BXA Intercollege Degree Programs

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Posner 150
http://www.cmu.edu/interdisciplinary

Mission Statement

The BXA Intercollege Degree Programs are designed for students who want to turn talent and passion into viable professions for the future through a challenging academic regimen. BXA students pursue their goals with the help of multifaceted advising, innovative pedagogical strategies, and a focus on the impact arts have on technology and vice versa.

The goal of the Bachelor of Computer Science and Arts (BCSA), the Bachelor of Science and Arts (BSA), the Bachelor of Humanities and Arts (BHA), and the additional major in Engineering and Arts (EA), housed under the BXA Intercollege Degree Programs, is to allow a select group of students who demonstrate interest and accomplishment in the fine arts and computer science, engineering, humanities, social sciences, or natural sciences to explore beyond the traditional academic major, or integrate more than one field of study across disciplines. These programs foster the creativity of students who explore innovative approaches to the academic environments of two colleges. By merging the components in the arts and computer science, engineering, natural sciences, or humanities into an interdisciplinary/multidisciplinary study, a unique, complex product is born. BXA students produce new information, challenging questions, and innovative theory. BXA students are models of independence, motivation, and well-rounded scholarship as humanists, scientists, and artists at the same time.

In the context of the Carnegie Mellon University environment, the BXA Intercollege Degree Programs hold a special role. BXA provides access to five strong colleges that offer specialized training with expert faculty and researchers. The BXA Programs challenge students to utilize those resources as they explore and develop their own approach to interdisciplinary studies in the fine arts and computer science, engineering, humanities and social sciences, or the natural and mathematical sciences.

BXA students balance courses in their CFA concentration with courses in their academic concentration, as well as BXA-specific courses. These BXA-specific courses give students the opportunity to integrate their areas of concentration by focusing on interdisciplinary approaches and arts-based research techniques. The curricula in the concentration areas provide students with a solid disciplinary foundation upon which they can draw for interdisciplinary projects.

A BXA intercollege degree prepares students for graduate study and careers in an enormous variety of fields, including traditional graduate training in the arts as well as academic areas, positions in arts and education nonprofits such as museums and foundations, and technical positions with media and technology companies.

Program Objectives

The skills developed by BXA students span the creative, the technical, the academic, and the practical. The objective of the BXA Intercollege Program is to prepare graduates for careers in which they will draw on their creative and academic skills to create, educate, communicate, and innovate across disciplines.

Students who complete the BXA curriculum will graduate with the following skills:

- Foundational knowledge and technical expertise in the CFA concentration area and the DCE/MCS/SCS concentration area
- Ability to describe the connections between these concentrations and how the student integrates them
- Ability to communicate ideas textually, visually, and orally
- Knowledge of how the concentration disciplines intersect with history, society, and culture from local and global perspectives
- Ability to use cognitive, behavioral, and ethical dimensions within the concentration disciplines to make decisions on individual and social levels
- Experience in engaging in art research to produce new knowledge both within the CFA concentration and the DCE/MCS/SCS concentration
- Experience in designing, researching, and completing a large-scale, object-based project that integrates both areas of concentration

Bachelor of Computer Science and Arts Degree Program

Carnegie Mellon University recognizes that there are students who are naturally gifted in both the fine arts and computer science. In order to accommodate students who want to pursue an education simultaneously in these areas, we offer a degree that combines the strengths of the College of Fine Arts (CFA) and the School of Computer Science (SCS). The Intercollege degree, called the Bachelor of Computer Science and Arts (BCSA), is a rigorous program that offers a unique group of qualified students the opportunity to develop their talents and interests in an area of the fine arts and computer science.

The BCSA curriculum is divided into three parts: 1) BCSA General Education coursework, 2) CFA concentration coursework, and 3) SCS concentration coursework.

Students choose their fine arts concentration from among the following schools in CFA: Architecture, Drama or Music. A student must meet the entry requirements for the particular CFA school of their choice. While in the BCSA Program, a student may change their CFA concentration only if they pass all admission requirements for that particular school.

The BCSA Degree Program is governed by faculty and administrators from both colleges and led by the director of the BXA Intercollege Degree Programs. The director and associate director of the BXA Intercollege Degree Programs are the primary advisors and liaisons between CFA and SCS. Students receive extensive advising support. Each student has two additional academic advisors: an advisor in the admitting school of CFA for their fine arts concentration and an advisor in SCS for their computer science concentration. This network of advisors guides each student through their curriculum.

BCSA Curriculum

<table>
<thead>
<tr>
<th>I. BCSA General Education</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. SCS Concentration</td>
<td>111</td>
</tr>
<tr>
<td>III. CFA Concentration</td>
<td>108</td>
</tr>
<tr>
<td>IV. Free Electives</td>
<td>40</td>
</tr>
<tr>
<td>Total BCSA Degree Requirements</td>
<td>380</td>
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</tbody>
</table>

I. BCSA General Education

(15 courses, 121 units minimum)

- Writing/Expression (1 course, 9 units, 76-101 required)
- Cultural Analysis (1 course, 9 units)
- Mathematics (2 courses, 20 units, 21-120 and either 21-122 or 21-241 required), Probability (1 course, 9 units minimum required)
- Science (2 courses, 18 units minimum)
- Engineering (In consultation with your academic advisor, an engineering course could substitute for one of the two Science requirements.)
- Economic, Political, & Social Institutions OR Cognition, Choice & Behavior (1 course, 9 units)
- One additional course from one of the following departments: English, History, Modern Languages, Philosophy, or Psychology (1 course, 9 units minimum)
- Computing @ Carnegie Mellon (1 course, 3 units, 99-101 or 99-102 required)
- BXA Required Courses (5 courses, 36 units minimum, 52-190 or 52-291, 52-391, 52-392, 52-401, 52-402)

II. Writing (1 course, 9 units)

Broadly considered, language is a tool used to communicate, as well as a way to organize non-visual and non-mathematical thinking. This requirement focuses on the social nature of language and the ways in which writing constitutes thinking.

76-101 Interpretation and Argument or 76-102 Advanced First Year Writing: Special Topics
or 76-106 Writing about Literature, Art and Culture & 76-107 and Writing about Data & 76-108 and Writing about Public Problems

All undergraduate students must complete the First-Year Writing requirement—the Department of English does not accept any Advanced Placement exemptions. This requirement can be completed in two different ways. Enroll in one of two full-semester courses 101 or 102 (by invitation only), 9 units, or enroll in two of three half-semester mini courses (back-to-back within a single semester) 106/107/108, 4.5 + 4.5 units.

Course options and topics: www.cmu.edu/hss/english/first_year/index.html

### Cultural Analysis (1 course, complete 9 units)

This requirement seeks to recognize cultures that have shaped and continue to shape the human experience; courses in this category are usually either broad in place, time, or cultural diversity.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-173</td>
<td>Survey of Western Music History</td>
<td>9</td>
</tr>
<tr>
<td>60-205</td>
<td>Critical Theory in Art III</td>
<td>9</td>
</tr>
<tr>
<td>70-342</td>
<td>Managing Across Cultures</td>
<td>9</td>
</tr>
<tr>
<td>76-221</td>
<td>Books You Should Have Read By Now</td>
<td>9</td>
</tr>
<tr>
<td>76-227</td>
<td>Comedy</td>
<td>9</td>
</tr>
<tr>
<td>76-232</td>
<td>Introduction to African American Literature</td>
<td>9</td>
</tr>
<tr>
<td>76-239</td>
<td>Introduction to Film Studies</td>
<td>9</td>
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<tr>
<td>76-241</td>
<td>Introduction to Gender Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-104</td>
<td>Global Histories</td>
<td>9</td>
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<tr>
<td>79-201</td>
<td>Introduction to Anthropology</td>
<td>9</td>
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<tr>
<td>79-202</td>
<td>Flesh and Spirit: Early Modern Europe, 1400-1750</td>
<td>9</td>
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<tr>
<td>79-207</td>
<td>Development of European Culture</td>
<td>9</td>
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<tr>
<td>79-222</td>
<td>Between Revolutions: The Development of Modern Latin America</td>
<td>9</td>
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<td>79-223</td>
<td>Mexico: From the Aztec Empire to the Drug War</td>
<td>9</td>
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<tr>
<td>79-226</td>
<td>African History: Earliest Times to 1780</td>
<td>9</td>
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<tr>
<td>79-229</td>
<td>Origins of the Arab-Israeli Conflict, 1880-1948</td>
<td>9</td>
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<tr>
<td>79-230</td>
<td>Arab-Israeli Conflict Since 1948</td>
<td>9</td>
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<tr>
<td>79-240</td>
<td>Development of American Culture</td>
<td>9</td>
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<td>79-241</td>
<td>African American History: Africa to the Civil War</td>
<td>9</td>
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<tr>
<td>79-242</td>
<td>African American History: Reconstruction to the Present</td>
<td>9</td>
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<tr>
<td>79-261</td>
<td>The Last Emperors: Chinese History and Society, 1600-1900</td>
<td>9</td>
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<tr>
<td>79-262</td>
<td>Modern China: From the Birth of Mao ... to Now</td>
<td>9</td>
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<tr>
<td>79-265</td>
<td>Russian History: From the First to the Last Tsar</td>
<td>9</td>
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<tr>
<td>79-282</td>
<td>Europe and the World Since 1800</td>
<td>9</td>
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<tr>
<td>79-316</td>
<td>Photography, the First 100 Years, 1839-1939</td>
<td>9</td>
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<tr>
<td>79-345</td>
<td>Roots of Rock &amp; Roll</td>
<td>9</td>
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<td>79-350</td>
<td>Early Christianity</td>
<td>9</td>
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<tr>
<td>79-395</td>
<td>The Arts in Pittsburgh</td>
<td>9</td>
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<tr>
<td>79-396</td>
<td>Music and Society in 19th and 20th Century</td>
<td>9</td>
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<tr>
<td>80-100</td>
<td>Introduction to Philosophy</td>
<td>9</td>
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<tr>
<td>80-250</td>
<td>Ancient Philosophy</td>
<td>9</td>
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<tr>
<td>80-251</td>
<td>Modern Philosophy</td>
<td>9</td>
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<tr>
<td>80-253</td>
<td>Continental Philosophy</td>
<td>9</td>
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<tr>
<td>80-254</td>
<td>Analytic Philosophy</td>
<td>9</td>
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<tr>
<td>80-255</td>
<td>Pragmatism</td>
<td>9</td>
</tr>
<tr>
<td>80-261</td>
<td>Empiricism and Rationalism</td>
<td>9</td>
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<tr>
<td>80-276</td>
<td>Philosophy of Religion</td>
<td>9</td>
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<tr>
<td>82-273</td>
<td>Introduction to Japanese Language and Culture</td>
<td>9</td>
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<tr>
<td>82-293</td>
<td>Introduction to Russian Culture</td>
<td>9</td>
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<tr>
<td>82-303</td>
<td>Introduction to French Culture</td>
<td>9</td>
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<tr>
<td>82-304</td>
<td>The Francophone World</td>
<td>9</td>
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<tr>
<td>82-327</td>
<td>The Emergence of the German Speaking World</td>
<td>9</td>
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<tr>
<td>82-333</td>
<td>Introduction to Chinese Language and Culture</td>
<td>9</td>
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<tr>
<td>82-342</td>
<td>Spain: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-343</td>
<td>Latin America: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-344</td>
<td>U.S. Latinos: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-345</td>
<td>Introduction to Hispanic Literary &amp; Cultural Studies *</td>
<td>9</td>
</tr>
</tbody>
</table>

* Indicates co-requisites and/or prerequisites required.

### Mathematics & Probability (3 courses, 29 units minimum)

Choose two mathematics courses (20 units):

- 21-120 Differential and Integral Calculus 10
- 21-122 Integration and Approximation 10
- or 21-241 Matrices and Linear Transformations

Choose one probability course (9 units minimum):

- 15-259/359 Probability and Computing 12
- 21-325 Probability 9
- 36-218 Probability Theory for Computer Scientists 9
- 36-225-36-226 Introduction to Probability Theory - Introduction to Statistical Inference 18

### Science & Engineering (2 courses, 18 units minimum)

Choose two science courses from differing departments or one science and one engineering course from the following list:

- 02-223 Personalized Medicine: Understanding Your Own Genome 9
- 02-261 Quantitative Cell and Molecular Biology Laboratory 9
- 03-121 Modern Biology 9
- 03-124 Modern Biology Laboratory 9
- 03-125 Evolution 9
- 03-132 Basic Science to Modern Medicine 9
- 06-100 Introduction to Chemical Engineering 12
- 06-221 Thermodynamics 9
- 09-105 Introduction to Modern Chemistry I 10
- 09-106 Modern Chemistry II 10
- 09-217 Organic Chemistry I 9
- 09-218 Organic Chemistry II 9
- 09-221 Laboratory I: Introduction to Chemical Analysis 12
- 09-225 Climate Change: Chemistry, Physics and Planetary Science 9
- 12-100 Introduction to Civil and Environmental Engineering 12
- 12-201 Geology 9
- 18-100 Introduction to Electrical and Computer Engineering 12
- 18-220 Electronic Devices and Analog Circuits 12
- 18-240 Structure and Design of Digital Systems 12
- 24-101 Fundamentals of Mechanical Engineering 12
- 24-231 Fluid Mechanics 10
- 24-261 Statics 10
- 24-351 Dynamics 10
- 27-100 Engineering the Materials of the Future 12
- 33-104 Experimental Physics 9
- 33-114 Physics of Musical Sound 9
- 33-120 Science and Science Fiction 9
- 33-121 Physics I for Science Students 12
- or 33-151 Matter and Interactions I 12
- 33-142 Physics II for Engineering and Physics Students 12
- or 33-152 Matter and Interactions II 12
- 33-224 Stars, Galaxies and the Universe 9
- 33-228 Electronics I 10
- 42-101 Introduction to Biomedical Engineering 12
- 42-203 Biomedical Engineering Laboratory 9
- 42-341 Introduction to Biomechanics 9
- 85-219 Biological Foundations of Behavior 9
- 85-310 Research Methods in Cognitive Psychology 9
- 85-314 Cognitive Neuroscience Research Methods 9
Economic, Political & Social Institutions OR Cognition, Choice & Behavior (1 course from either category, complete 9 units minimum)

Economic, Political & Social Institutions
This requirement explores the processes by which institutions organize individual preferences and actions into collective outcomes.

- 19-101 Introduction to Engineering and Public Policy 12
- 36-303 Sampling, Survey and Society * 9
- 70-332 Business, Society and Ethics 9
- 73-102 Principles of Microeconomics 9
- 73-103 Principles of Macroeconomics * 9
- 79-299 From Newton to the Nuclear Bomb: History of Science, 1750-1950 9
- 79-300 History of American Public Policy 9
- 79-320 Women, Politics, and Protest 9
- 79-331 Body Politics: Women and Health in America 9
- 80-135 Introduction to Political Philosophy 9
- 80-136 Social Structure, Public Policy & Ethics 9
- 80-243 Ethics of Leadership 9
- 80-244 Environmental Ethics 9
- 80-245 Medical Ethics 9
- 80-324 Philosophy of Economics 9
- 80-335 Social and Political Philosophy 9
- 80-341 Computers, Society and Ethics 9
- 84-104 Decision Processes in American Political Institutions 9
- 84-275 Comparative Politics 9
- 84-310 International Political Economy * 9
- 84-320 Domestic Politics and International Affairs 9
- 84-322 Nonviolent Conflict and Revolution 9
- 84-324 Democracies and War 9
- 84-362 Diplomacy and Statecraft 9
- 84-380 Grand Strategy in the United States 9
- 84-386 The Privatization of Force 9
- 84-389 Terrorism and Insurgency 9
- 84-402 Judicial Politics and Behavior 9
- 84-414 International and Subnational Security 9
- 88-257 Experimental Economics 9

Cognition, Choice, and Behavior
This requirement explores the process of thinking, decision making, and behavior in the context of the individual.

- 70-311 Organizational Behavior * 9
- 80-130 Introduction to Ethics 9
- 80-150 Nature of Reason 9
- 80-180 Nature of Language 9
- 80-221 Philosophy of Social Science 9
- 80-241 Ethical Judgments in Professional Life 9
- 80-242 Conflict and Dispute Resolution 9
- 80-270 Philosophy of Mind 9
- 80-271 Philosophy and Psychology 9
- 80-275 Metaphysics 9
- 80-281 Language and Thought 9
- 80-330 Ethical Theory 9
- 85-102 Introduction to Psychology 9
- 85-211 Cognitive Psychology 9
- 85-221 Principles of Child Development 9
- 85-241 Social Psychology 9
- 85-251 Personality 9
- 85-261 Abnormal Psychology 9
- 88-120 Reason, Passion and Cognition 9

* Indicates co-requisites and/or prerequisites required.

Complete ONE additional course from one of the following departments (1 course, complete 9 units minimum)

- English
- History
- Modern Languages
- Philosophy
- Psychology

Computing @ Carnegie Mellon (1 course, 3 units)
This is a mini-course, pass/no pass, to be completed in the first semester.

- 99-101 Computing @ Carnegie Mellon -REQUIRED
- 99-102 Computing @ Carnegie Mellon

BXA Required Courses (5 courses, 36 units minimum)
BXA-specific courses give students the opportunity to integrate their areas of concentration by focusing on interdisciplinary approaches and arts-based research techniques.

- 52-190 BXA Seminar I: Building the Wunderkammer
- 52-291 BXA Seminar II: Transferring Knowledge
- 52-391 BXA Junior Portfolio
- 52-392 BXA Seminar III: Deconstructing Disciplines
- 52-401 BXA Seminar IV: Capstone Project Research
- 52-402 BXA Seminar V: Capstone Project Production

II. School of Computer Science Concentration

Computer Science Concentration (111 units minimum)

Prerequisite

- 15-112 Fundamentals of Programming and Computer Science 12

Computer Science Core Requirements (56 units)

- 15-122 Principles of Imperative Computation 10
- 15-150 Principles of Functional Programming 10
- 15-210 Parallel and Sequential Data Structures and Algorithms 12
- 15-213 Introduction to Computer Systems 12
- 15-251 Great Ideas in Theoretical Computer Science 12

Concepts of Mathematics (10 units)

- 21-127 Concepts of Mathematics (co-requisite for 15-122; prerequisite for 15-150) 10

Applications Courses or CS Electives (5 courses, 45 units minimum)

Choose a minimum of five courses from SCS beyond the core requirements, 200-level or higher, not including 02-201, 02-223, 02-250, 02-261, 15-351, 16-223, 17-200, 17-333, 17-562. Listed below are suggested choices for these electives. Consult with the CS advisor if interested in courses not listed.

- 05-391 Designing Human Centered Software 12
- 05-418 Design Educational Games 12
- 11-291 Applied Computational Intelligence Lab 9
- 11-344 Machine Learning in Practice 12
- 11-411 Natural Language Processing 12
- 15-322 Introduction to Computer Music 9
- 15-323 Computer Music Systems and Information Processing 9
- 15-365 Experimental Animation 12
- 15-381 Artificial Intelligence: Representation and Problem Solving 9
- 15-388 Practical Data Science 9
Complete three courses:

- Media Studios (3 courses, 30 units)
- Directing Required Courses (10 units minimum)
- Architecture Electives (56 units minimum)

Complete two courses:

- Art Concentration (108 units minimum)
- Directing I: Sources - Fall
- Directing II: Fundamentals - Spring

Complete three courses:

- Media Studios (3 courses, 30 units)
- 2D Media Studio: Drawing - 10 units
- 2D Media Studio: Imaging - 10 units

Advanced Studios (4 courses, 40 units)

Complete four courses. Courses may be offered in the fall and/or spring. Students may take courses in any media area (ETB, SIS, CP or DP3). They may take all courses in one media area if a focus is desired.

- 60-250 2D Media Studio: Painting - 10 units
- 60-251 2D Media Studio: Print Media - 10 units
- 60-130-60-131 3-D Media Studio I (complete two minis, 5 units each) - 10 units
- 60-131-60-132 3-D Media Studio II-I (complete two minis, 5 units each) - 10 units
- 60-110 Electronic Media Studio: Introduction to the Moving Image - 10 units
- 60-210 Electronic Media Studio: Introduction to Interactivity - 10 units

Art History/Theory (2 courses, 18 units)

- 60-206 Critical Theory in Art III - Fall - 9 units
- 60-205 Critical Theory in Art IV - Spring - 9 units

Review Requirement (complete 2 required reviews, 0 units)

A review is required at the end of the sophomore and senior years. Pass/no pass only.

- 60-200 Sophomore Review - Spring - 0 units
- 60-400 Senior Review - Fall - 0 units

Drama Concentration (108 units minimum)

AUDITION/INTERVIEW REQUIRED FOR DIRECTING OR DRAMATURGY CONCENTRATION OPTION. PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR DESIGN OR PRODUCTION TECHNOLOGY AND MANAGEMENT CONCENTRATION OPTION.

Options available in the following areas: 1) Design, 2) Directing, 3) Dramaturgy, 4) Production Technology and Management

Note: There is no BHA Acting or Musical Theatre option.

Required Courses for All Concentration Options (20 units)

- 54-175-54-176 Conservatory Hour - 2 units
- 54-177 Foundations of Drama I - 6 units
- 54-281 Foundations of Drama II (prerequisite: 54-177) - 6 units
- 54-381 Special Topics in Drama: History, Literature and Criticism - 6 units

Work with Drama Faculty Option Coordinator to Approve Concentration Option (88 units minimum):

- Design Required Courses (26 units)
- 54-151-54-152 Stagecraft - Stagecraft - 26 units

A minimum of 62 additional Design units must be approved by the Design faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Directing Required Courses (52 units)

- 54-121-54-122 Directing I: Sources - Directing I: Sources - 18 units
- 54-221-54-222 Directing II: Fundamentals - Directing II: Fundamentals - 18 units
- 54-159-54-159 Production Practicum - Production Practicum (two times, 12 units total) - 12 units
Musicology Required Courses (45 units)

54-517 Director's Colloquium
   (four times, 4 units total) 1

A minimum of 36 additional Directing units must be approved by the Directing faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Dramaturgy Required Courses (53 units minimum)

54-109 Dramaturgy 1: Approaches to Text 9
54-184 Dramaturgy 2: Introduction to Production
   Dramaturgy 9
54-121 Directing I: Sources 9
54-159-54-159 Production Practicum-Production Practicum
   (two times. 12 units total) 12
54-200-54-200 Dramaturgy Forum-Dramaturgy Forum -Fall
   (minimum of two; every semester it is offered
   while enrolled) 2
54-xxx Dramaturgy 3, 4, 5 or 6 (minimum of two; all
   four if enrolled as BXA for six semesters or more) 18

A minimum of 29 additional Dramaturgy units must be approved by the Dramaturgy faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Production Technology and Management Required Courses (26 units)

54-151-54-152 Stagecraft-Stagecraft
   (13 units + 13 units) 26

A minimum of 62 additional PTM units must be approved by the PTM faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Music Concentration (108 units minimum)

AUDITION REQUIRED FOR PERFORMANCE CONCENTRATION OPTION.
PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR COMPOSITION, MUSICOLOGY, AUDIO RECORDING & PRODUCTION, OR SOUND THEORY & PRACTICE CONCENTRATION OPTION.

Options available in the following areas: 1) Performance (instrumental, piano, organ, voice), 2) Composition 3) Musicology, 4) Audio Recording & Production 5) Sound Theory & Practice

Required Course for All Concentration Options (9 units)

57-152 Harmony I-Fall 9
   or 57-149 Basic Harmony I

Work with Music Advisor to Approve Concentration Option (99 units minimum):

Performance and Composition Required Courses (76 units)

57-161 Eurhythmics I-Fall (recommended co-requisite: 57-181) 3
57-181 Solfege I-Fall 3
   or 57-180 Basic Solfege I
   or 57-185 Advanced Solfege I
57-173 Survey of Western Music History -Fall (co-
   requisite: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-69x BXA Studio (4 semesters) 36
57-xxx Major Ensemble (4 semesters) 24

A minimum of 23 additional Music units must be approved by the Music advisor. A list of these selected courses must be filed in the BXA office.

Musicology Required Courses (45 units)

57-283 Music History I
   (co-requisite: 57-190) 9
57-284 Music History II
   (co-requisite: 57-289) 9
57-285 Music History III
   (co-requisite: 57-290) 9
57-189 Introduction to Repertoire and Listening for
   Musicians 3
57-190 Repertoire and Listening for Musicians I 3
57-289 Repertoire and Listening for Musicians II 3
57-290 Repertoire and Listening for Musicians III 3
57-404 String Quartet: A Social History 9
57-405 Concerto: Virtuosity and Contrast 9
57-409 Puccini's Operas 9
57-427 Advanced Seminar in Film Musicology 9
57-485 History of the Symphony 9
57-611 Independent Study in History 6

Choose 36 units from:
57-209 The Beatles 9
57-306 World Music 9
57-477 Music of the Spirit 6
57-478 Survey of Historical Recording 6
57-480 History of Black American Music 6

A minimum of 18 additional Music units must be approved by the Music advisor. A list of these selected courses must be filed in the BXA office.

Audio Recording & Production Required Courses (40 units)

57-101 Introduction to Music Technology 6
   or 57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I-Fall 3
   or 57-180 Basic Solfege I
   or 57-185 Advanced Solfege I
57-173 Survey of Western Music History -Fall (co-
   requisite: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-337 Sound Recording 6
57-338 Sound Editing and Mastering 6
57-438 Multitrack Recording 9

Choose 59 units from:
57-153 Harmony II-Spring 9
   or 57-150 Basic Harmony II
57-182 Solfege II 3
   or 57-186 Advanced Solfege II
57-104 Introduction to Computing for Creative Practice 10
57-190 Twisted Signals: Multimedia Processing for the
   Arts 10
33-114 Physics of Musical Sound 9
54-166 Introduction to Sound Design for Theatre 6
54-275 3 History of Sound Design 3
54-666 Production Audio 6
57-344 Experimental Sound Synthesis 9
57-421 The Exploded Ensemble 6
57-425 Expanded Music Performance 9
57-427 Advanced Seminar in Film Musicology 9
57-478 Survey of Historical Recording 6
57-622 Independent Study in Sound Recording
   Production 3
60-131 3D Media Studio II 5
60-210 Electronic Media Studio: Introduction to
   Interactivity 10

Note: Students completing an IDeATe minor may double-count up to two of the IDeATe minor courses towards the Audio Recording & Production concentration.

Sound Theory & Practice Required Courses (47 units)

57-101 Introduction to Music Technology 6
   or 57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I-Fall 3
   or 57-180 Basic Solfege I
   or 57-185 Advanced Solfege I
57-173 Survey of Western Music History -Fall (co-
   requisite: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-190 Twisted Signals: Multimedia Processing for the
   Arts 10
57-911 Music Since 1945 9
57-616 Independent Study in Sound Studies 9
Carnegie Mellon University offers an intercollege degree that combines the strengths of the College of Fine Arts (CFA) and the College of Dietrich College of Humanities and Social Sciences (DC). The intercollege degree, called the Bachelor of Humanities and Arts (BHA), offers depth of study in both the fine arts and the humanities, social and behavioral sciences. The BHA Degree Program enables a student to receive broader exposure to both the fine arts and liberal arts than is generally possible through a Bachelor of Fine Arts degree in CFA, while obtaining deeper and more substantial training in the fine arts than is generally possible through a Bachelor of Arts or Bachelor of Science degree in DC. Students receive extensive training in one or more of the fine arts disciplines as well as related advanced training in areas such as writing, social sciences, behavioral sciences or cultural studies. The program also provides enough flexibility to allow students to explore other areas of interest. The most important aspect of the BHA Program is for students to blend their interests and to explore the connections between their chosen disciplines.

The BHA curriculum is divided into three parts: 1) BHA General Education coursework, 2) CFA concentration coursework, and 3) DC concentration coursework.

Students choose their fine arts concentration from among the following schools in CFA: Architecture, Art, Drama or Music. A student must meet the entry requirements for the particular CFA school of their choice. While in the BHA Program, a student may change their CFA concentration only if they pass all admission requirements for that particular school.

Students choose their humanities or social/behavioral sciences concentration from the list of majors and minors offered by DC.

The BHA Degree Program is governed by faculty and administrators from both colleges and led by the director of the BXA Intercollege Degree Programs. The director and associate director of the BXA Intercollege Degree Programs are the primary advisors and liaisons between CFA and DC. Students receive extensive advising support. Each student has two additional academic advisors: an advisor in the admitting school of CFA for their fine arts concentration and an advisor in DC for their humanities/

### BHA Curriculum

#### I. BHA General Education

(14 courses, 111 units minimum)

- Communicating: Language and Interpretations (3 courses, 27 units minimum, 76-101 required, two approved modern language courses required)
- Reflecting: Societies and Cultures (1 course, 9 units, 79-104 required)
- Modeling: Mathematics and Experiments (1 course, 9 units minimum)
- Deciding: Social Sciences and Values (3 courses, 27 units minimum, 36-200 or 36-201 required)
- Computing @ Carnegie Mellon (1 course, 3 units, 99-101 or 99-102 required)
- BXA Required Courses (5 courses, 36 units minimum, 52-190 or 52-291, 52-391, 52-392, 52-401, 52-402)

Courses in this category give special attention to the study of language as interpretation, expression and argument within and across multiple discourses. Students examine language for its internal logics and structures.

#### Communicating: Language and Interpretations (3 courses, 27 units minimum)

- Interpreting: Communication and/or Culture (3 units minimum)
- Listening: Media and Information (6 units minimum)
- Translating: Language and Culture (12 units minimum)

All undergraduate students must complete the First-Year Writing requirement—the Department of English does not accept any Advanced Placement exemptions. This requirement can be completed in two different ways. Enroll in one of two full-semester courses 101 or 102 (by invitation only), 9 units, or enroll in two of three half-semester mini courses (back-to-back within a single semester) 106/107/108, 4.5 + 4.5 units.

Course options and topics: www.cmu.edu/hss/english/first_year/index.html

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<thead>
<tr>
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<tbody>
<tr>
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#### II. DC Concentration

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#### III. CFA Concentration

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#### IV. Free Electives

(approximately 4 courses, 40 units minimum)

Take any Carnegie Mellon course. A maximum of 9 units of physical education and/or military science may be counted toward this requirement. Physical education and military science courses will not be calculated in a student’s QPA.

Note: Students completing an IDeATe minor may double-count up to two of the IDeATe minor courses towards the Sound Theory & Practice concentration.

### Bachelor of Humanities and Arts Degree Program

Carnegie Mellon University offers an intercollege degree that combines the strengths of the College of Fine Arts (CFA) and the College of Dietrich College of Humanities and Social Sciences (DC). The intercollege degree, called the Bachelor of Humanities and Arts (BHA), offers depth of study in both the fine arts and the humanities, social and behavioral sciences. The BHA Degree Program enables a student to receive broader exposure to both the fine arts and liberal arts than is generally possible through a Bachelor of Fine Arts degree in CFA, while obtaining deeper and more substantial training in the fine arts than is generally possible through a Bachelor of Arts or Bachelor of Science degree in DC. Students receive extensive training in one or more of the fine arts disciplines as well as related advanced training in areas such as writing, social sciences, behavioral sciences or cultural studies. The program also provides enough flexibility to allow students to explore other areas of interest. The most important aspect of the BHA Program is for students to blend their interests and to explore the connections between their chosen disciplines.

The BHA curriculum is divided into three parts: 1) BHA General Education coursework, 2) CFA concentration coursework, and 3) DC concentration coursework.

Students choose their fine arts concentration from among the following schools in CFA: Architecture, Art, Drama or Music. A student must meet the entry requirements for the particular CFA school of their choice. While in the BHA Program, a student may change their CFA concentration only if they pass all admission requirements for that particular school.

Students choose their humanities or social/behavioral sciences concentration from the list of majors and minors offered by DC.

The BHA Degree Program is governed by faculty and administrators from both colleges and led by the director of the BXA Intercollege Degree Programs. The director and associate director of the BXA Intercollege Degree Programs are the primary advisors and liaisons between CFA and DC. Students receive extensive advising support. Each student has two additional academic advisors: an advisor in the admitting school of CFA for their fine arts concentration and an advisor in DC for their humanities/
Modeling: Mathematics and Experiments (1 course, 9 units minimum)

Courses in this category stress the interplay of mathematical (formal) theories and experimental work. Some courses investigate the internal structure of theories, whereas others use them as models for producing real-world knowledge. Such models may be drawn from a variety of disciplines including the natural sciences, but also, for example, psychology and computer science. The interactions between theorizing and experimenting (observing) can be understood within an intellectual framework that invites comparative assessment. Select one course from the following course options:

Mathematics

21-111 Differential Calculus 10
21-120 Differential and Integral Calculus 10
21-127 Concepts of Mathematics 10
21-241 Matrices and Linear Transformations 10
80-110 Nature of Mathematical Reasoning 9
80-210 Logic and Proofs 9
80-211 Logic and Mathematical Inquiry 9

Natural Science

02-223 Personalized Medicine: Understanding Your Own Genome 9
02-261 Quantitative Cell and Molecular Biology Laboratory 9
03-121 Modern Biology 9
03-125 Evolution 9
03-132 Basic Science to Modern Medicine 9
03-133 Neurobiology of Disease 9
03-161 Molecules to Mind 9
09-103 Atoms, Molecules and Chemical Change 9
09-105 Introduction to Modern Chemistry I 10
12-201 Geology 9
33-104 Experimental Physics 9
33-114 Physics of Musical Sound 9
33-115 Physics for Future Presidents 9
33-124 Introduction to Astronomy 9

Other Courses

05-413 Human Factors 9
15-104 Introduction to Computing for Creative Practice 10
15-110 Principles of Computing 10
15-112 Fundamentals of Programming and Computer Science 12
33-120 Science and Science Fiction 9
80-220 Philosophy of Science 9
80-222 Measurement and Methodology 9
80-223 Causality and Probability 9
80-226 Revolutions in Science 9
80-312 Mathematical Revolutions 9
80-322 Philosophy of Physics 9
80-323 Philosophy of Biology 9
80-327 Philosophy of Neuroscience 9
85-370 Perception 9
88-275 Bubbles: Data Science for Human Minds 9
99-236 Introduction to Environmental Ideas 9
99-238 Materials, Energy and Environment 9

Deciding: Social Sciences and Values (3 courses, 27 units minimum)

The theme of this category is the exploration of cognitive, behavioral and ethical dimensions of decision-making on both the individual and social level. Making decisions requires a broad understanding of human rationality and social interaction. Some courses examine the critical collection and analysis of data for achieving such an understanding, whereas others emphasize the historical development of policies and values, which form the matrix for decision-making.

36-200 Reasoning with Data -REQUIRED 9
05-292 Learning Methods 12
08-200/19-211 Ethics and Policy Issues in Computing 9
73-102 Principles of Microeconomics 9
79-342 Introduction to Science and Technology Studies 9
80-130 Introduction to Ethics 9
80-136 Social Structure, Public Policy & Ethics 9
80-208 Critical Thinking 9
80-221 Philosophy of Social Science 9
80-242 Conflict and Dispute Resolution 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-248 Engineering Ethics 9
80-270 Philosophy of Mind 9
80-271 Philosophy and Psychology 9
80-292 Learning Science Principles 12
80-305 Choices, Decisions, and Games 9
80-324 Philosophy of Economics 9
80-330 Ethical Theory 9
80-336 Philosophy of Law 9
80-348 Health, Development, and Human Rights 9
80-405 Game Theory 9
80-430 Ethics and Medical Research 9
80-447 Global Justice 9
84-104 Decision Processes in American Political Institutions 9
84-309 Political Behavior 9
84-310 International Political Economy 9
84-311 International Development: Theory and Praxis 9
84-315 Contemporary Debates in Human Rights 9
84-318 Politics of Developing Nations 9
84-319 U.S. Foreign Policy and Interventions in World Affairs 9
84-320 Domestic Politics and International Affairs 9
84-321 Autocrats and Democrats 9
84-322 Nonviolent Conflict and Revolution 9
84-362 Diplomacy and Statecraft 9
84-363 Comparative Legal Systems 9
84-366 Presidential Politics: So, You Want to Be President of the United States 9
84-380 Grand Strategy in the United States 9
84-386 The Privatization of Force 9
84-389 Terrorism and Insurgency 9
84-402 Judicial Politics and Behavior 9
84-405 The Future of Warfare 9
84-414 International and Subnational Security 9
85-102 Introduction to Psychology 9
85-211 Cognitive Psychology 9
85-219 Biological Foundations of Behavior 9
85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9
85-261 Abnormal Psychology 9
85-395 Applications of Cognitive Science 9
88-120 Reason, Passion and Cognition 9
88-230 Human Intelligence and Human Stupidity 9
88-255 Strategic Decision Making: Cooperation and Competition in Social Interactions 9
88-430 Methods of Policy Analysis 12

Computing @ Carnegie Mellon (1 course, 3 units)

This is a mini-course, pass/no pass, to be completed in the first semester.

99-101 Computing @ Carnegie Mellon 3
or 99-102 Computing @ Carnegie Mellon 3
BXA Required Courses (5 courses, 36 units minimum)

BXA-specific courses give students the opportunity to integrate their areas of concentration by focusing on interdisciplinary approaches and arts-based research techniques.

- **52-190** BXA Seminar I: Building the Wunderkammer 9
- **or 52-291** BXA Seminar II: Transferring Knowledge 9
- **52-391** BXA Junior Portfolio 0
- **52-392** BXA Seminar III: Deconstructing Disciplines 9
- **52-401** BXA Seminar IV: Capstone Project Research 9
- **52-402** BXA Seminar V: Capstone Project Production 9

II. Dietrich College of Humanities and Social Sciences Concentration

(9 courses, 81 units minimum)

Each student meets individually with a BHA DC Academic Advisor to design an 81 unit DC concentration based on existing DC majors/minors. Please refer to the DC section of this catalog to review the individual majors and minors offered. Curriculum for several BHA DC concentration options are outlined below and others will be made available in the BXA office throughout the academic year.

A completed DC Concentration Sheet must be approved by the concentration faculty advisor and submitted to the BXA office by the end of the student’s sophomore year.

Anthropology Concentration (81 units minimum)

The BHA concentration in Anthropology offers students training in ethnographic methods and in theoretical understandings of culture. Students examine the evolution, depth, and complexities of ethnography, and explore notions of “culture” in diverse settings, over time and across space. In today’s world, students are increasingly aware of the importance of developing a sophisticated approach to culture and its articulation with changes in the domains of the arts, technology, economics, and politics.

The BHA concentration in Anthropology provides students with the tools to link artistic practices to various aspects of globalization. It is highly recommended that Anthropology students study abroad in some capacity.

There are three required courses for the concentration: 79-201 Introduction to Anthropology and 79-400 Global Studies Research Seminar, and one Methods course which may be satisfied by rotating options each semester. Students also choose 6 regional/topical courses (51 units). Demonstrating intermediate to advanced level proficiency in a language other than English is also crucial component of the concentration in Anthropology; all students are required to take at least two upper level (intermediate or above) language courses to satisfy this language pre-requisite requirement (which is in addition to required concentration courses).

Language Requirement

Every student is expected to take at least two upper level (intermediate or above) courses in a language other than English. These courses deepen the immersion in a culture or society that the Anthropology concentration provides a student, and when possible, should coordinate with the regional courses selected for the concentration.

Anthropology Required Introductory and Capstone Courses (2 courses, 21 units)

Students must earn a final grade of “C” or better for these courses to count toward the concentration.

- **79-201** Introduction to Anthropology 9
- **79-400** Global Studies Research Seminar 12

Required Anthropological Methods Course (1 course, 9 units)

Students must take one course in ethnographic, archaeological, or other anthropological methods selecting from the list below. Other courses may fulfill these requirements, with permission of the BHA Anthropology faculty advisor.

- **79-379** Extreme Ethnography 9
- **79-380** Hostile Environments: The Politics of Pollution in Global Perspective 9

Anthropological Perspectives (6 courses, 51 units minimum)

Students gain knowledge of specialized theoretical and regional topics by choosing 51 units (typically six courses) selecting from the list below.

- **57-306** World Music 9
- **79-203** Social and Political Change in 20th Century Central and Eastern Europe 9
- **79-211** Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange 9
- **79-222** Between Revolutions: The Development of Modern Latin America 9
- **79-223** Mexico: From the Aztec Empire to the Drug War 9
- **79-224** Mayan America 9
- **79-235** Caribbean Cultures 9
- **79-261** The Last Emperors: Chinese History and Society, 1600-1900 9
- **79-262** Modern China: From the Birth of Mao ... to Now 9
- **79-264** Tibet and China: History and Propaganda 6
- **79-275** Introduction to Global Studies 9
- **79-276** Beyond the Border 6
- **79-278** How (NOT) to Change the World 9
- **79-295** Race Relations in the Atlantic World 9
- **79-313** “Unwanted”: Refugees, Asylum Seekers, and Patterns of Global Migration 6
- **79-314** The Politics and Culture of Memory 9
- **79-315** Thirsty Planet: The Politics of Water in Global Perspective 9
- **79-317** Art; Anthropology, and Empire 9
- **79-332** Medical Anthropology 9
- **79-333** Sex, Gender & Anthropology 9
- **79-334** Climate Change and Climate Justice: Global Perspectives 6
- **79-342** Introduction to Science and Technology Studies 9
- **79-368** Un-natural Disasters: Societies and Environmental Hazards in Global Perspective 6
- **79-377** Food, Culture, and Power: A History of Eating 9

Note: Courses that count toward this category may be taken at another university, and the units transferred to the BHA concentration under the guidance of the BHA Anthropology faculty advisor.

Behavioral Economics, Policy & Organizations Concentration (81 units minimum)

Students in BEPO—the first and only major of its kind—will be uniquely trained in the integration of Economics and Psychology and will have a solid grounding in quantitative methods. The core includes courses in economics, psychology, behavioral economics, and quantitative methods. SDS offers the largest selection of behavioral economics courses anywhere in the world. Applied projects in courses will teach students how to collect original data, design field and laboratory experiments, analyze data, and develop interventions to improve economic outcomes and decisions. Students will be well equipped to enter a wide range of professions and graduate degree programs.

Quantitative Methods (3 courses, 27 units)

- **36-202** Statistics & Data Science Methods 9
- **88-251** Empirical Research Methods 9
- **88-252** Causal Inference in the Field: Using Data to Study Crime, Love, Sports & More 9

Economics Courses (2 courses, 18 units)

- **73-102** Principles of Microeconomics 9
- **73-160** Foundations of Microeconomics: Applications and Theory 9

Psychology Courses (2 courses, 18 units)

- **88-120** Reason, Passion and Cognition (freshman or sophomore year) 9
- **88-302** Behavioral Decision Making 9
Cognitive Neuroscience Concentration (81 units minimum)

Cognitive neuroscience is a science concerned with discovering biological bases of psychological functions. It addresses questions of how behavior is produced by neural circuits of the brain and also how those neural circuits are in turn influenced by behavioral experiences. Students with a concentration in Cognitive Neuroscience are expected to learn about existing findings within the field and also to become proficient in how to conduct and analyze scientific investigations directed toward understanding the biological basis of behavior. This includes observing behavior, formulating hypotheses, designing experiments to test these hypotheses, running experiments, performing statistical analyses, and writing reports.

Research Methods Training (18 units)
36-309 Experimental Design for Behavioral & Social Sciences
85-314 Cognitive Neuroscience Research Methods

Distribution Requirements (27 units)
Complete three courses with at least one from each category below.

Approaches to Cognitive Neuroscience:
15-386 Neural Computation
15-883 Computational Models of Neural Systems
36-746 Statistical Methods for Neuroscience and Psychology
85-345 Meaning in Mind and Brain
85-412 Cognitive Modeling
85-414 Cognitive Neuropsychology
85-419 Introduction to Parallel Distributed Processing
85-429 Cognitive Brain Imaging

Cognitive Neuroscience Electives:
03-133 Neurobiology of Disease
03-362 Cellular Neuroscience
03-364 Developmental Neuroscience
85-356 Music and Mind: The Cognitive Neuroscience of Sound
85-370 Perception
85-385 Auditory Perception: Sense of Sound
85-390 Human Memory
85-406 Autism: Psychological and Neuroscience Perspectives
85-442 Health Psychology
85-501 Stress, Coping and Well-Being

Cognitive Science Concentration (81 units minimum)

The field of cognitive science has grown out of increasingly active interaction among psychology, linguistics, artificial intelligence, philosophy, and neuroscience. All of these fields share the goal of understanding intelligence. By combining these diverse perspectives, students of cognitive science are able to understand cognition at a deep level. Because this concentration is administered by the Psychology Department, it focuses on human cognition and the experimental study of the human mind as illuminated by the techniques of the above disciplines.

Introduction and Survey Coursework (36 units)
03-121 Modern Biology
03-363 Systems Neuroscience
85-219 Biological Foundations of Behavior
85-211 Cognitive Psychology
or 85-213 Human Information Processing and Artificial Intelligence

Behavioral Economics Courses (2 courses, 18 units)
88-360 Behavioral Economics
88-367 Behavioral Economics in the Wild

Pre-requisite Courses
15-112 Fundamentals of Programming and Computer Science
12
21-120 & 21-122 Differential and Integral Calculus - Integration and Approximation
19-20
or 21-120 & 21-216 Differential and Integral Calculus and Multivariate Analysis
21-127 Concepts of Mathematics
10

Statistics Course (9 units)
36-309 Experimental Design for Behavioral & Social Sciences
9

Computational/Cognitive Modeling Core (29 units minimum)
Complete two of the following courses:
15-122 Principles of Imperative Computation
10
15-150 Principles of Functional Programming
10
15-251 Great Ideas in Theoretical Computer Science
12

Plus one of the following courses:
85-412 Cognitive Modeling
9
85-419 Introduction to Parallel Distributed Processing
9

Cognitive Psychology Core (36 units)
85-211 Cognitive Psychology
or 85-213 Human Information Processing and Artificial Intelligence
85-310 Research Methods in Cognitive Psychology
9

Plus two of the following (one of which must be 85-3xx or 85-4xx):
85-219 Biological Foundations of Behavior
9
85-370 Perception
9
85-390 Human Memory
9
85-395 Applications of Cognitive Science
9
85-408 Visual Cognition
9
85-414 Cognitive Neuropsychology
9
85-421 Language and Thought
9
85-435 Neural and Cognitive Models of Adaptive Decisions
9
80-310 Formal Logic
9
80-314 Logic and Artificial Intelligence
9
80-315 Modal Logic
9
80-381 Meaning in Language
9
80-383 Language in Use
9

Cognitive Science Elective (9 units)
Choose one elective in consultation with your Cognitive Science Advisor.

Creative Writing Concentration (81 units minimum)

In the Creative Writing concentration, BHA students develop their talents in writing fiction, poetry, and other imaginative forms. While studying with faculty members who are practicing poets and prose writers, students read widely in literature, explore the resources of their imaginations, sharpen their critical and verbal skills, and develop a professional attitude toward their writing. The Creative Writing program is based on a conservatory model, made up of faculty and students who have an intense commitment to their work.

Students in the Creative Writing concentration are required to take two of the introductory Survey of Forms courses, ideally in their sophomore year. Choices include Poetry (76-265), Fiction (76-260), Screenwriting (76-269), and Nonfiction (76-260). In order to proceed into the upper level courses in the major (and in each of the genres), students must do well in these introductory courses (receive a grade of A or B). After completing the Survey of Forms courses, students take four workshops in fiction, poetry, screenwriting, or nonfiction. At least two of the workshops must be taken in a single genre. In the writing workshops, students develop their critical and verbal abilities through close reading and analysis of poems, stories, and other literary forms. Their work is critiqued and evaluated by peers and the faculty.

Introductory and Survey Coursework (36 units)
03-121 Modern Biology
03-363 Systems Neuroscience
85-219 Biological Foundations of Behavior
85-211 Cognitive Psychology
or 85-213 Human Information Processing and Artificial Intelligence

Research Methods Training (18 units)
36-309 Experimental Design for Behavioral & Social Sciences
85-314 Cognitive Neuroscience Research Methods

" 85-310 Research Methods in Cognitive Psychology may be substituted if necessary.

Distribution Requirements (27 units)
Complete three courses with at least one from each category below.

Approaches to Cognitive Neuroscience:
15-386 Neural Computation
15-883 Computational Models of Neural Systems
36-746 Statistical Methods for Neuroscience and Psychology
85-345 Meaning in Mind and Brain
85-412 Cognitive Modeling
85-414 Cognitive Neuropsychology
85-419 Introduction to Parallel Distributed Processing
85-429 Cognitive Brain Imaging

Cognitive Neuroscience Electives:
03-133 Neurobiology of Disease
03-362 Cellular Neuroscience
03-364 Developmental Neuroscience
85-356 Music and Mind: The Cognitive Neuroscience of Sound
85-370 Perception
85-385 Auditory Perception: Sense of Sound
85-390 Human Memory
85-406 Autism: Psychological and Neuroscience Perspectives
85-442 Health Psychology
85-501 Stress, Coping and Well-Being

Cognitive Science Concentration (81 units minimum)

The field of cognitive science has grown out of increasingly active interaction among psychology, linguistics, artificial intelligence, philosophy, and neuroscience. All of these fields share the goal of understanding intelligence. By combining these diverse perspectives, students of cognitive science are able to understand cognition at a deep level. Because this concentration is administered by the Psychology Department, it focuses on human cognition and the experimental study of the human mind as illuminated by the techniques of the above disciplines.
### Decision Science Concentration (81 units minimum)

Decision Science is grounded in theories and methods drawn from psychology, economics, philosophy, statistics, and management science. Courses in the BHA concentration in Decision Science cover the three aspects of decision science: (a) normative analysis, creating formal models of rational choice; (b) descriptive research, studying how cognitive, emotional, social, and institutional factors affect judgment and choice, and (c) prescriptive interventions, seeking to improve judgment and decision making. In addition to gaining a broad education in the principles of judgment and decision making, students with a concentration in Decision Science gain broadly applicable skills in research design and analysis. They also have the chance to think about and discuss decision making in many different areas.

#### Disciplinary Perspectives (5 courses, 48 units)

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<td>73-102</td>
<td>Principles of Microeconomics</td>
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<td>85-211</td>
<td>Cognitive Psychology</td>
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<td>88-120</td>
<td>Reason, Passion and Cognition (freshman or sophomore year)</td>
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<tr>
<td>88-223</td>
<td>Decision Analysis</td>
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<td>88-302</td>
<td>Behavioral Decision Making</td>
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#### Research Methods (2 courses, 18 units)

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<th>Course Title</th>
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<tr>
<td>36-202</td>
<td>Statistics &amp; Data Science Methods</td>
<td>9</td>
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<tr>
<td>88-251</td>
<td>Empirical Research Methods</td>
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#### Electives (2 courses, 18 units)

Complete at least 18 units from the following categories of courses. The selected courses may be from one category or from any combination of categories. Note that not all elective courses are offered every year. At least one of these courses (9 units) must be a Department of Social and Decision Sciences course (88-xxx).

### Biological and Behavioral Aspects of Decision Making:

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<tr>
<td>85-352</td>
<td>Evolutionary Psychology</td>
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<td>85-377</td>
<td>Attitudes and Persuasion</td>
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<td>85-442</td>
<td>Health Psychology</td>
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<td>88-230</td>
<td>Human Intelligence and Human Stupidity</td>
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<td>88-342</td>
<td>The Neuroscience of Decision Making</td>
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<td>88-360</td>
<td>Behavioral Economics</td>
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<td>88-365</td>
<td>Behavioral Economics and Public Policy</td>
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<tr>
<td>88-380</td>
<td>Dynamic Decisions</td>
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### Managerial and Organizational Aspects of Decision Making:

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<th>Course Title</th>
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<tbody>
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<td>70-311</td>
<td>Organizational Behavior</td>
<td>9</td>
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<tr>
<td>70-381</td>
<td>Marketing I</td>
<td>9</td>
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<tr>
<td>70-460</td>
<td>Mathematical Models for Consulting</td>
<td>9</td>
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<tr>
<td>88-150</td>
<td>Managing Decisions</td>
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<tr>
<td>88-221</td>
<td>Analytical Foundations of Public Policy</td>
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<tr>
<td>88-406</td>
<td>Behavioral Economics in Organizations</td>
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<tr>
<td>88-418</td>
<td>Domestic Negotiation</td>
<td>9</td>
</tr>
<tr>
<td>88-419</td>
<td>International Negotiation</td>
<td>9</td>
</tr>
<tr>
<td>88-444</td>
<td>Public Policy and Regulation</td>
<td>9</td>
</tr>
<tr>
<td>88-451/452</td>
<td>Policy Analysis Senior Project</td>
<td>12</td>
</tr>
</tbody>
</table>

### Philosophical and Ethical Perspectives on Decision Making:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>80-208</td>
<td>Critical Thinking</td>
<td>9</td>
</tr>
<tr>
<td>80-221</td>
<td>Philosophy of Social 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>80-271</td>
<td>Philosophy and Psychology</td>
<td>9</td>
</tr>
<tr>
<td>80-305</td>
<td>Choices, Decisions, and Games</td>
<td>9</td>
</tr>
<tr>
<td>80-321</td>
<td>Causation, Law, and Social Policy</td>
<td>9</td>
</tr>
<tr>
<td>80-324</td>
<td>Philosophy of Economics</td>
<td>9</td>
</tr>
<tr>
<td>88-275</td>
<td>Bubbles: Data Science for Human Minds</td>
<td>9</td>
</tr>
<tr>
<td>88-409</td>
<td>Behavioral Economics Perspectives on Ethical Issues</td>
<td>9</td>
</tr>
</tbody>
</table>

### Economic and Statistical Methods for Decision Science:

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>70-374</td>
<td>Data Mining &amp; Business Analytics</td>
<td>9</td>
</tr>
<tr>
<td>70-455</td>
<td>Modern Data Management</td>
<td>9</td>
</tr>
<tr>
<td>70-460</td>
<td>Mathematical Models for Consulting</td>
<td>9</td>
</tr>
<tr>
<td>73-265</td>
<td>Economics and Data Science</td>
<td>9</td>
</tr>
<tr>
<td>73-347</td>
<td>Game Theory for Economists</td>
<td>9</td>
</tr>
<tr>
<td>80-405</td>
<td>Game Theory</td>
<td>9</td>
</tr>
<tr>
<td>88-255</td>
<td>Strategic Decision Making: Cooperation and Competition in Social Interactions</td>
<td>9</td>
</tr>
<tr>
<td>88-300</td>
<td>Programmed and Data Analysis for Social Scientists</td>
<td>9</td>
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<tr>
<td>88-360</td>
<td>Behavioral Economics</td>
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<tr>
<td>88-367</td>
<td>Behavioral Economics in the Wild</td>
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</tbody>
</table>

* 80-405 and 88-316 are different courses and are not cross-listed.

### Decision Science and Public Policy:

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>84-369</td>
<td>Decision Science for International Relations</td>
<td>9</td>
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<tr>
<td>84-402</td>
<td>Judicial Politics and Behavior</td>
<td>9</td>
</tr>
<tr>
<td>88-221</td>
<td>Analytical Foundations of Public Policy</td>
<td>9</td>
</tr>
<tr>
<td>88-365</td>
<td>Behavioral Economics and Public Policy</td>
<td>9</td>
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<tr>
<td>88-366</td>
<td>Behavioral Economics of Poverty and Development</td>
<td>9</td>
</tr>
<tr>
<td>88-405</td>
<td>Risk Perception and Communication</td>
<td>9</td>
</tr>
<tr>
<td>88-412</td>
<td>Energy, Climate Change, and Economic Growth</td>
<td>9</td>
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<tr>
<td>88-430</td>
<td>Methods of Policy Analysis</td>
<td>12</td>
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<tr>
<td>88-444</td>
<td>Public Policy and Regulation</td>
<td>9</td>
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<tr>
<td>88-451/452</td>
<td>Policy Analysis Senior Project</td>
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### Research Methods for Decision Science:

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<tr>
<td>36-303</td>
<td>Sampling, Survey and Society</td>
<td>9</td>
</tr>
<tr>
<td>70-460</td>
<td>Mathematical Models for Consulting</td>
<td>9</td>
</tr>
<tr>
<td>88-319</td>
<td>Large-scale social phenomenon</td>
<td>9</td>
</tr>
<tr>
<td>88-402</td>
<td>Modeling Complex Social Systems</td>
<td>9</td>
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</tbody>
</table>
88-417 Scientific Integrity and Communication 9
88-435 Decision Science and Policy 9

Economics Concentration (81 units minimum)
The BHA concentration in Economics provides a solid understanding of economic theory and quantitative economic analysis. The core disciplinary sequences in economic theory and quantitative analysis are combined with calculus and data analysis to provide students with knowledge and skills that allow for creative problem-solving.

Mathematics Pre-requisites
These courses are not counted as part of your DC Concentration. It may be used to satisfy general education or free elective requirements.
21-120 Differential and Integral Calculus 10
21-256 Multivariate Analysis 9

Economic Theory Requirements (36 units)
73-102 Principles of Microeconomics 9
73-103 Principles of Macroeconomics 9
73-230 Intermediate Microeconomics 9
73-240 Intermediate Macroeconomics 9

Quantitative Analysis Requirements (18 units)
These courses require 36-200 Reasoning with Data as a pre-requisite; 36-200 fulfills a general education Deciding requirement, as well.
73-265 Economics and Data Science 9
73-274 Econometrics I 9

Advanced Economics Electives (18 units)
Students must take two advanced elective courses. Advanced elective courses are those numbered 73-300 through 73-495, as well as courses designated by the program offered by other departments/programs. Additionally, students may work with their economics advisor to structure alternative sets of courses to meet these requirements based on their particular interests, subject to course availability.

Senior Work (9 UNITS)
73-497 Senior Project 9

Note: Students who have already taken 73-100 Principles of Economics should take 73-230 Intermediate Microeconomics and 73-240 Intermediate Macroeconomics for their Economic Theory Requirements. They will then take 27 units of Advanced Economics Electives.

English Concentration (81 units minimum)
The BHA concentration in English is distinctive in drawing from the artistic and research strengths of the Department's faculty in Literary and Cultural Studies, Rhetoric, and Creative Writing. Literary and Cultural Studies focuses on the way texts are formally constructed and how they function in historical and contemporary contexts. Creative Writing helps students focus on language as a tool to explore and depict experience. Rhetoric focuses on the principles through which writers construct texts and audiences respond to them. Drawing from all of these perspectives, students with a Concentration in English learn the research skills and writing strategies to enable them to analyze the language and texts of other writers and to report their research in effective texts of their own. Such training can prepare students for graduate work in literature, cultural studies, or rhetoric, and also for careers in law, business, or government, which require similar skills in interpretation, research, and writing.

Introductory Courses (2 courses, 18 units)
The 200-level core courses are designed to introduce students to writing in a variety of genres, to a knowledge of literary and other media forms, and to a basic theoretical knowledge of how texts are produced and interpreted. In the Interpretive Practices course, students are introduced to basic concepts, methods, and practices of literary and rhetorical approaches to texts. In the Survey of Forms course, students learn how to use language to express experience through poetic and narrative forms.
76-26x Survey of Forms (Nonfiction, Fiction, Poetry, Screenwriting) 9
76-294 Interpretive Practices: Introduction to Critical Reading 9

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The BHA concentration in Economics provides a solid understanding of economic theory and quantitative economic analysis. The core disciplinary sequences in economic theory and quantitative analysis are combined with calculus and data analysis to provide students with knowledge and skills that allow for creative problem-solving.

Mathematics Pre-requisites
These courses are not counted as part of your DC Concentration. It may be used to satisfy general education or free elective requirements.
21-120 Differential and Integral Calculus 10
21-256 Multivariate Analysis 9

Economic Theory Requirements (36 units)
73-102 Principles of Microeconomics 9
73-103 Principles of Macroeconomics 9
73-230 Intermediate Microeconomics 9
73-240 Intermediate Macroeconomics 9

Quantitative Analysis Requirements (18 units)
These courses require 36-200 Reasoning with Data as a pre-requisite; 36-200 fulfills a general education Deciding requirement, as well.
73-265 Economics and Data Science 9
73-274 Econometrics I 9

Advanced Economics Electives (18 units)
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76-26x Survey of Forms (Nonfiction, Fiction, Poetry, Screenwriting) 9
76-294 Interpretive Practices: Introduction to Critical Reading 9

Research Course (1 course, 9 units)
Research in English offers training in gathering information systematically and in building arguments based on that information. Students will hone their skills in reading texts, using critical commentary, assessing print and electronic materials, and conducting interviews and surveys. They will learn how to test their hypotheses against alternatives and present their research to audiences within the discipline of English. The historical or thematic content of this course will vary from one semester to another. While 76-394 is not a pre-requisite for 400-level courses, it is strongly recommended that students with a BHA concentration in English take this course in their junior year.
76-394 Research in English 9

Rhetoric Course (1 course, 9 units)
Complete one course from a set of varied offerings in Rhetoric as designated each term by the English Department. Rhetoric courses focus explicitly on language and discourse as objects of study and emphasize the relationships of language, text structure, and meaning within specific contexts.

300-Level Courses (2 courses, 18 units)
Complete two 300-level courses that investigate the production and interpretation of texts and other media from a variety of periods and theoretical and methodological perspectives. Course offerings that meet these requirements are advertised on a semester-by-semester basis. For students with a BHA Concentration in English, 76-294 Interpretive Practices: Introduction to Critical Reading is a prerequisite for these courses. Course options include but are not limited to the following:
76-323 God: A Literary and Cultural History 9
76-338 The American Cinema 9
76-343 Rise of the American Novel 9
76-344 Censored Texts 9
76-350 Theory from Classics to Contemporary 9
76-381 Mad-Men, Television, and the History of Advertising 9
76-3xx Any 300 level course with advisor approval 9

400-Level Courses (2 courses, 18 units)
Complete two 400-level seminar courses that investigate a specific topic in depth and allow students to work on a major research-based paper. Courses in this category will be advertised on a semester-by-semester basis. For students with a BHA Concentration in English, 76-294 Interpretive Practices: Introduction to Critical Reading is a prerequisite and 76-394 Research in English is pre- or co-requisite. Among current course offerings, examples include but are not limited to the following:
76-403 The Crucible of Modernity: Vienna 1900 9
76-410 The Long Eighteenth Century 9
76-421 Why Stories Matter 9
76-429 Digital Humanities: Politics and Early Modern Drama 9
76-439 Seminar in Film and Media Studies 9
76-444 History of Books and Reading 9
76-4xx Any 400 level course with advisor approval 9

Period Course Requirement
The period course requirement is not a separate course requirement per se but one that needs to be met through the selection of the required 300- and 400-level courses. At least two of these four required courses must be "period" courses, that is, courses that focus on texts that are connected in time and place or through common social concerns. One of these two courses must focus on a historical period prior to 1900. Courses in this category will vary from year to year and be advertised on a semester-by-semester basis. Such courses may be at either the 300- or 400-level.

Elective Course (1 course, 9 units)
Complete one course from the English Department's offerings. This course may be at the 200-, 300-, or 400-level. Electives may include any courses offered by the English Department with the exception of courses designed for non-majors. Some semester offerings may include cross-listed courses from Modern Languages or History.
Ethics, History, & Public Policy Concentration (81 units minimum)

The BHA concentration in Ethics, History, & Public Policy (EHPP) provides students with a rigorous, interdisciplinary humanistic and social-scientific education. The concentration in EHPP encourages the development of a broad technical skill set that will benefit students in whatever career they ultimately choose to pursue. Students with a concentration in EHPP learn how to analyze and construct arguments; to evaluate evidentiary statements; to persuade people to agree with their particular claims; to conduct research under time and resource constraints; and to craft policies that address real world problems in a way that is sensitive both to history and competing sets of values. Comprised of courses in the departments of History, Philosophy, Economics, and Decision Science, the BHA concentration in EHPP encourages specialization, internship experiences, and research in a wide range of policy areas.

Economics Requirement (1 course, 9 units)
73-102 Principles of Microeconomics 9

History Core (3 courses, 27 units)
Required History Core Courses (Students must earn a final grade of "C" or better for these courses to count toward the concentration):
79-200 Introduction to Historical Research & Writing 9
79-300 History of American Public Policy 9

Choose one Survey Course:

US Survey
79-240 Development of American Culture 9
79-249 20th & 21st Century U.S. History 9

Non-US Survey
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-203 Social and Political Change in 20th Century Central and Eastern Europe 9
79-205 20th & 21st Century Europe 9
79-207 Development of European Culture 9
79-222 Between Revolutions: The Development of Modern Latin America 9
79-223 Mexico: From the Aztec Empire to the Drug War 9
79-226 African History: Earliest Times to 1780 9
79-227 Modern Africa: The Slave Trade to the End of Apartheid 9
79-229 Origins of the Arab-Israeli Conflict, 1880-1948 9
79-230 Arab-Israeli Conflict Since 1948 9
79-237 Comparative Slavery 9
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-262 Modern China: From the Birth of Mao ... to Now 9
79-264 Tibet and China: History and Propaganda 6
79-265 Russian History: From the First to the Last Tsar 9
79-266 Russian History: From Communism to Capitalism 9
79-307 Religion and Politics in the Middle East 9

Philosophy Core (3 courses, 27 units)
Choose one course from three of the four categories below. No more than 18 units at the 100-level may be counted toward this requirement.

Ethics (9 units):
80-130 Introduction to Ethics 9
80-330 Ethical Theory 9

Political Philosophy (9 units):
80-135 Introduction to Political Philosophy 9
80-335 Social and Political Philosophy 9

Foundations of Social Science (9 units):
80-221 Philosophy of Social Science 9
80-321 Causation, Law, and Social Policy 9
80-324 Philosophy of Economics 9

Applied Philosophy (9 units):
80-136 Social Structure, Public Policy & Ethics 9
80-241 Ethical Judgments in Professional Life 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-341 Computers, Society and Ethics 9
80-344 Management, Environment, and Ethics 9
80-348 Health, Development, and Human Rights 9
80-447 Global Justice 9

Electorate Courses (2 courses, 18 units)
Choose any two courses from any of the following categories.

Engineering and Public Policy
19-424 Energy and the Environment 9

Business
70-311 Organizational Behavior 9
70-321 Negotiation and Conflict Resolution 9
70-332 Business, Society and Ethics 9
70-364 Business Law 9
70-365 International Trade and International Law 9
70-430 International Management 9

Economics
73-352 Public Economics 9
73-358 Economics of the Environment and Natural Resources 9
73-359 Benefit-Cost Analysis 9
73-365 Firms, Market Structures, and Strategy 9
73-372 International Money and Finance 9
73-408 Law and Economics 9
73-476 American Economic History 9

English
76-492 Rhetoric of Public Policy 9

History
79-219 Modern Cuba: A Travel Guide for Millennials, 1898 to the Present 6
79-221 Development and Democracy in Latin America 9
79-231 American Foreign Policy: 1945-Present 9
79-233 The United States and the Middle East since 1945 9
79-242 African American History: Reconstruction to the Present 9
79-267 The Soviet Union in World War II: Military, Political, and Social History 9
79-288 Bananas, Baseball, and Borders: Latin America and the United States 9
79-298 Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal 6
79-299 From Newton to the Nuclear Bomb: History of Science, 1750-1950 9
79-301 History of Surveillance: From the Plantation to Edward Snowden 9
79-302 Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons System 6
79-303 Pittsburgh and the Transformation of Modern Urban America 6
79-305 Moneyball Nation: Data in American Life 9
79-310 Modern U. S. Business History: 1870 to the Present 9
79-312 Archaeology of Death 6
79-315 Thirsty Planet: The Politics of Water in Global Perspective 9
79-320 Women, Politics, and Protest 9
79-322 Stalin and the Great Terror 9
79-325 U.S. Gay and Lesbian History 6
79-331 Body Politics: Women and Health in America 9
Global Studies Concentration (81 units minimum)

The BHA concentration in Global Studies is designed for students interested in humanistic approaches to understanding past and present processes of globalization. Participating faculty in the departments of History, Modern Languages, and English conduct research in Africa, Asia, Europe, Latin America, the Middle East, and the Pacific. The rigorous yet flexible Global Studies curriculum combines anthropology, history, literary and cultural studies, and advanced language training in order to help students make sense of complex interactions among global processes, regional and local cultures, and societal structures. BHA concentration students in Global Studies develop a broad understanding of their prospects and responsibilities as citizens of the world confronting challenging contemporary problems.

There are two required courses for the concentration: Introduction to Global Studies (79-275) and Global Studies Research Seminar (79-400). Students also choose among several courses focused on theory, research methods, transnational histories, and regional/national histories and cultures. Demonstrating intermediate to advanced level proficiency in a language other than English is a crucial component of the concentration in Global Studies.

In addition to coursework at Carnegie Mellon, BHA students with a concentration in Global Studies are encouraged to incorporate a semester of study abroad into their course of study in order to immerse themselves in society different from their own with unfamiliar cultural practices, language, and history.

Students should consult frequently with the BHA advisor, the Global Studies academic program manager, and the faculty director who will help students to craft a coherent course of study on specific topics and/or regions that may lead to the capstone research project (79-400 Global Studies Research Seminar), the BXA capstone project (52-401 and 52-402) or a Dietrich College senior honors thesis (http://hss.cmu.edu/seniorhonorsprogram.html). The faculty director and the academic program manager will also work with students to connect their academic interests and their participation in student organizations and/or organizations based in Pittsburgh with transnational reach.

Global Studies Introductory and Capstone Courses (2 courses, 21 units)

Students must earn a final grade of “C” or better for these courses to count toward the concentration.

- 79-275 Introduction to Global Studies 9
- 79-400 Global Studies Research Seminar 12

Language Requirement

Demonstrating intermediate to advanced level proficiency in a language other than English is a crucial component of the concentration in Global Studies. Normally this requirement can be satisfied by successfully completing a course conducted in the second language at the 300-level or above for French, German, Italian, or Spanish, or the fourth semester (Intermediate II) level or above for Arabic, Chinese, Japanese, or Russian. Comparable proficiency for other languages can be considered. Additional advanced cultural, historical, and literary study in the second language is strongly recommended. Courses in a language other than English may also be counted as Global Studies transnational, global, regional courses or Global Studies electives as appropriate.

Theoretical and Topical Core Courses (2 courses, 18 units)

To gain a solid foundation in the theories, methods, and analytical topics underpinning the concentration in Global Studies, students select 18 units (typically two courses) from the core courses listed below. Students must earn a final grade of “C” or better in these courses to fulfill the theoretical and topical core course requirement.

- 76-453 Literature of Empire 9
- 76-497 Culture: Interdisciplinary Approaches 9
- 79-211 Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange 9
- 79-278 How (NOT) to Change the World 9
- 79-289 Animal Planet: An Environmental History of People and Animals 9
- 79-297 Dilemmas and Controversies in Anthropology 9
- 79-314 The Politics and Culture of Memory 9
- 79-317 Art, Anthropology, and Empire 9
- 79-318 Sustainable Social Change: History and Practice 9
- 79-379 Extreme Ethnography 9
- 79-381 Energy and Empire: How Fossil Fuels Changed the World 9

Transnational, Global, and Regional Courses (3 courses, 27 units)

To gain insight into how complex transnational and global processes shape and are affected by local, national, and regional dynamics, students will select 27 units (typically three courses) from any subcategories below.

- 76-353 Transnational Feminisms: Fiction and Film 9
- 76-384 Race, Nation, and the Enemy 9
- 76-440 Postcolonial Theory: Diaspora and Transnationalism 9
- 79-224 Mayan America 9
- 79-233 The United States and the Middle East since 1945 9
- 79-237 Comparative Slavery 9
- 79-273 Jews and Muslims in History 9
- 79-276 Beyond the Border 6
- 79-282 Europe and the World Since 1800 9
- 79-283 Hungry World: Food and Famine in Global Perspective 9
- 79-288 Bananas, Baseball, and Borders: Latin America and the United States 9
- 79-289 Animal Planet: An Environmental History of People and Animals 9
- 79-295 Race Relations in the Atlantic World 9
- 79-315 Thirsty Planet: The Politics of Water in Global Perspective 9
- 79-333 Sex, Gender & Anthropology 9
- 79-350 Early Christianity 9
- 79-368 Un-natural Disasters: Societies and Environmental Hazards in Global Perspective 6
### Regional Courses:

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<thead>
<tr>
<th>Region</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Africa</td>
<td>79-225 West African History in Film</td>
</tr>
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<td>79-226 African History: Earliest Times to 1780</td>
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<td>79-227 Modern Africa: The Slave Trade to the End of Apartheid</td>
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<td>79-291 Globalization in East African History</td>
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<td>79-366 Entrepreneurs in Africa, Past, Present and Future</td>
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<td>84-312 Gender and Development in Sub-Saharan Africa</td>
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<td>79-231 African History: The Making of the African Diaspora</td>
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<td>82-456 Global Justice</td>
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<td>82-283 Language Diversity &amp; Cultural Identity</td>
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<td>82-304 The Francophone World</td>
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<td>82-345 Introduction to Hispanic Literary &amp; Cultural Studies</td>
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<td>84-315 Contemporary Debates in Human Rights</td>
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<td>84-319 U.S. Foreign Policy and Interventions in World Affairs</td>
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<td>84-322 Nonviolent Conflict and Revolution</td>
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<td>84-326 Theories of International Relations</td>
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<td>84-389 Terrorism and Insurgency</td>
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<td>The Americas</td>
<td>79-222 Origins of the Arab-Israeli Conflict, 1880-1949</td>
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<td>79-230 Arab-Israeli Conflict Since 1948</td>
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<td>79-307 Religion and Politics in the Middle East</td>
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<td>79-336 Oil &amp; Water: Middle East Perspectives</td>
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<td>79-398 Documenting the 1967 Arab-Israeli War</td>
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<td>79-223 Mexico: From the Aztec Empire to the Drug War</td>
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<td>79-235 Caribbean Cultures</td>
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<td>82-245 New Directions in Hispanic Studies</td>
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<td>82-343 Latin America: Language and Culture</td>
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<td>82-451 Studies in Latin American Literature and Culture</td>
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<td>82-455 Topics in Hispanic Studies</td>
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<td>The Middle East</td>
<td>79-222 Between Revolutions: The Development of Modern Latin America</td>
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<td>76-337 Representations of Islam in Early Modern England</td>
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<td>79-214 Paris in Revolt: History, Literature, Film</td>
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<td>79-216 Genghis Khan and the Mongol Empire</td>
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<td>79-231 American Foreign Policy: 1945-Present</td>
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<td>79-237 20th Century Germany</td>
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<td>79-257 Germany and the Second World War</td>
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<td>Europe</td>
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<td>76-355 Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange</td>
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<td>79-264 Tibet and China: History and Propaganda</td>
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<td>82-431 China and the West</td>
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<td>88-411 Rise of the Asian Economies</td>
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<td>79-203 Social and Political Change in 20th Century Central and</td>
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<td>82-215 Arab Culture Through Film &amp; Literature</td>
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<td>82-311 Advanced Arabic I</td>
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<td>82-541 Special Topics: Hispanic Studies</td>
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<td>84-312 Introduction to Archaeological Methods: The Social Life of</td>
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<td>79-312 Archaeology of Death</td>
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<td>79-316 Photography, the First 100 Years, 1839-1939</td>
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<td>79-324 #MeToo: Naming and Resisting Gender Violence</td>
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<td>79-343 Education, Democracy, and Civil Rights</td>
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<td>79-349 The Holocaust in Historical Perspective</td>
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<td>80-425 Environmental Ethics</td>
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### Electives (2 courses, 15 units minimum)

Students are required to take an additional 15 units (typically two courses) of electives, selected from one or both of the subcategories below: “Theoretical and Topical Core Courses” and “Thematic Courses,” listed above that are not used to fulfill those requirements may be counted as electives in addition to the courses listed below.

Global Studies offers students the opportunity to gain credit for a 9 unit elective while gaining first-hand experience interning with Pittsburgh-based organizations that work across borders. 79-506 Global Studies Internship is offered every semester and students should register for the course after consulting with the academic advisor and faculty director. The faculty director will assist students with matching their interests to local organizations and identifying an on-site supervisor available to collaborate in the ongoing and final evaluation of the student’s work.

### Thematic Courses

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<th>Course</th>
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<tr>
<td>57-306</td>
<td>World Music</td>
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<td>70-365</td>
<td>International Trade and International Law</td>
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<td>76-241</td>
<td>Introduction to Gender Studies</td>
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<td>76-330</td>
<td>Language &amp; Culture</td>
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<td>76-450</td>
<td>Law, Culture, and the Humanities</td>
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<td>79-201</td>
<td>Introduction to Anthropology</td>
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<td>79-284</td>
<td>Introduction to Archaeological Methods: The Social Life of Things</td>
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### Nation-based Courses

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<tr>
<td>76-337</td>
<td>Representations of Islam in Early Modern England</td>
</tr>
<tr>
<td>79-214</td>
<td>Paris in Revolt: History, Literature, Film</td>
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<tr>
<td>79-216</td>
<td>Genghis Khan and the Mongol Empire</td>
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<td>79-231</td>
<td>American Foreign Policy: 1945-Present</td>
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<td>79-256</td>
<td>20th Century Germany</td>
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<td>79-257</td>
<td>Germany and the Second World War</td>
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Students' understanding of politics is further informed by courses and colloquia offered by CMU’s top-ranked departments, divisions, and schools in business, computer science, and engineering. IRP students interested in developing their research skills are encouraged to apply for a research position with the Center for International Relations and Politics or work directly with a member of the IPS faculty. Students are also encouraged to join student organizations focused on domestic or international politics. Becoming involved in the Institute for Politics and Strategy, as well as attending lectures and events sponsored by the Center for International Relations and Politics will provide additional opportunities for students.

Pre-requisites

- 36-200 Reasoning with Data 9
- 73-102 Principles of Microeconomics 9

Core Courses (6 courses, 54 units)

- 84-104 Decision Processes in American Political Institutions 9
- 84-265 Political Science Research Methods 9
- 84-275 Comparative Politics 9
- 84-326 Theories of International Relations 9
- 84-369 Decision Science for International Relations 9
- 84-450 Policy Forum 6
- 36-202 Statistics & Data Science Methods 9

Language Requirement

BHA IRP students are required to complete the intermediate (200) level or the equivalent in a modern language other than English. This Language Requirement may be satisfied by the BHA General Education Modern Languages requirement if the 200-level is reached. Advanced level study is strongly encouraged.

Electives (3 courses, 21 units minimum)

International Relations and Politics BHA students will either:

**Option 1**

Take 21 units (three courses) from the elective lists below. At least two courses must be from the Institute for Politics and Strategy (84-xxx).

**Grand Strategy and Political Institutions**

- 79-203 Social and Political Change in 20th Century Central and Eastern Europe 9
- 79-298 Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal 6
- 79-301 History of Surveillance: From the Plantation to Edward Snowden 6
- 80-135 Introduction to Political Philosophy 9
- 80-321 Causation, Law, and Social Policy 9
- 80-335 Social and Political Philosophy 9
- 84-250 Writing for Political Science and Policy 9
- 84-309 Political Behavior 9
- 84-319 U.S. Foreign Policy and Interventions in World Affairs 9

**International Relations and Politics**

- 84-312 Domestic Politics and International Affairs 9
- 84-321 Autocrats and Democrats 9
- 84-322 Nonviolent Conflict and Revolution 9
- 84-323 War and Peace 9
- 84-324 Democracies and War 9
- 84-325 Contemporary American Foreign Policy 9
- 84-362 Diplomacy and Statecraft 9
- 84-363 Comparative Legal Systems 9
- 84-366 Presidential Politics: So, You Want to Be President of the United States 9
- 84-370 Global Nuclear Politics 9
- 84-372 Space and National Security 9
- 84-380 Grand Strategy in the United States 9
- 84-386 The Privatization of Force 9
- 84-387 Technology and Policy of Cyber War 9
- 84-388 Concepts of War and Cyber War 9
- 84-389 Terrorism and Insurgency 9
- 84-390 Social Media, Technology, and Conflict 9
Japanese Studies Concentration (81 units minimum)

A BHA concentration in Japanese Studies promotes not just language proficiency but also an understanding of Japanese culture. Students who arrive at Carnegie Mellon with previous language study and/or who have high Advanced Placement, an International Baccalaureate, a Cambridge GCE Advanced level, or internal placement exam scores will be able to begin taking courses in the concentration earlier in their undergraduate program. In all cases, progress in the concentration will be accelerated by study abroad, which is recommended for all students.

Prerequisites

Low-intermediate level proficiency in Japanese. This is equivalent to the completion of three courses (two at the 100-level and one at the 200-level) or exemption based on internal placement test scores.

Core Courses in Japanese (36-39 units)

82-272 Intermediate Japanese II & 9
82-273 Introduction to Japanese Language and Culture 9
82-371 Advanced Japanese I 9
82-372 Advanced Japanese II 9

* Placement out of 82-272 is possible. For students who place out of 82-272, a minimum of 9 additional units must be taken from the Japanese Electives of the "Japanese Studies and Interdisciplinary Electives" category below.

Core Courses in Modern Languages (12 units)

Complete one 9 unit course plus the Senior Seminar (3 units).

82-280 Learning About Language Learning 9
82-281 Tutoring for Community Outreach Var.
82-282 Community Service Learning Var.
82-383 Second Language Acquisition: Theories and Research 9
82-388 Understanding Second Language Fluency 9
82-480 Social and Cognitive Aspects of Bilingualism 9
82-580 Senior Seminar in Modern Languages 3
Linguistics Concentration (81 units minimum)

The BHA concentration in Linguistics combines courses from the departments of English, Modern Languages, Philosophy and Psychology and the Language Technologies Institute. Linguistics is the study of human language, and it encompasses a broad spectrum of research questions, approaches and methodologies. Some linguists are concerned with the cognitive aspects of language learning, production and comprehension; some are concerned with language as a social and cultural phenomenon; others engage in the analysis of linguistic form and meaning, some from a functional and others from a formal perspective. There are also computational approaches to linguistics with both applied and theoretical goals.

Introductory Course (1 course, 9 units)
80-180 Nature of Language 9

Fundamental Skills Courses (2 courses, 18 units)
Take one course each in two of the following three areas:

Sounds
80-282 Phonetics and Phonology I 9

Structure
80-280 Linguistic Analysis 9
80-285 Natural Language Syntax 9

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

Breadth Courses (2 courses, 18 units)
Take one course from each of the following two areas:

Language Learning and Language Cognition
76-420 The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process 9
80-281 Language and Thought 9
82-280 Learning About Language Learning 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Understanding Second Language Fluency 9
82-585 Topics in Second Language Acquisition 9
85-354 Infant Language Development 9
85-421 Language and Thought 9

Discourse, Society and Culture
76-385 Introduction to Discourse Analysis 9
or 76-484 Discourse Analysis 9
76-386 Language & Culture 9
80-283 It Matters How You Say It 9
82-273 Introduction to Japanese Language and Culture 9
82-283 Language Diversity & Cultural Identity 9
82-333 Introduction to Chinese Language and Culture 9

Elective Courses (4 courses, 36 units)
Take four additional electives. These can be additional courses from the Fundamental Skills courses or Breadth courses listed above, or any other course which must be approved by the Director as a linguistics elective. Listed below are the additional electives taught on a regular basis. Additional appropriate courses are offered irregularly or on a one-off basis. The Director will provide students with a list of possible electives each semester, and will assist students in selecting electives which are consistent with their goals and interests. A list of these courses must be filed in the BHA office.

11-411 Natural Language Processing 12
11-716 Graduate Seminar on Dialog Processing 6
11-721 Grammars and Lexicons 12
11-722 Grammar Formalisms 12
11-761 Language and Statistics I 12
11-762 Language and Statistics II 12
76-378 Literacy: Educational Theory and Community Practice 9
80-284 Invented Languages 9
80-286 Words and Word Formation: Introduction to Morphology 9
80-287 Historical and Comparative Linguistics 9
80-380 Philosophy of Language 9
80-382 Phonetics and Phonology II 9
80-384 Linguistics of Turkic Languages 9

Japanese Studies and Interdisciplinary Electives (33 units minimum)

Complete three courses from Japanese Electives and one course from Interdisciplinary Electives, or a minimum of two courses from Japanese Electives and two courses from Interdisciplinary Electives in consultation with the Japanese advisor. One course from Interdisciplinary Electives must be chosen from the History department courses, or with permission of the advisor students can instead complete at least one Japanese history course at the University of Pittsburgh (e.g., Modern Japan, Popular Religion in a Changing Japan, and Modern East Asia), one in Japan when they study abroad, or in a summer program at any other university.

Japanese Electives
82-373 Structure of the Japanese Language 9
82-374 Technical Japanese 9
82-473/474 Topics in Japanese Studies (Students may repeat with new topics.) 9
82-505 Undergraduate Internship 9
82-571/572 Special Topics: Japanese Studies 9

Interdisciplinary Electives

This list is compiled from possibilities such as but not limited to the following. Students should consult OLR and the advisor for the most up to date interdisciplinary electives appropriate for the Japanese Studies curriculum. Courses may be suggested to the advisor for approval as a substitute.

English
76-239 Introduction to Film Studies 9
76-386 Language & Culture 9
76-387 Writing in the Disciplines 6

History
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-262 Modern China: From the Birth of Mao ... to Now 9
79-275 Introduction to Global Studies 9

Modern Languages
82-278 Japanese Film and Literature: The Art of Storytelling 9
82-280 Learning About Language Learning 9
82-281 Tutoring for Community Outreach 9
82-282 Community Service Learning 9
82-373 Structure of the Japanese Language 9
82-374 Technical Japanese 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Understanding Second Language Fluency 9
82-480 Social and Cognitive Aspects of Bilingualism 9

Music
57-306 World Music 9

Philosophy
80-180 Nature of Language 9
80-280 Linguistic Analysis 9
80-281 Language and Thought 9
80-380 Philosophy of Language 9

Psychology
85-375 Crosscultural Psychology 9
85-421 Language and Thought 9

Social and Decision Science
88-384 Conflict and Conflict Resolution in International Relations 9

89-180 Undergraduate Internship 9
89-284 Invented Languages 9
89-286 Words and Word Formation: Introduction to Morphology 9
89-287 Historical and Comparative Linguistics 9
89-380 Philosophy of Language 9
89-382 Phonetics and Phonology II 9
89-384 Linguistics of Turkic Languages 9
Area 3: Logic/Philosophy of Mathematics (1 course, 9 units)

- 80-110  Nature of Mathematical Reasoning 9
- 80-210  Logic and Proofs 9
- 80-211  Logic and Mathematical Inquiry 9
- 80-310  Formal Logic 9
- 80-311  Undecidability and Incompleteness 9
- 80-312  Mathematical Revolutions 9
- 80-315  Modal Logic 9
- 80-411  Proof Theory 9
- 80-413  Category Theory 9

Area 4: Epistemology/Metaphysics (1 course, 9 units)

- 80-150  Nature of Reason 9
- 80-201  Knowledge and Justified Belief 9
- 80-208  Critical Thinking 9
- 80-214  Computing, AI, and Philosophy 9
- 80-220  Philosophy of Science 9
- 80-221  Philosophy of Social Science 9
- 80-222  Measurement and Methodology 9
- 80-223  Causality and Probability 9
- 80-226  Revolutions in Science 9
- 80-305  Choices, Decisions, and Games 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
- 80-327  Philosophy of Neuroscience 9
- 80-405  Game Theory 9
- 80-515  Seminar on the Foundations of Statistics 9
- 80-516  Causality and Learning 9
- 80-520  Seminar on Philosophy Science 9
- 80-521  Seminar on Formal Epistemology 9

Area 5: History of Philosophy (1 course, 9 units)

- 80-150  Nature of Reason 9
- 80-226  Revolutions in Science 9
- 80-250  Ancient Philosophy 9
- 80-251  Modern Philosophy 9
- 80-252  Kant 9
- 80-253  Continental Philosophy 9
- 80-254  Analytic Philosophy 9
- 80-255  Pragmatism 9
- 80-256  Modern Moral Philosophy 9
- 80-257  Nietzsche 9
- 80-261  Empiricism and Rationalism 9
- 80-362  Russell 9
- 80-363  19th Century Foundations of Science 9

Area 6: Electives (3 courses, 27 units)

Three other philosophy courses, or appropriate courses from other departments, with the permission of the Director.

Professional Writing Concentration (81 units minimum)

Professional Writing combines liberal and professional education with a strong foundation in rhetorical studies. The concentration in Professional Writing has a strong career orientation and is specifically designed to prepare students for successful careers as writers and communications specialists in a range of fields: publishing, government, journalism, the non-profit sector, education, public and media relations, corporate communications, advocacy writing, and the arts. The concentration is designed to develop articulate and reflective communications professionals with both the skills needed to enter and negotiate current work contexts (including writing for the web and other digital media) and the analytic and problem-solving skills needed to understand and keep pace with cultural and technological change.

Foundation Courses (5 courses, 39 units)

- 76-26x  Survey of Forms (Nonfiction, Fiction, Poetry, or Screenwriting) 9
- 76-271  Introduction to Professional and Technical Writing 9
- 76-300  Professional Seminar 9
- 76-373  Argument 9
- 76-390  Style 9
Rhetoric/Language Studies Course (1 course, 9 units)
Students with a concentration in Professional Writing complete one course from designated Rhetoric courses offered and advertised each semester by the English Department. Rhetoric courses focus on understanding the role of language and language practices in both personal and professional contexts. Courses emphasize the relationships between texts and their contexts and pay particular attention to textual features, meaning, processes of reading and writing, and the ways in which language practices vary over time and across situations and cultures. The courses also equip students with explicit techniques for analyzing, understanding, and exploring language practices. The Rhetoric/Language Studies courses may also be taken as part of the concentration requirements for three additional Advanced Writing/Rhetoric courses and include but are not limited to the following list.

76-319 Environmental Rhetoric 9
76-351 Rhetorical Invention 9
76-355 Leadership, Dialogue, and Change 9
76-386 Language & Culture 9
76-396 Non-Profit Advocacy: Genres, Methods, and Issues 9
76-428 Visual Verbal Communication 9
76-476 Rhetoric of Science 9
76-484 Discourse Analysis 9
76-491 Rhetorical Analysis 9

Advanced Writing/Rhetoric Courses (3 courses, 27 units minimum)
Students with a concentration in Professional Writing complete three Advanced Writing/Rhetoric courses at the 300- or 400-level. Options for these courses include all of the Rhetoric/Language Studies courses listed above plus the writing-focused courses listed below. Additional courses that fulfill these requirements are advertised on a semester-by-semester basis. For help in choosing which of the possible options are most appropriate for various professional goals – journalism, writing for new media, editing and publishing, public relations/corporate communications, or science and technical writing – consult your English Department advisor and the “Selected Core Courses & Electives for PW Majors” advising sheet available on a semester-by-semester basis. The English Elective may be any course offered by the Department with the exception of 76-270. The History concentration combines a structured sequence of courses, training in research methods, theoretical concepts, and analytical writing skills, plus a considerable array of electives. The History concentration focuses on new ways to understand the past and new ways to use what we know, as well as on connections between past and present and on how historical knowledge facilitates understanding of social, cultural, and policy change. The History concentration emphasizes empirical methods and conceptual analysis, as well as specific research skills relevant to many types of jobs and further professional training. The History concentration combines a structured sequence of courses, training in research methods, theoretical concepts, and analytical writing skills, plus a considerable array of electives. The English Elective course may not count as English electives.

76-301 Internship Var.
76-302 Global Communications Center Practicum 6
76-319 Environmental Rhetoric 9
76-351 Rhetorical Invention 9
76-355 Leadership, Dialogue, and Change 9
76-372 News Writing 9
76-375 Magazine Writing 9
76-386 Language & Culture 9
76-389 Rhetorical Grammar 9
76-391 Document & Information Design 12
76-396 Non-Profit Advocacy: Genres, Methods, and Issues 9
76-428 Visual Verbal Communication 9
76-476 Rhetoric of Science 9
76-481 Introduction to Multimedia Design 12
76-484 Discourse Analysis 9
76-487 Web Design 12
76-491 Rhetorical Analysis 9

Prerequisite English Elective
Students with a concentration in Professional Writing must complete one perquisite course from the English Department’s offerings, which focuses on the relationships between texts and their cultural and historical contexts. The course must be at or above the 200 level. 76-270 Writing for the Professions, 76-272 Language in Design, and 76-271 Introduction to Professional and Technical Writing may not count as English electives. Appropriate courses are advertised every semester in the English department’s “What Counts for What” publication.

English Elective (1 course, 6 units MINIMUM)
Students with a concentration in Professional Writing complete one additional course from the English Department’s offerings. This course should be one that focuses on the relationships between texts and their cultural and historical contexts. Courses in literature, cultural studies, rhetoric, and media studies that meet this requirement are advertised on a semester-by-semester basis. The English Elective may be any course offered by the Department with the exception of 76-270. The History concentration combines a structured sequence of courses, training in research methods, theoretical concepts, and analytical writing skills, plus a considerable array of electives. The English Elective course may not count as English electives.

Psychology Concentration (81 units minimum)
Psychology is a science that embraces both biological and social sciences. It is a science concerned with establishing principles and laws regarding the ways in which people think, feel, and behave through the scientific study of human behavior. Students with a concentration in Psychology are expected not only to learn about findings already established by psychologists, but also to become proficient in the investigation and analysis of behavior. This includes observing behavior, formulating hypotheses, designing experiments to test these hypotheses, running experiments, performing statistical analyses, and writing reports.

Breadth Courses (4 courses, 36 units)
To gain familiarity with the breadth of the field of Psychology, students take 85-102 Introduction to Psychology and three survey courses.

Required Intro Course
85-102 Introduction to Psychology 9

Survey Courses
85-211 Cognitive Psychology 9
85-213 Human Information Processing and Artificial Intelligence 9
85-219 Biological Foundations of Behavior 9
85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9

* A fourth survey course can be taken in place of Introduction to Psychology.

Research Methods and Statistics (2 courses, 18 units)
Students complete one course in Research Methods (9 units). The corresponding survey course is a prerequisite for this course.

76-295 Research Methods in Psychology 9
76-310 Research Methods in Social Psychology 9
76-314 Cognitive Neuroscience Research Methods 9
76-320 Research Methods in Developmental Psychology 9
85-330 Analytic Research Methods 9
85-340 Research Methods in Social Psychology 9

The following Statistics course is a prerequisite for all the Research Methods courses. This Statistics course counts toward the Psychology concentration.

36-309 Experimental Design for Behavioral & Social Sciences 9

Advanced Courses (3 courses, 27 units)
Complete any three advanced courses or seminars in Psychology numbered higher than 85-341 (excluding 85-480, 85-482, 85-484, 85-505, 85-506, 85-507, 85-508).

Social & Political History Concentration (81 units minimum)
The BHA concentration in Social & Political History focuses on new ways to understand the past and new ways to use what we know, as well as on connections between past and present and on how historical knowledge facilitates understanding of social, cultural, and policy change. The History concentration emphasizes empirical methods and conceptual analysis, as well as specific research skills relevant to many types of jobs and further professional training. The History concentration combines a structured sequence of courses, training in research methods, theoretical concepts, and analytical writing skills, plus a considerable array of electives. The BHA concentration in Social & Political History emphasizes broad-based, cumulative knowledge and interpretive skills in the study of the past. Offerings at the 200- and 300-level are designed to allow maximum flexibility in meeting requirements and maximum choice in focusing on particular themes, places, or eras. Upper-level courses aim to give
students majoring in History more time together in smaller classes and more experience working with primary and secondary sources. The senior capstone seminar, Advanced Studies in History, provides training and experience in conducting original research and in interpretive, analytical writing—skills that prepare graduates for professional careers as well as for graduate or law school.

Required History Courses (2 courses, 21 units)
Students must earn a final grade of “C” or better for these courses to count toward the concentration.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-200</td>
<td>Introduction to Historical Research &amp; Writing - Sophomore or Junior year</td>
<td>9</td>
</tr>
<tr>
<td>79-420</td>
<td>Historical Research Seminar -Fall, Senior year</td>
<td>12</td>
</tr>
</tbody>
</table>

Required Survey Courses (2 courses, 18 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-202</td>
<td>Flesh and Spirit: Early Modern Europe, 1400-1750</td>
</tr>
<tr>
<td>79-203</td>
<td>Social and Political Change in 20th Century Central and Eastern Europe</td>
</tr>
<tr>
<td>79-205</td>
<td>20th &amp; 21st Century Europe</td>
</tr>
<tr>
<td>79-207</td>
<td>Development of European Culture</td>
</tr>
<tr>
<td>79-211</td>
<td>Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange</td>
</tr>
<tr>
<td>79-221</td>
<td>Development and Democracy in Latin America</td>
</tr>
<tr>
<td>79-222</td>
<td>Between Revolutions: The Development of Modern Latin America</td>
</tr>
<tr>
<td>79-223</td>
<td>Mexico: From the Aztec Empire to the Drug War</td>
</tr>
<tr>
<td>79-225</td>
<td>West African History in Film</td>
</tr>
<tr>
<td>79-226</td>
<td>African History: Earliest Times to 1780</td>
</tr>
<tr>
<td>79-227</td>
<td>Modern Africa: The Slave Trade to the End of Apartheid</td>
</tr>
<tr>
<td>79-229</td>
<td>Origins of the Arab-Israeli Conflict, 1880-1948</td>
</tr>
<tr>
<td>79-230</td>
<td>Arab-Israeli Conflict Since 1949</td>
</tr>
<tr>
<td>79-233</td>
<td>The United States and the Middle East since 1945</td>
</tr>
<tr>
<td>79-235</td>
<td>Caribbean Cultures</td>
</tr>
<tr>
<td>79-240</td>
<td>Development of American Culture</td>
</tr>
<tr>
<td>79-241</td>
<td>African American History: Africa to Civil War</td>
</tr>
<tr>
<td>79-242</td>
<td>African American History: Reconstruction to the Present</td>
</tr>
<tr>
<td>79-245</td>
<td>Capitalism and Individualism in American Culture</td>
</tr>
<tr>
<td>79-249</td>
<td>20th &amp; 21st Century U.S. History</td>
</tr>
<tr>
<td>79-252</td>
<td>Recent U.S. History: 1945-Present</td>
</tr>
<tr>
<td>79-256</td>
<td>20th Century Germany</td>
</tr>
<tr>
<td>79-258</td>
<td>French History: From the Revolution to De Gaulle</td>
</tr>
<tr>
<td>79-261</td>
<td>The Last Emperors: Chinese History and Society, 1600-1900</td>
</tr>
<tr>
<td>79-262</td>
<td>Modern China: From the Birth of Mao ... to Now</td>
</tr>
<tr>
<td>79-265</td>
<td>Russian History: From the First to the Last Tsar</td>
</tr>
<tr>
<td>79-266</td>
<td>Russian History: From Communism to Capitalism</td>
</tr>
<tr>
<td>79-288</td>
<td>Bananas, Baseball, and Borders: Latin America and the United States</td>
</tr>
</tbody>
</table>

Social & Political History Elective Courses (5 courses, 42 units minimum)
A minimum of 42 additional History units must be approved with the History advisor. Any History courses not fulfilling another major requirement may be chosen as an elective.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-244</td>
<td>Women in American History</td>
<td>9</td>
</tr>
<tr>
<td>79-257</td>
<td>Germany and the Second World War</td>
<td>9</td>
</tr>
<tr>
<td>79-268</td>
<td>World War I: The Twentieth Century’s First Catastrophe</td>
<td>9</td>
</tr>
<tr>
<td>79-276</td>
<td>Beyond the Border</td>
<td>6</td>
</tr>
<tr>
<td>79-278</td>
<td>How (NOT) to Change the World</td>
<td>9</td>
</tr>
<tr>
<td>79-280</td>
<td>Coffee and Capitalism</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>79-300</td>
<td>History of American Public Policy</td>
<td>9</td>
</tr>
<tr>
<td>79-302</td>
<td>Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons System</td>
<td>6</td>
</tr>
</tbody>
</table>

79-303 Pittsburgh and the Transformation of Modern Urban America 6
79-305 Moneyball Nation: Data in American Life 9
79-307 Religion and Politics in the Middle East 9
79-309 The Chinese Revolution Through Film (1949-2000) 9
79-314 The Politics and Culture of Memory 9
79-316 Photography, the First 100 Years, 1839-1939 9
79-317 Art, Anthropology, and Empire 9
79-318 Sustainable Social Change: History and Practice 9
79-320 Women, Politics, and Protest 9
79-322 Stalin and the Great Terror 9
79-323 Family, Gender, and Sexuality in European History, 500-1800 9
79-331 Body Politics: Women and Health in America 9
79-338 History of Education in America 9
79-339 Juvenile Delinquency & Film: From Soul of Youth (1920) to West Side Story (1961) 6
79-345 Roots of Rock & Roll 9
79-346 American Political Humor 9
79-350 Early Christianity 9
79-352 Christianity Divided: The Protestant and Catholic Reformations, 1450-1650 9
79-353 Religious Identities and Religious Conflicts in Modern Europe 9
79-359 Truth, Propaganda, and “Alternative Facts”: A Historical Inquiry 9
79-363 The Rise of Modern Golf, 1860 to the Present 6
79-371 African American Urban History 9
79-372 Cities, Technology, and the Environment 6
79-374 Greening the Red, White, & Blue: Critical Issues American Environmental History 9
79-377 Food, Culture, and Power: A History of Eating 9
79-381 Energy and Empire: How Fossil Fuels Changed the World 9
79-385 Out of Africa: The Making of the African Diaspora 6
79-395 The Arts in Pittsburgh 9
79-396 Music and Society in 19th and 20th Century Europe and the U.S. 9

Statistics Concentration (81 UNITS MINIMUM)
In the BHA concentration in Statistics, students develop and master a wide array of skills in computing, mathematics, statistical theory, and the interpretation and display of complex data. In addition, students with a BHA concentration in Statistics gain experience in applying statistical tools to real problems in other fields and learn the nuances of interdisciplinary collaboration.

Mathematics Pre-requisites
These courses are not counted as part of your DC Concentration. They may be used to satisfy general education or free elective requirements.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-120</td>
<td>Differential and Integral Calculus</td>
<td>10</td>
</tr>
<tr>
<td>21-256</td>
<td>Multivariate Analysis</td>
<td>9</td>
</tr>
<tr>
<td>21-259</td>
<td>Calculus in Three Dimensions</td>
<td>10</td>
</tr>
<tr>
<td>21-240</td>
<td>Matrix Algebra with Applications</td>
<td></td>
</tr>
<tr>
<td>21-241</td>
<td>Matrices and Linear Transformations</td>
<td></td>
</tr>
<tr>
<td>21-242</td>
<td>Matrix Theory</td>
<td></td>
</tr>
</tbody>
</table>

Note: 21-240, 21-241, 21-242 must be completed before taking 36-401 Modern Regression. 21-241 and 21-242 are intended only for students with a very strong mathematical background.

Statistics Pre-requisite
This course is not counted as part of your DC Concentration. It fulfills the BHA General Education Statistics Requirement.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-200</td>
<td>Reasoning with Data</td>
<td>9</td>
</tr>
</tbody>
</table>

Statistics Core (6 courses, 54 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-202</td>
<td>Statistics &amp; Data Science Methods</td>
<td>9</td>
</tr>
<tr>
<td>36-290</td>
<td>Introduction to Statistical Research Methodology</td>
<td></td>
</tr>
<tr>
<td>36-225</td>
<td>Introduction to Probability Theory</td>
<td>9</td>
</tr>
</tbody>
</table>
36-226  Introduction to Statistical Inference  9
36-350  Statistical Computing  9
36-401  Modern Regression  9
36-402  Advanced Methods for Data Analysis  9

Special Topics and Electives (3 courses, 27 units)

Students must take a total of three courses from Special Topics (numbered 36-46x) and Statistics Electives listed below. Students will consult with the Statistics advisor to select the Special Topics and Electives courses that best fit for their areas of interest.

36-303  Sampling, Survey and Society  9
36-311  Statistical Analysis of Networks  9
36-315  Statistical Graphics and Visualization  9
36-490  Undergraduate Research  9
36-46x  Special Topics (topics and offerings vary)  9

Statistics & Machine Learning (81 UNITS MINIMUM)

In the BHA concentration in Statistics & Machine Learning, students must master a wide array of skills in computing, mathematics, statistical theory, and the interpretation and display of complex data. In addition, students gain experience in applying statistical tools to real problems in other fields and learn the nuances of interdisciplinary collaboration. This program is geared towards students interested in statistical computation, data science, or “Big Data” problems.

Mathematics Pre-requisites

These courses are not counted as part of your DC Concentration. They may be used to satisfy general education or free elective requirements.

21-120  Differential and Integral Calculus  10
21-127  Concepts of Mathematics  10
21-256  Multivariate Analysis  9
or 21-259  Calculus in Three Dimensions  9
21-240  Matrix Algebra with Applications  10
or 21-241  Matrices and Linear Transformations  9
or 21-242  Matrix Theory  9

Note: 21-240, 21-241, 21-242 must be completed before taking 36-401 Modern Regression. 21-241 and 21-242 are intended only for students with a very strong mathematical background.

Statistics Pre-requisite

This course is not counted as part of your DC Concentration. It fulfills the BHA General Education Statistics Requirement.

36-200  Reasoning with Data  9

Statistics Core (5 courses, 45 units)

36-225  Introduction to Probability Theory  9
36-226  Introduction to Statistical Inference  9
36-350  Statistical Computing  9
36-401  Modern Regression  9
36-402  Advanced Methods for Data Analysis  9

Data Analysis Electives (1 COURSE, 9 UNITS)

Students must take one course from the Special Topics (numbered 36-46x) and Statistics Electives listed below. Students will consult with the Statistics advisor to select the Special Topics and Electives courses that best fit for their areas of interest.

36-303  Sampling, Survey and Society  9
36-311  Statistical Analysis of Networks  9
36-315  Statistical Graphics and Visualization  9
36-490  Undergraduate Research  9
36-46x  Special Topics (topics and offerings vary)  9

Machine Learning Core (3 courses, 34 units)

15-112  Fundamentals of Programming and Computer Science  12
15-122  Principles of Imperative Computation  10
10-601  Introduction to Machine Learning (Masters)  12

Technical Writing Concentration (81 units minimum)

The concentration in Technical Writing is specifically designed to prepare students for successful careers involving scientific, technical, and computer-related communication, including writing and designing for digital media. Technical communicators develop and design web sites, explain science and technology to the public, develop print and multimedia materials, develop information management systems, design and deliver corporate training, and develop support systems for consumer products ranging from software for word processing or personal finances to complex data management systems. The Technical Writing concentration includes with a common core of foundation courses in print and on-line communication as well as a set of prerequisites in math, statistics, and computer programming.

Students must take two Theory/Specialization courses specific to either the Technical Communication or the Scientific and Medical Communication track. In addition, students in the SMC track take two courses in the natural sciences or engineering relevant to their areas of interest, while TC students take two electives in management, technology, and social issues.

Prerequisite Courses

21-111  Differential Calculus  10
or 21-112  Integral Calculus  9
or 21-120  Differential and Integral Calculus  9
or 21-127  Concepts of Mathematics  10
15-110  Principles of Computing (recommended for SMC-track students)  9
or 15-112  Fundamentals of Programming and Computer Science (recommended for TC-track students)  9

Technical Writing Core Courses (6 courses, 54 units)

76-26x  Survey of Forms (Nonfiction, Fiction, Poetry, or Screenwriting)  9
76-271  Introduction to Professional and Technical Writing  9
76-300  Professional Seminar  3
76-390  Style  9
76-391  Document & Information Design  12
76-487  Web Design  12

Theory/Specialization Courses (2 courses, 18 units minimum)

Complete two courses to deepen your area of specialty in Technical Communication (TC) or Scientific and Medical Communication (SMC). One course must be chosen from among courses designated as Recommended Options. Check with the English department each semester for additional options.

Recommended Options

76-319  Environmental Rhetoric  9
76-361  Topics in Digital Humanities: Corpus Rhetorical Analysis  9
76-395  Science Writing  9
76-425  Science in the Public Sphere  9
76-428  Visual Verbal Communication  9
76-474  Software Documentation  9
76-476  Rhetoric of Science  9
76-481  Introduction to Multimedia Design  12
76-491  Rhetorical Analysis  9
76-494  Healthcare Communications  9

Additional Options

Include but are not limited to the following:

76-301  Internship  6
76-302  Global Communications Center Practicum  6
76-318  Communicating in the Global Marketplace  9
76-319  Environmental Rhetoric  9
76-325  Intertextuality  9
76-340  American English  9
76-351  Rhetorical Invention  9
76-355  Leadership, Dialogue, and Change  9
76-360  Literary Journalism Workshop  9
76-361  Topics in Digital Humanities: Corpus Rhetorical Analysis  9
Complete two courses:

60-202 Concept Studio: Systems and Processes 10

60-280 Introduction to Contextual Practice 10

Media Studios (3 courses, 30 units)

Complete three courses:

60-150 2D Media Studio: Drawing 10
60-160 2D Media Studio: Imaging 10
60-250 2D Media Studio: Painting 10
60-251 2D Media Studio: Print Media 10
60-130-60-130 3-D Media Studio I 10
(complete two minis, 5 units each)
60-131-60-131 3D Media Studio II 10
(complete two minis, 5 units each)
60-110 Electronic Media Studio: Introduction to the Moving Image 10
60-210 Electronic Media Studio: Introduction to Interactivity 10

Advanced Studios (4 courses, 40 units)

Complete four courses. Courses may be offered in the fall and/or spring. Students may take courses in any media area (ETB, SIS, CP or DP3). They may take all courses in one media area if a focus is desired.

60-401/402 Senior Studio 10
60-403 Senior Critique Seminar 10
60-410 - 60-429 Advanced Electronic and Time-Based Work (ETB) 10
60-430 - 60-447 Advanced Sculpture, Installation and Site-Work (SIS) 10
60-448 - 60-449 Advanced Contextual Practice (CP) 10
60-450 - 60-498 Advanced Drawing, Painting, Print Media and Photography (DP3) 10
60-499 Studio Independent Study (one only) 10

Art History/Theory (2 courses, 18 units)

60-205 Critical Theory in Art III -Fall 9
60-206 Critical Theory in Art IV -Spring 9

Review Requirement (complete 2 required reviews, 0 units)

A review is required at the end of the sophomore and senior years. Pass/no pass only.

60-200 Sophomore Review -Spring 0
60-400 Senior Review -Fall 0

Drama Concentration (108 units minimum)

AUDITION/INTERVIEW REQUIRED FOR DIRECTING OR DRAMATURGY CONCENTRATION OPTION. PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR DESIGN OR PRODUCTION TECHNOLOGY AND MANAGEMENT CONCENTRATION OPTION.

Options available in the following areas: 1) Design, 2) Directing, 3) Dramaturgy, 4) Production Technology & Management

Note: There is no BHA Acting or Musical Theatre option.

Required Courses for All Concentration Options (20 units)

54-175-54-176 Conservatory Hour-Conservatory Hour (1 unit each) 2
54-177 Foundations of Drama I 6
54-281 Foundations of Drama II (prerequisite: 54-177) 6
54-381 Special Topics in Drama: History, Literature and Criticism 6

Work with Drama Faculty Option Coordinator to Approve Concentration Option (88 units minimum):

Design Required Courses (26 units)

54-151-54-152 Stagecraft-Stagecraft (13 units + 13 units) 26
A minimum of 62 additional Design units must be approved by the Design faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Directing Required Courses (52 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-121</td>
<td>Directing I: Sources-Directing I: Sources</td>
<td>18</td>
</tr>
<tr>
<td>54-221</td>
<td>Directing II: Fundamentals-Directing II: Fundamentals</td>
<td>18</td>
</tr>
<tr>
<td>54-159</td>
<td>Production Practicum-Production Practicum (two times, 12 units total)</td>
<td>12</td>
</tr>
<tr>
<td>54-517</td>
<td>Director's Colloquium (four times, 4 units total)</td>
<td>1</td>
</tr>
</tbody>
</table>

A minimum of 36 additional Directing units must be approved by the Directing faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Dramaturgy Required Courses (53 units minimum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-109</td>
<td>Dramaturgy 1: Approaches to Text</td>
<td>9</td>
</tr>
<tr>
<td>54-184</td>
<td>Dramaturgy 2: Introduction to Production</td>
<td>9</td>
</tr>
<tr>
<td>54-121</td>
<td>Directing I: Sources</td>
<td>9</td>
</tr>
<tr>
<td>54-159</td>
<td>Production Practicum-Production Practicum (two times, 12 units total)</td>
<td>12</td>
</tr>
<tr>
<td>54-200</td>
<td>Dramaturgy Forum-Dramaturgy Forum -Fall (minimum of two; every semester it is offered while enrolled)</td>
<td>2</td>
</tr>
<tr>
<td>54-xxx</td>
<td>Dramaturgy 3, 4, 5 or 6 (minimum of two; all four if enrolled as BXA for six semesters or more)</td>
<td>18</td>
</tr>
</tbody>
</table>

A minimum of 29 additional Dramaturgy units must be approved by the Dramaturgy faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Production Technology and Management Required Courses (26 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-151</td>
<td>Stagecraft-Stagecraft (13 units + 13 units)</td>
<td>26</td>
</tr>
</tbody>
</table>

A minimum of 62 additional PTM units must be approved by the PTM faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Musicology Required Courses (45 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-283</td>
<td>Music History I (co-requisite: 57-190)</td>
<td>9</td>
</tr>
<tr>
<td>57-284</td>
<td>Music History II (co-requisite: 57-289)</td>
<td>9</td>
</tr>
<tr>
<td>57-285</td>
<td>Music History III (co-requisite: 57-290)</td>
<td>9</td>
</tr>
<tr>
<td>57-189</td>
<td>Introduction to Repertoire and Listening for Musicians</td>
<td>3</td>
</tr>
<tr>
<td>57-190</td>
<td>Repertoire and Listening for Musicians I</td>
<td>3</td>
</tr>
<tr>
<td>57-289</td>
<td>Repertoire and Listening for Musicians II</td>
<td>3</td>
</tr>
<tr>
<td>57-290</td>
<td>Repertoire and Listening for Musicians III</td>
<td>3</td>
</tr>
<tr>
<td>57-404</td>
<td>String Quartet: A Social History</td>
<td>9</td>
</tr>
<tr>
<td>57-405</td>
<td>Concerto: Virtuosity and Contrast</td>
<td>9</td>
</tr>
<tr>
<td>57-409</td>
<td>Puccini's Operas</td>
<td>9</td>
</tr>
<tr>
<td>57-427</td>
<td>Advanced Seminar in Film Musicology</td>
<td>9</td>
</tr>
<tr>
<td>57-485</td>
<td>History of the Symphony</td>
<td>9</td>
</tr>
<tr>
<td>57-611</td>
<td>Independent Study in History</td>
<td>6</td>
</tr>
</tbody>
</table>

Choose 36 units from:

- 57-209 The Beatles | 9
- 57-306 World Music | 9
- 57-477 Music of the Spirit | 6
- 57-478 Survey of Historical Recording | 6
- 57-480 History of Black American Music | 6

A minimum of 18 additional Music units must be approved by the Music advisor. A list of these selected courses must be filed in the BXA office.

Audio Recording & Production Required Courses (40 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-101</td>
<td>Introduction to Music Technology (self-paced)</td>
<td>6</td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I-Fall or 57-180 Basic Solfege I</td>
<td>3</td>
</tr>
<tr>
<td>or 57-185</td>
<td>Advanced Solfege I</td>
<td>3</td>
</tr>
<tr>
<td>57-173</td>
<td>Survey of Western Music History -Fall (co-requisite: 57-188)</td>
<td>9</td>
</tr>
<tr>
<td>57-188</td>
<td>Repertoire and Listening for Musicians</td>
<td>1</td>
</tr>
<tr>
<td>57-337</td>
<td>Sound Recording</td>
<td>6</td>
</tr>
<tr>
<td>57-338</td>
<td>Sound Editing and Mastering</td>
<td>6</td>
</tr>
<tr>
<td>57-438</td>
<td>Multitrack Recording</td>
<td>9</td>
</tr>
</tbody>
</table>

Choose 59 units from:

- 57-153 Harmony II -Spring or 57-150 Basic Harmony II | 9
- 57-182 Solfege II or 57-186 Advanced Solfege II | 3
- 15-104 Introduction to Computing for Creative Practice | 10
- 18-090 Twisted Signals: Multimedia Processing for the Arts | 10
- 33-114 Physics of Musical Sound | 9
- 54-166 Introduction to Sound Design for Theatre | 6
- 54-275 History of Sound Design | 3
- 54-666 Production Audio | 6
- 57-344 Experimental Sound Synthesis | 9
- 57-421 The Exploded Ensemble | 6
- 57-425 Expanded Music Performance | 9
- 57-427 Advanced Seminar in Film Musicology | 9
- 57-478 Survey of Historical Recording | 6
- 57-622 Independent Study in Sound Recording Production | 3
- 60-131 3D Media Studio II | 5
- 60-210 Electronic Media Studio: Introduction to Interactivity | 10

Note: Students completing an IDeATe minor may double-count up to two of the IDeATe minor courses towards the Audio Recording & Production concentration.
BSA Program, a student may change their CFA concentration only if they pass all admission requirements for that particular school.

Students choose their science concentration from among the four departments in MCS: Biological Sciences, Chemistry, Mathematical Sciences, Neurobiology or Physics.

The BSA Degree Program is governed by faculty and administrators from both colleges and led by the director of the BXA Intercollege Degree Programs. The director and associate director of the BXA Intercollege Degree Programs are the primary advisors and liaisons between CFA and MCS. Students receive extensive advising support. Each student has two additional academic advisors: an advisor in the admitting school of CFA for their fine arts concentration and an advisor in MCS for their natural sciences/mathematics concentration. This network of advisors guides each student through their curriculum.

### BSA Curriculum

#### I. BSA General Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td></td>
</tr>
</tbody>
</table>

#### II. MCS Concentration

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>114-134</td>
<td></td>
</tr>
</tbody>
</table>

#### III. CFA Concentration

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td></td>
</tr>
</tbody>
</table>

#### IV. Free Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-29</td>
<td></td>
</tr>
</tbody>
</table>

Total BSA Degree Requirements

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>380</td>
</tr>
</tbody>
</table>

#### Technical Breadth Requirements (5 courses, 51 units)

As a 21st Century practicing scientist or mathematician, our graduates will work with others from a variety of technical backgrounds. Therefore, all of our students will be broadly trained within the technical fields of science and math. Students will fulfill this training by completing five (5) introductory technical courses in the Mellon College of Science at Carnegie Mellon University.

A student must take the five (5) courses listed below. AP/IB/Cambridge credit may be used to fulfill some of these requirements, but STEM electives must be taken at CMU or at another university for transfer credit to reach the total of five (5) Technical Breadth courses. A list of STEM electives can be found in the MCS general education requirements (http://coursecatalog.web.cmu.edu/melloncollegeofscience/#forstudentsenteringinthefall2015andbeyond).

- Mathematics (2 courses, 20 units)
  - 21-120 Differential and Integral Calculus
  - 21-122 Integration and Approximation
  - or 21-124 Calculus II for Biologists and Chemists

- Science (3 courses, 31 units)
  - 03-121 Modern Biology
  - 09-105 Introduction to Modern Chemistry I
  - 33-121 Physics I for Science Students
  - or 33-151 Matter and Interactions I

#### Nontechnical Breadth Requirements (8 courses, 42 units)

MCS aspires for all of our undergraduates to leave our campus with a strong sense of personal integrity, social responsibility, ethics, working with diverse others, global engagement, and personal health and well-being.

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### Bachelor of Science and Arts Degree Program

Carnegie Mellon University recognizes that there are students who are naturally gifted in both the fine arts and the natural sciences or mathematics. In order to accommodate students who want to pursue an education simultaneously in these areas, we offer a degree that combines the strengths of the College of Fine Arts (CFA) and the Mellon College of Science (MCS). The intercollege degree, called the Bachelor of Science and Arts (BSA), is a rigorous program that offers a unique group of qualified students the opportunity to develop their talents and interests in an area of the fine arts and an area of the natural sciences or mathematics.

The BSA curriculum is divided into three parts: 1) BSA General Education coursework, 2) CFA concentration coursework, and 3) MCS concentration coursework.

Students choose their fine arts concentration from among the following schools in CFA: Architecture, Art, Drama or Music. A student must meet the entry requirements for the particular CFA school of their choice. While in the...
The following non-technical breadth requirements will require students to develop a personalized plan for their course selection and meta-curricular participation to maximize their CMU experience. Our graduates will be well trained to be life-long and life-wide learners that will lead the scientific community and the world at large.

All candidates for BSA degree must complete the following non-technical breadth requirements:

First-year Courses (2 courses, 12 units)
76-101 Interpretation and Argument 9
or 76-102 Advanced First Year Writing: Special Topics 9
or 76-106 Writing about Literature, Art and Culture 9 & 76-107 and Writing about Data 9 & 76-108 and Writing about Public Problems

All undergraduate students must complete the First-Year Writing requirement—the Department of English does not accept any Advanced Placement exemptions. This requirement can be completed in two different ways. Enroll in one of two full-semester courses 101 or 102 (by invitation only), 9 units, or enroll in two of three half-semester mini courses (back-to-back within a single semester) 106/107/108, 4.5 + 4.5 units. Course options and topics: www.cmu.edu/hss/english/first_year/index.html

99-101 Computing @ Carnegie Mellon 3
or 99-102 Computing @ Carnegie Mellon

ENGAGE (3 courses, 3 units)
The ENGAGE courses are self-directed learning opportunities (using the MyCORE online platform) designed to enhance students’ engagement with wellness and community service. Choose three courses from the list below:

38-110 ENGAGE in Service 1
38-230 ENGAGE in Wellness: Looking Inward 1
38-330 ENGAGE in Wellness: Looking Outward 1
38-430 ENGAGE in Wellness: Looking Forward 1

Cultural/Global Understanding (1 course, 9 units)
Cultural or global understanding course(s) may be taken at any time. Nine (9) or more units from the following group of courses will fulfill this requirement. Any student who finds an appropriate Carnegie Mellon course not on the list below that might fulfill this requirement should contact their academic advisor to review the course description to determine if it can be substituted. Cultural and global understanding courses that are taken while studying abroad can be used to fulfill this category. In addition, transfer courses will also be considered for this category,

57-173 Survey of Western Music History 9
57-209 The Beatles 9
57-306 World Music 9
70-342 Managing Across Cultures 9
76-221 Books You Should Have Read By Now 9
76-227 Comedy 9
76-232 Introduction to African American Literature 9
76-239 Introduction to Film Studies 9
76-241 Introduction to Gender Studies 9
76-386 Language & Culture 9
79-104 Global Histories 9
79-201 Introduction to Anthropology 9
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-205 20th & 21st Century Europe 9
79-207 Development of European Culture 9
79-210 Identity, Nationhood, and State 9
79-211 Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange 9
79-221 Development and Democracy in Latin America 9
79-222 Between Revolutions: The Development of Modern Latin America 9
79-223 Mexico: From the Aztec Empire to the Drug War 9
79-227 Modern Africa: The Slave Trade to the End of Apartheid 9
79-229 Origins of the Arab-Israeli Conflict, 1880-1948 9
79-230 Arab-Israeli Conflict Since 1948 9
79-232 Arabian Peninsula Environmental History 9
79-233 The United States and the Middle East since 1945 9
79-235 Caribbean Cultures 9
79-240 Development of American Culture 9
79-241 African American History: Africa to the Civil War 9
79-242 African American History: Reconstruction to the Present 9
79-244 Women in American History 9
79-245 Capitalism and Individualism in American Culture 9
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-262 Modern China: From the Birth of Mao ... to Now 9
79-263 Mao and the Chinese Cultural Revolution 9
79-265 Russian History: From the First to the Last Tsar 9
79-266 Russian History: From Communism to Capitalism 9
79-267 The Soviet Union in World War II: Military, Political, and Social History 9
79-275 Introduction to Global Studies 9
79-297 Dilemmas and Controversies in Anthropology 9
79-307 Religion and Politics in the Middle East 9
79-345 Roots of Rock & Roll 9
79-349 The Holocaust in Historical Perspective 9
79-350 Early Christianity 9
79-377 Food, Culture, and Power: A History of Eating 9
80-100 Introduction to Philosophy 9
80-250 Ancient Philosophy 9
80-251 Modern Philosophy 9
80-253 Continental Philosophy 9
80-254 Analytic Philosophy 9
80-255 Pragmatism 9
80-276 Philosophy of Religion 9
82-xxx Any course from Modern Languages 9
99-241 Revolutions of Circularity 9

Humanities and Social Sciences (2 courses, 18 units)
To fulfill this requirement, students must complete a minimum of two (2) non-technical courses totaling at least 18 units in the Tepper School of Business and/or the Dietrich College of Humanities and Social Sciences. Courses counted toward the Cultural/Global Understanding requirement, and 76-101, do not count toward this requirement.
Check our web site for courses from DC, CFA, and Tepper that may NOT be used (http://www.cmu.edu/mcs/undergrad/advising/hss-finearts/deletions.html) to satisfy this requirement because they are too technical in nature, plus a list of courses in other colleges (including SCS, CIT, Tepper, and Heinz College) that do satisfy (http://www.cmu.edu/mcs/undergrad/advising/hss-finearts/additions.html) this requirement.

BXA Intercollege Degree Programs

BXA Required Courses (5 courses, 36 units minimum)
BXA-specific courses give students the opportunity to integrate their areas of concentration by focusing on interdisciplinary approaches and arts-based research techniques.

52-190 BXA Seminar I: Building the Wunderkammer 9
or 52-291 BXA Seminar II: Transferring Knowledge 9
52-391 BXA Junior Portfolio 0
52-392 BXA Seminar III: Deconstructing Disciplines 9
52-401 BXA Seminar IV: Capstone Project Research 9
52-402 BXA Seminar V: Capstone Project Production 9

II. Mellon College of Science Concentration

(number of courses vary, 114-134 units)
BSA students choose one of the following concentrations:
- Biological Sciences (114 units)
- Chemistry (121 units)
- Mathematical Sciences (123 units)
- Neurobiology (114 units)
- Physics (134 units)
Biological Sciences Concentration (114 units minimum)

Biological Sciences Required Courses (96 units minimum)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-201</td>
<td>Undergraduate Colloquium for Sophomores</td>
<td>2</td>
</tr>
<tr>
<td>03-220</td>
<td>Genetics</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>(corequisite: 03-343)</td>
<td></td>
</tr>
<tr>
<td>03-231</td>
<td>Honors Biochemistry - Spring, Sophomore year</td>
<td>9</td>
</tr>
<tr>
<td>03-320</td>
<td>Cell Biology - Fall, Junior year</td>
<td>9</td>
</tr>
<tr>
<td>03-343</td>
<td>Experimental Techniques in Molecular Biology -</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Fall, Junior year</td>
<td></td>
</tr>
<tr>
<td>09-106</td>
<td>Modern Chemistry II</td>
<td>10</td>
</tr>
<tr>
<td>09-207</td>
<td>Techniques in Quantitative Analysis</td>
<td>9</td>
</tr>
<tr>
<td>09-208</td>
<td>Techniques for Organic Synthesis and Analysis</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>or 03-344 Experimental Biochemistry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or 03-345 Experimental Cell and Developmental</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biology or 03-346 Experimental Neuroscience</td>
<td></td>
</tr>
<tr>
<td>09-217</td>
<td>Organic Chemistry I</td>
<td>9</td>
</tr>
<tr>
<td>09-218</td>
<td>Organic Chemistry II</td>
<td>9</td>
</tr>
<tr>
<td>33-122</td>
<td>Physics II for Biological Sciences and Chemistry Students</td>
<td>9</td>
</tr>
</tbody>
</table>

Biological Sciences Electives (2 courses, 18 units)

One course must be an advanced elective selected from 03-3xx or higher, excluding 03-445.

Chemistry Concentration (121 units minimum)

Chemistry Required Courses (103 units)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-106</td>
<td>Modern Chemistry II</td>
<td>10</td>
</tr>
<tr>
<td>09-219</td>
<td>Modern Organic Chemistry</td>
<td>10</td>
</tr>
<tr>
<td>09-220</td>
<td>Modern Organic Chemistry II</td>
<td>10</td>
</tr>
<tr>
<td>09-214</td>
<td>Physical Chemistry</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>or 09-344 Physical Chemistry (Quantum): Microscopic Principles of Physical Chemistry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or 09-345 Physical Chemistry (Thermo): Macroscopic Principles of Physical Chemistry</td>
<td></td>
</tr>
<tr>
<td>09-348</td>
<td>Inorganic Chemistry</td>
<td>10</td>
</tr>
<tr>
<td>09-221</td>
<td>Laboratory I: Introduction to Chemical Analysis</td>
<td>12</td>
</tr>
<tr>
<td>09-222</td>
<td>Laboratory II: Organic Synthesis and Analysis</td>
<td>12</td>
</tr>
<tr>
<td>09-321</td>
<td>Laboratory III: Molecular Design and Synthesis</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>or 09-323 Bioorganic Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>09-204</td>
<td>Professional Communication Skills in Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>09-201</td>
<td>Undergraduate Seminar I - Undergraduate Seminar</td>
<td>3</td>
</tr>
<tr>
<td>09-202</td>
<td>Seminar II: Safety and Environmental Issues for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemists - Undergraduate Seminar III</td>
<td></td>
</tr>
<tr>
<td>09-402</td>
<td>Undergraduate Seminar VI</td>
<td>3</td>
</tr>
<tr>
<td>33-122</td>
<td>Physics II for Biological Sciences and Chemistry Students</td>
<td>9</td>
</tr>
</tbody>
</table>

Note: Students who have a strong chemistry background, should enroll in 09-107 rather than 09-105. Students who complete 09-107 with an "A" grade will be exempted from the requirement to take 09-106 Modern Chemistry II.

Advanced Chemistry Electives (2 courses, 18 units)

May be any upper level chemistry course, 09-3xx or higher, or Biochemistry I, 03-231 or 03-232, with the exception of 09-433 Independent Study, which can be used only by permission of the Director of Undergraduate Studies.

Mathematical Sciences Concentration (123 units minimum)

Mathematical Sciences Required Courses (87 units minimum)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-110</td>
<td>Principles of Computing</td>
<td>10</td>
</tr>
<tr>
<td>21-127</td>
<td>Concepts of Mathematics</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>or 21-128 Mathematical Concepts and Proofs</td>
<td></td>
</tr>
<tr>
<td>21-228</td>
<td>Discrete Mathematics</td>
<td>9</td>
</tr>
<tr>
<td>21-241</td>
<td>Matrices and Linear Transformations</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>or 21-242 Matrix Theory</td>
<td></td>
</tr>
<tr>
<td>21-259</td>
<td>Calculus in Three Dimensions</td>
<td>9</td>
</tr>
<tr>
<td>21-260</td>
<td>or 21-268 Multidimensional Calculus</td>
<td></td>
</tr>
<tr>
<td>21-261</td>
<td>Differential Equations</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>or 21-261 Introduction to Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>33-231</td>
<td>Physical Analysis</td>
<td>9</td>
</tr>
<tr>
<td>21-355</td>
<td>Principles of Real Analysis I</td>
<td>9</td>
</tr>
<tr>
<td>21-373</td>
<td>Algebraic Structures</td>
<td>9</td>
</tr>
<tr>
<td>33-142</td>
<td>Physics II for Engineering and Physics Students</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>or 33-152 Matter and Interactions II</td>
<td></td>
</tr>
</tbody>
</table>

Mathematical Sciences Electives (2 courses, 18 units)

Students with a Music concentration should take 21-272 Introduction to Partial Differential Equations.

Mathematical Sciences, Statistics, or Computer Science Electives (2 courses, 18 units)

May be computer science course above the 100-level, mathematical science courses beyond the calculus sequence, and statistics courses at the level of 36-225 or higher.

Neurobiology Concentration (114 units minimum)

Neurobiology Required Courses (12 courses, 96 units)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-161</td>
<td>Molecules to Mind</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>or 85-219 Biological Foundations of Behavior</td>
<td></td>
</tr>
<tr>
<td>03-201</td>
<td>Undergraduate Colloquium for Sophomores</td>
<td>2</td>
</tr>
<tr>
<td>03-220</td>
<td>Genetics - Fall, Sophomore year</td>
<td>9</td>
</tr>
<tr>
<td>03-231</td>
<td>Honors Biochemistry - Spring, Sophomore year</td>
<td>9</td>
</tr>
<tr>
<td>03-320</td>
<td>Cell Biology - Fall, Junior year</td>
<td>9</td>
</tr>
<tr>
<td>03-342</td>
<td>Introduction to Biological Laboratory Practices</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>- Fall, Junior year</td>
<td></td>
</tr>
<tr>
<td>03-343</td>
<td>Experimental Techniques in Molecular Biology -</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Fall, Junior year</td>
<td></td>
</tr>
<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>09-217</td>
<td>Organic Chemistry I</td>
<td>9</td>
</tr>
<tr>
<td>33-122</td>
<td>Physics II for Biological Sciences and Chemistry Students</td>
<td>9</td>
</tr>
<tr>
<td>85-211</td>
<td>Cognitive Psychology</td>
<td>9</td>
</tr>
</tbody>
</table>

Neurobiology Electives (2 courses, 18 units)

One course must be an advanced elective selected from 03-3xx or higher.

Physics Concentration (134 units minimum)

Physics Required Courses (116 units)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-259</td>
<td>Calculus in Three Dimensions</td>
<td>9</td>
</tr>
<tr>
<td>33-104</td>
<td>Experimental Physics</td>
<td>9</td>
</tr>
<tr>
<td>33-142</td>
<td>Physics II for Engineering and Physics Students</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>or 33-152 Matter and Interactions II</td>
<td></td>
</tr>
<tr>
<td>33-201</td>
<td>Physics Sophomore Colloquium I - Fall</td>
<td>2</td>
</tr>
<tr>
<td>33-202</td>
<td>Physics Sophomore Colloquium II - Spring</td>
<td>2</td>
</tr>
<tr>
<td>33-211</td>
<td>Physics III: Modern Essentials</td>
<td>10</td>
</tr>
<tr>
<td>33-228</td>
<td>Electronics I</td>
<td>10</td>
</tr>
<tr>
<td>33-231</td>
<td>Physical Analysis</td>
<td>10</td>
</tr>
<tr>
<td>33-232</td>
<td>Mathematical Methods of Physics</td>
<td>10</td>
</tr>
<tr>
<td>33-234</td>
<td>Quantum Physics</td>
<td>10</td>
</tr>
<tr>
<td>33-301</td>
<td>Physics Upperclass Colloquium I - Fall</td>
<td>1</td>
</tr>
<tr>
<td>33-302</td>
<td>Physics Upperclass Colloquium II - Spring</td>
<td>1</td>
</tr>
<tr>
<td>33-331</td>
<td>Physical Mechanics I</td>
<td>10</td>
</tr>
<tr>
<td>33-338</td>
<td>Intermediate Electricity and Magnetism I</td>
<td>10</td>
</tr>
<tr>
<td>33-340</td>
<td>Modern Physics Laboratory</td>
<td>10</td>
</tr>
<tr>
<td>33-341</td>
<td>Thermal Physics I</td>
<td>10</td>
</tr>
</tbody>
</table>

Physics Electives (2 courses, 18 units)

Two courses to be pre-approved by the Physics Department.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>33-xxx</td>
<td>Two Physics Electives</td>
<td>18</td>
</tr>
</tbody>
</table>
III. College of Fine Arts Concentration

(number of courses vary, 108 units minimum)

BSA students choose one of the following concentrations:

- Architecture (108 units)
- Art (108 units)
- Drama (108 units)
- Music (108 units)

Architecture Concentration (108 units minimum)

Architecture Required Courses (52 units minimum)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-100</td>
<td>Architecture Design Studio: Foundation I - Fall</td>
<td>10</td>
</tr>
<tr>
<td>or 48-095</td>
<td>Spatial Concepts for Non-Architects I</td>
<td>12</td>
</tr>
<tr>
<td>62-122</td>
<td>Digital Media I - Fall</td>
<td>6</td>
</tr>
<tr>
<td>62-125</td>
<td>Drawing I - Fall, Freshman year</td>
<td>6</td>
</tr>
<tr>
<td>62-123</td>
<td>Digital Media II - Spring</td>
<td>6</td>
</tr>
<tr>
<td>62-126</td>
<td>Drawing II - Spring, Freshman year</td>
<td>6</td>
</tr>
<tr>
<td>48-240</td>
<td>Historical Survey of World Architecture and Urbanism</td>
<td>9</td>
</tr>
<tr>
<td>48-241</td>
<td>Modern Architecture - Fall, Sophomore year</td>
<td>9</td>
</tr>
</tbody>
</table>

Architecture Electives (56 units minimum)

- A minimum of 56 additional Architecture units must be approved by the Architecture advisor. A list of these selected courses must be filed in the BXA office.

Art Concentration (108 units minimum)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Concept Studios (2 courses, 20 units)

Complete two courses:

- 60-101 Concept Studio: The Self and the Human Being (10 units)
- 60-201 Concept Studio: Space and Time (10 units)
- 60-202 Concept Studio: Systems and Processes (10 units)
- 60-280 Introduction to Contextual Practice (10 units)

Media Studios (3 courses, 30 units)

Complete three courses:

- 60-150 2D Media Studio: Drawing (10 units)
- 60-160 2D Media Studio: Imaging (10 units)
- 60-250 2D Media Studio: Painting (10 units)
- 60-251 2D Media Studio: Print Media (10 units)
- 60-130-60-130 3-D Media Studio I-I (complete two minis, 5 units each) (10 units)
- 60-131-60-131 3D Media Studio II-II (complete two minis, 5 units each) (10 units)
- 60-240 Electronic Media Studio: Introduction to the Moving Image (10 units)
- 60-210 Electronic Media Studio: Introduction to Interactivity (10 units)

Advanced Studios (4 courses, 40 units)

Complete four courses. Courses may be offered in the fall and/or spring. Students may take courses in any media area (ETB, SIS, CP or DP3). They may take all courses in one media area if a focus is desired.

- 60-401/402 Senior Studio (10 units)
- 60-403 Senior Critique Seminar (10 units)
- 60-410 - 60-429 Advanced Electronic and Time-Based Work (ETB) (10 units)
- 60-430 - 60-447 Advanced Sculpture, Installation and Site-Work (SIS) (10 units)
- 60-448 - 60-449 Advanced Contextual Practice (CP) (10 units)

Dramaturgy Concentration (108 units minimum)

AUDITION/INTERVIEW REQUIRED FOR DIRECTING OR DRAMATURGY CONCENTRATION OPTION. PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR DESIGN OR PRODUCTION TECHNOLOGY AND MANAGEMENT CONCENTRATION OPTION.

Options available in the following areas: 1) Design, 2) Directing, 3) Dramaturgy, 4) Production Technology and Management

Note: There is no BSA Acting or Musical Theatre option.

Required Courses for All Concentration Options (20 units)

- 54-175-54-176 Conservatory Hour - Conservatory Hour (1 unit each) (2 units)
- 54-177 Foundations of Drama I (6 units)
- 54-281 Foundations of Drama II (prerequisite: 54-177) (6 units)
- 54-381 Special Topics in Drama: History, Literature and Criticism (6 units)

Work with Drama Faculty Option Coordinator to Approve Concentration Option (88 units minimum):

- 54-151-54-152 Stagecraft - Stagecraft (13 units + 13 units) (26 units)

A minimum of 62 additional Design units must be approved by the Design faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Directing Required Courses (52 units)

- 54-121-54-122 Directing I: Sources - Directing I: Sources (18 units)
- 54-221-54-222 Directing II: Fundamentals - Directing II: Fundamentals (18 units)
- 54-159-54-159 Production Practicum - Production Practicum (two times, 12 units total) (12 units)
- 54-517 Director's Colloquium (four times, 4 units total) (1 unit)

A minimum of 26 additional Directing units must be approved by the Directing faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Dramaturgy Required Courses (53 units minimum)

- 54-109 Dramaturgy 1: Approaches to Text (9 units)
- 54-184 Dramaturgy 2: Introduction to Production Dramaturgy (9 units)
- 54-121 Directing I: Sources (9 units)
- 54-159-54-159 Production Practicum - Production Practicum (two times, 12 units total) (12 units)
- 54-200-54-200 Dramaturgy Forum - Dramaturgy Forum - Fall (minimum of two; every semester it is offered while enrolled) (2 units)
- 54-3xx Dramaturgy 3, 4, 5 or 6 (minimum of two; all four if enrolled as BXA for six semesters or more) (18 units)

A minimum of 29 additional Dramaturgy units must be approved by the Dramaturgy faculty option coordinator. A list of these selected courses must be filed in the BXA office.
Production Technology and Management Required Courses (26 units)
54-151-54-152 Stagecraft-Stagecraft 26
(13 units + 13 units)

A minimum of 62 additional PTM units must be approved by the PTM faculty option coordinator. A list of these selected courses must be filed in the BXA office.

Music Concentration (108 units minimum)

AUDITION REQUIRED FOR PERFORMANCE CONCENTRATION OPTION.
PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR COMPOSITION, MUSICOLGY, AUDIO RECORDING & PRODUCTION, OR SOUND THEORY & PRACTICE CONCENTRATION OPTION.

Options available in the following areas: 1) Performance (instrumental, piano, organ, voice), 2) Composition 3) Musicology, 4) Audio Recording & Production, 5) Sound Theory & Practice

Required Course for All Concentration Options (9 units)
57-152 Harmony I -Fall 9
or 57-149 Basic Harmony I

Work with Music Advisor to Approve Concentration Option (99 units minimum):

Performance and Composition Required Courses (76 units)
57-161 Eurythmics I -Fall (recommended co-requisite: 57-181) 3
57-181 Solfege I -Fall 3
or 57-180 Basic Solfege I
or 57-185 Advanced Solfege I
57-173 Survey of Western Music History -Fall (co-require: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-69x BXA Studio (4 semesters) 36
57-xxxx Major Ensemble (4 semesters) 24

A minimum of 23 additional Music units must be approved by the Music advisor. A list of these selected courses must be filed in the BXA office.

Musicology Required Courses (45 units)
57-283 Music History I (co-requisite: 57-190) 9
57-284 Music History II (co-requisite: 57-289) 9
57-285 Music History III (co-requisite: 57-290) 9
57-189 Introduction to Repertoire and Listening for Musicians 3
57-190 Repertoire and Listening for Musicians I 3
57-289 Repertoire and Listening for Musicians II 3
57-290 Repertoire and Listening for Musicians III 3
57-404 String Quartet: A Social History 9
57-405 Concerto: Virtuosity and Contrast 9
57-409 Puccini’s Operas 9
57-427 Advanced Seminar in Film Musicology 9
57-485 History of the Symphony 9
57-611 Independent Study in History 6

Choose 36 units from:
57-209 The Beatles 9
57-306 World Music 9
57-477 Music of the Spirit 6
57-478 Survey of Historical Recording 6
57-480 History of Black American Music 6

A minimum of 18 additional Music units must be approved by the Music advisor. A list of these selected courses must be filed in the BXA office.

Audio Recording & Production Required Courses (40 units)
57-101 Introduction to Music Technology 6
or 57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I -Fall 3

or 57-180 Basic Solfege I
57-173 Survey of Western Music History -Fall (co-require: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-337 Sound Recording 6
57-338 Sound Editing and Mastering 6
57-438 Multitrack Recording 9

Choose 59 units from:
57-153 Harmony II -Spring 9
or 57-150 Basic Harmony II
57-182 Solfege II 3
or 57-186 Advanced Solfege II
15-104 Introduction to Computing for Creative Practice 10
18-090 Twisted Signals: Multimedia Processing for the Arts 10
33-114 Physics of Musical Sound 9
54-166 Introduction to Sound Design for Theatre 6
54-275 History of Sound Design 3
54-666 Production Audio 6
57-344 Experimental Sound Synthesis 9
57-421 The Exploded Ensemble 6
57-423 Expanded Music Performance 9
57-427 Advanced Seminar in Film Musicology 9
57-478 Survey of Historical Recording 6
57-622 Independent Study in Sound Recording Production Var.
60-131 3D Media Studio II 5
60-210 Electronic Media Studio: Introduction to Interactivity 10

Note: Students completing an IDeATe minor may double-count up to two of the IDeATe minor courses towards the Audio Recording & Production concentration.

Sound Theory & Practice Required Courses (47 units)
57-101 Introduction to Music Technology 6
or 57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I -Fall 3
or 57-180 Basic Solfege I
or 57-185 Advanced Solfege I
57-173 Survey of Western Music History -Fall (co-require: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
18-090 Twisted Signals: Multimedia Processing for the Arts 10
57-911 Music Since 1945 9
57-616 Independent Study in Sound Studies 9

Choose 52 units from:
57-153 Harmony II -Spring 9
or 57-150 Basic Harmony II
57-182 Solfege II 3
or 57-186 Advanced Solfege II
15-104 Introduction to Computing for Creative Practice 10
15-322 Introduction to Computer Music (pre-require: 15-112) 9
15-323 Computer Music Systems and Information Processing (pre-require: 15-122) 9
33-114 Physics of Musical Sound 9
57-337 Sound Recording 6
57-343 Interdisciplinary Studies in Listening, Culture, and Technology 9
57-344 Experimental Sound Synthesis 9
57-347 Electronic and Computer Music (pre-require: 57-101 or 57-171) 6
57-421 The Exploded Ensemble 6
57-425 Expanded Music Performance 9
57-438 Multitrack Recording 9
### Engineering and Arts Additional Major

Carnegie Mellon recognizes that there are STEM-minded students who want the opportunity to formally incorporate their fine arts talents with their current study in engineering. In order to accommodate students who wish to pursue an education in both areas, while retaining the full engineering curriculum and licensure, we offer an additional major that combines the strengths of the College of Fine Arts (CFA) and the College of Engineering (E). The Engineering and Arts (EA) additional major is an interdisciplinary program that offers a unique group of qualified Engineering students the foundation to develop their skills and interests in an area of the fine arts and engineering.

The EA curriculum has two main components: BXA requirements and fine arts concentration requirements. Each student's course of study is structured so it can be completed alongside their primary engineering major.

Students who currently have a primary major in engineering, choose their arts concentration from the School of Art in CFA. (CFA concentrations in Architecture, Drama and Music may be available during the 2018-19 academic year.) A student must meet the entry requirements for the particular CFA school of their choice. While in the EA Program, a student may change their CFA concentration only if they pass all admission requirements for that particular school.

The EA Additional Major Program is governed by faculty and administrators from both colleges and led by the director of the BXA Intercollege Degree Programs. Students receive extensive advising support. The academic advisors in the BXA Intercollege Degree Programs are the advisors and liaisons between CFA and Engineering. Each student has two additional academic advisors: an advisor in the admitting school of CFA to guide their focus in the arts, and their primary advisor in Engineering to guide their full major in engineering.

### Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. BXA Requirements</strong></td>
<td><strong>36</strong></td>
</tr>
<tr>
<td><strong>II. CFA Concentration</strong></td>
<td><strong>108</strong></td>
</tr>
<tr>
<td><strong>Total EA Additional Major Requirements</strong></td>
<td><strong>144</strong></td>
</tr>
</tbody>
</table>

### I. BXA Requirements

**BXA Required Courses (5 courses, 36 units minimum)**

BXA-specific courses give students the opportunity to integrate their areas of concentration by focusing on interdisciplinary approaches and arts-based research techniques.

- 52-190 BXA Seminar I: Building the Wunderkammer or 52-291 BXA Seminar II: Transferring Knowledge 9
- 52-391 BXA Junior Portfolio 0
- 52-392 BXA Seminar III: Deconstructing Disciplines 9
- 52-401 BXA Seminar IV: Capstone Project Research 9
- 52-402 BXA Seminar V: Capstone Project Production 9

Note: Students completing an IDeATe minor may double-count up to two of the IDeATe minor courses towards the Sound Theory & Practice concentration.

### IV. Free Electives

(approximately 1-3 courses, 9-29 units)

Take any Carnegie Mellon course. A maximum of 9 units of physical education and/or military science may be counted toward this requirement. Physical education and military science courses will not be calculated in a student's QPA.

### II. College of Fine Arts Concentration

**Arts Concentration (108 units minimum)**

**PORTFOLIO REQUIRED FOR ADMISSION**

**Concept Studios (2 courses, 20 units)**

Complete two courses:

- 60-101 Concept Studio: The Self and the Human Being 10
- 60-201 Concept Studio: Space and Time 10
- 60-202 Concept Studio: Systems and Processes 10
- 60-280 Introduction to Contextual Practice 10

**Media Studios (3 courses, 30 units)**

Complete three courses:

- 60-150 2D Media Studio: Drawing 10
- 60-160 2D Media Studio: Imaging 10
- 60-250 2D Media Studio: Painting 10
- 60-251 2D Media Studio: Print Media 10
- 60-130-60-130 3-D Media Studio I-I (complete two minis, 5 units each) 10
- 60-131-60-131 3-D Media Studio II-II (complete two minis, 5 units each) 10
- 60-110 Electronic Media Studio: Introduction to the Moving Image 10
- 60-210 Electronic Media Studio: Introduction to Interactivity 10

**Advanced Studios (4 courses, 40 units)**

Complete four courses. Courses may be offered in the fall and/or spring. Students may take courses in any media area (ETB, SIS, CP or DP3). They may take all courses in one media area if a focus is desired.

- 60-401/402 Senior Studio 10
- 60-403 Senior Critique Seminar 10
- 60-4xx Advanced Electronic and Time-Based Work (ETB) 10
- 60-4xx Advanced Sculpture, Installation and Site-Work (SIS) 10
- 60-4xx Advanced Drawing, Painting, Print Media and Photography (DP3) 10
- 60-499 Studio Independent Study (one only) 10

**Art History/Theory (2 courses, 18 units)**

- 60-205 Critical Theory in Art III- Fall 9
- 60-206 Critical Theory in Art IV- Spring 9

**Review Requirement (Complete 2 Required Reviews, 0 units)**

A review is required at the end of the sophomore and senior years. Pass/no pass only.

- 60-200 Sophomore Review- Spring 0
- 60-400 Senior Review- Fall 0

### Academic Standards

#### Professional and Community Standards

As a condition of enrollment BXA, and as a student in the College of Fine Arts, we expect you to positively contribute to the community in order to fully engage in the intellectual life at CFA. Classrooms, studios, rehearsal and performance spaces, exhibition venues, and off-campus curricular destinations are safe spaces for expression and self-identification. Students are expected to treat everyone with respect, regardless of race, country of origin, gender identity and expression, sexual orientation, disability, physical appearance, age, religion, political affiliation, or marital status. Lack of respect and harassment includes offensive comments related to any protected personal characteristic, deliberate intimidation, sustained disruption of speech, inappropriate physical contact, and unwelcome sexual attention. Violations of this agreement are subject to a response to be determined by the BXA Director and CFA Associate Deans.

#### Academic Actions

The academic performance of each BXA student is reviewed at the end of each semester. Academic actions are initiated by the Director
of the BXA Intercollege Degree Programs when students have not met minimum academic progress standards. A recommendation is presented to the associate deans of the appropriate colleges and Academic Actions Committee of the College of Fine Arts for confirmation. An appeals process is available to the student; these processes are listed under the specific program below.

Students with an academic action on their record may not be allowed to overload classes, cross-register for classes, or participate in study abroad during the semester the action is in effect, at the discretion of the student’s BXA, CFA, and academic college advisors. The academic actions listed below do not follow a particular sequence; any of these actions may be imposed at any time.

BCSA ACADEMIC ACTIONS

BCSA students are expected to maintain a 3.0 quality point average (QPA). If a student’s semester QPA falls below 2.5 at the end of the semester this signals an advising response. The student will be asked to meet with their BCSA Program advisor to discuss strategies to improve their academic performance.

If a student receives “C” or “D” grades in computer science courses (15-xxx) the student will be required to consult with their SCS advisor to discuss strategies to improve their academic performance.

If a student has two consecutive semesters with a semester QPA below 2.5, the BXA Director will meet with the student and carefully evaluate the situation in consultation with the student’s advisors in SCS and CFA. If it seems in the best interest of the student, the student may be advised to transfer out of the BCSA Program and into SCS or CFA.

Warning

A Warning is intended to notify the student of unsatisfactory performance and to suggest that the student take steps to determine and correct the cause of the difficulty. A Warning is imposed when a student’s cumulative QPA drops below a 2.75.

Conditions for removing a Warning: the student must receive at least a 3.0 QPA in the following semester, and at least a 2.5 cumulative QPA, with at least 36 units, no incompletes, and no grades less than a “C”. Otherwise the student may continue on Warning, or, depending on individual grades, the action could escalate to Probation, Final Probation, or Drop from the BCSA Program.

Probation

Probation is imposed when a student receives a “D” or “R” grade in a required CFA concentration course, or an “R” in a required SCS course, or if the student’s semester QPA is below a 2.0 (1.75 for freshmen).

Conditions for removing Probation: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes and no grades less than a “C”. The student will be moved to Warning if they meet these conditions, but the cumulative QPA is still between 2.5 and 2.75. Otherwise the student may continue on Probation, or, depending on the individual grades, the action could escalate to Final Probation, or Drop from the BCSA Program.

Final Probation

Final Probation is imposed when a student receives two or more “D” or “R” grades in required SCS or CFA concentration courses, or if the student’s semester QPA is below 2.0 (1.75 for freshmen) for the second consecutive semester.

Conditions for removing Final Probation: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes, and no grades less than a “C”. The student will be moved to Probation if they meet these conditions but their cumulative QPA is still between 2.0 and 2.49. They will be moved to Warning if they meet these conditions but their cumulative QPA is between 2.5 and 2.75. Otherwise the student may continue on Final Probation or, depending on individual grades, the action could escalate to Drop from the BCSA Program.

Academic Suspension

Academic suspension may be imposed when a student fails to meet the minimum semester or cumulative requirements for two consecutive semesters, and/or if a student has been on Final Probation for more than two semesters. Failure to maintain adequate progress toward graduation may also be a contributing factor in such decisions.

The minimum period of academic suspension is one semester, during which a student on academic suspension is expected to reflect on the circumstances leading up to the suspension, identify the issues that prevented them from achieving academic success, and take actions that address these issues and demonstrate sufficient readiness to return to the university and successfully resume their studies. These actions could include a work or internship experience, a limited amount of approved academic course work at another college or university, and — if relevant — appropriate medical care.

Midway through the semester before a suspended student is eligible to return to the university, they will be notified by the BXA Director with detailed instructions about the process for requesting approval to return and re-enroll.

Once cleared to return from academic suspension, the Enrollment Services office will be notified and the student will be eligible to enroll. While on academic suspension, students are considered to be on a mandatory “leave of absence,” and are governed by college and university policies concerning leaves of absence and withdrawals.

Drop from the BCSA Program

If a student has two consecutive semesters receiving “D” or “R” grades in required SCS and/or CFA concentration courses, the BXA Director will carefully evaluate the student’s situation in consultation with the student’s SCS and CFA advisors. At this time, the student may be advised to transfer out of the BCSA Program, or they may be dropped from the BCSA Program.

If a student has two consecutive semesters with a cumulative QPA below 2.0, and the student shows no progress or improvement in their academic performance, they can be dropped from the BCSA Program.

If a student is dropped from BCSA, they may be able to successfully transfer into SCS or CFA as a traditional full major, depending on their academic performance. If the student is doing poorly in both SCS and CFA courses, then the student should consider the following options:

• Transfer to another department/school within the university. The student is responsible for contacting the department/school of choice to discuss possible transfer.
• Request Transitional Student status in the College of Fine Arts for one semester. A student must make an appointment with the Associate Dean of the College of Fine Arts to discuss this option.
• Withdraw from Carnegie Mellon University. A Withdrawal/Leave of Absence form is available in the BXA office or in Enrollment Services.

Appeal of Academic Action

If a student believes an academic action is inconsistent with the policies of the college or merits additional review, a student should submit a formal written appeal, as specified in the initial academic action, to the associate deans of CFA and SCS listed below, with a copy to the deans of CFA and SCS, requesting review of the action including all relevant materials to substantiate their case and support their concerns.

Appeals should be addressed to:

Kristen Letts Kovak, Senior Associate Dean for Academics, College of Fine Arts
Guy Belloch, Associate Dean for Undergraduate Education, Computer Science Department

The deans will review the appeal and issue a decision and the basis for it within thirty (30) days.

If a student chooses to contest a Suspension or Drop, they must appeal to the associate deans within seven days from the date they were notified. All appeals should be in written form, under three pages in length, and authored by the student.

If, after carrying out the steps of either process described above, the student believes that the matter has not been adequately resolved, or if no decision has been rendered by the appropriate date, the student may appeal at the university level. To appeal at the university level, the student must present copies of all previously submitted documents and a formal letter of appeal to the provost. The provost or another designated university officer will respond in writing with a final resolution, including the basis for it, within thirty (30) days, or as soon thereafter as practical.

BHA Academic Actions

BHA students are expected to maintain a 3.0 quality point average (QPA). If a student’s semester QPA falls below 3.0 at the end of the semester this signals an advising response. The student will be asked to meet with their BHA Program advisor to discuss strategies to improve his/her academic performance.

If a student has two consecutive semesters with a semester QPA below 3.0, the BXA Director will meet with the student and carefully evaluate the situation in consultation with the student’s advisors in DC and CFA. If it seems in the best interest of the student, the student may be advised to transfer out of the BHA Program and into DC or CFA.

Warning

A Warning is intended to notify the student of unsatisfactory performance and to suggest that the student take steps to determine and correct the cause of the difficulty. A Warning is imposed when a student’s semester QPA falls below 2.5 at the end of the semester this signals an advising response. The student will be asked to meet with their BCSA Program advisor to discuss strategies to improve his/her academic performance.

Conditions for removing a Warning: the student must receive at least a 3.0 QPA in the following semester, and at least a 2.75 cumulative QPA, with at least 36 units, no incompletes, and no grades less than a “C”. Otherwise the student may continue on Warning, or, depending on individual grades, the action could escalate to Final Probation, or Drop from the BCSA Program.

Absence form is available in the BXA office or in Enrollment Services.
least 36 units, no incompletes, and no grades less than a “C.” Otherwise the student may continue on Probation, or, depending on individual grades, the action could escalate to Final Probation, or Drop from the BHA Program.

Probation
Probation is imposed when a student receives a “D” or “R” grade in a required CFA concentration course, or an “R” in a required DC course, or if the student’s semester GPA is below 2.0.

Conditions for removing Probation: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes and no grades less than a “C”. The student will be moved to Warning if they meet these conditions, but their cumulative QPA is still between 2.5 and 2.75. Otherwise the student may continue on Probation, or, depending on individual grades, the action could escalate to Final Probation, or Drop from the BHA Program.

Final Probation
Final Probation is imposed when a student receives two or more “D” or “R” grades in required DC or CFA concentration courses, or if the student’s semester GPA is below 2.0 (1.75 for freshmen) for the second consecutive semester.

Conditions for removing Final Probation: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes and no grades less than a “C”. The student will be moved to Warning if they meet these conditions, but their cumulative QPA is still between 2.5 and 2.75. Otherwise the student may continue on Final Probation, or, depending on individual grades, the action could escalate to Drop from the BHA Program.

Academic Suspension
Academic suspension may be imposed when a student fails to meet the minimum semester or cumulative requirements for two consecutive semesters, and/or if a student has been on Final Probation for more than two semesters. Failure to maintain adequate progress toward graduation may also be a contributing factor in such decisions.

The minimum period of academic suspension is one semester, during which a student on academic suspension is expected to reflect on the circumstances leading up to the suspension, identify the issues that prevented them from achieving academic success, and take actions that address these issues and demonstrate sufficient readiness to return to the university and successfully resume their studies. These actions could include a work or internship experience, a limited amount of approved academic course work at another college or university, and—if relevant—appropriate medical care.

Midway through the semester before a suspended student is eligible to return to the university, they will be notified by the BXA Director with detailed instructions about the process for requesting approval to return and re-enroll.

Once cleared to return from academic suspension, the Enrollment Services office will be notified and the student will be eligible to enroll. While on academic suspension, students are considered to be on a mandatory “leave of absence,” and are governed by college and university policies concerning leaves of absence and withdrawals.

Drop from the BHA Program
If a student has two consecutive semesters receiving “D” or “R” grades in required DC and/or CFA concentration courses, the BXA Director will carefully evaluate the student’s situation in consultation with the student’s DC and CFA advisors. At this time, the student may be advised to transfer out of the BHA Program, or they may be dropped from the BHA Program.

If a student has two consecutive semesters with a cumulative QPA below 2.5, and the student shows no progress or improvement in their academic performance, they can be dropped from the BHA Program.

If a student is dropped from BHA, they may be able to successfully transfer into DC or CFA as a traditional full major, depending on their academic performance. If the student is doing poorly in both DC and CFA courses, then the student should consider the following options:

- Transfer to another department/school within the university. The student is responsible for contacting the department/school of choice to discuss possible transfer.
- Request Transitional Student status in the College of Fine Arts for one semester. A student must make an appointment with the Associate Dean of the College of Fine Arts to discuss this option.
- Withdraw from Carnegie Mellon University. A Withdrawal/Leave of Absence form is available in the BXA office or in Enrollment Services.

Appeal of Academic Action
If a student believes an academic action is inconsistent with the policies of the college or merits additional review, a student should submit a formal written appeal, as specified in the initial academic action, to the associate deans of CFA and DC listed below, with a copy to the deans of BSA and DC, requesting review of the action including all relevant materials to substantiate their case and support their concerns.

Appeals should be addressed to:
Kristen Letts Kovak, Senior Associate Dean for Academics, College of Fine Arts
Ana Maria Ulloa-Shields, Assistant Dean and Director, Dietrich College Academic Advisory Center.

The dean will review the appeal and issue a decision and the basis for it within thirty (30) days.

If a student chooses to contest a Suspension or Drop, they must appeal to the associate deans within seven days from the date they were notified. All appeals should be in written form, under three pages in length, and authored by the student.

If, after carrying out the steps of either process described above, the student believes that the matter has not been adequately resolved, or if no decision has been rendered by the appropriate date, the student may appeal at the university level. To appeal at the university level, the student must present copies of all previously submitted documents and a formal letter of appeal to the provost. The provost or another designated university officer will respond in writing with a final resolution, including the basis for it, within thirty (30) days, or as soon thereafter as practical.

BSA Academic Actions
BSA students are expected to maintain a 3.0 quality point average (QPA). If a student’s semester QPA falls below 2.75 at the end of the semester this signals an advising response. The student will be asked to meet with their BSA Program advisor to discuss strategies to improve their academic performance.

If a student receives “C” and “D” grades in calculus and/or physics courses the student will be required to consult with their MCS advisor to discuss strategies to improve their academic performance.

If a student has two consecutive semesters with a semester QPA below 2.75, the BXA Director will meet with the student and carefully evaluate the situation in consultation with the student’s advisors in MCS and CFA. If it seems in the best interest of the student, the student may be advised to transfer out of the BSA Program and into MCS or CFA.

Warning
A Warning is intended to notify the student of unsatisfactory performance and to suggest that the student take steps to determine and correct the cause of the difficulty. A Warning is imposed when a student receives a “D” in a required MCS concentration course, or if the student’s semester QPA is between 2.0 and 2.49, or if the cumulative QPA drops below 2.75.

Conditions for removing Warning: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes and no grades less than a “C”. Otherwise the student may continue on Warning, or, depending on individual grades, the action could escalate to Probation, Final Probation, or Drop from the BSA Program.

Probation
Probation is imposed when a student receives a “D” or “R” grade in a required CFA concentration course, or an “R” in a required MCS course, or if the student’s semester QPA is below 2.0.

Conditions for removing Probation: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes and no grades less than a “C”. The student will be moved to Warning if they meet these conditions, but their cumulative QPA is still between 2.5 and 2.75. Otherwise the student may continue on Probation, or, depending on individual grades, the action could escalate to Final Probation, or Drop from the BSA Program.

Final Probation
Final Probation is imposed when a student receives two or more “D” or “R” grades in required MCS or CFA concentration courses, or if the student’s semester QPA is below 2.0 (1.75 for freshmen) for the second consecutive semester.

Conditions for removing Final Probation: the student must receive at least a 3.0 QPA in the following semester, with at least 36 units, no incompletes, and no grades less than a “C”. The student will be moved to Probation if they meet these conditions, but their cumulative QPA is still between 2.5 and 2.75. Otherwise the student may continue on Final Probation, or, depending on individual grades, the action could escalate to Drop from the BSA Program.

Academic Suspension
Academic suspension may be imposed when a student fails to meet the minimum semester or cumulative requirements for two consecutive semesters, and/or if a student has been on Final Probation for more than two semesters. Failure to maintain adequate progress toward graduation may also be a contributing factor in such decisions.

The minimum period of academic suspension is one semester, during which a student on academic suspension is expected to reflect on the circumstances leading up to the suspension, identify the issues that prevented them from achieving academic success, and take actions that address these issues and demonstrate sufficient readiness to return to the university and successfully resume their studies. These actions could include a work or internship experience, a limited amount of approved academic course work at another college or university, and—if relevant—appropriate medical care.

Midway through the semester before a suspended student is eligible to return to the university, they will be notified by the BXA Director with detailed instructions about the process for requesting approval to return and re-enroll.

Once cleared to return from academic suspension, the Enrollment Services office will be notified and the student will be eligible to enroll. While on academic suspension, students are considered to be on a mandatory “leave of absence,” and are governed by college and university policies concerning leaves of absence and withdrawals.

Drop from the BHA Program
If a student has two consecutive semesters receiving “D” or “R” grades in required DC and/or CFA concentration courses, the BXA Director will carefully evaluate the student’s situation in consultation with the student’s DC and CFA advisors. At this time, the student may be advised to transfer out of the BHA Program, or they may be dropped from the BHA Program.

If a student has two consecutive semesters with a cumulative QPA below 2.5, and the student shows no progress or improvement in their academic performance, they can be dropped from the BHA Program.

If a student is dropped from BHA, they may be able to successfully transfer into DC or CFA as a traditional full major, depending on their academic performance. If the student is doing poorly in both DC and CFA courses, then the student should consider the following options:

- Transfer to another department/school within the university. The student is responsible for contacting the department/school of choice to discuss possible transfer.
- Request Transitional Student status in the College of Fine Arts for one semester. A student must make an appointment with the Associate Dean of the College of Fine Arts to discuss this option.
- Withdraw from Carnegie Mellon University. A Withdrawal/Leave of Absence form is available in the BXA office or in Enrollment Services.

If a student believes an academic action is inconsistent with the policies of the college or merits additional review, a student should submit a formal written appeal, as specified in the initial academic action, to the associate
semester, and/or if a student has been on Final Probation for more than two semesters. Failure to maintain adequate progress toward graduation may also be a contributing factor in such decisions.

The minimum period of academic suspension is one semester, during which a student on academic suspension is expected to reflect on the circumstances leading up to the suspension, identify the issues that prevented them from achieving academic success, and take actions that address these issues and demonstrate sufficient readiness to return to the university and successfully resume their studies. These actions could include a work or internship experience, a limited amount of approved academic course work at another college or university, and — if relevant — appropriate medical care.

Midway through the semester before a suspended student is eligible to return to the university, they will be notified by the BXA Director with detailed instructions about the process for requesting approval to return and re-enroll.

Once cleared to return from academic suspension, the Enrollment Services office will be notified and the student will be eligible to enroll. While on academic suspension, students are considered to be on a mandatory “leave of absence,” and are governed by college and university policies concerning leaves of absence and withdrawals.

Drop from the BSA Program

If a student has two consecutive semesters receiving “D” or “R” grades in required MCS and/or CFA concentration courses, the BXA Director will carefully evaluate the student’s situation in consultation with the student’s MCS and CFA advisors. At this time, the student may be advised to transfer out of the BSA Program, or they may be dropped from the BSA Program.

If a student has two consecutive semesters with a cumulative QPA below 2.5, and the student shows no progress or improvement in their academic performance, they can be dropped from the BSA Program.

If a student is dropped from BSA, they may be able to successfully transfer into MCS or CFA as a traditional full major, depending on their academic performance. If the student is doing poorly in both MCS and CFA courses, then the student should consider the following options:

- Transfer to another department/school within the university. The student is responsible for contacting the department/school of choice to discuss possible transfer.
- Request Transitional Student status in the College of Fine Arts for one semester. A student must make an appointment with the Associate Dean of the College of Fine Arts to discuss this option.
- Withdraw from Carnegie Mellon University. A Withdrawal/Leave of Absence form is available in the BXA office or in Enrollment Services.

Appeal of Academic Action

If a student believes an academic action is inconsistent with the policies of the college or merits additional review, a student should submit a formal written appeal, as specified in the initial academic action, to the associate deans of CFA and MCS listed below, with a copy to the deans of CFA and MCS, requesting review of the action including all relevant materials to substantiate their case and support their concerns.

Appeals should be addressed to:
Kristen Letts Kovak, Senior Associate Dean for Academics, College of Fine Arts
Maggie Braun, Associate Dean for Undergraduate Affairs, Mellon College of Science

The deans will review the appeal and issue a decision and the basis for it within thirty (30) days.

If a student chooses to contest a Suspension or Drop, they must appeal to the associate deans within seven days of the date they were notified. All appeals should be in written form, under three pages in length, and authored by the student.

If, after carrying out the steps of either process described above, the student believes that the matter has not been adequately resolved, or if no decision has been rendered by the appropriate date, the student may appeal at the university level. To appeal at the university level, the student must present copies of all previously submitted documents and a formal letter of appeal to the provost. The provost or another designated university officer will respond in writing with a final resolution, including the basis for it, within thirty (30) days, or as soon thereafter as practical.

School Suspension

School Suspension is not applicable to the BCSA, BHA and BSA Programs.

University Suspension

University Suspension is imposed for exceptionally poor performance or for personal problems that create an impediment to any academic achievement. The student is required to withdraw from the university for a specific period. Re-admission is subject to conditions specified in each case by the Director of the BXA Intercollege Degree Programs.

Study Abroad While on Academic Action

BSA students with a cumulative QPA between 2.5 - 3.0 wishing to spend a semester abroad will need the BXA Director’s special permission.

BSA students with a cumulative QPA below 2.5 will not be allowed to pursue studies abroad.

Disabilities

Students with a learning disability or a physical disability are encouraged to email access@andrew.cmu.edu. The circumstances will remain confidential to the extent desired. The university has a formal procedure for documenting disabilities, notifying advisors and faculty, and making arrangements to utilize university resources in support of expressed needs, but will take no action until contacted by the student. The BXA academic advisors will work with the student to coordinate assistance.

Grading Policies

University grading policies may vary depending on the particular school/department. Please consult the Undergraduate Academic Regulations (http://coursecatalog.web.cmu.edu/servicesandoptions/undergraduateacademicregulations).

Intercollege Deans’ List

Students who earn 36 graded units (no “pass/no pass” grades) with a grade point average of 3.5 or higher, no “incompletes” and no “grades” qualify for BCSA, BHA or BSA Deans’ List. The BXA Intercollege Deans’ List Honors are posted each semester.

Intercollege Honors

BSA students who successfully complete a BXA Capstone Project under the guidance of a faculty member will graduate with BCSA, BHA or EA Intercollege Honors if all of the following conditions are met:
- grade of “A” achieved in 62-401 and 62-402
- overall QPA of 3.25 or higher
- research results presented at Meeting of the Minds Undergraduate Research Symposium

As a citizen of two colleges, a BXA student also has the opportunity to graduate with CFA College Honors, DC College Honors, E College Honors and MCS College Honors. These particular honors are defined by each college. Students will receive honors color cords during the BXA/CFA Commencement Honors Ceremony.

University Honors

Students who graduate with an overall QPA of 3.5 or higher will graduate with University Honors. Students will receive an honors medallion during the CFA Commencement Honors Ceremony.

BXA Internal Transfer/Additional Major Process

For current Carnegie Mellon students who wish to apply to a BXA program, an internal transfer and additional major application process takes place in both the fall and spring semester. Applications are available online and in the BXA office and are reviewed by a committee of BCSA, BHA, BSA and EA advisors in October and in March.

Study Abroad

Studying abroad is encouraged to broaden a student’s interdisciplinary experience. The timing and length of program are important considerations while planning. Many students study abroad during the fall semester of their junior year, however it is possible to study abroad during the sophomore year. Studying abroad during any summer and over winter and spring breaks are also great opportunities for travel.

Due to required BXA coursework, students should not study abroad in their last three semesters (junior spring, senior fall/spring). Spending an entire year abroad is not typically possible for students without intending to take an additional semester at Carnegie Mellon. It is important to talk to a BXA
academic advisor as soon as possible to identify the best time for study abroad.

Withdrawal or Leave of Absence

A student who decides to leave the university must meet with the Director of the BXA Intercollege Degree Programs and complete a Withdrawal or Leave of Absence form located in the BXA office or the HUB. Withdrawal means leaving the university with no intention of returning. Leave of Absence means temporarily leaving the university with a stated intention to return. A withdrawal or leave of absence from the university at any time up to and including the last day of classes (excluding the final examination period), means that no grades will be recorded for the semester. Financial responsibility for the semester is dependent upon the date of and the reasons for filing the form. Questions about financial responsibility should be directed to the HUB.

A leave of absence may be voluntary or involuntary. If the leave is voluntary, the student may return any time within four years following the beginning of the leave by filing an Application for Return from Leave of Absence form. If the leave is involuntary, that is, required for academic or disciplinary reasons, the conditions for return will be stated.