engineering 12
- 17-331 Information Security, Privacy, and Policy 12
- 17-333 Privacy Policy, Law, and Technology 9
- 17-355 Program Analysis 12
- 36-201 Statistical Reasoning and Practice 9
- 36-202 Methods for Statistics & Data Science 9
- 67-250 The Information Systems Milieux 9
- 88-300 Programming and Data Analysis for Social Scientists 9

**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.

**Social & Behavioral Science area**
- 05-413 Human Factors 9
- 17-224 Influence, Persuasion, and Manipulation Online 9
- 36-200 Reasoning with Data 9
- 70-311 Organizational Behavior 9
- 70-321 Negotiation and Conflict Resolution 9
- 70-341 Team Dynamics and Leadership 9
- 73-102 Principles of Microeconomics 9
- 73-103 Principles of Macroeconomics 9
- 84-265 Decision Science for International Relations 9
- 84-275 Comparative Politics 9
- 84-319 U.S. Foreign Policy and Interventions in World Affairs 9

**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.

**Ethics, Policy & Design Area**
- 05-413 Human Factors 9
- 08-200 Ethics and Policy Issues in Computing 9
- 16-161 ROB Freshman Seminar: Artificial Intelligence and Humanity 9
- 17-224 Influence, Persuasion, and Manipulation Online 9
- 36-200 Reasoning with Data 9
- 51-173 Design Center: Human Experience in Design 9
- 51-241 How People Work 9
- 51-371 Futures I 4.5
- 51-373 Futures II 4.5
- 51-382 Design Center: Design for Social Innovation 9
- 70-311 Organizational Behavior 9
- 70-321 Negotiation and Conflict Resolution 9
- 70-332 Business, Society and Ethics 9
- 70-341 Team Dynamics and Leadership 9
- 70-364 Business Law 9
- 73-102 Principles of Microeconomics 9
- 73-103 Principles of Macroeconomics 9
- 79-234 Technology and Society 9
- 79-299 From Newton to the Nuclear Bomb: History of Science, 1750-1950 9

**The Minor in Sociology**
Saurabh Bhargava, Faculty Director
Connie Angermeier, Senior Academic Program Manager and Advisor
Location: Porter Hall 208A
cl2@andrew.cmu.edu
Schedule an appointment: https://go.oncehub.com/ConnieAngermeier (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**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td><strong>Curriculum</strong></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td><strong>Core Courses</strong></td>
</tr>
</tbody>
</table>
A. Organizations
Complete one course.
70-311 Organizational Behavior 9

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

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

1. Sociology of Gender, Family, and Culture
70-342 Managing Across Cultures 9
70-385 Consumer Behavior 9
76-241 Introduction to Gender Studies 9
79-244 Women in American History 9
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-308 Crime and Justice in American Film 9
79-320 Women, Politics, and Protest 9
79-323 Family, Gender, and Sexuality in European History, 500-1800 9
79-331 Body Politics: Women and Health in America 9
79-343 Education, Democracy, and Civil Rights 9
79-377 Food, Culture, and Power: A History of Eating 9
80-224 Race, Gender and Science 9
80-245 Medical Ethics 9
80-246 Moral Psychology 9
80-256 Modern Moral Philosophy 9
80-305 Decision Theory 9
80-335 Social and Political Philosophy 9
80-348 Health, Human Rights, and International Development 9
84-369 Decision Science for International Relations 9
85-241 Social Psychology 9
85-350 Psychology of Prejudice 9
85-352 Evolutionary Psychology 9
85-358 Pro-Social Behavior 9
85-377 Attitudes and Persuasion 9
85-442 Health Psychology 9
85-446 Psychology of Gender 9
88-230 Human Intelligence and Human Stupidity 9
88-231 Thinking in Person vs. Thinking Online 9
88-380 Dynamic Decisions 9
88-388 Psychological Models of Decision Making 9

2. Sociology of Work, Organizations, and Technology
70-332 Business, Society and Ethics 9
73-348 Behavioral Economics 9
79-275 Introduction to Global Studies 9
79-342 Introduction to Science and Technology Studies 9
88-275 Bubbles: Data Science for Human Minds 9
80-341 Computers, Society and Ethics 9
88-255 Strategic Decision Making 9
88-341 Team Dynamics and Leadership 9
88-344 Environmental Policy and Planning 9
88-365 Behavioral Economics and Public Policy 9
88-366 Behavioral Economics of Poverty and Development 9

Note: Some courses have additional prerequisites.