BXA Intercollege Degree Programs

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Location: Hall of Arts 211
www.cmu.edu/interdisciplinary (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 curriculum. 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 Humanities and Arts (BHA), the Bachelor of Science and Arts (BSA) 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 Degree Programs 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.

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>Units</th>
<th>I. BCSA General Education</th>
<th>121</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II. SCS Concentration</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>III. CFA Concentration</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>IV. Free Electives</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>380</td>
</tr>
</tbody>
</table>

BCSA General Education
(15 courses, 122 units minimum)

- Writing (1 course, 9 units, 76-101 required)
- Mathematics (2 courses, 19 units minimum, 21-122 and either 21-259 or 21-241 required), Probability (1 course, 9 units minimum)
- Science & Engineering (2 courses, 18 units minimum)
- Economic, Political, & Social Institutions OR Cognition, Choice & Behavior (1 course, 9 units minimum)
- Two additional courses from Dietrich or CFA (2 course, 18 units minimum)
- University Requirement (1 course, 3 units, 99-101 required)
- BXA Required Courses (5 courses, 36 units, 52-190 or 52-291, 52-391, 52-392, 52-401, 52-402)

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 Writing about Data
& 76-108 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
Mathematics & Probability (3 courses, 28 units minimum)
Choose two mathematics courses (19 units minimum):
21-122 Integration and Approximation 10
21-259 Calculus in Three Dimensions 9
or 21-241 Matrices and Linear Transformations

Choose one probability course(s) (9 units minimum):
15-259 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
03-121 Modern Biology 9
03-125 Evolution 9
03-132 Basic Science to Modern Medicine 9
03-133 Neurobiology of Disease 9
06-100 Introduction to Chemical Engineering 12
09-105 Introduction to Modern Chemistry I 10
09-217 Organic Chemistry I 9
09-225 Climate Change: Chemistry, Physics and Planetary Science 9
12-100 Exploring CEE: Infrastructure and Environment in a Changing World 12
12-201 Geology 9
18-100 Introduction to Electrical and Computer Engineering 12
24-101 Fundamentals of Mechanical Engineering 12
24-358 Culinary Mechanics 9
27-215 Thermodynamics of Materials 12
33-114 Physics of Musical Sound 9
33-120 Science and Science Fiction 9
33-121 Physics I for Science Students 12
42-101 Introduction to Biomedical Engineering 12
85-219 Biological Foundations of Behavior 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
70-332 Business, Society and Ethics 9
70-364 Business Law 9
73-102 Principles of Microeconomics 9
73-103 Principles of Macroeconomics 9
79-189 History of Democracy: Thinking Beyond the Self 9
79-244 Women in American History 9
79-245 Capitalism and Individualism in American Culture 9
79-300 History of American Public Policy 9
79-310 U. S. Business History: 1870 to the Present 9
79-320 Women, Politics, and Protest 9
79-321 Documenting Human Rights 9
79-331 Body Politics: Women and Health in America 9
79-341 The Cold War in Documents and Film 9
79-383 The History of Capitalism 9
80-135 Introduction to Political Philosophy 9
80-136 Social Structure, Public Policy & Ethics 9
80-244 Environmental Ethics 9

80-245 Medical Ethics 9
80-335 Social and Political Philosophy 9
84-104 Decision Processes in American Political Institutions 9
84-275 Comparative Politics 9
84-322 Nonviolent Conflict and Revolution 9
84-326 Theories of International Relations 9
84-352 Representation and Voting Rights 9
84-362 Diplomacy and Statecraft 9
84-380 US Grand Strategy 9
84-386 The Privatization of Force 9
84-389 Terrorism and Insurgency 9
84-390 Social Media, Technology, and Conflict 9
84-405 The Future of Warfare 9
88-284 Topics of Law: The Bill of Rights 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
80-101 Dangerous Ideas in Science and Society 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
80-242 Conflict and Dispute Resolution 9
80-270 Problems of Mind and Body: Meaning and Doing 9
80-271 Mind and Body: The Objective and the Subjective 9
80-330 Ethical Theory 9
85-102 Introduction to Psychology 9
85-211 Cognitive Psychology 9
85-213 Human Information Processing and Artificial Intelligence 9
85-221 Principles of Child Development 9
85-241 Social Psychology 9
85-251 Personality 9
85-261 Psychopathology 9
85-370 Perception 9
88-120 Reason, Passion and Cognition 9
88-230 Human Intelligence and Human Stupidity 9
* Indicates co-requisites and/or prerequisites required.

Complete Two Additional courses from Dietrich or CFA (2 courses, complete 18 units minimum)
These courses must be non-technical/non-studio. Each CFA concentration has recommended courses for this category; consult with your BXA advisor to determine the best courses to fulfill this requirement.

University Requirement (1 course, 3 units)
This is a mini-course, pass/no pass, to be completed in the first semester or online in the summer prior to the first semester.
99-101 Computing @ Carnegie Mellon 3

BXA Required Courses (5 courses, 36 units)
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
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 (5 courses, 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 (1 course, 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, 15-362, 15-374, 15-384, 17-200, 17-333, 17-526. 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
10-335 Art and Machine Learning 12
11-291 Applied Computational Intelligence Lab 9
11-344 Machine Learning in Practice 12
11-411 Natural Language Processing 12
15-281 Artificial Intelligence: Representation and Problem Solving 12
15-322 Introduction to Computer Music 9
15-323 Computer Music Systems and Information Processing 9
15-365 Experimental Animation 12
15-388 Practical Data Science 9
15-415 Database Applications 12
15-451 Algorithm Design and Analysis 12
15-458 Discrete Differential Geometry 12
15-462 Computer Graphics 12
15-463 Computational Photography 12
15-464 Technical Animation 12
15-465 Animation Art and Technology 12
15-466 Computer Game Programming 12
15-494 Cognitive Robotics: The Future of Robot Toys 12
16-264 Humansoids 12
16-362 Mobile Robot Algorithms Laboratory 12
16-374 IDeAtE: Art of Robotic Special Effects 12
16-384 Robot Kinematics and Dynamics 12
16-385 Computer Vision 12
16-423 Designing Computer Vision Apps 12
16-455 IDeAtE: Human-Machine Virtuosity 12
16-465 Game Engine Programming 10
16-467 Human Robot Interaction 12
17-214 Principles of Software Construction: Objects, Design, and Concurrency 12
17-313 Foundations of Software Engineering 12
17-356 Software Engineering for Startups 12
17-437 Web Application Development 12

College of Fine Arts Concentration

(Defines number of courses vary, 108 units minimum)

BCSA students choose one of the following concentrations:

• Architecture (108 units)
• Art (108 units)
• Design (108 units)
• Drama (108 units)
• Music (108 units)

Architecture Concentration (108 units minimum)

Architecture Required Courses (7 courses, 52 units minimum)
48-100 Architecture Design Studio: Poiesis Studio I - Fall, Freshman year 10-15
or 48-095 Spatial Concepts for Non-Architecture Majors 10
62-122 Digital Media I - Fall, Freshman year 6
62-125 Drawing I - Fall, Freshman year 6
62-123 Digital Media II - Spring, Freshman year 6
62-126 Drawing II - Spring, Freshman year 6
48-240 Historical Survey of World Architecture and Urbanism I - Spring, Freshman year 9
48-241 Modern Architecture - Fall, Sophomore year 9

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)

Transdisciplinary Research Studios (2 courses, 20 units)
Complete two courses:
60-101 Transdisciplinary Research Studio I: Risk, Agency, Failure 10
60-201 Transdisciplinary Research Studio II: Publics 10
60-202 Transdisciplinary Research Studio III: Futures 10

Media Studios (3 courses, 30 units minimum)
Complete three courses:
60-131 3D Media Studio I: Foundations in Sculpture, Installation, and Site work 10
60-133 3D Media Studio II 10
60-150 2D Media Studio: Drawing 10
60-170 2D Media Studio: Painting 10
60-251 2D Media Studio: Print Media 10
60-260 2D Media Studio: Imaging 10
60-110 Electronic Media Studio: Introduction to the Moving Image 10
60-210 Electronic Media Studio: Introduction to Interactivity 10-12
or 60-212 Electronic Media Studio: Interactivity and Computation for Creative Practice

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
Advanced Electronic and Time-Based Work (ETB) (course numbers 60-410 through 60-429) 10
Advanced Sculpture, Installation and Site-Work (SIS) (course numbers 60-430 through 60-447) 10
Advanced Contextual Practice (CP) (course numbers 60-448 through 60-449) 10
Advanced Drawing, Painting, Print Media and Photography (DP3) (course numbers 60-450 through 60-498) 10
Critical Studies (2 courses, 18 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-205</td>
<td>Critical Theory in Art III -Fall</td>
<td>9</td>
</tr>
<tr>
<td>60-206</td>
<td>Critical Theory in Art IV -Spring</td>
<td>9</td>
</tr>
</tbody>
</table>

Note: Critical Theory I & II are strongly recommended.

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-200</td>
<td>Sophomore Review -Spring</td>
<td>0</td>
</tr>
<tr>
<td>60-400</td>
<td>Senior Review -Spring</td>
<td>0</td>
</tr>
</tbody>
</table>

**Design CONCENTRATION (108 UNITS MINIMUM)**

**Design Required Courses (16 courses, 98 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-101</td>
<td>Studio: Survey of Design -Fall, First-year</td>
<td>10</td>
</tr>
<tr>
<td>51-121</td>
<td>Visualizing -Fall, First-year</td>
<td>10</td>
</tr>
<tr>
<td>51-175</td>
<td>Design Studies: Place -Fall, First-year (mini-1)</td>
<td>5</td>
</tr>
<tr>
<td>51-177</td>
<td>Design Studies: Histories -Fall, First-year (mini-2)</td>
<td>5</td>
</tr>
<tr>
<td>51-102</td>
<td>Design Lab -Spring, First-year</td>
<td>10</td>
</tr>
<tr>
<td>51-122</td>
<td>Collaborative Visualizing -Spring, First-year</td>
<td>10</td>
</tr>
<tr>
<td>51-176</td>
<td>Design Studies: Futures -Spring, First-year (mini-3)</td>
<td>5</td>
</tr>
<tr>
<td>51-178</td>
<td>Design Studies: Experience -Spring, First-year (mini-4)</td>
<td>5</td>
</tr>
<tr>
<td>51-277</td>
<td>Design Studies: Systems -Fall, Sophomore year (mini-1)</td>
<td>5</td>
</tr>
<tr>
<td>51-279</td>
<td>Design Studies: Cultures -Fall, Sophomore year (mini-2)</td>
<td>5</td>
</tr>
<tr>
<td>51-282</td>
<td>Design Studies: Persuasion -Spring, Sophomore year (mini-3)</td>
<td>5</td>
</tr>
<tr>
<td>51-284</td>
<td>Design Studies: Power -Spring, Sophomore year (mini-4)</td>
<td>5</td>
</tr>
</tbody>
</table>

**Choice Two Studios -Fall, Sophomore year:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-225</td>
<td>Communications Studio I: Understanding Form &amp; Context</td>
<td>4.5+4.5</td>
</tr>
<tr>
<td>or 51-245</td>
<td>Communications Studio I: Understanding Form &amp; Context</td>
<td>4.5+4.5</td>
</tr>
<tr>
<td>or 51-265</td>
<td>Environments Studio I: Understanding Form &amp; Context</td>
<td>4.5+4.5</td>
</tr>
</tbody>
</table>

**Choose Two Corresponding Labs -Fall, Sophomore year:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-227</td>
<td>Prototyping Lab I: Communications</td>
<td>4.5</td>
</tr>
<tr>
<td>or 51-247</td>
<td>Prototyping Lab I: Products</td>
<td></td>
</tr>
<tr>
<td>or 51-267</td>
<td>Prototyping Lab I: Environments</td>
<td></td>
</tr>
</tbody>
</table>

Design Electives (10 units)

A minimum of 10 additional Design units must be approved by the Design advisor. A list of these selected courses must be filed in the BXA office.

**Drama Concentration (108 units minimum)**

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 (5 courses, 20 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-175-54-176</td>
<td>Conservatory Hour-Conservatory Hour (1 unit each)</td>
<td>2</td>
</tr>
<tr>
<td>54-281</td>
<td>Foundations of Drama I</td>
<td>6</td>
</tr>
<tr>
<td>54-281</td>
<td>Foundations of Drama II (prerequisite: 54-177)</td>
<td>6</td>
</tr>
<tr>
<td>54-381</td>
<td>Special Topics in Drama: History, Literature and Criticism</td>
<td>6</td>
</tr>
<tr>
<td>54-362</td>
<td>Anti-Racist &amp; Equitable Practices in Theater (optional)</td>
<td>6</td>
</tr>
</tbody>
</table>

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

**Design Required Courses (2 courses, 26 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-151-54-152</td>
<td>Stagecraft-Stagecraft (13 units + 13 units)</td>
<td>26</td>
</tr>
<tr>
<td>54-159-54-159</td>
<td>Production Practicum-Production Practicum (two times)</td>
<td></td>
</tr>
</tbody>
</table>

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 (10 courses, 64 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-121-54-122</td>
<td>Directing I: A Director's Mindset - Directing I: Sources</td>
<td>18</td>
</tr>
<tr>
<td>54-221-54-222</td>
<td>Directing II: In the Studio - Directing II: Fundamentals</td>
<td>18</td>
</tr>
<tr>
<td>54-159-54-159</td>
<td>Production Practicum-Production Practicum</td>
<td>12</td>
</tr>
<tr>
<td>54-517</td>
<td>Director's Colloquium</td>
<td>16</td>
</tr>
</tbody>
</table>

A minimum of 24 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 (9 courses, 53 units minimum)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</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 Dramatury</td>
<td></td>
</tr>
<tr>
<td>54-121</td>
<td>Directing I: A Director's Mindset</td>
<td>9</td>
</tr>
<tr>
<td>54-159-54-159</td>
<td>Production Practicum-Production Practicum (two times)</td>
<td></td>
</tr>
<tr>
<td>54-200-54-200</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 (2 courses, 26 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>54-151-54-152</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.

**MUSIC CONCENTRATION (108 UNITS MINIMUM)**

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

Required Course for All Concentration Options (1 course, 9 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-152</td>
<td>Harmony I</td>
<td>9</td>
</tr>
<tr>
<td>or 57-149</td>
<td>Basic Harmony I</td>
<td></td>
</tr>
</tbody>
</table>

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

**Audio Recording & Production Required Courses (7 courses, 40 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-101</td>
<td>Introduction to Music Technology</td>
<td>6</td>
</tr>
<tr>
<td>or 57-171</td>
<td>Introduction to Music Technology (self-paced)</td>
<td></td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I</td>
<td>3</td>
</tr>
<tr>
<td>or 57-180</td>
<td>Basic Solfege I</td>
<td></td>
</tr>
<tr>
<td>or 57-185</td>
<td>Advanced Solfege I</td>
<td></td>
</tr>
<tr>
<td>57-173</td>
<td>Survey of Western Music History (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:
Choose Sound Theory & Practice Required Courses (7 courses, 47 units)

A minimum of advisor. A list of these selected courses must be filed in the BXA office.

Composition Required Courses (12 courses, 76 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-161</td>
<td>Eurhythmics I (recommended co-requisite: 57-181)</td>
<td>3</td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I</td>
<td>3</td>
</tr>
<tr>
<td>or 57-180</td>
<td>Basic Solfege I</td>
<td></td>
</tr>
<tr>
<td>or 57-185</td>
<td>Advanced Solfege I</td>
<td></td>
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</table>

<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 (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>57-49x</td>
<td>BXA Studio (4 semesters)</td>
<td>36</td>
</tr>
<tr>
<td>57-xxx</td>
<td>Major Ensemble (4 semesters)</td>
<td>24</td>
</tr>
</tbody>
</table>

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.

Music Performance Required Courses (12 courses, 76 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-161</td>
<td>Eurhythmics I (recommended co-requisite: 57-181)</td>
<td>3</td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I</td>
<td>3</td>
</tr>
<tr>
<td>or 57-180</td>
<td>Basic Solfege I</td>
<td></td>
</tr>
<tr>
<td>or 57-185</td>
<td>Advanced Solfege I</td>
<td></td>
</tr>
<tr>
<td>57-173</td>
<td>Survey of Western Music History (co-requisite: 57-188)</td>
<td>9</td>
</tr>
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<td>Repertoire and Listening for Musicians</td>
<td>1</td>
</tr>
<tr>
<td>57-49x</td>
<td>BXA Studio (4 semesters)</td>
<td>36</td>
</tr>
<tr>
<td>57-xxx</td>
<td>Major Ensemble (4 semesters)</td>
<td>24</td>
</tr>
</tbody>
</table>

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.

Sound Theory & Practice Required Courses (7 courses, 47 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
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<tbody>
<tr>
<td>57-101</td>
<td>Introduction to Music Technology</td>
<td>6</td>
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<tr>
<td>or 57-171</td>
<td>Introduction to Music Technology (self-paced)</td>
<td></td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I</td>
<td>3</td>
</tr>
<tr>
<td>or 57-180</td>
<td>Basic Solfege I</td>
<td></td>
</tr>
<tr>
<td>or 57-185</td>
<td>Advanced Solfege I</td>
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</tr>
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<td>Survey of Western Music History (co-requisite: 57-188)</td>
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</tr>
<tr>
<td>57-188</td>
<td>Repertoire and Listening for Musicians</td>
<td>1</td>
</tr>
<tr>
<td>18-090</td>
<td>Twisted Signals: Multimedia Processing for the Arts</td>
<td>10</td>
</tr>
<tr>
<td>57-911</td>
<td>Music Since 1945</td>
<td>9</td>
</tr>
<tr>
<td>57-616</td>
<td>Independent Study in Sound Studies</td>
<td>9</td>
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</tbody>
</table>

Choose 52 units from:
BHA Curriculum

<table>
<thead>
<tr>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>I. BHA General Education</td>
</tr>
<tr>
<td>81</td>
<td>II. DC Concentration</td>
</tr>
<tr>
<td>108</td>
<td>III. CFA Concentration</td>
</tr>
<tr>
<td>78</td>
<td>IV. Free Electives</td>
</tr>
<tr>
<td>378</td>
<td>Total BHA Degree Requirements</td>
</tr>
</tbody>
</table>

**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, 79-145 or 79-189 required)
- Modeling: Mathematics and Experiments (1 course, 9 units minimum)
- Deciding: Social Sciences and Values (3 courses, 27 units minimum, 36-200 required)
- University Requirement (1 course, 3 units, 99-101 required)
- BXA Required Courses (5 courses, 36 units, 52-190 or 52-291, 52-391, 52-392, 52-401, 52-402)

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

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.

- 76-101 Interpretation and Argument 9
- 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-year 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

- 82-xxx Modern Languages 18

Complete two courses taught in a language offered by the Department of Modern Languages. A wide selection of courses are offered in Arabic Studies, Chinese Studies, French and Francophone Studies, German Studies, Hispanic Studies, Japanese Studies and Russian Studies. Students must complete two courses in the same language. Languages taught at other institutions are also acceptable (with advisor approval).

**Reflecting: Societies and Cultures (1 course, 9 units)**

This category emphasizes the study of history, society and culture from local and global perspectives.

- 79-145 Genocide and Weapons of Mass Destruction 9
- or 79-189 History of Democracy: Thinking Beyond the Self

**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
- 80-110 Nature of Mathematical Reasoning 9
- 80-210 Logic and Proofs 9
- 80-211 Logic and Mathematical Inquiry 9

**Natural Science**

- 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
- 80-226 Revolutions in Science 9
- 80-312 Mathematical Revolutions 9
- 80-327 Philosophy of Neuroscience 9
- 84-265 Political Science Research Methods 9
- 85-370 Perception 9
- 88-275 Bubbles: Data Science for Human Minds 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 iDeATe: Learning in Museums 12
- 73-102 Principles of Microeconomics 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
- 80-270 Problems of Mind and Body: Meaning and Doing 9
- 80-271 Mind and Body: The Objective and the Subjective 9
- 80-305 Decision Theory 9
- 80-330 Ethical Theory 9
- 80-348 Health, Human Rights, and International Development 9
- 80-405 Game Theory 9
- 80-447 Global Justice 9
- 84-104 Decision Processes in American Political Institutions 9
- 84-369 Decision Science for International Relations 9
- 85-102 Introduction to Psychology 9
University Requirement (1 course, 3 units)
This is a mini-course, pass/no pass, to be completed in the first semester or online prior to the first semester.

99-101 Computing @ Carnegie Mellon 3

BXA Required Courses (5 courses, 36 units)
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

Dietrich College of Humanities and Social Sciences Concentration
(9 courses, 81 units minimum)
BHA students declare an 81-unit DC concentration based on existing DC programs, through consultation with their BXA advisor and the DC concentration advisors. A completed DC Concentration Declaration form must be approved by the concentration advisor and submitted to the BXA office, by spring mid-semester break of the student’s sophomore year.
Curriculum for several BHA DC concentration options are outlined below, though this list is not exhaustive of all concentrations possible in DC.
BHA students who are admitted as freshmen are undeclared until they have met with a concentration advisor and have submitted their signed Declaration form. BHA students who are admitted through internal transfer must have chosen a DC concentration at the time of their application (which serves as declaration). All BHA students wishing to change their concentration advisors. A completed DC Concentration Declaration form

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 Methods for Statistics & Data Science 9
88-251 Empirical Research Methods 9
88-252 Causal Inference in the Field 9

Economics Courses (2 courses, 18 units)
73-102 Principles of Microeconomics 9
73-158 Markets, Models, and Math 9
or 73-230 Intermediate Microeconomics 9
or 73-328 Health Economics 9
or 73-347 Game Theory Applications for Economics and Business 9

Psychology Courses (2 courses, 18 units)
88-120 Reason, Passion and Cognition (freshman or sophomore year) 9
88-302 Behavioral Decision Making 9

Behavioral Economics Courses (2 courses, 18 units)
88-360 Behavioral Economics 9
88-367 Behavioral Economics in the Wild 9

Chinese Studies CONCENTRATION (81 UNITS MINIMUM)
A BHA concentration in Chinese Studies promotes not just language proficiency but also an understanding of Chinese 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 test 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
Intermediate level proficiency in Chinese. This is equivalent to the completion of three courses (two at the 100-level and one at the 200-level) or exemption based on Advanced Placement, International Baccalaureate, Cambridge GCE Advanced level or Chinese Mellon internal placement test scores.
Core Courses in Chinese Studies (4 courses, 39 units minimum)
82-232 Intermediate Chinese II 12
or 82-235 Fables, Legends and Stories from Ancient Chinese Civilization 12
82-331 Reading Into a New China I: Population, Youth, Marriage, & Housing 9
82-332 Reading Into a New China II: Transportation, Education, Pop Culture, & Health 9
82-333 Introduction to Chinese Language and Culture 12
* Students who place out of 82-232/82-235 must take a minimum of 9 additional units chosen from Chinese Studies Electives at the 400-level.

Core Courses in Modern Languages (1 course, 9 units)
Complete one course.
82-280 Bilingual & Bicultural Experiences in the US 9
82-282 Interpreting Global Texts & Cultures 9
82-283 Language Diversity & Cultural Identity 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-285 Podcasting: Language and Culture Through Storytelling 9
82-286 Cultural Complexities 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Topics in Second Language Acquisition 9
82-480 Translation Technologies 9

Note: In consultation with the concentration advisor, students may substitute a Modern Languages course elective with one related to language analysis, language learning, or acquisition of language and culture from the listings in Chinese Studies or from another department. Examples: 80-180 Nature of Language, 85-421 Language and Thought. In addition, students may choose to take 82-580 Senior Seminar in Modern Languages (3 units). The selected course may not double count in the Electives category.

Core Courses in Chinese History & Society (1 course, 9 units)
Complete one course in consultation with the concentration advisor.
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
Chinese Studies Electives:
82-334 Structure of Chinese 9
82-335 Chinese Culture Through Legends and Folktales 9
82-337 Mandarin Chinese for Oral Communication I 9
82-338 Mandarin Chinese for Oral Communication II 9
82-339 Business Language & Culture in China I 9
82-340 Business Language & Culture in China II 9
82-431 China and the West 9
82-432 Chinese Popular Culture: A Game of Learning * 9
82-433 Topics in Contemporary Culture of China * 9
82-434 Studies in Chinese Traditions * 9
82-436 Introduction to Classical Chinese 9
82-439 Modern China Through Literature Var. 9
82-440 Studies in Chinese Literature & Culture 9
82-505 Undergraduate Internship Var. 9
82-531/532 Special Topics in Chinese Studies (independent studies) Var. 9
82-533 Cultural Topics in Chinese Studies * 9

* Students may repeat these courses with new topics.

Interdisciplinary Electives:
This list is compiled from possibilities such as but not limited to the following. Students should consult SIO and the concentration advisor for approval as a substitute. Note that not all courses are offered each semester.

Business
70-342 Managing Across Cultures 9
70-365 International Trade and International Law 9
70-430 International Management 9

English
76-318 Communicating in the Global Marketplace 9
76-339 Topics in Film and Media 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
79-309 The Chinese Revolution Through Film (1949-2000) 9

Institute for Politics and Strategy (Choose in consultation with the concentration advisor.)
84-310 International Political Economy 9
84-326 Theories of International Relations 9
84-362 Diplomacy and Statecraft 9
84-369 Decision Science for International Relations 9
84-370 Global Nuclear Politics 9
84-380 US Grand Strategy 9
84-388 Concepts of War and Cyber War 6
84-405 The Future of Warfare 9

Modern Languages
82-137 Chinese Calligraphy: Culture and Skills 9
82-138 Comparative Ching: Perceptions Through Youtube & TikTok 9
82-230 Topics in Cultural Comparison * 9
82-234 Topics in Chinese History * 9
82-238 Topics in Chinese Culture 9
82-280 Bilingual & Bicultural Experiences in the US 9
82-282 Interpreting Global Texts & Cultures 9
82-283 Language Diversity & Cultural Identity 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-285 Podcasting: Language and Culture Through Storytelling 9
82-286 Cultural Complexities 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Topics in Second Language Acquisition 9
82-480 Translation Technologies 9

Philosophy
80-180 Nature of Language 9
80-263 Approaching Chinese Philosophy: Basic Texts and Implications 9
80-276 Philosophy of Religion 9
80-280 Linguistic Analysis 9
80-380 Philosophy of Language 9

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

* Students may repeat these courses with new topics.

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.

Prerequisite Courses
15-112 Fundamentals of Programming and Computer Science 12
21-120 Differential and Integral Calculus 10-20
or 21-111 & 21-112 Differential Calculus and Integral Calculus
21-127 Concepts of Mathematics 10

Statistics Course (1 course, 9 units)
36-309 Experimental Design for Behavioral & Social Sciences 9
or 85-309 Statistical Concepts and Methods for Behavioral and Social Science

Computational/Cognitive Modeling Core (3 courses, 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
85-426 Learning in Humans and Machines 9
85-435 Biologically Intelligent Exploration 9

Cognitive Psychology Core (4 courses, 36 units)
85-211 Cognitive Psychology 9
or 85-213 Human Information Processing and Artificial Intelligence
85-310 Research Methods in Cognitive Psychology 9
or 85-311 Modern Research Methods: Cumulative Science, Big Data, and Meta-Analysis
or 85-314 Cognitive Neuroscience Research Methods

Plus two of the following (one of which must be 85-3xx or 85-4xx):
the Department for current offerings. Students should discuss curriculum.

Reading in Forms classes are recommended, as is Complete three courses from the English Department's offerings.

English Electives (3 courses, 27 units)

English Electives (3 courses, 27 units)

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 (76-261). In order to proceed into the upper level courses in the concentration (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 writing and analysis of poems, stories and other literary forms. Their work is critiqued and evaluated by peers and the faculty.

Survey of Forms Courses (2 courses, 18 units)

76-260 Survey of Forms: Fiction 9
76-261 Survey of Forms: Creative Nonfiction 9
76-265 Survey of Forms: Poetry 9
76-269 Survey of Forms: Screenwriting 9

Note: A student must receive a grade of A or B in the Survey of Forms class in a specific genre in order to be eligible to enroll in a workshop of that genre. A student who receives a grade of C in a Survey of Forms course may enroll in a related workshop only with the permission of the workshop professor. A student who receives a D or F in Survey of Forms may not take a workshop in that genre.

Creative Writing Workshops (4 courses, 36 units)

Complete four Creative Writing workshops, at least two in a single genre. Workshops in all genres may be taken more than once for credit.

76-365 Poetry Workshop 9
76-366 Essay Writing Workshop 9
76-460 Beginning Fiction Workshop 9
76-462 Advanced Fiction Workshop 9
76-464 Creative Nonfiction Workshop 9
76-465 Advanced Poetry Workshop 9
76-469 Screenwriting Workshop 9

English Electives (3 courses, 27 units)

Complete three courses from the English Department's offerings. Reading in Forms classes are recommended, as is 76-306 Editing and Publishing. Please consult the list of courses published each semester by the Department for current offerings. Students should discuss curriculum choices with the concentration advisor to determine the best electives for their focus in Creative Writing.

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)

73-102 Principles of Microeconomics 9
85-102 Introduction to Psychology 9
88-120 Reason, Passion and Cognition (freshman or sophomore year) 9
88-223 Decision Analysis 12
88-302 Behavioral Decision Making 9

Research Methods (2 courses, 18 units)

36-202 Methods for Statistics & Data Science 9
76-408 Social and Institutional Psychology 9
76-409 Experimental Design for Behavioral & Social Sciences 9
85-309 Statistical Concepts and Methods for Behavioral and Social Science 9
88-251 Empirical Research Methods 9

Electives (2 courses, 18 units minimum)

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:

85-350 Psychology of Prejudice 9
85-352 Evolutionary Psychology 9
85-363 Attention, Its Development and Disorders 9
85-375 Crosscultural Psychology 9
85-377 Attitudes and Persuasion 9
85-442 Health Psychology 9
85-443 Social Factors and Well-Being 9
85-444 Relationships 9
85-446 Psychology of Gender 9
88-230 Human Intelligence and Human Stupidity 9
88-231 Thinking in Person vs. Thinking Online 9
88-342 The Neuroscience of Decision Making 9
88-360 Behavioral Economics 9
88-365 Behavioral Economics and Public Policy 9
88-372 Social and Emotional Brain 9
88-380 Dynamic Decisions 9

Managerial and Organizational Aspects of Decision Making:

70-311 Organizational Behavior 9
70-381 Marketing I 9
70-443 Digital Marketing and Social Media Strategy 9
70-460 Mathematical Models for Consulting 9
88-150 Managing Decisions 9
88-221 Analytical Foundations of Public Policy 9
88-406 Behavioral Economics @ Work 9
88-418 Negotiation: Strategies and Behavioral Insights 9
88-419 International Negotiation 9
88-444 Public Policy and Regulations 9
88-451/452 Policy Analysis Senior Project 12
Philosophical and Ethical Perspectives on Decision Making:
70-332 Business, Society and Ethics 9
80-208 Critical Thinking 9
80-221 Philosophy of Social Science 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-246 Moral Psychology 9
80-249 AI, Society, and Humanity 9
80-271 Mind and Body: The Objective and the Subjective 9
80-305 Decision Theory 9
80-321 Causation, Law, and Social Policy 9
80-324 Philosophy of Economics 9
88-275 Bubbles: Data Science for Human Minds 9

Quantitative Analysis Requirements (2 courses, 18 units)
These courses require 36-200 Reasoning with Data as a prerequisite; 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 (2 courses, 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 (1 course, 9 units)
73-497 Senior Project 9

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.

Foundations of Public Policy Requirement (1 course, 9 units)
Choose one 9-unit course from the list below.
73-102 Principles of Microeconomics 9
84-104 Decision Processes in American Political Institutions 9
84-110 Foundations of Political Economy 9

History Core (3 courses, 27 units)
Choose one 9-unit course from each category below. (Students must earn a final grade of "C" or better for these courses to count toward the concentration).
Policy History:
79-300 History of American Public Policy 9

U.S. History:
79-204 American Environmental History 9
79-231 American Civil Rights Movement: From Garveyism to Black Power 9
79-240 Development of American Culture 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
79-248 U.S. Constitution & the Presidency 9
79-249 Politics and Social Change in 20th Century America 9
79-320 Women, Politics, and Protest 9

Non-U.S. History:
Non-US Survey
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-203 The Other Europe: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1990 9
79-205 20th Century Europe 9
79-211 Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange 9
79-223 Mexico: From the Aztec Empire to the Drug War 9

Economic and Statistical Methods for Decision Science:
70-374 Data Mining & Business Analytics 9
70-455 Data Management Fundamentals 9
70-460 Mathematical Models for Consulting 9
73-265 Economics and Data Science 9
73-347 Game Theory Applications for Economics and Business 9
80-405 Game Theory 9
88-255 Strategic Decision Making 9
88-300 Programming and Data Analysis for Social Scientists 9
88-360 Behavioral Economics 9
88-367 Behavioral Economics in the Wild 9

Decision Science and Public Policy:
84-364 Comparative Presidential Behavior: Leadership, Personality, and Decision Making 9
84-369 Decision Science for International Relations 9
88-221 Analytical Foundations of Public Policy 9
88-344 Environmental Policy and Planning 9
88-365 Behavioral Economics and Public Policy 9
88-366 Behavioral Economics of Poverty and Development 9
88-405 Risk Perception and Communication 9
88-435 Decision Science and Policy 9
88-444 Public Policy and Regulations 9
88-451/452 Policy Analysis Senior Project 12

Research Methods for Decision Science:
36-303 Sampling, Survey and Society 9
70-460 Mathematical Models for Consulting 9
85-310 Research Methods in Cognitive Psychology 9
85-314 Cognitive Neuroscience Research Methods 9
88-252 Causal Inference in the Field 9
88-388 Psychological Models of Decision Making 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 Prerequisites
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 (4 courses, 36 units)
73-102 Principles of Microeconomics 9
73-103 Principles of Macroeconomics 9
73-230 Intermediate Microeconomics 9
73-240 Intermediate Macroeconomics 9
Choose any two courses from any of the following categories.

Philosophy Core (3 courses, 27 units)
Choose one course from three of the four categories below. No more than 9 units at the 100-level may be counted toward this requirement.

Ethics:
80-130 Introduction to Ethics 9
80-330 Ethical Theory 9

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

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

Applied Philosophy:
80-136 Social Structure, Public Policy & Ethics 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-249 AI, Society, and Humanity 9
80-336 Philosophy of Law 9
80-348 Health, Human Rights, and International Development 9
80-447 Global Justice 9

Elective 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
73-359 Benefit-Cost Analysis 9
73-365 Firms, Market Structures, and Strategy 9
73-408 Law and Economics 9
73-476 American Economic History 9

English:
76-492 Rhetoric of Public Policy 9

History:
79-145 Genocide and Weapons of Mass Destruction 9
79-189 History of Democracy: Thinking Beyond the Self 9
79-206 Crime and Punishment in Early Modern Europe 9
79-228 The Civil Rights Movement and the World 9
79-233 The United States and the Middle East since 1945 9
79-234 Technology and Society 9
79-242 African American History: Reconstruction to the Present 9
79-247 African Americans, Imprisonment, and the Carceral State 9
79-267 The Soviet Union in World War II: Military, Political, and Social History 9
79-280 Coffee and Capitalism 9
79-288 Bananas, Baseball, and Borders: Latin America and the United States 9
79-291 Innovation and Entertainment: A Business History of American Popular Culture 9
79-298 Guns in American History: Culture, Violence, and Politics 9
79-299 From Newton to the Nuclear Bomb: History of Science, 1750-1950 9
79-301 History of Surveillance: From the Plantation to Data Capitalism 9
79-303 Pittsburgh and the Transformation of Modern Urban America 9
79-305 Moneyball Nation: Data in American Life 9
79-310 U. S. Business History: 1870 to the Present 9
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 9
79-330 Medicine and Society: Health, Healers, and Hospitals 9
79-331 Body Politics: Women and Health in America 9
79-336 Introduction to Environmental Ideas 9
79-338 History of Education in America 9
79-339 Juvenile Delinquency & Film: From Soul of Youth (1920) to West Side Story (1961) 9
79-340 Juvenile Delinquency & Film: "Boyz N the Hood" (1991) to "The Wire" (2002-08) 9
79-342 Introduction to Science and Technology Studies 9
79-343 Education, Democracy, and Civil Rights 9
79-349 United States and the Holocaust 6
79-370 Technology in the United States 9
79-371 African American Urban History 9
79-381 Energy and Empire: How Fossil Fuels Changed the World 9
79-397 Environmental and Public Health Crises in the City 9

Philosophy:
80-101 Dangerous Ideas in Science and Society 9
80-256 Modern Moral Philosophy 9
80-305 Decision Theory 9
80-405 Game Theory 9

Institute for Politics and Strategy:
84-310 International Political Economy 9
84-380 US Grand Strategy 9
84-393 Legislative Decision Making: US Congress 6
84-402 Judicial Politics and Behavior 9

Social and Decision Sciences:
88-223 Decision Analysis 12
88-281 Topics in Law: 1st Amendment 9
88-284 Topics of Law: The Bill of Rights 9
88-444 Public Policy and Regulations 9

Note: Other elective courses may be approved at the discretion of the EHPP concentration advisor. A list of these courses must be filed in the BXA office.
Film & Visual Media CONCENTRATION (81 units minimum)

The BHA concentration in Film & Visual Media trains students through a combination of coursework in visual media, film history and analysis, screenwriting, and production of film and other visual media. This concentration offers a comprehensive education in film and visual media, from theoretical framing and historical-cultural contextualization to training skills in both creating and analyzing film, and developing a complex blend of creative, professional and technical competencies. CMU's Department of English is an ideal home for the Film & Visual Media concentration due to the department's combination of creative writers, film and media studies scholars, film makers, digital humanities and visual communication researchers.

Introductory Courses (2 courses, 18 units)
76-239 Introduction to Film Studies 9
76-259 Film History 9

Production Course (1 course, 9 units)
76-292 Film Production 9

Screenwriting Course (1 course, 9 units)
76-269 Survey of Forms: Screenwriting 9

Topics in Film & Visual Media Studies (2 courses, 18 units)
76-312 Crime and Justice in American Film 9
76-339 Topics in Film and Media (Can be taken more than once) 9
76-353 Transnational Feminisms: Fiction and Film 9
76-367 Fact Into Film: Translating History into Cinema 9
76-377 Shakespeare on Film 9
76-438 The Wire: Crime, Realism, and Long-Form TV 9
76-439 Film Seminar: The Rise of the Art Film 9
76-448 Shakespeare on Film 9
76-449 Race and Media 9
79-225 West African History in Film 9
79-306 Fact into Film: Translating History into Cinema 9
79-308 Crime and Justice in American Film 9
79-309 The Chinese Revolution Through Film (1949-2000) 9
79-319 India Through Film 6
79-326 Shall We Dance? Culture, Politics, and Movement in the 20th Century 6
79-339 Juvenile Delinquency & Film: From Soul of Youth (1920) to West Side Story (1961) 6
79-340 Juvenile Delinquency & Film: From "Boyz n the Hood"(1991) to "The Wire"(2002-08) 6
79-341 The Cold War in Documents and Film 9
82-215 Arab Culture Through Dialogues, Film, and Literature 9
82-278 Japanese Film and Literature: The Art of Storytelling 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-355 Topics in Hispanic Std: Beyond the Film Screen: The Hispanic World Through Film 9

Courses in Film Production, Screenwriting, Digital Media, Literature & Culture, and/or Film & Visual Media Studies (3 courses, 27 units)

Students may take an additional three Dietrich College courses for a minimum of 27 units of courses offered in the categories listed above. Because there are dozens of options available, including many of the courses listed above, please consult with the Department of concentration advisor for guidance.

French & Francophone STUDIES CONCENTRATION (81 UNITS MINIMUM)

A BHA concentration in French & Francophone Studies promotes not just language proficiency but also an understanding of French and francophone cultures. 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
Intermediate level proficiency in French. This is equivalent to the completion of four courses (two at the 100-level and two at the 200-level) or exemption based on Advanced Placement, International Baccalaureate, Cambridge GCE Advanced level or Carnegie Mellon internal placement test scores.

Core Courses in French & Francophone Studies (3 courses, 27 units)
82-303 French & Francophone Cultures 9
82-304 French & Francophone Sociolinguistics 9
82-3xx or 82-4xx 9
Note: 82-303 or 82-304 can be repeated with a different topic. A 400-level course may be substituted with the concentration advisor’s approval.

Core Courses in Modern Languages (1 course, 9 units)
Complete one course.
82-280 Bilingual & Bicultural Experiences in the US 9
82-282 Interpreting Global Texts & Cultures 9
82-283 Language Diversity & Cultural Identity 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-285 Podcasting: Language and Culture Through Storytelling 9
82-286 Cultural Complexities 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Topics in Second Language Acquisition 9
82-480 Translation Technologies 9

Note: In consultation with the concentration advisor, students may substitute a Modern Languages course elective with one related to language analysis, language learning, or acquisition of language and culture from the listings in French & Francophone Studies or from another department. Examples: 80-180 Nature of Language, 85-421 Language and Thought. In addition, students may choose to take 82-580 Senior Seminar in Modern Languages (3 units). The selected course may not double count in the Electives category.

French & Francophone Studies and Interdisciplinary Electives (5 courses, 45 units minimum)
Complete four courses from French & Francophone Electives and one course from Interdisciplinary Electives or three courses from French & Francophone Electives and two courses from Interdisciplinary Electives in consultation with the concentration advisor.

French & Francophone Studies Electives:
82-415/416 Topics in French and Francophone Studies * 9
82-501/502 Special Topics in French & Francophone Studies * Var.
82-505 Undergraduate Internship Var.

* Students may repeat these courses with new topics.

Interdisciplinary Electives:
This list is compiled from possibilities such as but not limited to the following. Students should consult SIO and the concentration advisor for the most up to date interdisciplinary electives appropriate for the French & Francophone Studies curriculum. Courses may be suggested to the concentration advisor for approval as a substitute. Note that not all courses are offered each semester.

English
76-239 Introduction to Film Studies 9
76-318 Communicating in the Global Marketplace 9
76-385 Introduction to Discourse Analysis 9
76-386 Language & Culture 9

History
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-205 20th Century Europe 9
79-227 Modern Africa: The Slave Trade to the End of Apartheid 9
79-258 Napoleon 6
Complete one course.

Institute for Politics and Strategy (Choose in consultation with the concentration advisor.)

84-265 Political Science Research Methods 9
84-275 Comparative Politics 9
84-313 International Organizations and Law 9
84-322 Nonviolent Conflict and Revolution 9
84-324 The Future of Democracy 9
84-326 Theories of International Relations 9
84-362 Diplomacy and Statecraft 9
84-364 Comparative Presidential Behavior: Leadership, Personality, and Decision Making 9

Modern Languages
82-227 Germany & the European Union 9
82-280 Bilingual & Bicultural Experiences in the US 9
82-282 Interpreting Global Texts & Cultures 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-285 Podcasting: Language and Culture Through Storytelling 9
82-286 Cultural Complexities 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Topics in Second Language Acquisition 9
82-400 Translation Technologies 9

Note: In consultation with the concentration advisor, students may substitute a Modern Languages course elective with one related to language analysis, language learning, or acquisition of language and culture from the listings in German Studies or from another department. Examples: 80-180 Nature of Language, 85-421 Language and Thought. In addition, students may choose to take 82-580 Senior Seminar in Modern Languages (3 units). The selected course may not double count in the Electives category.

German Studies Electives (5 courses, 45 units minimum)

Complete four courses from German Studies Electives and one course from Interdisciplinary Electives or three courses from German Studies Electives and two courses from Interdisciplinary Electives in consultation with the concentration advisor.

German Studies Electives:
82-420 The Crucible of Modernity: Vienna 1900 9
82-425/426 Topics in German Literature and Culture 9
82-427 Nazi and Resistance Culture 9
82-428 History of German Film 9
82-429 German Reading and Film Workshop: German in Today’s World 9
82-505 Undergraduate Internship Var.
82-521/522 Special Topics in German Studies Var.

* Students may repeat these courses with new topics.

Interdisciplinary Electives:

This list is compiled from possibilities such as but not limited to the following. Students should consult SIO and the concentration advisor for approval as a substitute. Note that not all courses are offered each semester.

English
76-239 Introduction to Film Studies 9
76-386 Language & Culture 9
76-387 Writing in the Disciplines 6
76-483 Corpus Analysis in Rhetoric 9

History
79-205 20th Century Europe 9
79-257 Germany and the Second World War 9
79-349 United States and the Holocaust 6

Institute for Politics and Strategy (Choose in consultation with the concentration advisor.)
84-310 International Political Economy 9
84-326 Theories of International Relations 9
84-362 Diplomacy and Statecraft 9

Modern Languages
82-227 Germany & the European Union 9
82-280 Bilingual & Bicultural Experiences in the US 9
82-282 Interpreting Global Texts & Cultures 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-285 Podcasting: Language and Culture Through Storytelling 9
82-286 Cultural Complexities 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Topics in Second Language Acquisition 9

German Studies Concentration (81 units minimum)

A BHA concentration in German Studies promotes not just language proficiency but also an understanding of German 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
Intermediate level proficiency in German. This is equivalent to the completion of four courses (two at the 100-level and two at the 200-level) or exemption based on Advanced Placement, International Baccalaureate, Cambridge GCE Advanced level or Carnegie Mellon internal placement test scores.

Core Courses in German Studies (3 courses, 27 units)
82-320 Contemporary Society in Germany, Austria and Switzerland 9
82-323 Germany, Austria and Switzerland in the 20th Century 9
82-327 The Emergence of the German Speaking World 9

Note: A 400-level course may be substituted with the concentration advisor’s approval.

Core Courses in Modern Languages (1 course, 9 units)
Complete one course.
82-280 Bilingual & Bicultural Experiences in the US 9
82-282 Interpreting Global Texts & Cultures 9

82-383 Second Language Acquisition: Theories and Research 9
82-284 Multicultural Pittsburgh: VR Storytelling 9
82-285 Podcasting: Language and Culture Through Storytelling 9
82-286 Cultural Complexities 9
82-383 Second Language Acquisition: Theories and Research 9
82-388 Topics in Second Language Acquisition 9
82-480 Translation Technologies 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, literacy 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.

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 and the Global Studies concentration advisor 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 (https://www.cmu.edu/dietrich/students/undergraduate/programs/senior-honors/). The concentration advisor 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 Proficiency 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. If needed these courses may be counted toward the BHA General Education Communicating: Language and Interpretations category. Additional 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.

79-201 Introduction to Anthropology 9
79-211 Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange 9
79-278 How (Not) to Change the World 9
79-280 Coffee and Capitalism 9
79-289 Animal Planet: An Environmental History of People and Animals 9
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
79-318 Sustainable Social Change: History and Practice 9
79-377 Food, Culture, and Power: A History of Eating 9
79-379 Extreme Ethnography 9
79-380 Hostile Environments: The Politics of Pollution in Global Perspective 9
79-381 Energy and Empire: How Fossil Fuels Changed the World 9
79-383 The History of Capitalism 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.

Transnational and Global Courses:

76-337 Intersectional Feminism 9
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 6
79-237 Comparative Slavery 9
79-276 Beyond the Border 9
79-280 Coffee and Capitalism 9
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
79-313 “Unwanted”: Refugees, Asylum Seekers, and Patterns of Global Migration 9
79-350 Early Christianity 9
79-368 Un-natural Disasters: Societies and Environmental Hazards in Global Perspective 9
79-385 Out of Africa: The Making of the African Diaspora 6
80-348 Health, Human Rights, and International Development 9
80-447 Global Justice 9
82-283 Language Diversity & Cultural Identity 9
82-304 French & Francophone Sociolinguistics 9
82-345 Introduction to Hispanic Literary & Cultural Studies 9
84-322 Nonviolent Conflict and Revolution 9
84-326 Theories of International Relations 9
84-370 Global Nuclear Politics 9
84-389 Terrorism and Insurgency 9

Regional Courses:

Africa
79-225 West African History in Film 9
79-226 African History: Earliest Times to 1780 9
79-227 Modern Africa: The Slave Trade to the End of Apartheid 9
79-290 The Slave Passage: From West Africa to the Americas 9
82-427 Nazi and Resistance Culture 9
82-428 History of German Film 9
82-480 Translation Technologies 9

Philosophy
80-136 Social Structure, Public Policy & Ethics 9
80-180 Nature of Language 9
80-251 Modern Philosophy 9
80-253 Continental Philosophy 9
80-256 Modern Moral Philosophy 9
80-275 Metaphysics 9
80-280 Linguistic Analysis 9
80-380 Philosophy of Language 9

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

BXA Intercollege Degree Programs
Eastern and Southern Asia and the Pacific
79-264 Tibet and China: History and Propaganda 6
88-411 Rise of the Asian Economies 9

Europe
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-203 The Other Europe: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1990 9
79-205 20th Century Europe 9
79-208 Witchcraft and Witch-Hunting 9
79-268 World War I: The Twentieth Century’s First Catastrophe 9
79-270 Anti-Semitism Then and Now: Perspectives from the Middle Ages to the Present 6
79-323 Family, Gender, and Sexuality in European History, 500-1800 9
82-320 Contemporary Society in Germany, Austria and Switzerland 9
82-415 Topics in French and Francophone Studies 9
82-441 Studies in Peninsular Literature and Culture 9

The Middle East
79-229 The Origins of the Palestinian-Israeli Conflict, 1880-1948 9
79-230 Arab-Israeli Conflict Since 1948 9
79-307 Religion and Politics in the Middle East 9
79-336 Introduction to Environmental Ideas 9
79-398 Documenting the 1967 Arab-Israeli War 9
84-323 War and Peace in the Contemporary Middle East 9

The Americas
79-223 Mexico: From the Aztec Empire to the Drug War 9
82-245 New Directions in Hispanic Studies 9
82-343 Latin America Language and Culture 9
82-451 Studies in Latin American Literature and Culture 9
82-455 Topics in Hispanic Studies 9
82-456 Topics in Hispanic Studies 9
84-308 Political Economy of Latin America 9

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 “Transnational, Global, and Regional 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 concentration advisor. The concentration advisor 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:
57-306 World Music 9
70-365 International Trade and International Law 9
76-241 Introduction to Gender Studies 9
76-386 Language & Culture 9
76-449 Race and Media 9
76-450 Law, Culture, and the Humanities 9
76-468 Space and Mobilities 9
79-204 American Environmental History 9
79-228 The Civil Rights Movement and the World 9
79-281 Introduction to Religion 9
79-286 Archaeology: Understanding the Ancient World 6
79-311 PaleoKitchen: Food and Cooking in the Ancient World 6
79-316 Photography, the First 100 Years, 1839-1939 9
79-324 #MeToo: Naming and Resisting Gender Violence 6
79-330 Medicine and Society: Health, Healers, and Hospitals 9
79-343 Education, Democracy, and Civil Rights 9
79-349 United States and the Holocaust 6
79-397 Environmental and Public Health Crises in the City 6
80-244 Environmental Ethics 9
80-335 Social and Political Philosophy 9
82-215 Arab Culture Through Dialogues, Film, and Literature 9
82-541 Special Topics in Hispanic Studies Var.: 9
84-275 Comparative Politics 9
84-310 International Political Economy 9
84-318 Politics of Developing Nations 9
84-362 Diplomacy and Statecraft 9

Nation-based Courses:
79-216 Genghis Khan and the Mongol Empire 3
79-257 Germany and the Second World War 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: Game of Thrones 9
79-266 Russian History and Revolutionary Socialism 9
79-267 The Soviet Union in World War II: Military, Political, and Social History 9
79-269 Russian History: From Socialism to Capitalism 9
79-309 The Chinese Revolution Through Film (1949-2000) 9
79-319 India Through Film 6
79-320 Women, Politics, and Protest 9
79-322 Stalin and the Great Terror 9
79-331 Body Politics: Women and Health in America 9
82-253 Korean Culture Through Film 9
82-254 World of Korea, Then and Now 9
82-273 Introduction to Japanese Language and Culture 9
82-278 Japanese Film and Literature: The Art of Storytelling 9
82-293 Russian Cinema: From the Bolshevik Revolution to Putin’s Russia 9
82-294 19th Century Russian Masterpieces 9
82-303 French & Francophone Cultures 9
82-305 French in its Social Contexts 9
82-333 Introduction to Chinese Language and Culture Var.: 9
82-342 Spain: Language and Culture 9
82-344 U.S. Latinos: Language and Culture 9
82-361 Italian Language and Culture I 9
82-420 The Crucible of Modernity: Vienna 1909 9
82-425 Topics in German Literature and Culture 9
82-427 Nazi and Resistance Culture 9
82-428 History of German Film Var.: 9
82-433 Topics in Contemporary Culture of China 9
82-434 Studies in Chinese Traditions 9
82-440 Studies in Chinese Literature & Culture 9
82-473 Topics in Japanese Studies 9

Hispanic Studies CONCENTRATION (81 UNITS MINIMUM)
A BHA concentration in Hispanic Studies promotes not just language proficiency but also an understanding of its varied cultures. 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
Intermediate level proficiency in Spanish. This is equivalent to the completion of four courses (two at the 100-level and two at the 200-level) or exemption based on Advanced Placement, International Baccalaureate, Cambridge GCE Advanced level or Carnegie Mellon internal placement test scores.

### Core Courses in Hispanic Studies (3 courses, 27 units)
**Complete two courses.**

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<tr>
<td>82-342</td>
<td>Spain: Language and Culture</td>
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<td>82-343</td>
<td>Latin America Language and Culture</td>
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<tr>
<td>82-344</td>
<td>U.S. Latinos: Language and Culture</td>
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**Complete required course.**

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<td>82-345</td>
<td>Introduction to Hispanic Literary &amp; Cultural Studies</td>
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### Core Courses in Modern Languages (1 course, 9 units)
**Complete one course.**

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<th>Units</th>
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<tbody>
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<td>82-280</td>
<td>Bilingual &amp; Bicultural Experiences in the US</td>
<td>9</td>
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<td>82-282</td>
<td>Interpreting Global Texts &amp; Cultures</td>
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<td>82-283</td>
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<td>Multicultural Pittsburgh: VR Storytelling</td>
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<td>82-285</td>
<td>Podcasting: Language and Culture Through Storytelling</td>
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<tr>
<td>82-286</td>
<td>Cultural Complexities</td>
<td>9</td>
</tr>
<tr>
<td>82-383</td>
<td>Second Language Acquisition: Theories and Research</td>
<td>9</td>
</tr>
<tr>
<td>82-388</td>
<td>Topics in Second Language Acquisition</td>
<td>9</td>
</tr>
<tr>
<td>82-480</td>
<td>Translation Technologies</td>
<td>9</td>
</tr>
</tbody>
</table>

Note: In consultation with the concentration advisor, students may substitute a Modern Languages course elective with one related to language analysis, language learning, or acquisition of language and culture from the listings in Hispanic Studies or from another department. Examples: 80-180 Nature of Language, 85-421 Language and Thought. In addition, students may choose to take 82-580 Senior Seminar in Modern Languages (3 units). The selected course may not double count in the Electives category.

### Hispanic Studies and Interdisciplinary Electives (5 courses, 45 units)
**Complete five courses from Hispanic Studies Electives or four courses from Hispanic Studies Electives and one course from Interdisciplinary Electives in consultation with the concentration advisor.**

### Hispanic Studies Electives:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>82-441</td>
<td>Studies in Peninsular Literature and Culture *</td>
<td>9</td>
</tr>
<tr>
<td>82-443</td>
<td>Spanish Reading and Translation Workshop</td>
<td>9</td>
</tr>
<tr>
<td>82-444</td>
<td>The Structure of Spanish</td>
<td>9</td>
</tr>
<tr>
<td>82-451</td>
<td>Studies in Latin American Literature and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-455/456</td>
<td>Topics in Hispanic Studies *</td>
<td>9</td>
</tr>
<tr>
<td>82-506</td>
<td>Hispanic Studies Internship</td>
<td>Var.</td>
</tr>
<tr>
<td>82-541/542</td>
<td>Special Topics in Hispanic Studies *</td>
<td>Var.</td>
</tr>
</tbody>
</table>

* Students may repeat these courses with new topics.

### Interdisciplinary Electives:
This list is compiled from possibilities such as but not limited to the following. Students should consult SIO and the concentration advisor for the most up to date interdisciplinary electives appropriate for the Hispanic Studies curriculum. Courses may be suggested to the concentration advisor for approval as a substitute. Note that not all courses are offered each semester.

### Information Systems CONCENTRATION (81 UNITS MINIMUM)

Did you enjoy computer science or more technical courses in high school, but are mostly interested in the practical and social applications of technology? Do you have a passion for business and want to use advanced technology to change how companies work? Do you want to learn how data and technology can be harnessed for social good?

The BHA concentration in Information Systems combines aspects of computer science, information technology, and business management to provide you with an uncommonly well-rounded portfolio. You will be uniquely positioned for an impactful career in an increasingly digitized and connected world and able to adapt to rapid evolution across industries.

In addition to building a solid foundation in computing, communications, and software development, you will also study social sciences and organizational theory to develop "big picture" critical thinking and understand the human impacts of technological change. This blend prepares you to take a leading role in our digital future.

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

### Mathematics and Computer Science Prerequisite Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-112</td>
<td>Fundamentals of Programming and Computer Science</td>
<td>12</td>
</tr>
<tr>
<td>15-121</td>
<td>Introduction to Data Structures or 15-122 Principles of Imperative Computation</td>
<td>10</td>
</tr>
</tbody>
</table>

**Choose one:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-112</td>
<td>Integral Calculus</td>
<td>10</td>
</tr>
<tr>
<td>21-120</td>
<td>Differential and Integral Calculus</td>
<td>10</td>
</tr>
<tr>
<td>21-127</td>
<td>Concepts of Mathematics</td>
<td>10</td>
</tr>
<tr>
<td>21-240</td>
<td>Matrix Algebra with Applications</td>
<td>10</td>
</tr>
</tbody>
</table>

### Information Systems Professional Core (7 courses, 75 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-250</td>
<td>The Information Systems Milieux -Spring</td>
<td>9</td>
</tr>
<tr>
<td>67-262</td>
<td>Database Design and Development -Fall</td>
<td>9</td>
</tr>
<tr>
<td>67-272</td>
<td>Application Design and Development -Spring</td>
<td>12</td>
</tr>
<tr>
<td>67-373</td>
<td>Information Systems Consulting Project -Spring</td>
<td>12</td>
</tr>
</tbody>
</table>
investigates the way in which leaders and citizens construct grand strategy. Statesmen, scholars, and policy makers often define grand strategy as the political and institutional arrangements within and among these levels; and at the national, regional, international, and transnational levels; examines the effects of culture, economics, and society on the international system through a rich set of elective courses.

Thinking systematically about international and domestic politics is the core objective of the IRP concentration. The concentration taps into and contributes to CMU’s strengths in other social sciences that combine analytical and empirical methods. IRP includes an innovative initiative that incorporates decision science in international relations. It enables students to study public policy and intern in Washington for one semester. Courses taken through CMU/WSP will count toward the elective requirements if the 200-level is reached. Advanced level study is strongly encouraged.

The Carnegie Mellon University Washington Semester Program (CMU/WSP) allows students to study public policy and intern in Washington for one semester. Courses taken through CMU/WSP will count toward the elective requirements 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).

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>66-221</td>
<td>Topics of Law: Introduction to Intellectual Property Law</td>
<td>9</td>
</tr>
<tr>
<td>79-301</td>
<td>History of Surveillance: From the Plantation to Data Capitalism</td>
<td>6</td>
</tr>
<tr>
<td>79-302</td>
<td>Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems</td>
<td>6</td>
</tr>
<tr>
<td>80-135</td>
<td>Introduction to Political Philosophy</td>
<td>9</td>
</tr>
<tr>
<td>80-321</td>
<td>Causation, Law, and Social Policy</td>
<td>9</td>
</tr>
<tr>
<td>80-335</td>
<td>Social and Political Philosophy</td>
<td>9</td>
</tr>
<tr>
<td>84-319</td>
<td>U.S. Foreign Policy and Interventions in World Affairs</td>
<td>9</td>
</tr>
</tbody>
</table>
Option 2
Complete their electives via the Carnegie Mellon University Washington Semester Program (CMU/WSP) Politics and Public Policy elective sequence. The Washington Semester Program (CMU/WSP) Politics and Public Policy Elective Sequence includes:

84-450-84-450 Policy Seminar-Policy Seminar (This course will count as the Policy Seminar Core Course Requirement)
84-360 CMU/WSP Internship Seminar 12
84-3xx CMU/WSP Elective Seminars (Take 24 units from the elective list below) 24

Economics and Society
19-452 EPP Projects II 12
70-342 Managing Across Cultures 9
70-365 International Trade and International Law 9
70-430 International Management 9
73-103 Principles of Macroeconomics 9
73-328 Health Economics 12
73-332 Political Economy 9
80-136 Social Structure, Public Policy & Ethics 9
80-244 Environmental Ethics 9
80-249 AI, Society, and Humanity 9
80-348 Health, Human Rights, and International Development 9
80-447 Global Justice 9
84-307 Economic and Political History of Contemporary China 9
84-308 Political Economy of Latin America 9
84-310 International Political Economy 9
84-311 International Development: Theory and Praxis 9
84-312 Terrorism in Sub-Saharan Africa 6
84-313 International Organizations and Law 9
84-318 Politics of Developing Nations 9
88-411 Rise of the Asian Economies 9

International Cultures
76-318 Communicating in the Global Marketplace 9
76-386 Language & Culture 9
79-203 The Other Europes: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1990 9
79-205 20th Century Europe 9
79-223 Mexico: From the Aztec Empire to the Drug War 9
79-224 Mayan America 9
79-227 Modern Africa: The Slave Trade to the End of Apartheid 9
79-229 The Origins of the Palestinian-Israeli Conflict, 1880-1948 9
79-230 Arab-Israeli Conflict Since 1948 9
79-233 The United States and the Middle East since 1945 9
79-257 Germany and the Second World War 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: Game of Thrones 9
79-266 Russian History and Revolutionary Socialism 9
79-267 The Soviet Union in World War II: Military, Political, and Social History 9
79-275 Introduction to Global Studies 9
79-288 Bananas, Baseball, and Borders: Latin America and the United States 9
79-307 Religion and Politics in the Middle East 9
79-313 “Unwanted”: Refugees, Asylum Seekers, and Patterns of Global Migration 6
79-314 The Politics and Culture of Memory 9
79-318 Sustainable Social Change: History and Practice 9
79-320 Women, Politics, and Protest 9
79-338 History of Education in America 9
79-342 Introduction to Science and Technology Studies 9
79-343 Education, Democracy, and Civil Rights 9
79-371 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 9
79-398 Documenting the 1967 Arab-Israeli War 9
85-375 Crosscultural Psychology 9
300 or 400- level language course

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 Advanced Placement, International Baccalaureate, a Cambridge GCE Advanced level or Carnegie Mellon internal placement test scores.

Core Courses in Japanese Studies (4 courses, 39 units)
- 82-272 Intermediate Japanese II 12
- 82-273 Introduction to Japanese Language and Culture 9
- 82-371 Advanced Japanese I 9
- 82-372 Advanced Japanese II 9

* Students who place out of 82-272 Intermediate Japanese II must take 12 units chosen from the Japanese Studies and Interdisciplinary Electives category below.

Core Courses in Modern Languages (1 course, 9 units)
Complete one course.
- 82-280 Bilingual & Bicultural Experiences in the US 9
- 82-282 Interpreting Global Texts & Cultures 9
- 82-283 Language Diversity & Cultural Identity 9
- 82-284 Multicultural Pittsburgh: VR Storytelling 9
- 82-285 Podcasting: Language and Culture Through Storytelling 9
- 82-286 Cultural Complexities 9
- 82-383 Second Language Acquisition: Theories and Research 9
- 82-388 Topics in Second Language Acquisition 9
- 82-480 Translation Technologies 9

Note: In consultation with the concentration advisor, students may substitute a Modern Languages course elective with one related to language analysis, language learning or acquisition of language and culture from the listings in Japanese Studies or from another department. Examples: 80-180 Nature of Language, 85-421 Language and Thought. In addition, students may choose to take 82-580 Senior Seminar in Modern Languages (3 units). The selected course may not double count in the Electives category.

Japanese Studies and Interdisciplinary Electives (4 courses, 33 units minimum)
Complete three courses from Japanese Studies Electives and one course from Interdisciplinary Electives or two courses from Japanese Studies Electives and two courses from Interdisciplinary Electives in consultation with the concentration advisor. With permission of the concentration advisor, students are encouraged to complete at least one Japanese history course that qualifies for Japanese Studies and Interdisciplinary Electives at the University of Pittsburgh, one in Japan when they study abroad or in a summer program at any other university.

Japanese Studies Electives
- 82-373 Structure of the Japanese Language 9
- 82-374 Issues in Japanese Technology & Society 9
- 82-473/474 Topics in Japanese Studies *Var.
- 82-505 Undergraduate Internship Var.
- 82-571/572 Special Topics in Japanese Studies *Var.

* Students may repeat these courses with new topics.

Interdisciplinary Electives
This list is compiled from possibilities such as but not limited to the following. Students should consult SIO and concentration advisor for the most up to date interdisciplinary electives appropriate for the Japanese Studies curriculum. Courses may be suggested to the concentration advisor for approval as a substitute. Note that not all courses are offered each semester.

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

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

Linguistics Core (2 courses, 18 units)
Take one course each in 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:
80-381 Meaning in Language 9
80-383 Language in Use 9

Extended Core (3 courses, 27 units)
Choose three courses from Extended Core or additional courses from the Linguistics Core above.
80-283 It Matters How You Say It 9
80-284 Invented Languages 9
80-286 Words and Word Formation: Introduction to Morphology 9
80-287 Language Variation and Change 9
80-288 Intonation: Transcription and Analysis 9
80-382 Phonetics and Phonology II 9
80-384 Linguistics of Turkic Languages 9
80-385 Linguistics of Germanic Languages 9
80-388 Linguistic Typology: Diversity and Universals 9
80-488 Acoustics of Human Speech: Theory, Data, and Analysis 9

Elective Courses (3 courses, 27 units)
Take three additional electives. These can be additional courses from the Core or Extended Core courses listed above, the electives list below, or any other elective which must be approved by the concentration advisor 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 concentration advisor will provide students with a list of possible electives each semester, and will assist students in selecting electives that are consistent with their goals and interests. A list of these courses must be filed in the BXA office.

Philosophy:
80-380 Philosophy of Language 9
80-484 Language and Thought 9

English:
76-318 Communicating in the Global Marketplace 9
76-325 Intertextuality 9
76-385 Introduction to Discourse Analysis 9
76-386 Language & Culture 9
76-389 Rhetorical Grammar 9

Modern Languages:
82-283 Language Diversity & Cultural Identity 9
82-305 French in its Social Contexts 9
82-373 Structure of the Japanese Language 9
82-383 Second Language Acquisition: Theories and Research 9
82-585 Topics in Second Language Acquisition 9
82-304 French & Francophone Sociolinguistics 9

Psychology:
85-354 Infant Language Development 9
85-421 Language and Thought 9

Language Technologies Institute:
11-411 Natural Language Processing 12
11-492 Speech Processing 12
11-422 Grammar Formalisms 9

LITERATURE & CULTURE CONCENTRATION (81 UNITS MINIMUM)
The BHA concentration in Literature & Culture teaches students how to read, interpret and write persuasively about novels, poems, plays and other imaginative works across a variety of genres and media forms. Along with teaching students the analytical skills and methodological tools to interpret these works, this major teaches the importance of understanding imaginative works within their cultural and historical contexts. In addition, the concentration is designed to train students in strong professional and academic skills like critical thinking, inductive reasoning and persuasive argumentation that are applicable to other fields of study and a variety of career paths.

Prerequisite Course
76-26x Survey of Forms (Creative Nonfiction, Fiction, Poetry, Screenwriting) 9

Required Introductory Courses (2 courses, 18 units)
76-245 Shakespeare's Dark Plays 9
or 76-247 Shakespeare: Comedies and Romances 9
76-275 Critical Writing Workshop 9

200-Level Literature & Culture Course (1 course, 9 units)
Course options include but are not limited to the following:
76-207 Special Topics in Literature & Culture 9
76-210 Banned Books 9
76-217 Literature & Culture of the 20th and 21st Century 9
76-221 Books You Should Have Read By Now 9
76-223 Contemporary Black Literature 9
76-230 Literature & Culture in the 19th Century 9
76-233 Literature and Culture in the Renaissance 9
76-232 Introduction to Black Literature 9
76-238 What Was the Hip-Hop Generation? 9
76-245 Shakespeare's Dark Plays 9
76-290 Literature & Culture in the 20th Century 9

300-Level Course (1 course, 9 units)
Course options include but are not limited to the following:
76-310 Advanced Studies in Film and Media 9
76-311 Acting Out in the London Theatre 9
76-313 Creative Visual Storytelling in Film Production 9
76-314 Data Stories 9
76-337 Intersectional Feminism 9
76-341 Gender and Sexuality in Performance 9
76-343 Rise of the American Novel 9
76-352 Music, Technology, and Culture 9
76-353 Transnational Feminisms: Fiction and Film 9
76-361 Corpus Rhetorical Analysis 9
76-367 Fact Into Film: Translating History into Cinema 9
76-377 Shakespeare on Film 9
76-388 Coding for Humanists 9

400-Level Course (1 course, 9 units)
Course options include but are not limited to the following:
76-410 The Long Eighteenth Century 9
76-412 Performance and 18th Century Theatrical Culture 9
76-414 Politics, Media, and Romantic Literature 1789-1830 9
76-429 Introduction to Digital Humanities 9
76-440 Postcolonial Theory: Diaspora and Transnationalism 9
76-443 Restoration & 18th-Century Theatre 9
76-444 History of Books and Reading 9
76-448 Shakespeare on Film 9

Theory Course (1 course, 9 units)
Course options include but are not limited to the following:
76-350 Critical Theories about Literature 9

Rhetoric Course (1 course, 9 units)
Course options include but are not limited to the following:
76-318 Communicating in the Global Marketplace 9
76-319 Environmental Rhetoric 9
76-351 Rhetorical Invention 9
Epistemology, Ethics and Social Philosophy, and Philosophy of Mind are their electives. Sample curricula emphasizing Pre-Law, Metaphysics and but do not require, students to choose a thematic concentration through humanities education and sharpens their analytical skills. We encourage, The BHA Concentration in in Philosophy provides students with a broad Philosophy Concentration (81 units minimum)

psychology or statistics. The sequence of courses, mostly at the 300-level, three advanced courses in areas that use logical and computational tools, Bearing in mind prerequisites, Logic & Computation students must complete

Logic & Computation Electives (3 courses, 25 units minimum)

area of focus (or specialization) that students write their senior thesis under the supervision of a faculty member. The resulting education in logic, analytic philosophy, mathematics, statistics and computer science enables students to pursue professional careers or graduate study. The analytic and communication skills developed in the major support a wide range of career choices, including those among the fields of technology, business and law. Fields of graduate study for which students are well prepared include, for example, computer science, cognitive science, philosophy, logic and linguistics. Prerequisites

Logic & Computation Core (6 courses, 56 units)

Logic & Computation Electives (3 courses, 25 units minimum) Bearing in mind prerequisites, Logic & Computation students must complete three advanced courses in areas that use logical and computational tools, such as philosophy, computer science, linguistics, mathematical logic, psychology or statistics. The sequence of courses, mostly at the 300-level, must be selected in consultation with the concentration advisor. Philosophy Concentration (81 units minimum)
The BHA Concentration in in Philosophy provides students with a broad humanities education and sharpens their analytical skills. We encourage, but do not require, students to choose a thematic concentration through their electives. Sample curricula emphasizing Pre-Law, Metaphysics and Epistemology, Ethics and Social Philosophy, and Philosophy of Mind are...
Foundation Courses (5 courses, 39 units)
76-26x Survey of Forms (Nonfiction, Fiction, Poetry or Screenwriting)
76-271 Introduction to Professional and Technical Writing
76-300 Professional Seminar
76-373 Argument
76-390 Style

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.

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. All students with a concentration in PW, regardless of their career focus, are encouraged to take 76-391 Document & Information Design and 76-487 Web Design to extend their skills in writing for print to include information design for digital media. Both courses focus on the role of the writer in these specializations and provide lab instruction in the relevant software and related computer skills.

80-514 Categorical Logic
80-518 Seminar on Topics in Logic

Area 4: Epistemology/Metaphysics (1 course, 9 units)
80-150 Nature of Reason
80-201 Knowledge and Justified Belief
80-208 Critical Thinking
80-220 Philosophy of Science
80-221 Philosophy of Social Science
80-222 Measurement and Methodology
80-223 Causality and Probability
80-224 Race, Gender and Science
80-226 Revolutions in Science
80-305 Decision Theory
80-322 Philosophy of Physics
80-324 Philosophy of Economics
80-326 Epistemology of Machine Learning
80-327 Philosophy of Neuroscience
80-405 Game Theory
80-515 Seminar on the Foundations of Statistics
80-516 Causality and Machine Learning
80-520 Seminar on Philosophy Science
80-521 Seminar on Formal Epistemology: Belief and Evidence

Area 5: History of Philosophy (1 course, 9 units)
80-150 Nature of Reason
80-226 Revolutions in Science
80-250 Ancient Philosophy
80-251 Modern Philosophy
80-252 Kant
80-253 Continental Philosophy
80-254 Analytic Philosophy
80-255 Pragmatism
80-256 Modern Moral Philosophy
80-257 Nietzsche
80-261 Experience, Reason, and Truth
80-263 Approaching Chinese Philosophy: Basic Texts and Implications
80-358 Hume
80-362 Russell
80-363 19th Century Foundations of Science

Area 6: Electives (3 courses, 27 units)
Three other philosophy courses, or appropriate courses from other departments, with the permission of the concentration advisor.

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.

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, 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.
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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>85-102</td>
<td>Introduction to Psychology</td>
<td>9</td>
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</tbody>
</table>

Survey Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-211</td>
<td>Cognitive Psychology</td>
<td>9</td>
</tr>
<tr>
<td>or 85-213</td>
<td>Human Information Processing and Artificial Intelligence</td>
<td>9</td>
</tr>
<tr>
<td>85-219</td>
<td>Biological Foundations of Behavior</td>
<td>9</td>
</tr>
<tr>
<td>85-221</td>
<td>Principles of Child Development</td>
<td>9</td>
</tr>
<tr>
<td>85-241</td>
<td>Social Psychology</td>
<td>9</td>
</tr>
<tr>
<td>85-251</td>
<td>Personality</td>
<td>9</td>
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</tbody>
</table>

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.

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-310</td>
<td>Research Methods in Cognitive Psychology</td>
<td>9</td>
</tr>
<tr>
<td>85-314</td>
<td>Cognitive Neuroscience Research Methods</td>
<td>9</td>
</tr>
<tr>
<td>85-320</td>
<td>Research Methods in Developmental Psychology</td>
<td>9</td>
</tr>
<tr>
<td>85-330</td>
<td>Analytic Research Methods</td>
<td>9</td>
</tr>
<tr>
<td>85-340</td>
<td>Research Methods in Social Psychology</td>
<td>9</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-309</td>
<td>Experimental Design for Behavioral &amp; Social Sciences - Fall</td>
<td>9</td>
</tr>
</tbody>
</table>

or 85-309 Statistical Concepts and Methods for Behavioral and Social Science

Advanced Courses (3 courses, 27 units)


Russian Studies CONCENTRATION (81 UNITS MINIMUM)

A BHA concentration in Russian Studies promotes not just language proficiency but also an understanding of Russian 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

Intermediate level proficiency in Russian. This is equivalent to the completion of three courses (two at the 100-level and one at the 200-level) or exemption based on Advanced Placement, International Baccalaureate, Cambridge GCE Advanced level or Carnegie Mellon internal placement test scores.

Core Courses in Russian Studies (3 courses, 33 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>82-292</td>
<td>Intermediate Russian II</td>
<td>12</td>
</tr>
<tr>
<td>82-294</td>
<td>19th Century Russian Masterpieces</td>
<td>Var.</td>
</tr>
<tr>
<td>or 82-295</td>
<td>20th Century Russian Masterpieces</td>
<td></td>
</tr>
<tr>
<td>79-265</td>
<td>Russian History: Game of Thrones</td>
<td>9</td>
</tr>
<tr>
<td>or 79-266</td>
<td>Russian History and Revolutionary Socialism</td>
<td>9</td>
</tr>
</tbody>
</table>

Core Courses in Modern Languages (1 course, 9 units)

Complete one course.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>82-280</td>
<td>Bilingual &amp; Bicultural Experiences in the US</td>
<td>9</td>
</tr>
<tr>
<td>82-282</td>
<td>Interpreting Global Texts &amp; Cultures</td>
<td>9</td>
</tr>
<tr>
<td>82-283</td>
<td>Language Diversity &amp; Cultural Identity</td>
<td>9</td>
</tr>
<tr>
<td>82-284</td>
<td>Multicultural Pittsburgh: VR Storytelling</td>
<td>9</td>
</tr>
<tr>
<td>82-285</td>
<td>Podcasting: Language and Culture Through Storytelling</td>
<td>9</td>
</tr>
<tr>
<td>82-286</td>
<td>Cultural Complexities</td>
<td>9</td>
</tr>
<tr>
<td>82-383</td>
<td>Second Language Acquisition: Theories and Research</td>
<td>9</td>
</tr>
<tr>
<td>82-388</td>
<td>Topics in Second Language Acquisition</td>
<td>9</td>
</tr>
<tr>
<td>82-480</td>
<td>Translation Technologies</td>
<td>9</td>
</tr>
</tbody>
</table>

Note: In consultation with the concentration advisor, students may substitute a Modern Languages course elective with one related to language analysis, language learning, or acquisition of language and culture from the listings in Russian Studies or from another department. Examples: 80-180 Nature of Language, 85-421 Language and Thought. In addition, students may choose to take 82-580 Senior Seminar in Modern Languages (3 units). The selected course may not double count in the Electives category.

Russian Studies and Interdisciplinary Electives (5 courses, 39 units minimum)

Complete two courses from Russian Studies Electives or one course from Russian Studies Electives and one course from Interdisciplinary Electives in consultation with the concentration advisor.

Russian Studies Electives:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>82-293</td>
<td>Russian Cinema: From the Bolshevik Revolution to Putin's Russia</td>
<td>Var.</td>
</tr>
<tr>
<td>82-391</td>
<td>Advanced Russian I - Berlin, Paris, New York, Harbin</td>
<td>9</td>
</tr>
<tr>
<td>82-392</td>
<td>Advanced Russian II: Great Short Works</td>
<td>9</td>
</tr>
<tr>
<td>82-394</td>
<td>Russian for Heritage Speakers: Babushkas, Russia &amp; Beyond</td>
<td>9</td>
</tr>
<tr>
<td>82-397</td>
<td>Topics in Russian Language &amp; Culture</td>
<td>Var.</td>
</tr>
<tr>
<td>82-599</td>
<td>Russian Studies Thesis</td>
<td>9</td>
</tr>
</tbody>
</table>

* Students may repeat these courses with new topics.
Interdisciplinary Electives:

This list is compiled from possibilities such as but not limited to the following. Students should consult SIO and the concentration advisor for the most up to date interdisciplinary electives appropriate for the Russian Studies curriculum. Courses may be suggested to the concentration advisor for approval as a substitute. Note that not all courses are offered each semester.

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

**History**
- 79-205 20th Century Europe 9
- 79-267 The Soviet Union in World War II: Military, Political, and Social History 9
- 79-322 Stalin and the Great Terror 9
- 79-341 The Cold War in Documents and Film 9

Institute for Politics and Strategy (Choose in consultation with the concentration advisor.)
- 84-380 US Grand Strategy 9
- 84-405 The Future of Warfare 9

**Modern Languages**
- 82-208 Eastern Europe: Society and Culture 9
- 82-280 Bilingual & Bicultural Experiences in the US 9
- 82-282 Interpreting Global Texts & Cultures 9
- 82-283 Language Diversity & Cultural Identity 9
- 82-284 Multicultural Pittsburgh: VR Storytelling 9
- 82-285 Podcasting: Language and Culture Through Storytelling 9
- 82-286 Cultural Complexities 9
- 82-383 Second Language Acquisition: Theories and Research 9
- 82-388 Topics in Second Language Acquisition 9
- 82-480 Translation Technologies 9

**Philosophy**
- 80-180 Nature of Language 9
- 80-280 Linguistic Analysis 9
- 80-380 Philosophy of Language 9

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

* Students may repeat these courses with new topics.

**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 Survey Courses (2 courses, 18 units)
- 79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
- 79-203 The Other Europeans: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1900 9
- 79-204 American Environmental History 9
- 79-205 20th Century Europe 9
- 79-206 Crime and Punishment in Early Modern Europe 9
- 79-211 Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange 9
- 79-223 Mexico: From the Aztec Empire to the Drug War 9
- 79-225 West African History in Film 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 The Origins of the Palestinian-Israeli Conflict, 1880-1948 9
- 79-230 Arab-Israeli Conflict Since 1948 9
- 79-231 American Civil Rights Movement: From Garveyism to Black Power 9
- 79-233 The United States and the Middle East since 1945 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
- 79-249 Politics and Social Change in 20th Century America 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
- 79-265 Russian History: Game of Thrones 9
- 79-266 Russian History and Revolutionary Socialism 9
- 79-269 Russian History: From Socialism to Capitalism 9
- 79-288 Bananas, Baseball, and Borders: Latin America and the United States 9
- 79-307 Religion and Politics in the Middle East 9
- 79-320 Women, Politics, and Protest 9

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. Any History (79-xxx) class can count as an SPH elective except for 79-198, 79-200, 79-400, 79-420, 79-449, 79-491). See the History Department website (www.cmu.edu/dietrich/history) or contact the History advisor for the most current elective offerings.

Students may satisfy the elective requirements in SPH with up to 27 units of the following courses offered by other departments in Dietrich College:

- 73-476 American Economic History 9
- 76-230 Literature & Culture in the 19th Century 9
- 76-239 Introduction to Film Studies 9
- 76-285 Russian Cinema: From the Bolshevik Revolution to Putin's Russia 9
- 76-449 Race and Media 9
- 80-135 Introduction to Political Philosophy 9
- 80-226 Revolutions in Science 9
- 80-335 Social and Political Philosophy 9
- 82-208 Eastern Europe: Society and Culture 9
- 82-245 New Directions in Hispanic Studies 9
- 82-247 The Hispanic World: History, Culture and Globalization 9
- 82-293 Russian Cinema: From the Bolshevik Revolution to Putin's Russia 9
- 82-327 The Emergence of the German Speaking World 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 Prerequisites

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>or 21-259</td>
<td>Calculus in Three Dimensions</td>
<td>9</td>
</tr>
<tr>
<td>21-240</td>
<td>Matrix Algebra with Applications</td>
<td>10</td>
</tr>
<tr>
<td>or 21-241</td>
<td>Matrices and Linear Transformations</td>
<td>9</td>
</tr>
<tr>
<td>or 21-242</td>
<td>Matrix Theory</td>
<td>9</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 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>Methods for Statistics &amp; Data Science</td>
<td>9</td>
</tr>
<tr>
<td>or 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>
<tr>
<td>36-226</td>
<td>Introduction to Statistical Inference</td>
<td>9</td>
</tr>
<tr>
<td>36-350</td>
<td>Statistical Computing</td>
<td>9</td>
</tr>
<tr>
<td>36-401</td>
<td>Modern Regression</td>
<td>9</td>
</tr>
<tr>
<td>36-402</td>
<td>Advanced Methods for Data Analysis</td>
<td>9</td>
</tr>
</tbody>
</table>

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 concentration advisor to select the Special Topics and Electives courses that best fit for their areas of interest.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-303</td>
<td>Sampling, Survey and Society</td>
<td>9</td>
</tr>
<tr>
<td>36-311</td>
<td>Statistical Analysis of Networks</td>
<td>9</td>
</tr>
<tr>
<td>36-313</td>
<td>Statistics of Inequality and Discrimination</td>
<td>9</td>
</tr>
<tr>
<td>36-315</td>
<td>Statistical Graphics and Visualization</td>
<td>9</td>
</tr>
<tr>
<td>36-490</td>
<td>Undergraduate Research</td>
<td>9</td>
</tr>
<tr>
<td>36-490</td>
<td>Undergraduate Research</td>
<td>9</td>
</tr>
<tr>
<td>36-490</td>
<td>Special Topics (topics and offerings vary)</td>
<td>9</td>
</tr>
<tr>
<td>36-490</td>
<td>Undergraduate Research</td>
<td>9</td>
</tr>
<tr>
<td>36-497</td>
<td>Corporate Capstone Project</td>
<td>9</td>
</tr>
</tbody>
</table>

Statistics & Machine Learning Concentration (81 UNITS MINIMUM)

In the BHA concentration in Statistics & Machine Learning, 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 & Machine Learning 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 and Computer Science Prerequisites

These five 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>21-127</td>
<td>Concepts of Mathematics</td>
<td>10</td>
</tr>
<tr>
<td>21-256</td>
<td>Multivariate Analysis</td>
<td>9</td>
</tr>
<tr>
<td>or 21-259</td>
<td>Calculus in Three Dimensions</td>
<td>10</td>
</tr>
<tr>
<td>21-240</td>
<td>Matrix Algebra with Applications</td>
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</tr>
<tr>
<td>or 21-241</td>
<td>Matrices and Linear Transformations</td>
<td>10</td>
</tr>
<tr>
<td>or 21-242</td>
<td>Matrix Theory</td>
<td>9</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 Electives (1 course, 9 units)

Students must take one course from the Statistics Electives listed below. Students will consult with the concentration advisor to select the Special Topics and Electives courses that best fit for their areas of interest.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
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<td>36-313</td>
<td>Statistics of Inequality and Discrimination</td>
<td>9</td>
</tr>
<tr>
<td>36-315</td>
<td>Statistical Graphics and Visualization</td>
<td>9</td>
</tr>
<tr>
<td>36-46x</td>
<td>Special Topics (topics and offerings vary)</td>
<td>9</td>
</tr>
<tr>
<td>36-490</td>
<td>Undergraduate Research</td>
<td>9</td>
</tr>
<tr>
<td>36-493</td>
<td>Sports Analytics Capstone</td>
<td>9</td>
</tr>
<tr>
<td>36-497</td>
<td>Corporate Capstone Project</td>
<td>9</td>
</tr>
</tbody>
</table>

Machine Learning Core (2 courses, 22 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-122</td>
<td>Principles of Imperative Computation</td>
<td>10</td>
</tr>
<tr>
<td>10-301</td>
<td>Introduction to Machine Learning</td>
<td>12</td>
</tr>
</tbody>
</table>

Machine Learning Elective (1 course, 9 units minimum)

Students must take one course from the ML Electives listed below. Students will consult with the Statistics & Machine Learning advisor to choose an elective that best fits their area of interest. This course may have additional pre-requisites. Keep in mind this is not an exhaustive list and other applicable courses can be reviewed to be approved as an ML elective - please speak with the concentration advisor about this.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>05-434</td>
<td>Machine Learning in Practice</td>
<td>12</td>
</tr>
<tr>
<td>10-403/703</td>
<td>Deep Reinforcement Learning &amp; Control</td>
<td>12</td>
</tr>
<tr>
<td>10-405/605</td>
<td>Machine Learning with Large Datasets</td>
<td>12</td>
</tr>
<tr>
<td>(Undergraduate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-417</td>
<td>Intermediate Deep Learning</td>
<td>12</td>
</tr>
<tr>
<td>10-418</td>
<td>Machine Learning for Structured Data</td>
<td>12</td>
</tr>
<tr>
<td>10-707</td>
<td>Advanced Deep Learning</td>
<td>12</td>
</tr>
<tr>
<td>11-411</td>
<td>Natural Language Processing</td>
<td>12</td>
</tr>
<tr>
<td>11-441</td>
<td>Machine Learning for Text and Graph-Based Mining</td>
<td>9</td>
</tr>
<tr>
<td>11-485</td>
<td>Introduction to Deep Learning</td>
<td>9</td>
</tr>
<tr>
<td>11-661/761</td>
<td>Language and Statistics</td>
<td>12</td>
</tr>
<tr>
<td>15-386</td>
<td>Neural Computation</td>
<td>9</td>
</tr>
<tr>
<td>15-387</td>
<td>Computational Perception</td>
<td>9</td>
</tr>
<tr>
<td>16-311</td>
<td>Introduction to Robotics</td>
<td>12</td>
</tr>
<tr>
<td>16-385/720</td>
<td>Computer Vision</td>
<td>12</td>
</tr>
</tbody>
</table>
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 with a Technical Writing concentration take two Theory/Specialization courses specific to either the Technical Communication (TC) or the Scientific and Medical Communication (SMC) 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
or 21-120 Differential and Integral Calculus
or 21-127 Concepts of Mathematics
15-110 Principles of Computing (recommended for SMC-track students) 10
or 15-112 Fundamentals of Programming and Computer Science (recommended for TC-track students)

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 9
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 or Scientific and Medical Communication. 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
76-359 User Experience Methods for Documents 9
76-361 Corpus Rhetorical Analysis 9
76-388 Coding for Humanists 9
76-395 Science Writing 9
76-419 Media in a Digital Age 9
76-425 Rhetoric, Science, and 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 Var.
76-302 Communication Support Tutoring Practicum 6
76-318 Communicating in the Global Marketplace 9
76-319 Environmental Rhetoric 9
76-325 Intertextuality 9
76-351 Rhetorical Invention 9
76-355 Leadership, Dialogue, and Change 9
76-359 User Experience Methods for Documents 9
76-360 Literary Journalism Workshop 9
76-361 Corpus Rhetorical Analysis 9
76-372 News Writing 9
76-375 Magazine Writing 9
76-378 Literacy: Educational Theory and Community Practice 9
76-386 Language & Culture 9
76-388 Coding for Humanists 9
76-389 Rhetorical Grammar 9
76-391 Document & Information Design 9
76-395 Science Writing 9
76-396 Non-Profit Message Creation 9
76-419 Media in a Digital Age 9
76-420 The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process 9
76-425 Rhetoric, Science, and the Public Sphere 9
76-428 Visual Verbal Communication 9
76-472 Topics in Journalism: Storytelling in a Digital Age 9
76-474 Software Documentation 9
76-475 Law, Performance, and Identity 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
39-605 Engineering Design Projects 12

Electives (1 course, 9 units)

Students with a Technical Writing concentration take one course outside of English to deepen their area of specialty in their track. Typically, students in the SMC track select courses in the natural sciences, psychology, and social and decision sciences, or (for example) healthcare-related courses in the Heinz School. Students in the TC track typically select courses from engineering, design, HCI, computer science, math or statistics. Students should work with their faculty advisor to select courses that are meaningful for their track.

College of Fine Arts Concentration

(number of courses vary, 108 units minimum)

BHA students choose one of the following concentrations:

• Architecture (108 units)
• Art (108 units)
• Design (108 units)
• Drama (108 units)
• Music (108 units)

ARCHITECTURE CONCENTRATION (108 UNITS MINIMUM)

Architecture Required Courses (7 courses, 52 units minimum)
48-100 Architecture Design Studio: Poeisis Studio 1 -Fall, Freshman year 10-15
or 48-095 Spatial Concepts for Non-Architecture Majors 6
62-122 Digital Media I -Fall, Freshman year 6
62-125 Drawing I -Fall, Freshman year 6
62-123 Digital Media II -Spring, Freshman year 6
62-126 Drawing II -Spring, Freshman year 6
48-240 Historical Survey of World Architecture and Urbanism I -Spring, Freshman year 9
48-241 Modern Architecture -Fall, Sophomore year 9

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)

Transdisciplinary Research Studios (2 courses, 20 units)
Complete two courses:
Design Required Courses (16 courses, 98 units)

Media Studios (3 courses, 30 units minimum)

Complete three courses:

- 60-131 3D Media Studio I: Foundations in Sculpture, Installation, and Site work (10 units)
- 60-133 3D Media Studio II (10 units)
- 60-150 2D Media Studio: Drawing (10 units)
- 60-170 2D Media Studio: Painting (10 units)
- 60-251 2D Media Studio: Print Media (10 units)
- 60-260 2D Media Studio: Imaging (10 units)
- 60-110 Electronic Media Studio: Introduction to the Moving Image (10 units)
- 60-210 Electronic Media Studio: Introduction to Interactivity or 60-212 Electronic Media Studio: Interactivity and Computation for Creative Practice (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)
- Advanced Electronic and Time-Based Work (ETB) (course numbers 60-410 through 60-429) (10 units)
- Advanced Sculpture, Installation and Site-Work (SIS) (course numbers 60-430 through 60-447) (10 units)
- Advanced Contextual Practice (CP) (course numbers 60-448 through 60-449) (10 units)
- Advanced Drawing, Painting, Print Media and Photography (DP3) (course numbers 60-450 through 60-498) (10 units)
- 60-499 Studio Independent Study (one only) (10 units)

* Courses offered intermittently; speak with a BXA advisor to determine course availability.

Critical Studies (2 courses, 18 units)

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

Note: Critical Theory I & II are strongly recommended.

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 - Spring (0 units)

**DESIGN CONCENTRATION (108 UNITS MINIMUM)**

Design Required Courses (16 courses, 98 units)

- 51-101 Studio: Survey of Design - Fall, First-year (10 units)
- 51-121 Visualizing - Fall, First-year (10 units)
- 51-175 Design Studies: Place - Fall, First-year (mini-1) (5 units)
- 51-177 Design Studies: Histories - Fall, First-year (mini-2) (5 units)
- 51-102 Design Lab - Spring, First-year (10 units)
- 51-122 Collaborative Visualizing - Spring, First-year (10 units)
- 51-176 Design Studies: Futures - Spring, First-year (mini-3) (5 units)
- 51-178 Design Studies: Experience - Spring, First-year (mini-4) (5 units)
- 51-277 Design Studies: Systems - Fall, Sophomore year (mini-1) (5 units)
- 51-279 Design Studies: Cultures - Fall, Sophomore year (mini-2) (5 units)
- 51-282 Design Studies: Persuasion - Spring, Sophomore year (mini-3) (5 units)
- 51-284 Design Studies: Power - Spring, Sophomore year (mini-4) (5 units)

Choose Two Studios - Fall, Sophomore year:

- 51-225 Communications Studio I: Understanding Form & Context (4.5 units)
- or 51-245 Products Studio I: Understanding Form & Context (4.5 units)
- or 51-265 Environments Studio I: Understanding Form & Context (4.5 units)

Choose Two Corresponding Labs - Fall, Sophomore year:

- 51-227 Prototyping Lab I: Communications (4.5 units)
- or 51-247 Prototyping Lab I: Products (4.5 units)
- or 51-267 Prototyping Lab I: Environments (4.5 units)

Design Electives (10 units)

A minimum of 10 additional Design units must be approved by the Design advisor. A list of these selected courses must be filed in the BXA office.

**DRAMA CONCENTRATION (108 UNITS MINIMUM)**

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 (5 courses, 20 units)

- 54-175-54-176 Conservatory Hour-Conservatory Hour (1 unit each) (10 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)
- 54-362 Anti-Racist & Equitable Practices in Theater (optional) (6 units)

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

Design Required Courses (2 courses, 26 units)

- 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 (10 courses, 64 units)

- 54-121-54-122 Directing I: A Director's Mindset - Directing I: Sources (18 units)
- 54-221-54-222 Directing II: In the Studio - Directing II: Fundamentals (18 units)
- 54-159-54-159 Production Practicum-Production Practicum (two times) (12 units)
- 54-517 Director's Colloquium (four times) (16 units)

A minimum of 24 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 (9 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: A Director's Mindset (9 units)
- 54-159-54-159 Production Practicum-Production Practicum (two times) (12 units)
- 54-200-54-200 Dramaturgy Forum-Dramaturgy Forum - Fall (minimum of two; every semester it is offered while enrolled) (2 units)
- 54-xxx 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 (2 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)**

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

Required Course for All Concentration Options (1 course, 9 units)
57-152 Harmony I or 57-149 Basic Harmony I

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

Audio Recording & Production Required Courses (7 courses, 40 units)
57-101 Introduction to Music Technology 6
57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I
57-179 Solfege I (co-requisite: 57-181)
57-180 Basic Solfege I
57-178 Basic Solfege I
57-185 Advanced Solfege I
57-177 Survey of Western Music History 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 9
57-150 Basic Harmony II
57-182 Solfege II 3
57-186 Advanced Solfege II
57-104 Introduction to Computing for Creative Practice 10
57-149 Twisted Signals: Multimedia Processing for the Arts 10
57-114 Physics of Musical Sound 9
57-166 Introduction to Sound Design for Theatre 6
57-175 History of Sound Design 3
57-165 Production Audio 6
57-344 Experimental Sound Synthesis 9
57-421 Exploded Ensemble 6
57-425 Expanded Music Performance 9
57-427 Advanced Seminar in Film Musicology 9
57-478 Survey of Historical Recording 6
57-422 Independent Study in Sound Recording Production 3
60-131 2D Media Studio: Foundations in Sculpture, Installation, and Site work 10
60-121 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.

Composition Required Courses (12 courses, 76 units)
57-161 Eurhythms I (recommended co-requisite: 57-181) 3
57-181 Solfege I
57-179 Solfege I (co-requisite: 57-181)
57-180 Basic Solfege I
57-178 Basic Solfege I
57-185 Advanced Solfege I
57-177 Survey of Western Music History 9
57-188 Repertoire and Listening for Musicians 1
57-49x 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.

Music Performance Required Courses (12 courses, 76 units)
57-161 Eurhythms I (recommended co-requisite: 57-181) 3
57-181 Solfege I
57-179 Solfege I (co-requisite: 57-181)
57-180 Basic Solfege I
57-178 Basic Solfege I
57-185 Advanced Solfege I
57-177 Survey of Western Music History (co-requisite: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-49x 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.

Sound Theory & Practice Required Courses (7 courses, 47 units)
57-101 Introduction to Music Technology 6
57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I
57-179 Solfege I (co-requisite: 57-181)
57-180 Basic Solfege I
57-178 Basic Solfege I
57-185 Advanced Solfege I
57-177 Survey of Western Music History (co-requisite: 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 9
57-150 Basic Harmony II
57-182 Solfege II 3
57-186 Advanced Solfege II
57-104 Introduction to Computing for Creative Practice 10
57-322 Introduction to Computer Music (pre-requisite: 15-112) 9
57-323 Computer Music Systems and Information Processing (pre-requisite: 15-122) 9
57-344 Physics of Musical Sound 9
57-337 Sound Recording 6
57-345 Music, Technology, and Culture 9
57-344 Experimental Sound Synthesis 9
57-347 Electronic and Computer Music (pre-requisite: 57-101 or 57-171) 6
57-421 Exploded Ensemble 6
57-425 Expanded Music Performance 9
57-438 Multitrack Recording 9
57-478 Survey of Historical Recording 6
57-629 Contemporary Soundscape 9
57-829 Contemporary Soundscape 9
60-131 2D Media Studio: Foundations in Sculpture, Installation, and Site work 10
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 Sound Theory & Practice concentration.
Free Electives

(approximately 9 courses, 78 units)
Take any Carnegie Mellon course. Many BHA students use their electives to broaden or deepen their concentrations. 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 GPA.

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 outside 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.

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 and an advisor in MCS for their natural sciences/mathematics concentration. This network of advisors guides each student through their curriculum.

BSA Curriculum

<table>
<thead>
<tr>
<th>BSA Degree Requirements</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. BSA General Education</td>
<td>129</td>
</tr>
<tr>
<td>II. MCS Concentration</td>
<td>114-135</td>
</tr>
<tr>
<td>III. CFA Concentration</td>
<td>108</td>
</tr>
<tr>
<td>IV. Free Electives</td>
<td>8-29</td>
</tr>
<tr>
<td>Total BSA Degree Requirements</td>
<td>380</td>
</tr>
</tbody>
</table>

BSA General Education

(18 courses, 129 units minimum)
- Mathematics (2 courses, 20 units, 21-120 and 21-122 or 21-124 required)
- Science (3 courses, 31 units, 03-121, 09-105, and 33-121 or 33-131 required)
- First-year Courses (2 courses, 12 units, 76-101 and 99-101 required)
- ENGAGE (3 courses, 3 units)
- Cultural/Global Understanding (1 course, 9 units)
- Humanities and Social Sciences (2 courses, 18 units)
- BXA Required Courses (5 courses, 36 units, 52-190 or 52-291, 52-391, 52-392, 52-401, 52-402)

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/schools-colleges/melloncollegeofscience/ #generaleducationrequirements#textcontainer)

Mathematics (2 courses, 20 units)
- 21-120 Differential and Integral Calculus 10
- 21-122 Integration and Approximation 10
- or 21-124 Calculus II for Biologists and Chemists

Science (3 courses, 31 units)
- 03-121 Modern Biology 9
- 09-105 Introduction to Modern Chemistry 10
- 33-121 Physics I for Science Students 12
- or 33-151 Matter and Interactions 1

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. The following non-technical breadth requirements will require students to develop a personalized plan for their course selection and 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 & 76-107 and Writing about Data & 76-108 and Writing about Public Problems 9

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](http://www.cmu.edu/hss/english/first_year/index.html)

99-101 Computing @ Carnegie Mellon 3

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)

[www.cmu.edu/schools-colleges/melloncollegeofscience/culturalglobal/index.html](http://www.cmu.edu/schools-colleges/melloncollegeofscience/culturalglobal/index.html)

Cultural or global understanding course(s) may be taken at any time. Nine (9) or more units from the following groups 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. However, this course requirement cannot be satisfied with AP/IB/Cambridge exam credit.

- 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
- 76-232 Introduction to Black Literature 9
- 76-239 Introduction to Film Studies 9
- 76-241 Introduction to Gender Studies 9
- 76-386 Language & Culture 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 Required Courses (5 courses, 36 units)**

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-145</td>
<td>Genocide and Weapons of Mass Destruction</td>
<td>9</td>
</tr>
<tr>
<td>79-189</td>
<td>History of Democracy: Thinking Beyond the Self</td>
<td>9</td>
</tr>
<tr>
<td>79-201</td>
<td>Introduction to Anthropology</td>
<td>9</td>
</tr>
<tr>
<td>79-202</td>
<td>Flesh and Spirit: Early Modern Europe, 1400-1750</td>
<td>9</td>
</tr>
<tr>
<td>79-205</td>
<td>20th Century Europe</td>
<td>9</td>
</tr>
<tr>
<td>79-208</td>
<td>Witchcraft and Witch-Hunting</td>
<td>9</td>
</tr>
<tr>
<td>79-211</td>
<td>Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange</td>
<td>9</td>
</tr>
<tr>
<td>79-223</td>
<td>Mexico: From the Aztec Empire to the Drug War</td>
<td>9</td>
</tr>
<tr>
<td>79-227</td>
<td>Modern Africa: The Slave Trade to the End of Apartheid</td>
<td>9</td>
</tr>
<tr>
<td>79-229</td>
<td>The Origins of the Palestinian-Israeli Conflict, 1880-1948</td>
<td>9</td>
</tr>
<tr>
<td>79-230</td>
<td>Arab-Israeli Conflict Since 1948</td>
<td>9</td>
</tr>
<tr>
<td>79-232</td>
<td>Arabian Peninsula Environmental History</td>
<td>9</td>
</tr>
<tr>
<td>79-233</td>
<td>The United States and the Middle East since 1945</td>
<td>9</td>
</tr>
<tr>
<td>79-234</td>
<td>Technology and Society</td>
<td>9</td>
</tr>
<tr>
<td>79-240</td>
<td>Development of American Culture</td>
<td>9</td>
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<tr>
<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>79-244</td>
<td>Women in American History</td>
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<tr>
<td>79-245</td>
<td>Capitalism and Individualism in American Culture</td>
<td>9</td>
</tr>
<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>79-263</td>
<td>Mao and the Chinese Cultural Revolution</td>
<td>9</td>
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<tr>
<td>79-265</td>
<td>Russian History: Game of Thrones</td>
<td>9</td>
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<tr>
<td>79-266</td>
<td>Russian History and Revolutionary Socialism</td>
<td>9</td>
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<tr>
<td>79-267</td>
<td>The Soviet Union in World War II: Military, Political, and Social History</td>
<td>9</td>
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<tr>
<td>79-275</td>
<td>Introduction to Global Studies</td>
<td>9</td>
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<tr>
<td>79-280</td>
<td>Coffee and Capitalism</td>
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<td>79-283</td>
<td>Hungry World: Food and Famine in Global Perspective</td>
<td>9</td>
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<td>79-307</td>
<td>Religion and Politics in the Middle East</td>
<td>9</td>
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<tr>
<td>79-343</td>
<td>Education, Democracy, and Civil Rights</td>
<td>9</td>
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<td>79-345</td>
<td>Roots of Rock &amp; Roll</td>
<td>9</td>
</tr>
<tr>
<td>79-350</td>
<td>Early Christianity</td>
<td>9</td>
</tr>
<tr>
<td>79-377</td>
<td>Food, Culture, and Power: A History of Eating</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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<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>
</tr>
<tr>
<td>80-254</td>
<td>Analytic Philosophy</td>
<td>9</td>
</tr>
<tr>
<td>80-255</td>
<td>Pragmatism</td>
<td>9</td>
</tr>
<tr>
<td>80-276</td>
<td>Philosophy of Religion</td>
<td>9</td>
</tr>
<tr>
<td>82-xxx</td>
<td>Any course from Modern Languages</td>
<td>9</td>
</tr>
<tr>
<td>84-380</td>
<td>US Grand Strategy</td>
<td>9</td>
</tr>
</tbody>
</table>

**Mellon College of Science Concentration**

(number of courses vary, 114-135 units)

BSA students declare one of the following concentrations, through consultation with their BXA advisor and the MCS concentration advisors.

- Biological Sciences (114 units)
- Chemistry (121 units)
- Mathematical Sciences (123 units)
- Neurobiology (114 units)
- Physics (135 units)

BSA students who are admitted as freshmen are undeclared until they have met with a concentration advisor and have submitted their signed Declaration form. BSA students who are admitted through internal transfer must have chosen an MCS concentration at the time of their application (which serves as declaration). All BSA students wishing to change their MCS concentration at any time following the initial declaration must meet with the advisor of their intended concentration area to complete a new Declaration form, which will be reviewed during the internal transfer application period.

**Biological Sciences Concentration (114 units minimum)**

**Biological Sciences Required Courses (11 courses, 96 units minimum)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</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 - 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>03-343</td>
<td>Experimental Techniques in Molecular Biology - Fall, Junior year</td>
<td>12</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>
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<tr>
<td>09-208</td>
<td>Techniques for Organic Synthesis and Analysis</td>
<td>9</td>
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<tr>
<td>09-334</td>
<td>Experimental Chemistry</td>
<td>9</td>
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<tr>
<td>09-345</td>
<td>Experimental Cell and Developmental Biology</td>
<td>9</td>
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<tr>
<td>09-346</td>
<td>Experimental Neuroscience</td>
<td>9</td>
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<tr>
<td>09-217</td>
<td>Organic Chemistry I</td>
<td>9</td>
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<tr>
<td>09-218</td>
<td>Organic Chemistry II</td>
<td>9</td>
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<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 and 03-545.

**Chemistry Concentration (121 units minimum)**

**Chemistry Required Courses (14 courses, 103 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<td>09-106</td>
<td>Modern Chemistry II</td>
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<td>09-219</td>
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<td>09-214</td>
<td>Physical Chemistry</td>
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<tr>
<td>or 09-344</td>
<td>Physical Chemistry (Quantum): Microscopic Principles of Physical Chemistry</td>
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<td>or 09-345</td>
<td>Physical Chemistry (Thermo): Macroscopic Principles of Physical Chemistry</td>
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<td>09-348</td>
<td>Inorganic Chemistry</td>
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<td>09-221</td>
<td>Laboratory I: Introduction to Chemical Analysis</td>
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<td>09-222</td>
<td>Laboratory II: Organic Synthesis and Analysis</td>
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<td>09-321</td>
<td>Laboratory III: Molecular Design and Synthesis</td>
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<tr>
<td>or 09-323</td>
<td>Bioorganic Chemistry Laboratory</td>
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</table>
Neurobiology Electives (2 courses, 18 units)

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

Physics Concentration (135 units minimum)

Physics Required Courses (16 courses, 126 units)

Neurobiology Concentration (114 units minimum)

Neurobiology Required Courses (12 courses, 96 units)

Mathematical Sciences Concentration (123 units minimum)

Mathematical Sciences Required Courses (9 courses, 87 units minimum)

(Reasonable substitutions within the core program will be allowed.)

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 09-435 Independent Study, which can be used only by permission of the Director of Undergraduate Studies.

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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.

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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)

Neurobiology Electives (2 courses, 18 units)

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

Physics Concentration (135 units minimum)

Physics Required Courses (16 courses, 126 units)

Neurobiology Concentration (114 units minimum)

Neurobiology Required Courses (12 courses, 96 units)

Mathematical Sciences Concentration (123 units minimum)

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(Reasonable substitutions within the core program will be allowed.)

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 09-435 Independent Study, which can be used only by permission of the Director of Undergraduate Studies.

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Neurobiology Concentration (114 units minimum)

Neurobiology Required Courses (12 courses, 96 units)

Neurobiology Electives (2 courses, 18 units)

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

Physics Concentration (135 units minimum)

Physics Required Courses (16 courses, 126 units)

Neurobiology Concentration (114 units minimum)

Neurobiology Required Courses (12 courses, 96 units)

Mathematical Sciences Concentration (123 units minimum)

Mathematical Sciences Required Courses (9 courses, 87 units minimum)

(Reasonable substitutions within the core program will be allowed.)

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 09-435 Independent Study, which can be used only by permission of the Director of Undergraduate Studies.

Mathematical Sciences Electives (2 courses, 18 units)

Students with a Music concentration should take 21-469 Computational 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)

Neurobiology Electives (2 courses, 18 units)

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

Physics Concentration (135 units minimum)

Physics Required Courses (16 courses, 126 units)
**Design Required Courses (16 courses, 98 units)**

- 51-101 | Studio: Survey of Design -Fall, First-year | 10
- 51-121 | Visualizing -Fall, First-year | 10
- 51-175 | Design Studies: Place -Fall, First-year (mini-1) | 5
- 51-177 | Design Studies: Histories -Fall, First-year (mini-2) | 5
- 51-102 | Design Lab -Spring, First-year | 10
- 51-122 | Collaborative Visualizing -Spring, First-year | 10
- 51-176 | Design Studies: Futures -Spring, First-year (mini-3) | 5
- 51-178 | Design Studies: Experience -Spring, First-year (mini-4) | 5
- 51-277 | Design Studies: Systems -Fall, Sophomore year (mini-1) | 5
- 51-279 | Design Studies: Cultures -Fall, Sophomore year (mini-2) | 5
- 51-282 | Design Studies: Persuasion -Spring, Sophomore year (mini-3) | 5

**Design Electives (10 units)**

A minimum of 10 additional Design units must be approved by the Design advisor. A list of these selected courses must be filed in the BXA office.

**Drama Concentration (108 Units Minimum)**

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 (5 courses, 20 units)**

- 54-175-54-176 Conservatory Hour-Conservatory Hour (1 unit each) | 2
- 54-177 Foundations of Drama | 6
- 54-281 Foundations of Drama II (prerequisite: 54-177) | 6
- 54-381 Special Topics in Drama: History, Literature and Criticism | 6
- 54-362 Anti-Racist & Equitable Practices in Theater (optional) | 6

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

**Design Required Courses (2 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 (10 courses, 64 units)**

- 54-121-54-122 Directing I: A Director's Mindset - Directing I: Sources | 18
- 54-221-54-222 Directing II: In the Studio - Directing II: Sources | 18
- 54-159-54-159 Production Practicum-Production Practicum (two times) | 12
- 54-517 Director's Colloquium (four times) | 16

A minimum of 24 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 (9 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: A Director's Mindset | 9
- 54-159-54-159 Production Practicum-Production Practicum (two times) | 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 (2 courses, 26 units)
54-151-54-152 Stagecraft-Stagecraft (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)**

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

Required Course for All Concentration Options (1 course, 9 units)
57-101  Harmony I (Recommended co-requisite: 57-181)
57-181  Solfege I
or 57-180  Basic Solfege I
or 57-185  Advanced Solfege I
57-173  Survey of Western Music History (co-requisite: 57-188)
57-188  Repertoire and Listening for Musicians (co-requisite: 57-188)
57-190  Repertoire and Listening for Musicians
57-153  Repertoire and Listening for Musicians (co-requisite: 57-188)
57-188  Repertoire and Listening for Musicians (co-requisite: 57-188)
57-150  Advanced Solfege I
57-171  Introduction to Music Technology (self-paced)

Choose 59 units from:
57-153  Harmony II
57-182  Solfege II
or 57-186  Advanced Solfege II
15-104  Introduction to Computing for Creative Practice
18-090  Twisted Signals: Multimedia Processing for the Arts
33-114  Physics of Musical Sound
54-166  Introduction to Sound Design for Theatre
54-275  History of Sound Design
54-666  Production Audio
57-344  Experimental Sound Synthesis
57-421  Exploded Ensemble
57-425  Expanded Music Performance
57-427  Advanced Seminar in Film Musicology
57-478  Survey of Historical Recording
57-622  Independent Study in Sound Recording
60-131  3D Media Studio I: Foundations in Sculpture, Installation, and Site work
60-210  Electronic Media Studio: Introduction to Interactivity

Choose 52 units from:
57-180  Basic Harmony I
or 57-185  Advanced Solfege I
15-104  Introduction to Computing for Creative Practice
15-322  Introduction to Computer Music (pre-requisite: 15-112)
15-323  Computer Music Systems and Information Processing (pre-requisite: 15-122)
33-114  Physics of Musical Sound
57-337  Sound Recording
57-343  Music, Technology, and Culture
57-344  Experimental Sound Synthesis
57-347  Electronic and Computer Music (pre-requisite: 57-101 or 57-171)
57-421  Exploded Ensemble
57-425  Expanded Music Performance
57-438  Multitrack Recording
57-478  Survey of Historical Recording
57-829  Contemporary Soundscapes
60-131  3D Media Studio I: Foundations in Sculpture, Installation, and Site work
60-210  Electronic Media Studio: Introduction to Interactivity

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

Composition Required Courses (12 courses, 76 units)
57-161  Eurythmics I (Recommended co-requisite: 57-181)
57-181  Solfege I
or 57-180  Basic Solfege I
or 57-185  Advanced Solfege I
57-173  Survey of Western Music History (co-requisite: 57-188)
57-188  Repertoire and Listening for Musicians

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.

**MUSIC PERFORMANCE REQUIRED COURSES (12 COURSES, 76 UNITS)**

57-161  Eurythmics I (Recommended co-requisite: 57-181)
57-181  Solfege I
or 57-180  Basic Solfege I
or 57-185  Advanced Solfege I
57-173  Survey of Western Music History (co-requisite: 57-188)
57-188  Repertoire and Listening for Musicians
57-49x  BXA Studio (4 semesters)
57-xxx  Major Ensemble (4 semesters)

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.

**SOUND THEORY & PRACTICE REQUIRED COURSES (7 COURSES, 47 UNITS)**

57-101  Introduction to Music Technology
57-181  Solfege I
or 57-180  Basic Solfege I
or 57-185  Advanced Solfege I
57-173  Survey of Western Music History (co-requisite: 57-188)
57-188  Repertoire and Listening for Musicians
18-090  Twisted Signals: Multimedia Processing for the Arts
57-911  Music Since 1945
57-616  Independent Study in Sound Studies

Choose 52 units from:
57-153  Harmony II
57-182  Solfege II
or 57-186  Advanced Solfege II
15-104  Introduction to Computing for Creative Practice
15-322  Introduction to Computer Music (pre-requisite: 15-112)
15-323  Computer Music Systems and Information Processing (pre-requisite: 15-122)
33-114  Physics of Musical Sound
57-337  Sound Recording
57-343  Music, Technology, and Culture
57-344  Experimental Sound Synthesis
57-347  Electronic and Computer Music (pre-requisite: 57-101 or 57-171)
57-421  Exploded Ensemble
57-425  Expanded Music Performance
57-438  Multitrack Recording
57-478  Survey of Historical Recording
57-829  Contemporary Soundscapes
60-131  3D Media Studio I: Foundations in Sculpture, Installation, and Site work
60-210  Electronic Media Studio: Introduction to Interactivity

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

**FREE ELECTIVES**

(approximately 1-3 courses, 8-29 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.

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, 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: EA requirements and fine arts concentration requirements. Each student’s course of study is structured so it can be completed alongside their primary engineering major.

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 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.

EA Curriculum

<table>
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<th>Units</th>
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<tr>
<td>I. BXA Requirements</td>
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<tr>
<td>II. CFA Concentration</td>
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<tr>
<td>Total EA Additional Major</td>
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</table>

**BXA Requirements**

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

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

- BXA Seminar I: Building the Wunderkammer or BXA Seminar II: Transferring Knowledge (9 units)
- BXA Junior Portfolio (0 units)
- BXA Seminar III: Deconstructing Disciplines (9 units)
- BXA Seminar IV: Capstone Project Research (9 units)
- BXA Seminar V: Capstone Project Production (9 units)

**College of Fine Arts Concentration**

*(number of courses vary, 108 units minimum)*

EA 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 (7 courses, 52 units minimum)

- Architecture Design Studio: Poeisisis Studio 1 -Fall, Freshman year (10-15 units)
- or 48-099: Spatial Concepts for Non-Architecture Majors
- 48-100: Architecture Design Studio: Poeisisis Studio 1 -Fall, Freshman year (10-15 units)
- 48-122: Digital Media I -Fall, Freshman year (6 units)
- 48-125: Drawing I -Fall, Freshman year (6 units)
- 48-123: Digital Media II -Spring, Freshman year (6 units)

**Art Concentration (108 units minimum)**

*Courses offered intermittently; speak with a BXA advisor to determine course availability.*

- 48-201: Modern Architecture -Fall, Sophomore year (9 units)
- 48-216: Drawing II -Spring, Freshman year (6 units)
- 48-240: Historical Survey of World Architecture and Urbanism I -Spring, Freshman year (9 units)

**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)**

Transdisciplinary Research Studios (2 courses, 20 units)

Complete two courses:

- 60-101: Transdisciplinary Research Studio I: Risk, Agency, Failure (10 units)
- 60-201: Transdisciplinary Research Studio II: Publics (10 units)
- 60-202: Transdisciplinary Research Studio III: Futures (10 units)

Media Studios (3 courses, 30 units minimum)

Complete three courses:

- 60-131: 3D Media Studio I: Foundations in Sculpture, Installation, and Site Work (10 units)
- 60-133: 3D Media Studio II (10 units)
- 60-150: 2D Media Studio: Drawing (10 units)
- 60-170: 2D Media Studio: Painting (10 units)
- 60-251: 2D Media Studio: Print Media (10 units)
- 60-260: 2D Media Studio: Imaging (10 units)
- 60-110: Electronic Media Studio: Introduction to the Moving Image (10 units)
- 60-210: Electronic Media Studio: Introduction to Interactivity or 60-212 Electronic Media Studio: Interactivity and Computation for Creative Practice (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)
- Advanced Electronic and Time-Based Work (ETB) (course numbers 60-410 through 60-429) (10 units)
- Advanced Sculpture, Installation and Site-Work (SIS) (course numbers 60-430 through 60-447) (10 units)
- Advanced Contextual Practice (CP) (course numbers 60-448 through 60-449) (10 units)
- Advanced Drawing, Painting, Print Media and Photography (DP3) (course numbers 60-450 through 60-498) (60-499: Studio Independent Study (one only) (10 units)

Note: Critical Theory I & II are strongly recommended.

**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 -Spring (0 units)

**DRAMA CONCENTRATION (108 UNITS MINIMUM)**

Options available in the following areas: 1) Design, 2) Directing, 3) Dramaturgy, 4) Production Technology and Management
Note: There is no EA Acting or Musical Theatre option.

Required Courses for All Concentration Options (5 courses, 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
54-362 Anti-Racist & Equitable Practices in Theater (optional) 6

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

Design Required Courses (2 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 (10 courses, 64 units)
54-121-54-122 Directing I: A Director's Mindset - Directing I: Sources 18
54-221-54-222 Directing II: In the Studio - Directing II: Fundamentals 18
54-159-54-159 Production Practicum-Production Practicum (two times) 12
54-517 Director's Colloquium (four times) 16
A minimum of 24 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 (9 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: A Director's Mindset 9
54-159-54-159 Production Practicum-Production Practicum (two times) 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 (2 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)
Options available in the following areas: 1) Audio Recording & Production, 2) Composition, 2) Music Performance (instrumental, organ, piano, voice), 4) Sound Theory & Practice

Required Course for All Concentration Options (1 course, 9 units)
57-152 Harmony I or 57-149 Basic Harmony I 9
Work with Music Advisor to Approve Concentration Option (99 units minimum):

Audio Recording & Production Required Courses (7 courses, 40 units)
57-101 or 57-171 Introduction to Music Technology 6
57-181 or 57-180 or 57-185 Solfege I 3
57-173 Survey of Western Music History (co-requirement: 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 9
57-172 or 57-150 or 57-153 Basic Harmony II 3
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 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 I: Foundations in Sculpture, Installation, and Site work 10
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.

Composition Required Courses (12 courses, 76 units)
57-161 Eurhythmics I (recommended co-requirement: 57-181) 3
57-181 or 57-180 or 57-185 Solfege I 3
57-173 Survey of Western Music History (co-requirement: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-49x 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.

Music Performance Required Courses (12 courses, 76 units)
57-161 Eurhythmics I (recommended co-requirement: 57-181) 3
57-181 or 57-180 or 57-185 Solfege I 3
57-173 Survey of Western Music History (co-requirement: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-49x 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.
Sound Theory & Practice Required Courses (7 courses, 47 units)
57-101 Introduction to Music Technology 6
or 57-171 Introduction to Music Technology (self-paced)
57-181 Solfege I 3
or 57-180 Basic Solfege I
or 57-185 Advanced Solfege I
57-173 Survey of Western Music History (co-requisite: 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 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-requisite: 15-112) 9
15-323 Computer Music Systems and Information Processing (pre-requisite: 15-122) 9
33-114 Physics of Musical Sound 9
57-337 Sound Recording 6
57-343 Music, Technology, and Culture 9
57-344 Experimental Sound Synthesis 9
57-347 Electronic and Computer Music (pre-requisite: 57-101 or 57-171) 6
57-421 Exploded Ensemble 6
57-425 Expanded Music Performance 9
57-438 Multitrack Recording 9
57-478 Survey of Historical Recording 6
57-829 Contemporary Sounds capes 9
60-131 3D Media Studio I: Foundations in Sculpture, Installation, and Site work 10
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 Sound Theory & Practice concentration.

Academic Policies

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 Standards and Actions
Academic standards are established to ensure a student is progressing well in their desired CMU degree. Deviation from these standards will prompt an academic action, which notifies both the student and their advisors so appropriate responses can be considered.

At the end of every semester, the academic performance of each BXA student is evaluated based on the established academic standards listed below. As the College of Fine Arts is the unifying body among the BXA degrees, the BXA Director presents recommendations for academic actions to the College of Fine Arts Academic Advisory Council (CFA-AAC) for a final review and council vote in accordance with CFA-AAC protocol. Once the actions are approved, the student will receive written notice of the action. Copies of all communications will also be sent to their BXA, CFA and academic college advisors.

Academic Standards
BXA students are expected to maintain a cumulative GPA of 2.0 or higher and to make satisfactory progress toward their academic degree. Meeting one or more of the following conditions in the semester will result in an academic action. Note that meeting a singular criterion more than once within the current semester is equivalent to meeting 2 or more criteria:

- Semester GPA below 2.0
- Cumulative GPA below 2.0
- Grade of D or R in a required concentration course*
- Grade of R in a general education course
- Completing fewer than 27 factorable units toward intended degree in a semester (free electives do not count toward total)

*as defined by each degree option.

Academic Actions
All academic actions are cumulative and sequential. Should a student resume good standing and later meet the criteria for another academic action, they will continue where they previously left off. All academic actions also transfer between colleges. BXA students who enter the program through internal transfer on action, will continue on the equivalent action.

After an action of probation, the student’s BXA advisor will initiate an intervention team. This team will include the student’s BXA college liaison and all three of their associated advisors (BXA, CFA and academic college advisors) to strategize a path to success and discuss available resources.

Students on an academic action are not allowed to overload classes, cross-register for classes or participate in study abroad during the semesters the action is in effect.

First Academic Action:
Warning: Warning will be administered if a student meets 1 criterion for an academic action within the current semester.
Probation: Probation will be administered if a student meets 2 or more criteria for an academic action.

Second Academic Action:
Probation: Probation will be administered if a student was previously on a “Warning” and now meets 1 or more criteria for an academic action within the current semester.
Final Probation: Final Probation will be administered if a student was previously on a “Probation” and now meets only 1 criterion for an academic action within the current semester.
Suspension: Suspension will be administered if a student was previously on a “Probation” and now meets 2 or more criteria for an academic action or meets an individual criterion multiple times within the current semester.

Third Academic Action:
Final Probation: Final Probation will be administered if a student was previously on a “Final Probation” and now meets 1 or more criteria for an academic action within the current semester.
Drop: Drop will be administered if a student was previously on Final Probation and now meets 2 or more criteria for an academic action within the given semester. -OR- If a student was previously on a “Suspension” and now meets 1 or more of the criteria for an academic action within the current semester.
Suspension: Suspension will be administered if a student was previously on a “Final Probation” and now meets only 1 criterion for an academic action within the current semester.

Fourth Academic Action:
Suspension: Suspension will be administered if a student was previously on a “Suspension” and now meets 1 or more of the criteria for an academic action within the current semester.
Drop: Drop will be administered if a student was previously on a “Suspension” and now meets 1 or more of the criteria for an academic action within the current semester. (If the student has failed to secure admittance to a different program by this time, the student will also be dropped from the university.)
Fifth Academic Action:
Drop: Drop will be administered if a student was previously on a “Suspension” and now meets 1 or more of the criteria for an academic action within the current semester. (If the student has failed to secure admittance to a different program by this time, the student will also be dropped from the university.)

Appeal of Academic Action
Students have the right to appeal academic actions. If a student believes an academic action is inconsistent with BXA policies or merits additional review, a student should submit a formal written appeal, as specified in the initial academic action letter, to the assistant/associate deans listed below, with a copy to the deans of both CFA and their academic college. Appeals should include all relevant materials to substantiate their case and support their concerns.

A student may appeal to the relevant assistant/associate deans within seven days from the date of their academic action letter. All appeals should be in written form, under three pages in length (not including appendices) and authored by the student.

BCSA Appeals should be addressed to:
Kristen Letts Kovak, Senior Associate Dean for Academics, College of Fine Arts
Guy Bellocq, Associate Dean for Undergraduate Education, Computer Science Department

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

BSA 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

If, after carrying out the steps of the 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 when possible.

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. Please note that requests for accommodations are not retroactive; you must ask that accommodation requests be put in place before you anticipate needing them.

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 online each semester.

Intercollege Honors
BXA students who successfully complete a BXA Capstone Project under the guidance of a faculty member will graduate with BCSA, BHA, BSA 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. BXA students will receive honors color cords during the BXA/CFA Commencement Honors Ceremony and EA additional major students at the College of Engineering 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 BXA/CFA Commencement Honors Ceremony.

Internal Transfer/Additional Major Process
For current Carnegie Mellon students who wish to apply to a BXA program, an internal transfer and additional major (EA) application process takes place in both the fall and spring semester. Applications are available online and are reviewed by a committee of BCSA, BHA, BSA and EA advisors in October and in March. However, certain concentrations consider applications only once a year; please consult with a BXA advisor for guidance on scheduling your application.

All students applying for internal transfer should meet with their current advisor, a BXA advisor, and an advisor in their target area, as well as take preliminary coursework in their target area and complete their first semester before applying. For all concentrations, there are required courses that must be taken before an application will be considered; please consult with a BXA advisor for guidance on scheduling these courses.

Current BXA students who wish to change their BXA program (e.g. BHA to BCSA) or change their CFA concentration (e.g. BHA architecture to BHA art) or delineated options within CFA concentrations (e.g. music performance to music composition) must apply for that change through the internal transfer process. Current BHA and BSA students who wish to change their academic college concentration after declaring (e.g. BHA creative writing to BHA psychology, BSA physics to BSA mathematical sciences) must submit a new DC/MCS Concentration Declaration form for approval of that change, which will be reviewed at the internal transfer committee meeting each semester. Current BXA students seeking internal transfer out of BXA into another college program must apply and meet entry requirements to that program.

Study Abroad
Studying abroad is encouraged to broaden BXA students’ interdisciplinary experiences through traditional and non-traditional study abroad, from coursework and artistic studios to for-credit internships, volunteer service and research opportunities.

Courses taken while studying abroad may count toward your BXA concentration requirements, your general education requirements or your free electives. Studying abroad should not delay your graduation, as long as you work with your study abroad advisor and your BXA advisor to plan the most appropriate courses.

The timing and length of program are important considerations while planning. Due to required BXA coursework, students should avoid studying abroad in their last three semesters (junior spring, senior fall/spring). Spending an entire year abroad is not typically possible for BXA students without intending to take an additional semester at Carnegie Mellon. Many students study abroad during the spring of their sophomore year or the fall semester of their junior year, as well during the summer, and over winter and spring breaks. Talk to your BXA academic advisor early in your academic career to identify the best time for study abroad.

When studying abroad, students are still enrolled at Carnegie Mellon. A student never takes a leave of absence to study abroad. Prior to studying abroad, students should discuss their plans with their BXA academic advisor and their college advisor. Students must also complete a Study Abroad Credit Approval form prior to departure for study abroad, which must be signed after completion by the BXA advisor.

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Students will receive credit for courses for which they receive a grade of "C" or better. However, grades received abroad do not count toward a student's Carnegie Mellon University QPA.

Transfer Credit

Once a BXA student enrolls at Carnegie Mellon University as a degree candidate, they may transfer a maximum of five courses from another institution (excepting official study abroad programs through the CMU Office of International Education) for credit towards their BXA degree. This applies to courses taken at other institutions in the United States, as well as courses taken internationally in the student's home country.

Individual departments may impose stricter limits regarding the number or type of courses students propose to take elsewhere to fulfill requirements. Some departments may not accept transfer credit from online courses.

Students must have prior approval to transfer courses from their BXA advisor, as well as concentration advisors, to use coursework towards requirements. To receive permission, students must provide course information (syllabi) to the corresponding department for evaluation of appropriate credit. When the course is finished, official transcripts must be sent to Carnegie Mellon University before credit will be recorded.

Transfer courses must be taken for a letter grade and students must earn a C (2.00) or above (B or above at a community college). Transfer credit is not factored into a student's CMU QPA.

The following courses must be taken at CMU and cannot be transferred in:

- First-Year Writing Requirement Course (76101, 76102, 76106/7/8)
- Reflecting: Societies and Cultures (79-104, 79-145, 79-189)
- 36-200: Statistical Reasoning (AP credit only)
- 99-101: Computing @ Carnegie Mellon

Students currently on university suspension are permitted to take no more than three courses per semester at another institution and no more than a total of five courses.

Withdrawal or Leave of Absence

A student who decides to leave the university must meet with their BXA advisor and complete a Withdrawal or Leave of Absence form. 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 grades of W will be recorded for all classes 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.