BXA Intercollege Degree Programs

M. Stephanie Murray, Director
Solar Decathlon House
http://www.cmu.edu/interdisciplinary

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

The goal of the Bachelor of Humanities and Arts (BHA), the Bachelor of Science and Arts (BSA), and the Bachelor of Computer Science and Arts (BCSA) BXA Intercollege Degree Programs is to allow a select group of students who demonstrate interest and accomplishment in the fine arts and the humanities, social sciences, natural sciences, computer science, and emerging media 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 humanities, natural sciences, or computer science 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 four 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 the humanities and social sciences, the natural and mathematical sciences, or computer science. BXA students balance courses in their CFA concentration with courses in their academic concentration, as well as BXA-specific courses. These BXA-specific courses give students the opportunity to integrate their areas of concentration by focusing on interdisciplinary approaches and arts-based research techniques. The curricula in the concentration areas provide students with a solid disciplinary foundation upon which they can draw for interdisciplinary projects.

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

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

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

* Foundational knowledge and technical expertise in the CFA concentration area and the DC/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 DC/MCS/SCS concentration
* Experience in designing, researching, and completing a large-scale, object-based project that integrates both areas of concentration

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

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

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

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

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

Masters of Arts Management (MAM) Option
BHA students who have an interest in arts management and wish to go on for an advanced degree may select courses in their sophomore and junior years to prepare them for this area. A student in the junior year may apply to the Accelerated Master's Program with the School of Public Policy & Management at Heinz College. In this program students take both graduate and undergraduate courses in the senior year, earn the BHA degree, and continue on for an additional year to complete the work for the Masters of Arts Management (MAM) degree.

BHA Curriculum

| I. BHA General Education | 111 |
| DC Concentration | 81 |
| III. CFA Concentration | 108 |
| IV. Free Electives | 78 |
| Total BHA Degree Requirements | 378 |

I. BHA General Education

(14 courses, 111 units minimum)

* Communicating: Language and Interpretations (3 courses, 27 units minimum, 76-101 required, two approved modern language courses required)
* Reflecting: Societies and Cultures (1 course, 9 units, 79-104 required)
* Modeling: Mathematics and Experiments (1 course, 9 units minimum)
* Deciding: Social Sciences and Values (3 courses, 27 units minimum, 36-201 required)
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
(there are various topics by section) www.cmu.edu/hss/english/first_year/index.html

82-xxx Modern Languages 18

Complete two courses taught in a language offered by the Modern Language Department. A wide selection of courses are offered in Arabic, Chinese Studies, European Studies, French and Francophone Studies, German Studies, Hispanic Studies, Italian, Japanese Studies, Russian Studies, and Spanish. 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.

79-104 Global Histories 9
(there are various topics by section) http://www.history.cmu.edu/undergraduate/fall.html

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 Calculus I 10
21-112 Calculus II 10
21-120 Differential and Integral Calculus 10
21-122 Integration and Approximation 10
21-124 Calculus II for Biologists and Chemists 10
21-127 Concepts of Mathematics 10
21-241 Matrices and Linear Transformations 10
21-256 Multivariate Analysis 9
21-257 Models and Methods for Optimization 9
21-259 Calculus in Three Dimensions 9
80-110 Nature of Mathematical Reasoning 9
80-210 Logic and Proofs 9
80-211 Logic and Mathematical Inquiry 9
80-212 Arguments and Logical Analysis 9

Natural Science

02-223 Personalized Medicine: Understanding Your Own Genome 9
02-250 Introduction to Computational Biology 12
02-261 Quantitative Cell and Molecular Biology Laboratory 9
03-121 Modern Biology 9
03-125 Evolution 9
03-132 Basic Science to Modern Medicine 9
03-161 Molecules to Mind 9
03-220 Genetics 9
03-230 Intro to Mammalian Physiology 9
03-231 Biochemistry I 9
03-232 Biochemistry II 9
03-250 Introduction to Computational Biology 12

03-320 Cell Biology 9
03-362 Cellular Neuroscience 9
03-363 Systems Neuroscience 9
09-101 Introduction to Experimental Chemistry 3
09-103 Atoms, Molecules and Chemical Change 9
09-105 Introduction to Modern Chemistry I 10
09-106 Modern Chemistry II 10
09-108 The Illusion and Magic of Food 6
09-207 Techniques in Quantitative Analysis 9
09-217 Organic Chemistry I 9
09-218 Organic Chemistry II 9
09-221 Laboratory I: Introduction to Chemical Analysis 12
12-201 Geology 9
33-100 Basic Experimental Physics 6
33-104 Experimental Physics 9
33-111 Physics I for Science Students 12
33-112 Physics II for Science Students 12
33-114 Physics of Musical Sound 9
33-115 Physics for Future Presidents 9
33-124 Introduction to Astronomy 9
33-131 Matter and Interaction 1 12
33-132 Matter and interactions II 12
33-211 Physics III: Modern Essentials 10
33-213 Mini-Course in Special Relativity 4
33-224 Stars, Galaxies and the Universe 9
33-355 Nanoscience and Nanotechnology 9

Other Courses
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.

- 36-201 Statistical Reasoning and Practice -REQUIRED
- 08-200/19-211 Ethics and Policy Issues in Computing
- 36-207 Probability and Statistics for Business Applications
- 36-220 Engineering Statistics and Quality Control
- 36-247 Statistics for Lab Sciences
- 36-303 Sampling, Survey and Society
- 73-100 Principles of Economics
- 73-230 Intermediate Microeconomics
- 73-328 Health Economics
- 73-338 Financial Crises and Risk
- 73-341 Within the Firm: Managing through Incentives
- 73-353 Economic Foundations of Regulation: Applications to Financial Markets
- 73-372 International Money and Finance
- 73-407 Fundamentals of Statistical Modeling
- 73-433 Environmental Policy and Economics
- 76-359 Planning and Testing Documents
- 79-342 Introduction to Science and Technology Studies
- 80-130 Introduction to Ethics
- 80-136 Social Structure, Public Policy & Ethics
- 80-208 Critical Thinking
- 80-222 Philosophy of Science
- 80-230 Ethical Theory
- 80-242 Conflict and Dispute Resolution
- 80-244 Environmental Ethics
- 80-245 Medical Ethics
- 80-248 Engineering Ethics
- 80-270 Philosophy of Mind
- 80-271 Philosophy and Psychology
- 80-305 Choices, Decisions, and Games
- 80-321 Causation, Law, and Social Policy
- 80-324 Philosophy of Economics
- 80-335 Deliberative Democracy: Theory and Practice
- 80-336 Philosophy of Law
- 80-348 Health Development and Human Rights
- 80-405 Game Theory
- 80-430 Ethics and Medical Research
- 80-447 Global Justice
- 84-104 Decision Processes in American Political Institutions
- 84-310 International Political Economy and Organizations
- 84-320 Domestic Politics and International Affairs
- 84-321 Autocrats and Democrats
- 84-330 The Rights Debate: The US Supreme Court and the Modern Political Divide

* Indicates co-requisites and/or prerequisites required.

Computing @ Carnegie Mellon (1 course, 3 units)

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

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

BXA Required Courses (5 courses, 36 units minimum)

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

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

II. Dietrich College of Humanities and Social Sciences Concentration

(9 courses, 81 units minimum)

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

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

Anthropology Concentration (81 units minimum)

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

The BHA concentration in Anthropology provides students with the tools to link artistic practices to various aspects of globalization. It is highly recommended that Anthropology students study abroad in some capacity.
Students in the Anthropology concentration are required to take two prerequisite advanced language courses, an introductory course and a methods/theory course (18 units), six regional/topical courses (54 units), and complete a culminating capstone/independent study (9 units).

**Prerequisite Language Courses**

Every student is expected to take two upper level (intermediate or above) language courses (18 units). These courses deepen the immersion in a culture or society that the Anthropology concentration provides a student, and should coordinate with the regional courses selected for the concentration.

**Introductory and Methods Courses** (2 courses, 18 units)

Students must complete 18 units (two courses) selecting from the list below.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-201</td>
<td>Introduction to Anthropology</td>
<td>9</td>
</tr>
<tr>
<td>79-297</td>
<td>Dilemmas and Controversies in Anthropology</td>
<td>9</td>
</tr>
<tr>
<td>79-380</td>
<td>Ethnographic Methods</td>
<td>9</td>
</tr>
</tbody>
</table>

**Anthropological Perspectives** (6 courses, 54 units)

Students gain knowledge of specialized theoretical and regional topics by choosing 54 units (typically six courses) selecting from the list below. Up to two advanced language and society courses in Modern Languages may be used in this category.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-203</td>
<td>Social and Political Change in 20th Century Central and Eastern Europe</td>
<td>9</td>
</tr>
<tr>
<td>79-221</td>
<td>Development and Democracy in Latin America</td>
<td>9</td>
</tr>
<tr>
<td>79-222</td>
<td>Between Revolutions: The Development of Modern Latin America</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>79-224</td>
<td>Mayan America</td>
<td>9</td>
</tr>
<tr>
<td>79-235</td>
<td>Caribbean Cultures</td>
<td>9</td>
</tr>
<tr>
<td>79-261</td>
<td>The Last Emperors: Chinese History and Society, 1600-1900</td>
<td>9</td>
</tr>
<tr>
<td>79-262</td>
<td>Modern China: From the Birth of Mao ... to Now</td>
<td>9</td>
</tr>
<tr>
<td>79-264</td>
<td>Tibet and China: History and Propaganda</td>
<td>9</td>
</tr>
<tr>
<td>79-275</td>
<td>Introduction to Global Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-276</td>
<td>Beyond the Border</td>
<td>9</td>
</tr>
<tr>
<td>79-295</td>
<td>Race Relations in the Atlantic World</td>
<td>9</td>
</tr>
<tr>
<td>79-314</td>
<td>The Politics and Culture of Memory</td>
<td>9</td>
</tr>
<tr>
<td>79-317</td>
<td>Art, Anthropology, and Empire</td>
<td>9</td>
</tr>
<tr>
<td>79-332</td>
<td>Medical Anthropology</td>
<td>9</td>
</tr>
<tr>
<td>79-333</td>
<td>Sex, Gender &amp; Anthropology</td>
<td>9</td>
</tr>
<tr>
<td>79-342</td>
<td>Introduction to Science and Technology Studies</td>
<td>9</td>
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<tr>
<td>82-xxx</td>
<td>Modern Languages Advanced Language and Society courses</td>
<td>Var</td>
</tr>
</tbody>
</table>

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

**Capstone/Independent Study** (1 course, 9 units)

Every student is required to do a culminating research project; this may be part of an advanced course (9 units). Students should work with the BHA Anthropology faculty advisor to determine the best method for completing the capstone research project. This project may be complementary to the BHA Capstone Project sequence (52-401 and 52-402) that is completed in the senior year.

**Cognitive Neuroscience Concentration** (81 units minimum)

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

**Introductory and Survey Coursework** (36 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>03-121</td>
<td>Modern Biology</td>
<td>9</td>
</tr>
<tr>
<td>03-363</td>
<td>Systems Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>85-219</td>
<td>Biological Foundations of Behavior</td>
<td>9</td>
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<tr>
<td>85-211</td>
<td>Cognitive Psychology</td>
<td>9</td>
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</table>

or 85-213  Human Information Processing and Artificial Intelligence

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<tr>
<th>Research Methods Training (18 units)</th>
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<tbody>
<tr>
<td>36-309  Experimental Design for Behavioral and Social Sciences</td>
</tr>
<tr>
<td>85-314  Cognitive Neuroscience Research Methods</td>
</tr>
</tbody>
</table>

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

**Distribution Requirements** (27 units)

Complete three courses with at least one from each category below.

**Approaches to Cognitive Neuroscience:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-386</td>
<td>Neural Computation</td>
<td>9</td>
</tr>
<tr>
<td>15-883</td>
<td>Computational Models of Neural Systems</td>
<td>12</td>
</tr>
<tr>
<td>36-746</td>
<td>Statistical Methods for Neuroscience and Psychology</td>
<td>12</td>
</tr>
<tr>
<td>85-345</td>
<td>Meaning in Mind and Brain</td>
<td>9</td>
</tr>
<tr>
<td>85-412</td>
<td>Cognitive Modeling</td>
<td>9</td>
</tr>
<tr>
<td>85-414</td>
<td>Cognitive Neuropsychology</td>
<td>9</td>
</tr>
<tr>
<td>85-419</td>
<td>Introduction to Parallel Distributed Processing</td>
<td>9</td>
</tr>
<tr>
<td>85-429</td>
<td>Cognitive Brain Imaging</td>
<td>9</td>
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</tbody>
</table>

**Cognitive Neuroscience Electives:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-362</td>
<td>Cellular Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>03-364</td>
<td>Developmental Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>85-356</td>
<td>Music and Mind: The Cognitive Neuroscience of Sound</td>
<td>9</td>
</tr>
<tr>
<td>85-370</td>
<td>Perception</td>
<td>9</td>
</tr>
<tr>
<td>85-385</td>
<td>Auditory Perception: Sense of Sound</td>
<td>9</td>
</tr>
<tr>
<td>85-390</td>
<td>Human Memory</td>
<td>9</td>
</tr>
<tr>
<td>85-406</td>
<td>Autism: Psychological and Neuroscience Perspectives</td>
<td>9</td>
</tr>
<tr>
<td>85-426</td>
<td>Learning in Humans and Machines</td>
<td>9</td>
</tr>
<tr>
<td>85-442</td>
<td>Health Psychology</td>
<td>9</td>
</tr>
<tr>
<td>85-501</td>
<td>Stress, Coping and Well-Being</td>
<td>9</td>
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</tbody>
</table>

**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 major (and in each of the genres), students must do well in these introductory courses (receive a grade of A or B). After completing the Survey of Forms courses, students take four workshops in fiction, poetry, screenwriting, or nonfiction. At least two of the workshops must be taken in a single genre. In the writing workshops, students develop their critical and verbal abilities through close writing and analysis of poems, stories, and other literary forms. Their work is criticized and evaluated by peers and the faculty.

**Survey of Forms Courses** (2 courses, 18 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-260</td>
<td>Survey of Forms: Fiction</td>
<td>9</td>
</tr>
<tr>
<td>76-261</td>
<td>Survey of Forms: Creative Nonfiction</td>
<td>9</td>
</tr>
<tr>
<td>76-265</td>
<td>Survey of Forms: Poetry</td>
<td>9</td>
</tr>
<tr>
<td>76-269</td>
<td>Survey of Forms: Screenwriting</td>
<td>9</td>
</tr>
</tbody>
</table>

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 R 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>76-365</td>
<td>Beginning Poetry Workshop</td>
<td>9</td>
</tr>
</tbody>
</table>
Biological and Behavioral Aspects of Decision Making: Sciences course (88-xxx).

One of these courses (9 units) must be a Department of Social and Decision Sciences course with the Creative Writing 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, 45 units)

85-211 Cognitive Psychology 9
88-120 Reason, Passion and Cognition (freshman or sophomore year) 9
88-220 Policy Analysis I 9
88-223 Decision Analysis 9
88-302 Behavioral Decision Making 9

Research Methods (2 courses, 18 units)

36-202 Statistical Methods 9
88-251 Empirical Research Methods 9

Electives (2 courses, 18 units)

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

Biological and Behavioral Aspects of Decision Making:

85-352 Evolutionary Psychology 9
85-377 Attitudes and Persuasion 9
85-442 Health Psychology 9
88-342 The Neuroscience of Decision Making 9
88-360 Behavioral Economics 9
88-365 Behavioral Economics and Public Policy 9

Managerial and Organizational Aspects of Decision Making:

70-311 Organizational Behavior 9
or 88-260 Organizations 9
70-381 Marketing I 9
70-460 Mathematical Models for Consulting 9
88-221 Policy Analysis II 9
88-406 Behavioral Economics in Organizations 9
88-418 Negotiation - Domestic Focus 9
88-419 Negotiation - International Focus 9
88-444 Public Policy and Regulation 9
88-451 Policy Analysis Senior Project 12
or 88-452 Policy Analysis Senior Project 12

Philosophical and Ethical Perspectives on Decision Making:

80-208 Critical Thinking 9
80-221 Philosophy of Social Science 9
80-245 Medical Ethics 9
80-305 Choices, Decisions, and Games 9
80-321 Causation, Law, and Social Policy 9
88-409 Behavioral Economics Perspectives on Ethical Issues 9

Economic and Statistical Methods for Decision Science:

70-460 Mathematical Models for Consulting 9
73-347 Game Theory for Economists 9
80-337 Philosophy, Politics & Economics 9
80-405 Game Theory * 9
88-255 Behavioral and Applied Game Theory 9
88-360 Behavioral Economics 9
88-367 Behavioral Economics in the Wild 9

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

Decision Science and Public Policy:

84-393 Legislative Decision Making: US Congress 9
88-221 Policy Analysis II 9
88-365 Behavioral Economics and Public Policy 9
88-366 Behavioral Economics in Development 6
88-405 Risk Perception and Communication 9
88-412 Energy, Climate Change, and Economic Growth in the 21st Century 9
88-444 Public Policy and Regulation 9
88-451 Policy Analysis Senior Project 12
or 88-452 Policy Analysis Senior Project 12

Research Methods for Decision Science:

36-303 Sampling, Survey and Society 9
70-460 Mathematical Models for Consulting 9
88-319 Large-scale social phenomenon 9
88-402 Modeling Complex Social Systems 9
88-435 Decision Science and Policy 9

Economics Concentration (81 units minimum)

The BHA concentration in Economics provides a solid understanding of economic theory and quantitative economic analysis. The introductory core disciplinary sequences in economic theory and quantitative analysis rely on a knowledge base of calculus and statistics. The advanced data analysis component pays additional attention to ordinal data and the study of surveys. Students also study political, historical, cultural, and social institutions within an economic context.

Mathematics Pre-requisites

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

21-120 Differential and Integral Calculus 10
21-256 Multivariate Analysis 9

Economic Theory Requirements (27 units)

73-100 Principles of Economics 9
73-230 Intermediate Microeconomics 9
73-240 Intermediate Macroeconomics 9

Quantitative Analysis Requirements (18 units)

These courses require 36-201 Statistical Reasoning and Practice as a prerequisite; 36-201 fulfills a general education Decision requirement, as well.

36-202 Statistical Methods 9
73-407 Fundamentals of Statistical Modeling 9

Advanced Economics Electives (27 units)

Students must take three advanced elective courses. Advanced elective courses are those numbered 73-300 through 73-495 (excluding 73-374 Econometrics II, 73-407 Fundamentals of Statistical Modeling, and 73-450 Economics Colloquium) 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 Project** (9 units)

Students will take the Senior Project course in conjunction with the 52-401 BXA Seminar IV: Capstone Fall course in the fall of their senior year.

73-497 Senior Project

9

**English Concentration (81 units minimum)**

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

**Introductory Courses** (2 courses, 18 units)

The 200-level core courses are designed to introduce students to writing in a variety of genres, to a knowledge of literary and other media forms, and to a basic theoretical knowledge of how texts are produced and interpreted. In the Interpretive Practices course, students are introduced to basic concepts, methods, and practices of literary and rhetorical approaches to texts. In the Survey of Forms course, students learn how to use language to express experience through poetic and narrative forms.

76-26x Survey of Forms (Nonfiction, Fiction, Poetry, Screenwriting)

9

76-294 Interpretive Practices

9

**Research Course** (1 course, 9 units)

Research in English offers training in gathering information systematically and in building arguments based on that information. Students will hone their skills in reading texts, using critical commentary, assessing print and electronic materials, and conducting interviews and surveys. They will learn how to test their hypotheses against alternatives and present their research to audiences within the discipline of English. The historical or thematic content of this course will vary from one semester to another. While 76-294 is not a prerequisite for 400-level courses, it is strongly recommended that students with a BHA concentration in English take this course in their junior year.

76-394 Research in English

9

**Rhetoric Course** (1 course, 9 units)

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

**300-Level Courses** (2 courses, 18 units)

Complete two 300-level courses that investigate the production and interpretation of texts and other media from a variety of periods and theoretical and methodological perspectives. Course offerings that meet these requirements are advertised on a semester-by-semester basis. For students with a BHA Concentration in English, 76-294 Interpretive Practices is a prerequisite for these courses. Course options include but are not limited to the following:

76-262 God: A Literary and Cultural History

9

76-338 The American Cinema

9

76-343 Rise of the American Novel

9

76-344 Censored Texts

9

76-350 Theory from Classics to Contemporary

9

76-381 Mad-Men, Television, and the History of Advertising

9

76-3xx Any 300 level course with advisor approval

9

**400-Level Courses** (2 courses, 18 units)

Complete two 400-level seminar courses that investigate a specific topic in depth and allow students to work on a major research-based paper. Courses in this category will be advertised on a semester-by-semester basis. For students with a BHA Concentration in English, 76-294 Interpretive Practices is a prerequisite and 76-394 Research in English is pre- or co-requisite.

Among current course offerings, examples include but are not limited to the following:

76-403 The Crucible of Modernity: Vienna 1900

9

76-410 The Long Eighteenth Century

Var.

76-421 Why Stories Matter

9

76-429 Conversions DH

9

76-439 Seminar in Film and Media Studies

9

76-444 History of Books and Reading: Media before "New Media"

9

76-4xx Any 400 level course with advisor approval

9

**Period Course Requirement**

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

**Elective Course** (1 course, 9 units)

Complete one course from the English Department’s offerings. This course may be at the 200-, 300-, or 400-level. Electives may include any courses offered by the English Department with the exception of courses designed for non-majors. Some semester offerings may include cross-listed courses from Modern Languages or History.

**Environmental Studies Concentration (81 units minimum)**

The concentration in Environmental Studies focuses on human-environment interactions from a multitude of disciplinary perspectives. The curriculum draws on the expertise of faculty across several Carnegie Mellon colleges in order to provide students with the interdisciplinary background and skills necessary to understand environmental problems and the means to mitigate them. It emphasizes three general areas: (1) natural science and technology; (2) social sciences; and (3) the humanities. The flexible curriculum features training in research methods; a set of core courses on fundamental environmental issues including energy, pollution, and biological diversity; and a project course experience geared toward policy formulation. It is recommended that students take 21-111 Calculus I and 36-202 Statistical Methods as prerequisites for higher-level coursework.

Note that some courses carry prerequisites and/or reserve seats for primary majors. Students interested in pursuing the concentration must meet beforehand with the faculty director and their BHA academic advisor in order to map out a course of study. Students are encouraged to be alert to new course offerings; every effort will be made to find equivalent courses that meet student interest when done in consultation with the faculty director.

**Foundation of Environmental Sciences (18 units minimum)**

Complete one required science course:

03-121 Modern Biology

9

Choose one of the following courses:

03-124 Modern Biology Laboratory (co-requisite: 03-121)

9

03-125 Evolution

9

09-103 Atoms, Molecules and Chemical Change

9

09-105 Introduction to Modern Chemistry I

10

09-106 Modern Chemistry II

10

**Disciplinary Perspectives (18 units)**

Choose two of the following courses:

09-510 Chemistry and Sustainability

9

73-148 Environmental Economics

9

76-319 Environmental Rhetoric

9

79-374 American Environmental History: Critical Issues

9

**Thematic Electives (15 units minimum)**

Choose two of the following courses:

12-100 Introduction to Civil and Environmental Engineering

12

19-101 Introduction to Engineering and Public Policy

12

19-424 Energy and the Environment

9
Choose one Survey Course:

79-227 African History: Height of Trans-Atlantic Slave Trade to the End of Apartheid 9
79-229 Origins of the Arab-Israeli Conflict, 1880-1948 9
79-230 Arab-Israeli Conflict and Peace Process since 1948 9
79-237 Comparative Slavery 9
79-251 India/America: Democracy, Diversity, Development 9
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-262 Modern China: From the Birth of Mao ... to Now 9
79-264 Tibet and China: History and Propaganda 9
79-265 Russian History: From the First to the Last Tsar 9
79-266 Russian History: From Communism to Capitalism 9
79-307 Religion and Politics in the Middle East 9

Philosophy Core (3 courses, 27 units)

Choose one course from three of the four categories below. No more than 18 units at the 100-level may be counted toward this requirement.

Ethics (9 units):
80-130 Introduction to Ethics 9
80-230 Ethical Theory 9

Political Philosophy (9 units):
80-135 Introduction to Political Philosophy 9
80-334 Social and Political Philosophy 9

Foundations of Social Science (9 units):
80-221 Philosophy of Social Science 9
80-321 Causation, Law, and Social Policy 9
80-324 Philosophy of Economics 9
80-337 Philosophy, Politics & Economics 9

Applied Philosophy (9 units):
80-136 Social Structure, Public Policy & Ethics 9
80-241 Ethical Judgments in Professional Life 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-247 Ethics and Global Economics 9
80-335 Deliberative Democracy: Theory and Practice 9
80-341 Computers, Society and Ethics 9
80-344 Management, Environment, and Ethics 9
80-348 Health Development and Human Rights 9
80-447 Global Justice 9

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:
73-148 Environmental Economics 9
73-310 Evolution of Economic Ideas and Analysis 9
73-352 Public Economics 9
73-358 Economics of the Environment and Natural Resources 9
73-359 Benefit-Cost Analysis 9
73-365 Firms, Market Structures, and Strategy 9
73-372 International Money and Finance 9
73-375 History of Money and Monetary Policy 9
73-408 Law and Economics 9
Global Studies Concentration (81 units minimum)

The BHA concentration in Global Studies is designed for students interested in humanistic approaches to understanding past and present processes of globalization. Participating faculty in the departments of History, Modern Languages, and English conduct research in Africa, Asia, Europe, Latin America, the Middle East, and the Pacific. The rigorous yet flexible Global Studies curriculum combines anthropology, history, literary and cultural studies, and advanced language training in order to help students make sense of complex interactions among global processes, regional and local cultures, and societal structures. BHA concentration students in Global Studies develop a broad understanding of how people faced choices 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 Advanced Seminar in Global Studies (79-400). Students also choose among several courses focused on theory, research methods, transnational histories, and regional/national histories and cultures. Demonstrating intermediate to advanced level proficiency in a language other than English is a crucial component of the concentration in Global Studies.

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

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

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

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

79-275 Introduction to Global Studies 9
79-400 Advanced Seminar in Global Studies 12

Language Requirement

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

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

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

84-402 Judicial Politics and Behavior 9
84-404 Game Theory 9
88-223 Decision Analysis 9
88-345 Perspectives on Industrial Research and Development 9
88-371 Entrepreneurship, Regulation and Technological Change 9
88-387 Social Norms and Economics 9
88-444 Public Policy and Regulation 9

Note: Other elective courses may be approved at the discretion of the EHPP faculty advisor and should be noted on a student’s DC Concentration Sheet.
Regional Courses:

- Sustainable Social Change: History and Practice
- Medical Anthropology
- Doing Transnational History
- Food, Culture, and Power: A History of Eating
- Ethnographic Methods
- Energy and Empire: How Fossil Fuels Changed the World

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:

- Global Masala: South Asians in the Diaspora
- Transnational Feminisms: Fiction and Film
- Postcolonial Theory: Diaspora and Transnationalism
- The Global Renaissance
- Mayan America
- The United States and the Middle East since 1945
- Comparative Slavery
- India/America: Democracy, Diversity, Development
- Jews and Muslims in History: From the Time of Muhammad to the Present
- Beyond the Border
- Brewing Revolution? Coffee and Social Change from Adam Smith to Starbucks
- Europe and the World since 1800
- Bananas, Baseball, and Borders: Latin America and the United States
- Animal Planet: An Environmental History of People and Animals
- The Slave Passage: From West Africa to the Americas
- Race Relations in the Atlantic World
- The Politics of Water: Global Controversies, Past and Present
- Sex, Gender & Anthropology
- Introduction to Science and Technology Studies
- The Making of the African Diaspora
- Health Development and Human Rights
- Global Justice
- Language Diversity & Cultural Identity
- The Francophone World
- Introduction to Hispanic Literary and Cultural Studies
- Theories of International Relations
- Terrorism and Insurgency

Regional Courses:

- West African History in Film
- African History: Earliest Times to 1780
- African History: Height of Trans-Atlantic Slave Trade to the End of Apartheid
- Globalization in East African History
- Entrepreneurs in Africa, Past, Present and Future
- South Asian Literature
- Tibet and China: History and Propaganda
- China and the West
- Rise of the Asian Economies
- Flesh and Spirit: Early Modern Europe, 1400-1750
- Social and Political Change in 20th Century Central and Eastern Europe
- 20th/21st Century Europe

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 academic advisor and faculty director. The faculty director will assist students with matching their interests to local organizations and identifying an on-site supervisor available to collaborate in the ongoing and final evaluation of the student’s work.

Thematic Courses:

- International Trade and International Law
- Introduction to Gender Studies
- Communicating in the Global Marketplace
- Language & Culture
- Space and Mobilities Studies
- Introduction to Anthropology
- Crime and Punishment in Early Modern Europe
- Archaeology: Understanding the Ancient World
- The Mummy’s Curse: Uses and Abuses of Archaeology
- Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal
- History of Surveillance: From the Plantation to Edward Snowden
- Medicine and Society
- The Holocaust in Historical Perspective
- Global Studies Internship
- Environmental Ethics
- Ethics and Global Economics
- Deliberative Democracy: Theory and Practice
leaders to defend their respective nation-states. The IRP major investigates the way in which leaders and citizens construct grand strategy and national security policy more generally; the impact of domestic and international forces on states’ security and economic policies; and the significance of alliances, coalitions, and international institutions for world politics.

Although the study of grand strategy and political institutions is the flagship initiative of the concentration, students are also able to study 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 is rooted in the discipline of political science but also utilizes the interdisciplinary strengths of behavioral decision science, complex social systems, economics, and political history. Thus, students pursuing this concentration will use the analytic tools of game theory, economic and statistical analysis, qualitative analysis, rational choice theory, and theories of behavioral decision making as they study alliances, coalitions, institutions, and political strategy.

Recognizing the influence of language and culture on politics, students are required to complete the intermediate (200) level, or its equivalent, in a modern language other than English. Advanced-level study is strongly encouraged.

Open to all Carnegie Mellon undergraduates, 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 sequence in public policy for the IRP concentration.

Students’ understanding of politics is further informed by courses and colloquia offered by CMU’s top-ranked departments, divisions, and schools in business, computer science, engineering, and the humanities.

IRP students interested in developing their research skills are encouraged to apply for a research position with the Center for International Relations and Politics. They are also encouraged to join student organizations focused on domestic or international politics. Becoming involved in the Institute for Politics and Strategy, as well as attending lectures and events sponsored by the Center for International Relations and Politics will provide additional opportunities for students.

The International Relations and Politics concentration is offered through the Institute for Politics and Strategy.

**Core Courses** (6 courses, 54 units)
- 84-104 Decision Processes in American Political Institutions
- 84-265 Political Science Research Methods
- 84-275 Comparative Politics
- 84-326 Theories of International Relations
- 36-202 Statistical Methods
- 73-100 Principles of Economics
- or 88-220 Policy Analysis I

**Language Requirement**

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

**Electives** (3 courses, 27 units minimum)

International Relations and Politics BHA students will either:

**Option 1** take 27 units (three courses) from the elective lists below.

Students must take two courses (18 units) from the Grand Strategy and Political Institutions category. The remaining one course (9 units) must come from the Economics and Society or International Cultures categories. At least two courses (18 units) must be from the Institute for Politics and Strategy (84-xxx).

**Grand Strategy and Political Institutions** (Courses, 18 units)
- 79-203 Social and Political Change in 20th Century Central and Eastern Europe
- 79-231 American Foreign Policy: 1945-Present
- 79-298 Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal
- 79-301 History of Surveillance: From the Plantation to Edward Snowden
- 79-389 Stalin and Stalinism

**International Relations and Politics Concentration** (81 units minimum)

The International Relations and Politics (IRP) BHA concentration analyzes the role of politics at the national, regional, international, and transnational levels; examines political and institutional arrangements within and among these levels; and investigates the grand strategy of nation-states.

Statesmen, scholars, and policy makers often define grand strategy as the combination of diplomatic, economic, military, and political factors used by
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<tr>
<th>Course Code</th>
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<td>80-135</td>
<td>Introduction to Political Philosophy</td>
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<td>80-321</td>
<td>Causation, Law, and Social Policy</td>
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<td>Deliberative Democracy: Theory and Practice</td>
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<td>84-309</td>
<td>Political Behavior</td>
<td>9</td>
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<td>84-320</td>
<td>Domestic Politics and International Affairs</td>
<td>9</td>
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<td>84-321</td>
<td>Autocrats and Democrats</td>
<td>9</td>
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<td>84-322</td>
<td>Nonviolent Conflict and Revolution</td>
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<td>84-323</td>
<td>War and Peace</td>
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<td>84-324</td>
<td>Democracies and War</td>
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<tr>
<td>84-362</td>
<td>Diplomacy and Statecraft</td>
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<td>84-366</td>
<td>Presidential Politics: So, You Want to Be President of the United States</td>
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<td>84-380</td>
<td>Grand Strategy in the United States</td>
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<td>84-386</td>
<td>The Privatization of Force</td>
<td>9</td>
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<td>84-387</td>
<td>Technology and Policy of Cyber War</td>
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<td>84-388</td>
<td>Concepts of War and Cyber War</td>
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<td>84-389</td>
<td>Terrorism and Insurgency</td>
<td>9</td>
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<td>84-393</td>
<td>Legislative Decision Making: US Congress</td>
<td>9</td>
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<td>84-402</td>
<td>Judicial Politics and Behavior</td>
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<tr>
<td>84-414</td>
<td>International and Subnational Security</td>
<td>9</td>
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<td>88-281</td>
<td>Topics in Law: 1st Amendment</td>
<td>9</td>
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<td>88-284</td>
<td>Topics of Law: The Bill of Rights</td>
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<td><strong>Economics and Society</strong></td>
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<td>70-342</td>
<td>Managing Across Cultures</td>
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<td>70-365</td>
<td>International Trade and International Law</td>
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<td>70-430</td>
<td>International Management</td>
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<td>73-148</td>
<td>Environmental Economics</td>
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<td>73-328</td>
<td>Health Economics</td>
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<td>73-331</td>
<td>Political Economy of Inequality and Redistribution</td>
<td>9</td>
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<td>73-375</td>
<td>History of Money and Monetary Policy</td>
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<td>73-394</td>
<td>Development Economics</td>
<td>9</td>
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<td>79-386</td>
<td>Entrepreneurs in Africa, Past, Present and Future</td>
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<td>80-136</td>
<td>Social Structure, Public Policy &amp; Ethics</td>
<td>9</td>
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<td>80-244</td>
<td>Environmental Ethics</td>
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<td>Ethics and Global Economics</td>
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<td>Health Development and Human Rights</td>
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<td>80-447</td>
<td>Global Justice</td>
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<td>84-310</td>
<td>International Political Economy and Organizations</td>
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<td>88-411</td>
<td>Rise of the Asian Economies</td>
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<td>88-412</td>
<td>Energy, Climate Change, and Economic Growth in the 21st Century</td>
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<td><strong>International Cultures</strong></td>
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<td>76-318</td>
<td>Communicating in the Global Marketplace</td>
<td>9</td>
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<td>76-322</td>
<td>Global Masala: South Asians in the Diaspora</td>
<td>9</td>
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<tr>
<td>76-386</td>
<td>Language &amp; Culture</td>
<td>9</td>
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<tr>
<td>79-205</td>
<td>20th/21st Century Europe</td>
<td>9</td>
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<td>79-221</td>
<td>Development and Democracy in Latin America</td>
<td>9</td>
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<td>79-222</td>
<td>Between Revolutions: The Development of Modern Latin America</td>
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<td>79-223</td>
<td>Mexico: From the Aztec Empire to the Drug War</td>
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<td>Mayan America</td>
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<td>African History: Height of Trans-Atlantic Slave Trade to the End of Apartheid</td>
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<td>Origins of the Arab-Israeli Conflict, 1880-1948</td>
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<td>79-251</td>
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<td>9</td>
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<td>79-256</td>
<td>20th Century Germany</td>
<td>9</td>
</tr>
<tr>
<td>79-257</td>
<td>Germany and the Second World War</td>
<td>9</td>
</tr>
<tr>
<td>79-259</td>
<td>France During World War II</td>
<td>9</td>
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<td>79-262</td>
<td>Modern China: From the Birth of Mao ... to Now</td>
<td>9</td>
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<td>79-264</td>
<td>Tibet and China: History and Propaganda</td>
<td>9</td>
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<td>79-265</td>
<td>Russian History: From the First to the Last Tsar</td>
<td>9</td>
</tr>
<tr>
<td>79-266</td>
<td>Russian History: From Communism to Capitalalism</td>
<td>9</td>
</tr>
<tr>
<td>79-267</td>
<td>The Soviet Union in World War II: Military, Political, and Social History</td>
<td>9</td>
</tr>
<tr>
<td>79-275</td>
<td>Introduction to Global Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-288</td>
<td>Bananas, Baseball, and Borders: Latin America and the United States</td>
<td>9</td>
</tr>
<tr>
<td>79-291</td>
<td>Globalization in East African History</td>
<td>6</td>
</tr>
<tr>
<td>79-307</td>
<td>Religion and Politics in the Middle East</td>
<td>9</td>
</tr>
<tr>
<td>79-314</td>
<td>The Politics and Culture of Memory</td>
<td>9</td>
</tr>
<tr>
<td>79-320</td>
<td>Women, Politics, and Protest</td>
<td>9</td>
</tr>
<tr>
<td>79-326</td>
<td>History of Education in America</td>
<td>9</td>
</tr>
<tr>
<td>79-342</td>
<td>Introduction to Science and Technology Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-377</td>
<td>Food, Culture, and Power: A History of Eating</td>
<td>9</td>
</tr>
<tr>
<td>79-381</td>
<td>Energy and Empire: How Fossil Fuels Changed the World</td>
<td>9</td>
</tr>
<tr>
<td>79-385</td>
<td>The Making of the African Diaspora</td>
<td>9</td>
</tr>
<tr>
<td>79-398</td>
<td>Documenting the 1967 Arab-Israeli War</td>
<td>9</td>
</tr>
<tr>
<td>82-304</td>
<td>The Francophone World</td>
<td>9</td>
</tr>
<tr>
<td>82-320</td>
<td>Contemporary Society in Germany, Austria and Switzerland</td>
<td>9</td>
</tr>
<tr>
<td>82-323</td>
<td>Germany, Austria and Switzerland in the 20th Century</td>
<td>9</td>
</tr>
<tr>
<td>82-333</td>
<td>Introduction to Chinese Language and Culture</td>
<td>Var.</td>
</tr>
<tr>
<td>82-342</td>
<td>Spain: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-343</td>
<td>Latin America: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-344</td>
<td>U.S. Latinos: Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-345</td>
<td>Introduction to Hispanic Literary and Cultural Studies</td>
<td>9</td>
</tr>
<tr>
<td>82-361</td>
<td>Italian Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-362</td>
<td>Italian Language and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-433</td>
<td>Topics in Contemporary Culture of China</td>
<td>9</td>
</tr>
<tr>
<td>82-441</td>
<td>Studies in Peninsular Literature and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-451</td>
<td>Studies in Latin American Literature and Culture</td>
<td>9</td>
</tr>
<tr>
<td>82-455</td>
<td>Topics in Hispanic Studies</td>
<td>9</td>
</tr>
<tr>
<td>82-474</td>
<td>Topics in Japanese Studies</td>
<td>9</td>
</tr>
<tr>
<td>85-375</td>
<td>Crosscultural Psychology</td>
<td>9</td>
</tr>
<tr>
<td>300 or 400-level language course (at most one for this category)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option 2</strong></td>
<td>complete the majority of their electives via the Carnegie Mellon University Washington Semester Program (CMU/WSP) Public Policy elective sequence. Any elective units not fulfilled during CMU/WSP may be completed through coursework from the Grand Strategy and Political Institutions elective list.</td>
<td></td>
</tr>
<tr>
<td><strong>The Washington Semester Program (CMU/WSP)</strong> Public Policy Elective Sequence includes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Internship Seminar</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Policy Forum</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Core Seminar</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Elective Seminar</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Japanese Studies</strong> Concentration (81 units minimum)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A list of CMU/WSP Core and Elective Seminars may be found in the CMU/WSP section of the undergraduate catalog (<a href="http://coursecatalog.web.cmu.edu/previous/2016-2017/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/#carnegiemellonuniversitywashingtonsemesterprogram">http://coursecatalog.web.cmu.edu/previous/2016-2017/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/#carnegiemellonuniversitywashingtonsemesterprogram</a>) .</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisites</strong></td>
<td></td>
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</tr>
<tr>
<td>Low-intermediate level proficiency in Japanese. This is equivalent to the completion of three courses (two at the 100-level and one at the 200-level) or exemption based on internal placement test scores.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core Courses in Japanese (36–39 units)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

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

Core Courses in Modern Languages (12 units)
Complete one 9 unit course plus the Senior Seminar (3 units).
82-280 Learning About Language Learning 9
82-281 Tutoring for Community Outreach Var.
82-282 Community Service Learning Var.
82-383 Second Language Acquisition: Theories and Research 9
82-388 Understanding Second Language Fluency Var.
82-480 Social and Cognitive Aspects of Bilingualism 9
82-580 Senior Seminar in Modern Languages 3

Japanese Studies and Interdisciplinary Electives (33 units minimum)
Complete three courses from Japanese Electives and one course from Interdisciplinary Electives, or a minimum of two courses from Japanese Electives and two courses from Interdisciplinary Electives in consultation with the Japanese advisor. One course from Interdisciplinary Electives must be chosen from the History department courses, or with permission of the advisor students can instead complete at least one Japanese history course at the University of Pittsburgh (e.g., Modern Japan, Popular Religion in a Changing Japan, and Modern East Asia), one in Japan when they study abroad, or in a summer program at any other university.

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

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

English
76-239 Introduction to Film Studies 9
76-386 Language & Culture 9
76-387 Narrative & Argument 9

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

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

Music
57-306 World Music 9

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

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

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

Linguistics Concentration (81 units minimum)
The BHA concentration in Linguistics combines courses from the departments of English, Modern Languages, Philosophy and Psychology and the Language Technologies Institute. Linguistics is the study of human language, and it encompasses a broad spectrum of research questions, approaches and methodologies. Some linguists are concerned with the cognitive aspects of language learning, production and comprehension; some are concerned with language as a social and cultural phenomenon; others engage in the analysis of linguistic form and meaning, some from a functional and others from a formal perspective. There are also computational approaches to linguistics with both applied and theoretical goals.

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

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

Sounds:
80-282 Phonetics and Phonology I 9

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

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

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

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

Discourse, Society and Culture:
76-385 Introduction to Discourse Analysis 9
76-386 Language & Culture 9
80-283 Syntax and Discourse 9
82-273 Introduction to Japanese Language and Culture 9
82-283 Language Diversity & Cultural Identity 9
82-333 Introduction to Chinese Language and Culture 9

Elective Courses (4 courses, 36 units)
Take four additional electives. These can be additional courses from the Fundamental Skills courses or Breadth courses listed above, or any other course which must be approved by the Director as a linguistics elective. Listed below are the additional electives taught on a regular basis. Additional appropriate courses are offered irregularly or on a one-off basis. The Director will provide students with a list of possible electives each semester, and will assist students in selecting electives which are consistent with their goals and interests. A list of these courses must be filed in the BXA office.
11-411 Natural Language Processing 12
11-716 Graduate Seminar on Dialog Processing 6
11-721 Grammars and Lexicons 12
11-722 Grammar Formalisms 12
11-761 Language and Statistics 12
76-378 Literacy: Educational Theory and Community Practice 9
80-284 Invented Languages 9
80-286 Words and Word Formation: Introduction to Morphology 9
80-287 Historical and Comparative Linguistics 9
80-380 Philosophy of Language 9
80-382 Phonetics and Phonology II 9
80-384 Linguistics of Turkic Languages 9
80-385 Linguistics of Germanic Languages 9
82-373 Structure of the Japanese Language 9
82-585 Topics in Second Language Acquisition 9

Language Requirement
Students must successfully complete two semesters of consecutive language courses. Students may not test out of this requirement. However, language courses taken at other institutions or as part of a study abroad program will typically substitute for a semester of language study.

Philosophy (81 units minimum)
The BHA Concentration 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 suggested below. However, alternative emphases can be proposed and approved by the Director.

In any of the areas listed, substitutions of courses that cohere with a student’s interest may be allowed with approval from the Advisor.

Introduction to Philosophy (1 course, 9 units)
80-100 Introduction to Philosophy 9

Area 1: Values and Normative Theory (1 course, 9 units)
80-130 Introduction to Ethics 9
80-135 Introduction to Political Philosophy 9
80-136 Social Structure, Public Policy & Ethics 9
80-230 Ethical Theory 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-247 Ethics and Global Economics 9
80-248 Engineering Ethics 9
80-334 Social and Political Philosophy 9
80-335 Deliberative Democracy: Theory and Practice 9
80-337 Philosophy, Politics & Economics 9
80-348 Health Development and Human Rights 9
80-430 Ethics and Medical Research 9
80-447 Global Justice 9

Area 2: Philosophy of Mind/Language/Metaphysics (1 course, 9 units)
80-180 Nature of Language 9
80-270 Philosophy of Mind 9
80-271 Philosophy and Psychology 9
80-276 Philosophy of Religion 9
80-280 Linguistic Analysis 9
80-281 Language and Thought 9
80-282 Phonetics and Phonology I 9
80-283 Syntax and Discourse 9
80-284 Invented Languages 9
80-371 Philosophy of Perception 9
80-380 Philosophy of Language 9
80-381 Meaning in Language 9
80-382 Phonetics and Phonology II 9
80-383 Language in Use 9
80-384 Linguistics of Turkic Languages 9
80-580 Seminar on the Philosophy of Language 9

Area 3: Logic/Philosophy of Mathematics (1 course, 9 units)
80-110 Nature of Mathematical Reasoning 9
80-210 Logic and Proofs 9
80-211 Logic and Mathematical Inquiry 9
80-212 Arguments and Logical Analysis 9
80-310 Formal Logic 9
80-311 Undecidability and Incompleteness 9
80-312 Philosophy of Mathematics 9
80-315 Modal Logic 9
80-411 Proof Theory 9
80-413 Category Theory 9
80-513 Seminar on Philosophy of Mathematics 9
80-514 Categorical Logic 9

Area 4: Epistemology/Metaphysics (1 course, 9 units)
80-150 Nature of Reason 9
80-201 Epistemology 9
80-208 Critical Thinking 9
80-220 Philosophy of Science 9
80-221 Philosophy of Social Science 9
80-222 Measurement and Methodology 9
80-226 Revolutions in Science 9
80-305 Choices, Decisions, and Games 9
80-321 Causation, Law, and Social Policy 9
80-322 Philosophy of Physics 9
80-323 Philosophy of Biology 9
80-324 Philosophy of Economics 9
80-405 Game Theory 9
80-515 Seminar on the Foundations of Statistics 9
80-516 Causality and Learning 9
80-520 Seminar on Philosophy Science 9
80-521 Seminar on Formal Epistemology 9

Area 5: History of Philosophy (1 course, 9 units)
80-150 Nature of Reason 9
80-226 Revolutions in Science 9
80-250 Ancient Philosophy 9
80-251 Modern Philosophy 9
80-252 Kant 9
80-253 Continental Philosophy 9
80-254 Analytic Philosophy 9
80-255 Pragmatism 9
80-256 Modern Moral Philosophy 9
80-257 Nietzsche 9
80-258 Hume 9
80-261 Empiricism and Rationalism 9
80-262 Introduction to the Philosophy of Bertrand Russell 9
80-363 19th Century Foundations of Science 9

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

Professional Writing Concentration (81 units minimum)
Professional Writing combines liberal and professional education with a strong foundation in rhetorical studies. The concentration in Professional Writing has a strong career orientation and is specifically designed to prepare students for successful careers as writers and communications specialists in a range of fields: publishing, government, journalism, the non-profit sector, education, public and media relations, corporate communications, advocacy writing, and the arts. The concentration is designed to develop articulate and reflective communications professionals with both the skills needed to enter and negotiate current work contexts (including writing for the web and other digital media) and the analytic and problem-solving skills needed to understand and keep pace with cultural and technological change.

Foundation Courses (4 courses, 36 units)
76-26x Survey of Forms (Nonfiction, Fiction, Poetry, or Screenwriting) 9
Students with a concentration in Professional Writing complete one additional course from the English Department’s offerings. This course should be one that focuses on the relationships between texts and their cultural and historical contexts. Courses in literature, cultural studies, rhetoric, and media studies that meet this requirement are advertised on a semester-by-semester basis. The English Elective may be any course offered by the Department with the exception of 76-270 Writing for the Professions and 76-272 Language in Design, both of which are designed for non-majors and overlap with 76-271 Introduction to Professional and Technical Writing. Students with a concentration in PW are additionally encouraged to supplement their PW coursework with 76-300 Professional Seminar (3 units) to learn more about internship and career options in professional writing. 76-300 meets once per week and is offered every fall semester.

Psychology Concentration (81 units minimum)

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

Breadth Courses (4 courses, 36 units)

To gain familiarity with the breadth of the field of Psychology, students take 85-102 Introduction to Psychology and three survey courses.

Required Intro Course:

85-102 Introduction to Psychology 9

Survey Courses:

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

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.

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

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

36-309 Experimental Design for Behavioral and Social Sciences -Fall

Advanced Courses (3 courses, 27 units)


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 analyses 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
Communication track. In addition, students in the SMC track take two specific to either the Technical Communication or the Scientific and Medical Communication track. One 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 related communication, including writing and designing for digital media. Technical communicators develop and design web sites, explain science and related communication, including writing and designing for digital media.

Students with a TW concentration take two Theory/Specialization courses chosen as an elective.

Recommended Options:

- 76-321 Environmental Rhetoric
- 76-361 Topics in Digital Humanities: Corpus Rhetorical Analysis
- 76-395 Science Writing
- 76-425 Science in the Public Sphere
- 76-428 Visual Communication
- 76-474 Software Documentation
- 76-476 Rhetoric of Science
- 76-481 Introduction to Multimedia Design
- 76-491 Rhetorical Analysis
- 76-494 Healthcare Communications

Additional Options include but are not limited to the following:

- 76-301 Internship
- 76-302 Global Communication Center Practicum
- 76-318 Communicating in the Global Marketplace
- 76-319 Environmental Rhetoric
- 76-325 Intertextuality
- 76-340 American English
- 76-351 Rhetorical Invention
- 76-355 Leadership, Dialogue, and Change
- 76-360 Literary Journalism Workshop
- 76-361 Topics in Digital Humanities: Corpus Rhetorical Analysis
- 76-372 News Writing
- 76-375 Magazine Writing
- 76-378 Literacy: Educational Theory and Community Practice
- 76-386 Language & Culture
- 76-389 Rhetorical Grammar
- 76-391 Document & Information Design
- 76-395 Science Writing
- 76-396 Non-Profit Advocacy: Genres, Methods, and Issues
- 76-420 The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process
- 76-425 Science in the Public Sphere
- 76-428 Visual Communication
- 76-472 Multimedia Storytelling in a Digital Age
- 76-474 Software Documentation
- 76-475 Law, Performance, and Identity
II. 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 (52 units minimum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-100</td>
<td>Architecture Design Studio: Foundation I - Fall</td>
<td>10</td>
</tr>
<tr>
<td>or 48-095</td>
<td>Spatial Concepts for Non-Architects I</td>
<td>12</td>
</tr>
<tr>
<td>48-120</td>
<td>Analog and Digital Media I - Fall, Freshman year</td>
<td>12</td>
</tr>
<tr>
<td>48-125</td>
<td>Analog and Digital Media II - Spring, Freshman year</td>
<td>12</td>
</tr>
<tr>
<td>48-240</td>
<td>Historical Survey of World Architecture and Urbanism I - Spring, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>48-241</td>
<td>Modern Architecture - Fall, Sophomore year</td>
<td>9</td>
</tr>
</tbody>
</table>

Architecture Electives (56 units minimum)

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

Art Concentration (108 units minimum)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Concept Studios (2 courses, 20 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-101</td>
<td>Concept Studio: The Self and the Human Being</td>
<td>10</td>
</tr>
<tr>
<td>60-201</td>
<td>Concept Studio: Space and Time</td>
<td>10</td>
</tr>
<tr>
<td>60-202</td>
<td>Concept Studio: Systems and Processes</td>
<td>10</td>
</tr>
<tr>
<td>60-203</td>
<td>Concept Studio: EcoArt</td>
<td>10</td>
</tr>
<tr>
<td>60-204</td>
<td>Concept Studio: Networked Narrative</td>
<td>10</td>
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</tbody>
</table>

Media Studios (3 courses, 30 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-150</td>
<td>2D Media Studio: Drawing</td>
<td>10</td>
</tr>
<tr>
<td>60-160</td>
<td>2D Media Studio: Imaging</td>
<td>10</td>
</tr>
<tr>
<td>60-250</td>
<td>2D Media Studio: Painting</td>
<td>10</td>
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<tr>
<td>60-251</td>
<td>2D Media Studio: Print Media</td>
<td>10</td>
</tr>
<tr>
<td>60-130-60-130</td>
<td>3-D Media Studio I-III</td>
<td>10</td>
</tr>
<tr>
<td>or</td>
<td>(complete two minis, 5 units each)</td>
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</tr>
<tr>
<td>60-131-60-131</td>
<td>3-D Media Studio II-III</td>
<td>10</td>
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<tr>
<td>or</td>
<td>(complete two minis, 5 units each)</td>
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</tr>
<tr>
<td>60-110</td>
<td>Electronic Media Studio: Introduction to the Moving Image</td>
<td>10</td>
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<tr>
<td>60-210</td>
<td>Electronic Media Studio: Introduction to Interactivity</td>
<td>10</td>
</tr>
</tbody>
</table>

Advanced Studies (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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-401/402</td>
<td>Senior Studio</td>
<td>10</td>
</tr>
<tr>
<td>60-403</td>
<td>Extended Studio</td>
<td>10</td>
</tr>
<tr>
<td>60-410 - 60-429</td>
<td>Advanced Electronic and Time-Based Work (ETB)</td>
<td>10</td>
</tr>
<tr>
<td>60-430 - 60-447</td>
<td>Advanced Sculpture, Installation and Site-Work (SIS)</td>
<td>10</td>
</tr>
<tr>
<td>60-448 - 60-449</td>
<td>Advanced Contextual Practice (CP)</td>
<td>10</td>
</tr>
<tr>
<td>60-450 - 60-498</td>
<td>Advanced Drawing, Painting, Print Media and Photography (DP3)</td>
<td>10</td>
</tr>
<tr>
<td>60-499</td>
<td>Studio Independent Study (one only)</td>
<td>10</td>
</tr>
</tbody>
</table>

Art History/Theory (2 courses, 18 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-205</td>
<td>Modern Visual Culture 1789-1960 - Fall</td>
<td>9</td>
</tr>
<tr>
<td>60-206</td>
<td>Contemporary Visual Culture 1960 - Present - Spring</td>
<td>9</td>
</tr>
</tbody>
</table>

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 Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-200</td>
<td>Sophomore Review - Fall</td>
<td>0</td>
</tr>
<tr>
<td>60-400</td>
<td>Senior Review - Fall</td>
<td>0</td>
</tr>
</tbody>
</table>

Design Concentration (108 units minimum)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Design Required Courses (96 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-101</td>
<td>Studio: Survey of Design - Fall, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-103</td>
<td>Design Workshop I - Fall, Freshman year</td>
<td>3</td>
</tr>
<tr>
<td>51-121</td>
<td>Visualizing - Fall, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-171</td>
<td>Placing - Fall, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-102</td>
<td>Design Lab - Spring, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-104</td>
<td>Design Workshop II - Spring, Freshman year</td>
<td>3</td>
</tr>
<tr>
<td>51-122</td>
<td>Collaborative Visualizing - Spring, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-172</td>
<td>Systems - Spring, Freshman year</td>
<td>9</td>
</tr>
</tbody>
</table>

Choose Two Studios:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-225</td>
<td>Communications Studio I: Understanding Form &amp; Context - Fall, Sophomore year</td>
<td>4.5, 4.5</td>
</tr>
<tr>
<td>or 51-245</td>
<td>Products Studio I: Understanding Form &amp; Context</td>
<td></td>
</tr>
<tr>
<td>or 51-265</td>
<td>Environments Studio I: Understanding Form &amp; Context</td>
<td></td>
</tr>
</tbody>
</table>

Choose Two Corresponding Labs:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-227</td>
<td>Prototyping Lab I: Communications - Fall, Sophomore year</td>
<td>4.5, 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>
<tr>
<td>51-271</td>
<td>How People Work - Fall, Sophomore year</td>
<td>9</td>
</tr>
<tr>
<td>51-371</td>
<td>Futures - Fall, Junior year or later</td>
<td>9</td>
</tr>
</tbody>
</table>

Design Electives (12 units minimum)

A minimum of 12 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)

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

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

There is no BHA Acting or Musical Theatre option.

Required Courses for All Concentration Options (20 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</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>54-177</td>
<td>Foundations of Drama I</td>
<td>6</td>
</tr>
<tr>
<td>54-281</td>
<td>Foundations of Drama II</td>
<td>6</td>
</tr>
</tbody>
</table>
A minimum of 2 additional Design units must be approved by the Design faculty option coordinator. A list of these selected courses must be filed in the BXA office.

### Directing Required Courses (52 units)

54-159 Production Practicum 6
54-517 Director's Colloquium 1 (four times, 4 units total)

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

### Dramaturgy Required Courses (53 units minimum)

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

A minimum of 35 additional Dramaturgy units must be approved by the Dramaturgy faculty option coordinator. A list of these selected courses must be filed in the BXA office.

### Production Technology and Management Required Courses (26 units)

54-151-54-152 Stagecraft-Stagecraft 26 (15 units + 11 units)

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

### Music Concentration (108 units minimum)

**AUDITION REQUIRED FOR PERFORMANCE CONCENTRATION OPTION. PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR COMPOSITION, MUSICOLOGY, OR MUSIC TECHNOLOGY CONCENTRATION OPTION.**

Options available in the following areas: 1) Performance (instrumental, piano, organ, voice), 2) Composition 3) Musicology, 4) Music Technology

### Required Course for All Concentration Options (9 units)

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

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

### Performance and Composition Required Courses (76 units)

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

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

### Musicology Required Courses (45 units)

57-283 Music History I (co-requisite: 57-190) 9
57-284 Music History II (co-requisite: 57-289) 9
57-285 Music History III (co-requisite: 57-290) 9
57-189 Introduction to Repertoire and Listening for Musicians 3
57-190 Repertoire and Listening for Musicians I 3
57-289 Repertoire and Listening for Musicians II 3
57-290 Repertoire and Listening for Musicians III 3
57-611 Independent Study in History 6

Choose 36 units from:

57-209 The Beatles 9
57-306 World Music 9
57-430 Music of Iran 9
57-477 Music of the Spirit 6
57-478 Survey of Historical Recording 6
57-480 History of Black American Music 6

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

### Music Technology Required Courses (40 units)

57-101 Introduction to Music Technology 6
57-181 Solfege I-Fall 3 or 57-180 Basic Solfege I or 57-185 Advanced Solfege I
57-173 Survey of Western Music History -Fall (co-requisite: 57-188) 9
57-188 Repertoire and Listening for Musicians 1
57-337 Sound Recording 6
57-347 Electronic and Computer Music 6
57-xxx Independent Study in Music Technology or Sound Recording 9

Choose 36 units from:

15-322 Introduction to Computer Music 9
15-323 Computer Music Systems and Information Processing 9
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
54-666 Production Audio 6
57-153 Harmony II -Spring 9
57-182 Solfege II -Spring 3 or 57-186 Advanced Solfege II
57-283 Music History I (co-requisite: 57-190) 9
57-284 Music History II (co-requisite: 57-289) 9
57-285 Music History III (co-requisite: 57-290) 9
57-190 Repertoire and Listening for Musicians I 3
57-289 Repertoire and Listening for Musicians II 3
57-338 Sound Editing and Mastering 6
57-344 Experimental Sound Synthesis 9
57-345 Hacking the Music World 9
57-438 Multitrack Recording 9
60-131 3D Media Studio II 5
60-210 Electronic Media Studio: Introduction to Interactivity 10

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.
IV. 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 of the fine arts and an area of the natural sciences or mathematics.

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

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

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

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

BSA Curriculum

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. BSA General Education</td>
</tr>
<tr>
<td>II. MCS Concentration</td>
</tr>
<tr>
<td>III. CFA Concentration</td>
</tr>
<tr>
<td>IV. Free Electives</td>
</tr>
<tr>
<td>Total BSA Degree Requirements</td>
</tr>
</tbody>
</table>

I. 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 33-111 required)
- First-year Courses (2 courses, 12 units, 76-101 and 99-101 or 99-102 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 minimum, 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/previous/2016-2017/melloncollegeofscience/#fortudentsenteringinthefall2015andbeyond).

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 I 10
- 33-121 Physics I for Science Students 12

Non-technical 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 meta-curricular participation to maximize their CMU experience. Our graduates will be well trained to be life-long and life-wide learners that will lead the scientific community and the world at large.

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

First-year Courses (2 courses, 12 units)

- 76-101 Interpretation and Argument 9
- 99-101 Computing at Carnegie Mellon 3
- or 99-102 Computing at Carnegie Mellon

ENGAGE (3 courses, 3 units)

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

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

Cultural/Global Understanding (1 course, 9 units)

Cultural or global understanding course(s) may be taken at any time. Nine (9) or more units from the following group of courses will fulfill this requirement. Any student who finds an appropriate Carnegie Mellon course not on the list below that might fulfill this requirement should contact their academic advisor to review the course description to determine if it can be substituted. Cultural and global understanding courses that are taken while studying abroad can be used to fulfill this requirement. In addition, transfer courses must be taken at CMU or at another university for transfer 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
- 73-331 Political Economy of Inequality and Redistribution 9
- 76-221 Books You Should Have Read By Now 9
- 76-227 Comedy 9
- 76-232 Introduction to African American Literature 9
- 76-239 Introduction to Film Studies 9
- 76-241 Introduction to Gender Studies 9
- 76-386 Language & Culture 9
- 79-104 Global Histories 9
- 79-201 Introduction to Anthropology 9
- 79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
- 79-205 20th/21st Century Europe 9
### II. Mellon College of Science Concentration

- **(number of courses vary, 114-134 units)**

  BSA students choose one of the following concentrations:
  - Biological Sciences (117 units)
  - Chemistry (121 units)
  - Mathematical Sciences (123 units)
  - Neurobiology (114 units)
  - Physics (134 units)

#### Biological Sciences Concentration (117 units minimum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-207</td>
<td>Development of European Culture</td>
<td>9</td>
</tr>
<tr>
<td>79-221</td>
<td>Development in Latin America</td>
<td>9</td>
</tr>
<tr>
<td>79-229</td>
<td>Origins of the Arab-Israeli Conflict, 1800-1948</td>
<td>9</td>
</tr>
<tr>
<td>79-230</td>
<td>Arab-Israeli Conflict and Peace Process since 1948</td>
<td>9</td>
</tr>
<tr>
<td>79-240</td>
<td>Development of American Culture</td>
<td>9</td>
</tr>
<tr>
<td>79-241</td>
<td>African American History: Africa to the Civil War</td>
<td>9</td>
</tr>
<tr>
<td>79-242</td>
<td>African American History: Reconstruction to the Present</td>
<td>9</td>
</tr>
<tr>
<td>79-255</td>
<td>Irish History</td>
<td>6</td>
</tr>
<tr>
<td>79-261</td>
<td>The Last Emperors: Chinese History and Society, 1600-1900</td>
<td>9</td>
</tr>
<tr>
<td>79-265</td>
<td>Russian History: From the First to the Last Tsar</td>
<td>9</td>
</tr>
<tr>
<td>79-266</td>
<td>Russian History: From Communism to Capitalism</td>
<td>9</td>
</tr>
<tr>
<td>79-275</td>
<td>Introduction to Global Studies</td>
<td>9</td>
</tr>
<tr>
<td>79-297</td>
<td>Dilemmas and Controversies in Anthropology</td>
<td>9</td>
</tr>
<tr>
<td>79-307</td>
<td>Religion and Politics in the Middle East</td>
<td>9</td>
</tr>
<tr>
<td>79-345</td>
<td>Roots of Rock &amp; Roll</td>
<td>9</td>
</tr>
<tr>
<td>79-349</td>
<td>The Holocaust in Historical Perspective</td>
<td>9</td>
</tr>
<tr>
<td>79-350</td>
<td>Early Christianity</td>
<td>9</td>
</tr>
<tr>
<td>79-357</td>
<td>History of Black American Music</td>
<td>6</td>
</tr>
<tr>
<td>79-377</td>
<td>Food, Culture, and Power: A History of Eating</td>
<td>9</td>
</tr>
<tr>
<td>80-100</td>
<td>Introduction to Philosophy</td>
<td>9</td>
</tr>
<tr>
<td>80-250</td>
<td>Ancient Philosophy</td>
<td>9</td>
</tr>
<tr>
<td>80-251</td>
<td>Modern Philosophy</td>
<td>9</td>
</tr>
<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>99-241</td>
<td>Revolutions of Circularity</td>
<td>9</td>
</tr>
<tr>
<td>99-3xx</td>
<td>Any of the Country Today courses</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Humanities and Social Sciences (2 courses, 18 units)

- To fulfill this requirement, students must complete a minimum of two (2) nontechnical 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 minimum)

- 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>52-190</td>
<td>BXA Seminar I: Building the Wunderkammer</td>
<td>9</td>
</tr>
<tr>
<td>or 52-291</td>
<td>BXA Seminar II: Transferring Knowledge</td>
<td>9</td>
</tr>
<tr>
<td>52-391</td>
<td>BXA Junior Portfolio</td>
<td>0</td>
</tr>
<tr>
<td>52-392</td>
<td>BXA Seminar III: Deconstructing Disciplines</td>
<td>9</td>
</tr>
<tr>
<td>52-401</td>
<td>BXA Seminar IV: Capstone Fail</td>
<td>9</td>
</tr>
<tr>
<td>52-402</td>
<td>BXA Seminar V: Capstone Spring</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-124</td>
<td>Modern Biology Laboratory</td>
<td>9</td>
</tr>
<tr>
<td>or 03-343</td>
<td>Experimental Techniques in Molecular Biology</td>
<td>9</td>
</tr>
<tr>
<td>03-201/202</td>
<td>Undergraduate Colloquium for Sophomores</td>
<td>2</td>
</tr>
<tr>
<td>03-220</td>
<td>Genetics</td>
<td>9</td>
</tr>
<tr>
<td>03-231</td>
<td>Biochemistry I</td>
<td>9</td>
</tr>
<tr>
<td>or 03-232</td>
<td>Biochemistry I</td>
<td>9</td>
</tr>
<tr>
<td>03-320</td>
<td>Cell Biology</td>
<td>9</td>
</tr>
<tr>
<td>09-106</td>
<td>Modern Chemistry II</td>
<td>10</td>
</tr>
<tr>
<td>09-217</td>
<td>Organic Chemistry I</td>
<td>9</td>
</tr>
<tr>
<td>09-218</td>
<td>Organic Chemistry II</td>
<td>9</td>
</tr>
<tr>
<td>09-221</td>
<td>Laboratory I: Introduction to Chemical Analysis</td>
<td>12</td>
</tr>
<tr>
<td>or 09-222</td>
<td>Laboratory II: Organic Synthesis and Analysis</td>
<td>12</td>
</tr>
<tr>
<td>or 03-344</td>
<td>Experimental Biochemistry</td>
<td>9</td>
</tr>
<tr>
<td>or 03-345</td>
<td>Experimental Cell and Developmental Biology</td>
<td>9</td>
</tr>
<tr>
<td>or 03-346</td>
<td>Experimental Neuroscience</td>
<td>9</td>
</tr>
<tr>
<td>33-122</td>
<td>Physics II for Biological Sciences and Chemistry</td>
<td>9</td>
</tr>
</tbody>
</table>

* Students must complete 03-343 if they wish to take 03-344/5/6.

#### Biological Sciences Electives (2 courses, 18 units)

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

#### Chemistry Concentration (121 units minimum)

- **Chemistry Required Courses (103 units)**

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

#### 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 Concentration (123 units minimum)

- **Mathematical Sciences Required Courses (87 units minimum)**

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

Mathematical Sciences Electives (2 courses, 18 units)

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

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

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

Neurobiology Concentration (114 units minimum)

Neurobiology Required Courses (12 courses, 96 units)

03-161 Molecules to Mind 9
or 85-219 Biological Foundations of Behavior 2
03-201 Undergraduate Colloquium for Sophomores 9
03-220 Genetics 9
03-231 Biochemistry I 9
03-320 Cell Biology 9
03-342 Introduction to Biological Laboratory Practices 1
03-343 Experimental Techniques in Molecular Biology 12
03-362 Cellular Neuroscience 9
03-363 Systems Neuroscience 9
09-217 Organic Chemistry I 9
33-122 Physics II for Biological Sciences and Chemistry Students 9
85-211 Cognitive Psychology 9

Neurobiology Electives (2 courses, 18 units)

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

Physics Concentration (134 units minimum)

Physics Required Courses (116 units)

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

Physics Electives (2 courses, 18 units)

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

33-xxx Two Physics Electives 18

Note: 33-114 Physics of Musical Sound (9 units) is highly recommended for students with a Music concentration.

III. College of Fine Arts Concentration

(number of courses vary, 108 units minimum)

BSA students choose one of the following concentrations:

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

Architecture Concentration (108 units minimum)

Architecture Required Courses (52 units minimum)

48-100 Architecture Design Studio: Foundation I-Fall, Freshman year 10
or 48-095 Spatial Concepts for Non-Architects I 9
48-120 Analog and Digital Media I-Fall, Freshman year 12
48-125 Analog and Digital Media II -Spring, Freshman year 12
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)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Concept Studios (2 courses, 20 units)

Complete two courses:

60-101 Concept Studio: The Self and the Human Being 10
60-201 Concept Studio: Space and Time 10
60-202 Concept Studio: Systems and Processes 10
60-203 Concept Studio: EcoArt 10
60-204 Concept Studio: Networked Narrative 10

Media Studios (3 courses, 30 units)

Complete three courses:

60-150 2D Media Studio: Drawing 10
60-160 2D Media Studio: Imaging 10
60-250 2D Media Studio: Painting 10
60-251 2D Media Studio: Print Media 10
60-130-60-131 3-D Media Studio I-I (complete two minis, 5 units each) 10
60-131-60-133 3D Media Studio II-II (complete two minis, 5 units each) 10
60-110 Electronic Media Studio: Introduction to the Moving Image 10
60-210 Electronic Media Studio: Introduction to Interactivity 10

Advanced Studios (4 courses, 40 units)

Complete four courses. Courses may be offered in the fall and/or spring. Students may take courses in any media area if a focus is desired.

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

Art History/Theory (2 courses, 18 units)

60-205 Modern Visual Culture 1789-1960 -Fall 9
60-206 Contemporary Visual Culture 1960 - Present - Spring 9

Review Requirement (Complete 2 required reviews, 0 units)

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

60-200 Sophomore Review -Spring 0
60-400 Senior Review -Fall 0
Design Concentration (108 units minimum)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Design Required Courses (96 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-101</td>
<td>Studio: Survey of Design -Fall, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-103</td>
<td>Design Workshop I -Fall, Freshman year</td>
<td>3</td>
</tr>
<tr>
<td>51-121</td>
<td>Visualizing -Fall, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-171</td>
<td>Placing -Fall, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-102</td>
<td>Design Lab -Spring, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-104</td>
<td>Design Workshop II -Spring, Freshman year</td>
<td>3</td>
</tr>
<tr>
<td>51-122</td>
<td>Collaborative Visualizing -Spring, Freshman year</td>
<td>9</td>
</tr>
<tr>
<td>51-172</td>
<td>Systems -Spring, Freshman year</td>
<td>9</td>
</tr>
</tbody>
</table>

Choose Two Studios:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-225</td>
<td>Communications Studio I: Understanding Form &amp; Context -Fall, Sophomore year</td>
<td>4.5, 4.5</td>
</tr>
<tr>
<td>51-245</td>
<td>Products Studio I: Understanding Form &amp; Context</td>
<td></td>
</tr>
<tr>
<td>51-265</td>
<td>Environments Studio I: Understanding Form &amp; Context</td>
<td></td>
</tr>
</tbody>
</table>

Choose Two Corresponding Labs:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-227</td>
<td>Prototyping Lab I: Communications -Fall, Sophomore year</td>
<td>4.5, 4.5</td>
</tr>
<tr>
<td>51-247</td>
<td>Prototyping Lab I: Products</td>
<td></td>
</tr>
<tr>
<td>51-267</td>
<td>Prototyping Lab I: Environments</td>
<td></td>
</tr>
<tr>
<td>51-271</td>
<td>How People Work -Fall, Sophomore year</td>
<td>9</td>
</tr>
<tr>
<td>51-371</td>
<td>Futures -Fall, Junior year or later</td>
<td>9</td>
</tr>
</tbody>
</table>

Design Electives (12 units minimum)

A minimum of 12 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)

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

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

There is no BSA Acting or Musical Theatre option.

Required Courses for All Concentration Options (20 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-175-54-176</td>
<td>Conservatory Hour-Conservatory Hour</td>
<td>2</td>
</tr>
<tr>
<td>54-177</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>9</td>
</tr>
</tbody>
</table>

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

Design Required Courses (26 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-151-54-152</td>
<td>Stagecraft-Stagecraft</td>
<td>26</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 (52 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-121-54-122</td>
<td>Directing I: Sources-Directing I: Sources</td>
<td>18</td>
</tr>
<tr>
<td>54-221-54-222</td>
<td>Directing II: Fundamentals-Directing II: Fundamentals</td>
<td>18</td>
</tr>
<tr>
<td>54-159</td>
<td>Production Practicum</td>
<td>6</td>
</tr>
<tr>
<td>54-517</td>
<td>Director's Colloquium (four times, 4 units total)</td>
<td>1</td>
</tr>
</tbody>
</table>

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

Dramaturgy Required Courses (53 units minimum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-109</td>
<td>Dramaturgy 1: Approaches to Text</td>
<td>9</td>
</tr>
<tr>
<td>54-184</td>
<td>Dramaturgy 2: Introduction to Production</td>
<td>9</td>
</tr>
<tr>
<td>54-121</td>
<td>Directing I: Sources</td>
<td>9</td>
</tr>
</tbody>
</table>
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>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td>II. SCS Concentration</td>
</tr>
<tr>
<td>111</td>
<td>III. CFA Concentration</td>
</tr>
<tr>
<td>108-118</td>
<td>IV. Free Electives</td>
</tr>
<tr>
<td>380</td>
<td>Total BCSA Degree Requirements</td>
</tr>
</tbody>
</table>

#### I. BCSA General Education

(15 courses, 121 units minimum)

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

#### IV. Free Electives (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 (various topics by section) www.cmu.edu/hss/english/first_year/index.html

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

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

<table>
<thead>
<tr>
<th>Units</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-173</td>
<td>Survey of Western Music History *</td>
</tr>
<tr>
<td>70-342</td>
<td>Managing Across Cultures *</td>
</tr>
<tr>
<td>76-232</td>
<td>Introduction to African American Literature *</td>
</tr>
<tr>
<td>76-239</td>
<td>Introduction to Film Studies *</td>
</tr>
<tr>
<td>79-241</td>
<td>Introduction to Gender Studies *</td>
</tr>
<tr>
<td>79-104</td>
<td>Global Histories</td>
</tr>
<tr>
<td>79-207</td>
<td>Development of European Culture</td>
</tr>
<tr>
<td>79-222</td>
<td>Between Revolutions: The Development of Modern Latin America</td>
</tr>
<tr>
<td>79-226</td>
<td>African History: Earliest Times to 1780</td>
</tr>
<tr>
<td>79-230</td>
<td>Arab-Israeli Conflict and Peace Process since 1948</td>
</tr>
<tr>
<td>79-240</td>
<td>Development of African Culture</td>
</tr>
<tr>
<td>79-241</td>
<td>African American History: Africa to the Civil War</td>
</tr>
<tr>
<td>79-242</td>
<td>African American History: Reconstruction to the Present</td>
</tr>
<tr>
<td>79-255</td>
<td>Irish History</td>
</tr>
<tr>
<td>79-262</td>
<td>Modern China: From the Birth of Mao ... to Now</td>
</tr>
</tbody>
</table>
individual preferences and actions into collective outcomes. This requirement explores the processes by which institutions organize Economic, Political & Social Institutions & Behavior (1 course from either category, complete 9 units minimum) Economic, Political & Social Institutions OR Cognition, Choice, and Behavior

Choose two courses from the following list:

- 03-121 Modern Biology
- 09-105 Introduction to Modern Chemistry I
- 21-259 Calculus in Three Dimensions
- 33-111 Physics I for Science Students

Engineering

In consultation with your academic advisor, an engineering course could substitute for one of the two Science requirements.

Economic, Political & Social Institutions OR Cognition, Choice & Behavior (1 course from either category, complete 9 units minimum)

Economic, Political & Social Institutions

This requirement explores the processes by which institutions organize individual preferences and actions into collective outcomes.

- 19-101 Introduction to Engineering and Public Policy * 12
- 36-303 Sampling, Survey and Society * 9
- 70-332 Business, Society and Ethics 9
- 73-100 Principles of Economics 9
- 73-230 Intermediate Microeconomics * 9
- 73-240 Intermediate Macroeconomics * 9
- 79-300 History of American Public Policy 9
- 79-320 Women, Politics, and Protest 9
- 79-331 Body Politics: Women and Health in America 9
- 80-135 Introduction to Political Philosophy 9
- 80-136 Social Structure, Public Policy & Ethics 9
- 80-244 Environmental Ethics 9

- 80-245 Medical Ethics 9
- 80-341 Computers; Society and Ethics 9
- 84-104 Decision Processes in American Political Institutions 9
- 88-220 Policy Analysis I 9

* Indicates co-requisites and/or prerequisites required.

Cognition, Choice, and Behavior

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

- 70-311 Organizational Behavior * 9
- 80-130 Introduction to Ethics 9
- 80-150 Nature of Reason 9
- 80-180 Nature of Language 9
- 80-221 Philosophy of Social Science 9
- 80-230 Ethical Theory 9
- 80-241 Ethical Judgments in Professional Life 9
- 80-270 Philosophy of Mind 9
- 80-271 Philosophy and Psychology 9
- 80-275 Metaphysics 9
- 80-281 Language and Thought 9
- 85-102 Introduction to Psychology 9
- 85-211 Cognitive Psychology 9
- 85-221 Principles of Child Development 9
- 85-241 Social Psychology 9
- 85-251 Personality 9
- 85-261 Abnormal Psychology 9
- 88-120 Reason, Passion and Cognition 9
- 88-260 Organizations 9

* Indicates co-requisites and/or prerequisites required.

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

- English
- History
- Modern Languages
- Philosophy
- Psychology

Computing @ Carnegie Mellon (1 course, 3 units)

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

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

BXA Required Courses (5 courses, 36 units minimum)

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

- 52-190 BXA Seminar I: Building the Wunderkammer 9
- 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 Fall 9
- 52-402 BXA Seminar V: Capstone Spring 9

II. School of Computer Science Concentration

Computer Science Concentration (111 units minimum)

Prerequisite

- 15-112 Fundamentals of Programming and Computer Science 12

Computer Science Core Requirements (56 units)

- 15-122 Principles of Imperative Computation 10
- 15-150 Principles of Functional Programming 10
BXA Intercollege Degree Programs

15-210 Parallel and Sequential Data Structures and Algorithms 12
15-213 Introduction to Computer Systems 12
15-251 Great Theoretical Ideas in Computer Science 12

Concepts of Mathematics (10 units)

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

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

Choose a minimum of five courses from SCS beyond the core requirements, 200-level or higher, not including 15-221, 15-351, 16-223, 08-200, 08-532. Listed below are suggested choices for these electives. Consult with the CS advisor if interested in courses not listed.

05-391 Designing Human Centered Software 12
05-418 Design Educational Games 12
11-344 Machine Learning in Practice 12
11-411 Natural Language Processing 12
15-322 Introduction to Computer Music 9
15-323 Computer Music Systems and Information Processing 9
15-365 Experimental Animation 12
15-381 Artificial Intelligence: Representation and Problem Solving 9
15-388 Practical Data Science 9
15-415 Database Applications 12
15-437 Web Application Development 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
16-264 Humanoids 12
16-362 Mobile Robot Programming Laboratory 12
16-384 Robot Kinematics and Dynamics 12
16-385 Computer Vision 9
16-467 Human Robot Interaction 12

III. College of Fine Arts Concentration

(number of courses vary, 108-118 units minimum)

BCSA students choose one of the following concentrations:

- Architecture (108 units)
- Art (118 units)
- Design (108 units)
- Drama (108 units)
- Music (108 units)

Architecture Concentration (108 units minimum)

Architecture Required Courses (52 units minimum)

48-100 Architecture Design Studio: Foundation I - Fall, Freshman year 10-12
or 48-095 Spatial Concepts for Non-Architects I
48-120 Analog and Digital Media I - Fall, Freshman year 12
48-125 Analog and Digital Media II - Spring, Freshman year 12
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 (118 units minimum)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Concept Studios (2 courses, 20 units)

Complete two courses:

60-101 Concept Studio: The Self and the Human Being 10
60-201 Concept Studio: Space and Time 10
60-202 Concept Studio: Systems and Processes 10
60-203 Concept Studio: EcoArt 10
60-204 Concept Studio: Networked Narrative 10

Media Studios (2 courses, 20 units)

Complete two courses:

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

Advanced Studios (6 courses, 60 units)

Complete six 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 Extended Studio 10
60-410 - 60-429 Advanced Electronic and Time-Based Work (ETB) 10
60-430 - 60-447 Advanced Sculpture, Installation and Site-Work (SIS) 10
60-448 - 60-449 Advanced Contextual Practice (CP) 10
60-450 - 60-498 Advanced Drawing, Painting, Print Media and Photography (PDP) 10
60-499 Studio Independent Study (one only) 10

Art History/Theory (2 courses, 18 units)

60-205 Modern Visual Culture 1789-1960 - Fall 9
60-206 Contemporary Visual Culture 1960 - Present - Spring 9

Review Requirement (Complete 2 required reviews, 0 units)

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

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

Design Concentration (108 units minimum)

PORTFOLIO REVIEW REQUIRED FOR ADMISSION

Design Required Courses (96 units)

51-101 Studio: Survey of Design - Fall, Freshman year 9
51-103 Design Workshop I - Fall, Freshman year 3
51-121 Visualizing - Fall, Freshman year 9
51-171 Placing - Fall, Freshman year 9
51-102 Design Lab - Spring, Freshman year 9
51-104 Design Workshop II - Spring, Freshman year 3
51-122 Collaborative Visualizing - Spring, Freshman year 9
51-172 Systems - Spring, Freshman year 9

Choose Two Studios:

51-225 Communications Studio I: Understanding Form & Context - Fall, Sophomore year 4.5, 4.5
or 51-245 Products Studio I: Understanding Form & Context
or 51-265 Environments Studio I: Understanding Form & Context
A minimum of 12 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)**

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

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

There is no BHA Acting or Musical Theatre option.

**Required Courses for All Concentration Options (20 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</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>54-177</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>
</tbody>
</table>

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

**Design Required Courses (26 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-151-54-152</td>
<td>Stagecraft-Stagecraft (15 units + 11 units)</td>
<td>26</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 (52 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-121-54-122</td>
<td>Directing I: Sources-Directing II: Sources (Fundamentals)</td>
<td>18</td>
</tr>
<tr>
<td>54-221-54-222</td>
<td>Directing II: Fundamentals-Directing II (Fundamentals)</td>
<td>18</td>
</tr>
<tr>
<td>54-159</td>
<td>Production Practicum</td>
<td>6</td>
</tr>
<tr>
<td>54-517</td>
<td>Director's Colloquium (four times, 4 units total)</td>
<td>1</td>
</tr>
</tbody>
</table>

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

**Dramaturgy Required Courses (53 units minimum)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-109</td>
<td>Dramaturgy 1: Approaches to Text</td>
<td>9</td>
</tr>
<tr>
<td>54-184</td>
<td>Dramaturgy 2: Introduction to Production Dramaturgy</td>
<td>9</td>
</tr>
<tr>
<td>54-121</td>
<td>Directing I: Sources</td>
<td>9</td>
</tr>
<tr>
<td>54-159</td>
<td>Production Practicum</td>
<td>6</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 35 additional Dramaturgy units must be approved by the Dramaturgy faculty option coordinator. A list of these selected courses must be filed in the BXA office.

**Production Technology and Management Required Courses (26 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>54-151-54-152</td>
<td>Stagecraft-Stagecraft (15 units + 11 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)**

**AUDITION REQUIRED FOR PERFORMANCE CONCENTRATION OPTION. PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR COMPOSITION, MUSICOLOGY, OR MUSIC TECHNOLOGY CONCENTRATION OPTION.**

Options available in the following areas: 1) Performance (instrumental, piano, organ, voice), 2) Composition 3) Musicology, 4) Music Technology

**Required Course for All Concentration Options (9 units)**

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

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

**Performance and Composition Required 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>Eurhythms I -Fall (recommended co-requisite: 57-181)</td>
<td>3</td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I -Fall</td>
<td>3</td>
</tr>
<tr>
<td>57-180</td>
<td>Basic Solfege I</td>
<td></td>
</tr>
<tr>
<td>57-185</td>
<td>Advanced Solfege I</td>
<td></td>
</tr>
<tr>
<td>57-173</td>
<td>Survey of Western Music History -Fall (co-requisite: 57-188)</td>
<td>9</td>
</tr>
<tr>
<td>57-188</td>
<td>Repertoire and Listening for Musicians</td>
<td>1</td>
</tr>
<tr>
<td>57-69x</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.

**Musicology Required Courses (45 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-283</td>
<td>Music History I (co-requisite: 57-190)</td>
<td>9</td>
</tr>
<tr>
<td>57-284</td>
<td>Music History II (co-requisite: 57-289)</td>
<td>9</td>
</tr>
<tr>
<td>57-285</td>
<td>Music History III (co-requisite: 57-290)</td>
<td>9</td>
</tr>
<tr>
<td>57-189</td>
<td>Introduction to Repertoire and Listening for Musicians</td>
<td>3</td>
</tr>
<tr>
<td>57-190</td>
<td>Repertoire and Listening for Musicians II</td>
<td>3</td>
</tr>
<tr>
<td>57-289</td>
<td>Repertoire and Listening for Musicians III</td>
<td>3</td>
</tr>
<tr>
<td>57-290</td>
<td>Repertoire and Listening for Musicians III</td>
<td>3</td>
</tr>
<tr>
<td>57-611</td>
<td>Independent Study in History</td>
<td>6</td>
</tr>
</tbody>
</table>

Choose 36 units from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-209</td>
<td>The Beatles</td>
<td>9</td>
</tr>
<tr>
<td>57-306</td>
<td>World Music</td>
<td>9</td>
</tr>
<tr>
<td>57-430</td>
<td>Music of Iran</td>
<td>9</td>
</tr>
<tr>
<td>57-477</td>
<td>Music of the Spirit</td>
<td>6</td>
</tr>
<tr>
<td>57-478</td>
<td>Survey of Historical Recording</td>
<td>6</td>
</tr>
<tr>
<td>57-480</td>
<td>History of Black American Music</td>
<td>6</td>
</tr>
</tbody>
</table>

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

**Music Technology Required Courses (40 units)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-101</td>
<td>Introduction to Music Technology</td>
<td>6</td>
</tr>
<tr>
<td>57-181</td>
<td>Solfege I -Fall</td>
<td>3</td>
</tr>
<tr>
<td>57-180</td>
<td>Basic Solfege I</td>
<td></td>
</tr>
<tr>
<td>57-185</td>
<td>Advanced Solfege I</td>
<td></td>
</tr>
<tr>
<td>57-173</td>
<td>Survey of Western Music History -Fall (co-requisite: 57-188)</td>
<td>9</td>
</tr>
<tr>
<td>57-188</td>
<td>Repertoire and Listening for Musicians</td>
<td>1</td>
</tr>
<tr>
<td>57-337</td>
<td>Sound Recording</td>
<td>6</td>
</tr>
<tr>
<td>57-347</td>
<td>Electronic and Computer Music</td>
<td>6</td>
</tr>
<tr>
<td>57-xxx</td>
<td>Independent Study in Music Technology or Sound Recording</td>
<td>9</td>
</tr>
</tbody>
</table>

Choose 36 units from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-322</td>
<td>Introduction to Computer Music</td>
<td>9</td>
</tr>
<tr>
<td>15-323</td>
<td>Computer Music Systems and Information Processing</td>
<td>9</td>
</tr>
<tr>
<td>18-090</td>
<td>Twisted Signals: Multimedia Processing for the Arts</td>
<td>10</td>
</tr>
<tr>
<td>33-114</td>
<td>Physics of Musical Sound</td>
<td>9</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Units</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>54-166</td>
<td>Introduction to Sound Design for Theatre</td>
<td>6</td>
</tr>
<tr>
<td>54-666</td>
<td>Production Audio</td>
<td>6</td>
</tr>
<tr>
<td>57-153</td>
<td>Harmony II -Spring</td>
<td>9</td>
</tr>
<tr>
<td>57-182</td>
<td>Solfege II -Spring</td>
<td>3</td>
</tr>
<tr>
<td>or 57-186</td>
<td>Advanced Solfege II</td>
<td></td>
</tr>
<tr>
<td>57-283</td>
<td>Music History I (co-requisite: 57-190)</td>
<td>9</td>
</tr>
<tr>
<td>57-284</td>
<td>Music History II (co-requisite: 57-289)</td>
<td>9</td>
</tr>
<tr>
<td>57-285</td>
<td>Music History III (co-requisite: 57-290)</td>
<td>9</td>
</tr>
<tr>
<td>57-190</td>
<td>Repertoire and Listening for Musicians I</td>
<td>3</td>
</tr>
<tr>
<td>57-289</td>
<td>Repertoire and Listening for Musicians II</td>
<td>3</td>
</tr>
<tr>
<td>57-290</td>
<td>Repertoire and Listening for Musicians III</td>
<td>3</td>
</tr>
<tr>
<td>57-338</td>
<td>Sound Editing and Mastering</td>
<td>6</td>
</tr>
<tr>
<td>57-344</td>
<td>Experimental Sound Synthesis</td>
<td>9</td>
</tr>
<tr>
<td>57-345</td>
<td>Hacking the Music World</td>
<td>9</td>
</tr>
<tr>
<td>57-438</td>
<td>Multitrack Recording</td>
<td>9</td>
</tr>
<tr>
<td>60-131</td>
<td>3D Media Studio II</td>
<td>5</td>
</tr>
<tr>
<td>60-210</td>
<td>Electronic Media Studio: Introduction to Interactivity</td>
<td>10</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.

### IV. Free Electives

(approximately 3-4 courses, 30–40 units minimum)

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