

BXA Intercollege Degree Programs

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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 non-profits 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

	Units
I. BHA General Education	111
II. 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, 36-200 or 36-201 required)

- Computing @ Carnegie Mellon (1 course, 3 units, 99-101 or 99-102 required)
- BXA Required Courses (5 courses, 36 units minimum, 52-190 or 52-291, 52-391, 52-392, 52-401, 52-402)

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
(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
(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	Differential Calculus	10
21-120	Differential and Integral Calculus	10
21-127	Concepts of Mathematics	10
21-241	Matrices and Linear Transformations	10
80-110	Nature of Mathematical Reasoning	9
80-210	Logic and Proofs	9
80-211	Logic and Mathematical Inquiry	9
80-212	Arguments and Logical Analysis	9

Natural Science

02-223	Personalized Medicine: Understanding Your Own Genome	9
02-261	Quantitative Cell and Molecular Biology Laboratory	9
03-121	Modern Biology	9
03-125	Evolution	9
03-132	Basic Science to Modern Medicine	9
03-161	Molecules to Mind	9
09-103	Atoms, Molecules and Chemical Change	9
09-105	Introduction to Modern Chemistry I	10
12-201	Geology	9
33-104	Experimental Physics	9
33-111	Physics I for Science Students	12
33-114	Physics of Musical Sound	9
33-115	Physics for Future Presidents	9
33-124	Introduction to Astronomy	9

Other Courses

02-223	Personalized Medicine: Understanding Your Own Genome	9
05-413	Human Factors	9
15-104	Introduction to Computing for Creative Practice	10
15-110	Principles of Computing	10
15-112	Fundamentals of Programming and Computer Science	12
18-090	Twisted Signals: Multimedia Processing for the Arts	10
33-120	Science and Science Fiction	9
36-202	Methods for Statistics and Data Science	9
80-220	Philosophy of Science	9
80-222	Measurement and Methodology	9
80-223	Causality and Probability	9
80-226	Revolutions in Science	9
80-322	Philosophy of Physics	9
80-323	Philosophy of Biology	9
80-327	Philosophy of Neuroscience	9
85-370	Perception	9
99-238	Materials, Energy and Environment	9

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

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

36-200	Reasoning with Data -REQUIRED	9
or 36-201	Statistical Reasoning and Practice	
73-102	Principles of Microeconomics	9
73-103	Principles of Macroeconomics	9
79-342	Introduction to Science and Technology Studies	9
80-130	Introduction to Ethics	9
80-136	Social Structure, Public Policy & Ethics	9
80-208	Critical Thinking	9
80-221	Philosophy of Social Science	9
80-230	Ethical Theory	9
80-242	Conflict and Dispute Resolution	9
80-244	Environmental Ethics	9
80-245	Medical Ethics	9
80-248	Engineering Ethics	9
80-270	Philosophy of Mind	9
80-271	Philosophy and Psychology	9
80-305	Choices, Decisions, and Games	9
80-324	Philosophy of Economics	9
80-335	Deliberative Democracy: Theory and Practice	9
80-336	Philosophy of Law	9
80-348	Health Development and Human Rights	9
80-405	Game Theory	9
80-430	Ethics and Medical Research	9
80-447	Global Justice	9
84-104	Decision Processes in American Political Institutions	9
84-309	Political Behavior	9
84-310	International Political Economy and Organizations	9
84-319	U.S. Foreign Policy and Interventions in World Affairs	9
84-320	Domestic Politics and International Affairs	9
84-321	Autocrats and Democrats	9
84-322	Nonviolent Conflict and Revolution	9
84-333	Power and Levers for Change in Washington, DC	12

84-336	Implementing Public Policy: From Good Idea To Reality	12
84-346	Legal Issues in Public Administration	6
84-348	Advocacy, Policy and Practice	6
84-362	Diplomacy and Statecraft	9
84-366	Presidential Politics: So, You Want to Be President of the United States	9
84-380	Grand Strategy in the United States	9
84-386	The Privatization of Force	9
84-388	Concepts of War and Cyber War	6
84-389	Terrorism and Insurgency	9
84-402	Judicial Politics and Behavior	9
84-414	International and Subnational Security	9
85-102	Introduction to Psychology	9
85-211	Cognitive Psychology	9
85-219	Biological Foundations of Behavior	9
85-221	Principles of Child Development	9
85-241	Social Psychology	9
85-251	Personality	9
85-261	Abnormal Psychology	9
85-395	Applications of Cognitive Science	9
88-120	Reason, Passion and Cognition	9

Computing @ Carnegie Mellon (1 course, 3 units)

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

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

BXA Required Courses (5 courses, 36 units minimum)

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

52-190	BXA Seminar I: Building the Wunderkammer	9
or 52-291	BXA Seminar II: Transferring Knowledge	
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. Dietrich College of Humanities and Social Sciences Concentration

(9 courses, 81 units minimum)

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

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

Anthropology Concentration (81 units minimum)

The BHA concentration in Anthropology offers students training in ethnographic methods and in theoretical understandings of culture. Students examine the evolution, depth, and complexities of ethnography, and explore notions of "culture" in diverse settings, over time and across space. In today's world, students are increasingly aware of the importance of developing a sophisticated approach to culture and its articulation with changes in the domains of the arts, technology, economics, and politics. The BHA concentration in Anthropology provides students with the tools to link artistic practices to various aspects of globalization. It is highly recommended that Anthropology students study abroad in some capacity. There are three required courses for the concentration: Introduction to Anthropology (79-201) and Advanced Seminar in Global Studies (79-400), and one Methods course which may be satisfied by rotating options each semester. Students also choose 6 regional/topical courses (51 units). Demonstrating intermediate to advanced level proficiency in a language other than English is also crucial component of the concentration in

Anthropology; all students are required to take at least two upper level (intermediate or above) language courses to satisfy this language pre-requisite requirement (which is in addition to required concentration courses).

Language Requirement

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

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

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

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

Required Anthropological Methods Course (1 course, 9 units)

Students must take one course in ethnographic, archaeological, or other anthropological methods. Courses may also be taken as independent studies or from another university.

79-xxx	See advisor for current course list	9
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Anthropological Perspectives (6 courses, 51 units minimum)

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

79-203	Social and Political Change in 20th Century Central and Eastern Europe	9
79-211	Introduction to Southeast Asia	9
79-221	Development and Democracy in Latin America	9
79-222	Between Revolutions: The Development of Modern Latin America	9
79-223	Mexico: From the Aztec Empire to the Drug War	9
79-224	Mayan America	9
79-235	Caribbean Cultures	9
79-261	The Last Emperors: Chinese History and Society, 1600-1900	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-264	Tibet and China: History and Propaganda	6
79-275	Introduction to Global Studies	9
79-276	Beyond the Border	6
79-287	The Mummy's Curse: Uses and Abuses of Archaeology	6
79-295	Race Relations in the Atlantic World	9
79-311	PaleoKitchen: Food and Cooking in the Ancient World	6
79-314	The Politics and Culture of Memory	9
79-315	The Politics of Water: Global Controversies, Past and Present	9
79-317	Art, Anthropology, and Empire	9
79-332	Medical Anthropology	9
79-333	Sex, Gender & Anthropology	9
79-342	Introduction to Science and Technology Studies	9

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

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

Students in BEPO—the first and only major of its kind—will be uniquely trained in the integration of Economics and Psychology and will have a solid grounding in quantitative methods. The core includes courses in economics, psychology, behavioral economics, and quantitative methods. SDS offers the largest selection of behavioral economics courses anywhere in the world. Applied projects in courses will teach students how to collect original data, design field and laboratory experiments, analyze data, and

develop interventions to improve economic outcomes and decisions. Students will be well equipped to enter a wide range of professions and graduate degree programs.

Quantitative Methods (3 courses, 27 units)

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

Economics Courses (2 courses, 18 units)

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

Psychology Courses (2 courses, 18 units)

88-120	Reason, Passion and Cognition	9
88-302	Behavioral Decision Making	9

Behavioral Economics Courses (2 courses, 18 units)

88-360	Behavioral Economics	9
88-367	Behavioral Economics in the Wild	9

Cognitive Neuroscience Concentration (81 units minimum)

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

Introductory and Survey Coursework (36 units)

03-121	Modern Biology	9
03-363	Systems Neuroscience	9
85-219	Biological Foundations of Behavior	9
85-211	Cognitive Psychology	9
or 85-213	Human Information Processing and Artificial Intelligence	

Research Methods Training (18 units)

36-309	Experimental Design for Behavioral and Social Sciences	9
85-314	Cognitive Neuroscience Research Methods *	9

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

Distribution Requirements (27 units)

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

Approaches to Cognitive Neuroscience:

15-386	Neural Computation	9
15-883	Computational Models of Neural Systems	12
36-746	Statistical Methods for Neuroscience and Psychology	12
85-345	Meaning in Mind and Brain	9
85-412	Cognitive Modeling	9
85-414	Cognitive Neuropsychology	9
85-419	Introduction to Parallel Distributed Processing	9
85-429	Cognitive Brain Imaging	9

Cognitive Neuroscience Electives:

03-133	Neurobiology of Disease	9
03-362	Cellular Neuroscience	9
03-364	Developmental Neuroscience	9
85-356	Music and Mind: The Cognitive Neuroscience of Sound	9

85-370	Perception	9
85-385	Auditory Perception: Sense of Sound	9
85-390	Human Memory	9
85-406	Autism: Psychological and Neuroscience Perspectives	9
85-426	Learning in Humans and Machines	9
85-442	Health Psychology	9
85-501	Stress, Coping and Well-Being	9

Cognitive Science Concentration (81 units minimum)

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

Pre-requisite Courses

15-112	Fundamentals of Programming and Computer Science	12
21-120 & 21-122	Differential and Integral Calculus - Integration and Approximation	19-20
or 21-120 & 21-256	Differential and Integral Calculus and Multivariate Analysis	
21-127	Concepts of Mathematics	10

Statistics Course (9 units)

36-309	Experimental Design for Behavioral and Social Sciences	9
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Computational/Cognitive Modeling Core (29 units minimum)

Complete two of the following courses:

15-122	Principles of Imperative Computation	10
15-150	Principles of Functional Programming	10
15-251	Great Ideas in Theoretical Computer Science	12

Plus one of the following courses:

85-412	Cognitive Modeling	9
85-419	Introduction to Parallel Distributed Processing	9
85-426	Learning in Humans and Machines	9

Cognitive Psychology Core (36 units)

85-211	Cognitive Psychology	9
or 85-213	Human Information Processing and Artificial Intelligence	
85-310	Research Methods in Cognitive Psychology	9

Plus two of the following (one of which must be 85-3xx or 85-4xx):

85-219	Biological Foundations of Behavior	9
85-370	Perception	9
85-390	Human Memory	9
85-395	Applications of Cognitive Science	9
85-408	Visual Cognition	9
85-414	Cognitive Neuropsychology	9
80-310	Formal Logic	9
80-314	Logic and Artificial Intelligence	9
80-315	Modal Logic	9
80-316	Causation Probability & AI	9
80-381	Meaning in Language	9
80-383	Language in Use	9

Cognitive Science Elective (9 units)

Choose one elective in consultation with your Cognitive Science Advisor.

Creative Writing Concentration (81 units minimum)

In the Creative Writing concentration, BHA students develop their talents in writing fiction, poetry, and other imaginative forms. While studying with faculty members who are practicing poets and prose writers, students read

widely in literature, explore the resources of their imaginations, sharpen their critical and verbal skills, and develop a professional attitude toward their writing. The Creative Writing program is based on a conservatory model, made up of faculty and students who have an intense commitment to their work.

Students in the Creative Writing concentration are required to take two of the introductory Survey of Forms courses, ideally in their sophomore year. Choices include Poetry (76-265), Fiction (76-260), Screenwriting (76-269), and Nonfiction (76-261). 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 critiqued and evaluated by peers and the faculty.

Survey of Forms Courses (2 courses, 18 units)

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

Note: A student must receive a grade of A or B in the Survey of Forms class in a specific genre in order to be eligible to enroll in a workshop of that genre. A student who receives a grade of C in a Survey of Forms course may enroll in a related workshop only with the permission of the workshop professor. A student who receives a D or 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.

76-365	Beginning Poetry Workshop	9
76-366	Essay Writing Workshop	9
76-460	Beginning Fiction Workshop	9
76-462	Advanced Fiction Workshop	9
76-464	Creative Nonfiction Workshop	9
76-465	Advanced Poetry Workshop	9
76-469	Screenwriting Workshop	9
76-4xx	Elective Workshops (various forms)	9

English Electives (3 courses, 27 units)

Complete three courses from the English Department's offerings. Reading in Forms classes are recommended, as is 76-306 Editing and Publishing. Please consult the list of courses published each semester by the Department for current offerings. Students should discuss curriculum choices with the 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)

73-102	Principles of Microeconomics	9
85-211	Cognitive Psychology	9
88-120	Reason, Passion and Cognition (freshman or sophomore year)	9
88-223	Decision Analysis	9
88-302	Behavioral Decision Making	9

Research Methods (2 courses, 18 units)

36-202	Methods for Statistics and Data Science	9
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88-251	Empirical Research Methods	9
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Electives (2 courses, 18 units)

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

Biological and Behavioral Aspects of Decision Making:

85-352	Evolutionary Psychology	9
85-377	Attitudes and Persuasion	9
85-442	Health Psychology	9
88-230	Human Intelligence and Human Stupidity	9
88-342	The Neuroscience of Decision Making	9
88-355	Social Brains: Neural Bases of Social Perception and Cognition	9
88-360	Behavioral Economics	9
88-365	Behavioral Economics and Public Policy	9
88-380	Dynamic Decisions	9

Managerial and Organizational Aspects of Decision Making:

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

Philosophical and Ethical Perspectives on Decision Making:

80-208	Critical Thinking	9
80-221	Philosophy of Social Science	9
80-244	Environmental Ethics	9
80-245	Medical Ethics	9
80-305	Choices, Decisions, and Games	9
80-321	Causation, Law, and Social Policy	9
88-275	Bubbles: Big Data for Human Minds	9
88-409	Behavioral Economics Perspectives on Ethical Issues	9

Economic and Statistical Methods for Decision Science:

70-374	Data Mining & Business Analytics	9
70-455	Modern Data Management	9
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	Analytical Foundations of Public Policy	9
88-365	Behavioral Economics and Public Policy	9
88-366	Behavioral Economics of Poverty and Development	9
88-405	Risk Perception and Communication	9
88-412	Energy, Climate Change, and Economic Growth in the 21st Century	9
88-444	Public Policy and Regulation	9
88-451/452	Policy Analysis Senior Project	12

Research Methods for Decision Science:

36-303	Sampling, Survey and Society	9
70-460	Mathematical Models for Consulting	9

88-252	Causal Inference in the Field: Using Data to Study Crime, Love, Sports & More	9
88-319	Large-scale social phenomenon	9
88-402	Modeling Complex Social Systems	9
88-417	Scientific Integrity and Communication	9
88-435	Decision Science and Policy	9

Economics Concentration (81 units minimum)

The BHA concentration in Economics provides a solid understanding of economic theory and quantitative economic analysis. The 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. It may be used to satisfy general education or free elective requirements.

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

Economic Theory Requirements (36 units)

73-102	Principles of Microeconomics	9
73-103	Principles of Macroeconomics	9
73-230	Intermediate Microeconomics	9
73-240	Intermediate Macroeconomics	9

Quantitative Analysis Requirements (18 units)

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

36-202	Methods for Statistics and Data Science	9
73-265	Economics and Data Science	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) 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.

English Concentration (81 units minimum)

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

Introductory Courses (2 courses, 18 units)

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

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

Research Course (1 course, 9 units)

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

76-394	Research in English	9
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Rhetoric Course (1 course, 9 units)

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

300-Level Courses (2 courses, 18 units)

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

76-323	God: A Literary and Cultural History	9
76-338	The American Cinema	9
76-343	Rise of the American Novel	9
76-344	Censored Texts	9
76-350	Theory from Classics to Contemporary	9
76-381	Mad-Men, Television, and the History of Advertising	9
76-3xx	Any 300 level course with advisor approval	9

400-Level Courses (2 courses, 18 units)

Complete two 400-level seminar courses that investigate a specific topic in depth and allow students to work on a major research-based paper. Courses in this category will be advertised on a semester-by-semester basis. For students with a BHA Concentration in English, 76-294 Interpretive Practices: Introduction to Critical Reading is a prerequisite and 76-394 Research in English is pre- or co-requisite. Among current course offerings, examples include but are not limited to the following:

76-403	The Crucible of Modernity:Vienna 1900	9
76-410	The Long Eighteenth Century	Var.
76-421	Why Stories Matter	9
76-429	Early Modern Theatre, Conversion, & Digital Humanities	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	

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 Differential Calculus and 36-202 Methods for Statistics and Data Science 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
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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
60-203	Concept Studio: EcoArt	10
76-395	Science Writing	9
79-372/90-765	Cities, Technology, and the Environment	6
80-348	Health Development and Human Rights	9
88-223	Decision Analysis	9
88-302	Behavioral Decision Making	9
88-412	Energy, Climate Change, and Economic Growth in the 21st Century	9
90-798	Environmental Policy & Planning	12
90-808	Energy Policy	6
90-xxx	Heinz College courses (open to seniors)	

Research and Analytical Methods (18 units)

Choose two of the following courses:

36-309	Experimental Design for Behavioral and Social Sciences	9
79-380	Ethnographic Methods	9
79-381	Energy and Empire: How Fossil Fuels Changed the World	9
88-220	Policy Analysis I	9
88-251	Empirical Research Methods	9

88-252	Causal Inference in the Field: Using Data to Study Crime, Love, Sports & More	9
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Project Course (12 units)

Complete one of the following courses:

19-451	EPP Projects (pre-approved sections)	12
19-452	EPP Projects	12

Ethics, History, & Public Policy Concentration (81 units minimum)

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

Economics Requirement (1 course, 9 units)

73-102	Principles of Microeconomics	9
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History Core (3 courses, 27 units)

Required History Core Courses (Students must earn a final grade of "C" or better for these courses to count toward the concentration):

79-200	Introduction to Historical Research & Writing	9
79-300	History of American Public Policy	9

Choose one Survey Course:

US Survey

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

Non-US Survey

79-202	Flesh and Spirit: Early Modern Europe, 1400-1750	9
79-203	Social and Political Change in 20th Century Central and Eastern Europe	9
79-205	20th/21st Century Europe	9
79-207	Development of European Culture	9
79-222	Between Revolutions: The Development of Modern Latin America	9
79-223	Mexico: From the Aztec Empire to the Drug War	9
79-226	African History: Earliest Times to 1780	9
79-227	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	6
79-265	Russian History: From the First to the Last Tsar	9
79-266	Russian History: From Communism to Capitalism	9
79-307	Religion and Politics in the Middle East	9

Philosophy Core (3 courses, 27 units)

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

Ethics (9 units):

80-130	Introduction to Ethics	9
80-230	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
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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
73-352	Public Economics	9
73-358	Economics of the Environment and Natural Resources	9
73-359	Benefit-Cost Analysis	9
73-365	Firms, Market Structures, and Strategy	9
73-372	International Money and Finance	9
73-408	Law and Economics	9
73-476	American Economic History	9

English

76-492	Rhetoric of Public Policy	9
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History

79-219	Modern Cuba: A Travel Guide for Millennials, 1898 to the Present	6
79-221	Development and Democracy in Latin America	9
79-231	American Foreign Policy: 1945-Present	9
79-233	The United States and the Middle East since 1945	9
79-242	African American History: Reconstruction to the Present	9
79-250	Running for President: Campaigns & Elections in History of American Presidency	9
79-253	American Massacres in History and Memory	6

79-267	The Soviet Union in World War II: Military, Political, and Social History	9
79-288	Bananas, Baseball, and Borders: Latin America and the United States	9
79-298	Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal	6
79-299	From Newton to the Nuclear Bomb: History of Science, 1750-1950	9
79-301	History of Surveillance: From the Plantation to Edward Snowden	6
79-302	Drone Warfare and Killer Robots: Ethics, Law, Politics, and Strategy	9
79-303	Pittsburgh and the Transformation of Modern Urban America	6
79-305	Moneyball Nation: Data in American Life	9
79-310	Modern U. S. Business History: 1870 to the Present	9
79-312	Archaeology of Death	6
79-315	The Politics of Water: Global Controversies, Past and Present	9
79-320	Women, Politics, and Protest	9
79-325	U.S. Gay and Lesbian History	6
79-331	Body Politics: Women and Health in America	9
79-336	Oil & Water: Middle East Perspectives	6
79-338	History of Education in America	9
79-339	Juvenile Delinquency and Film (1920 to "The Wire")	9
79-340	Juvenile Delinquency and Juvenile Justice	9
79-342	Introduction to Science and Technology Studies	9
79-349	The Holocaust in Historical Perspective	9
79-370	Disasters in American History (2):Epidemics & Fires	6
79-371	African American Urban History	9
79-374	American Environmental History: Critical Issues	9
79-381	Energy and Empire: How Fossil Fuels Changed the World	9
79-389	Stalin and Stalinism	9

Philosophy

80-241	Ethical Judgments in Professional Life	9
80-256	Modern Moral Philosophy	9
80-305	Choices, Decisions, and Games	9
80-341	Computers, Society and Ethics	9
80-344	Management, Environment, and Ethics	9
80-405	Game Theory	9

Institute for Politics and Strategy

84-310	International Political Economy and Organizations	9
84-380	Grand Strategy in the United States	9
84-393	Legislative Decision Making: US Congress	9
84-402	Judicial Politics and Behavior	9

Social and Decision Sciences

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.

Global Studies Concentration (81 units minimum)

The BHA concentration in Global Studies is designed for students interested in humanistic approaches to understanding past and present processes of globalization. Participating faculty in the departments of History, Modern Languages, and English conduct research in Africa, Asia, Europe, Latin America, the Middle East, and the Pacific. The rigorous yet flexible

Global Studies curriculum combines anthropology, history, literary and cultural studies, and advanced language training in order to help students make sense of complex interactions among global processes, regional and local cultures, and societal structures. BHA concentration students in Global Studies develop a broad understanding of their prospects and responsibilities as citizens of the world confronting challenging contemporary problems.

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

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

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

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

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

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

Language Requirement

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

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

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

76-453	Literature of Empire	9
76-497	Culture: Interdisciplinary Approaches	9
79-200	Introduction to Historical Research & Writing	9
79-297	Dilemmas and Controversies in Anthropology	9
79-314	The Politics and Culture of Memory	9
79-317	Art, Anthropology, and Empire	9
79-318	Sustainable Social Change: History and Practice	9
79-377	Food, Culture, and Power: A History of Eating	9
79-380	Ethnographic Methods	9
79-381	Energy and Empire: How Fossil Fuels Changed the World	9

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

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

Transnational and Global Courses:

76-322	Global Masala: South Asians in the Diaspora	9
76-353	Transnational Feminisms: Fiction and Film	9
76-384	Race, Nation, and the Enemy	9
76-440	Postcolonial Theory: Diaspora and Transnationalism	9
76-448	The Global Renaissance	9
79-212	Nationalism, Diplomacy and the Origins of the First World War	6
79-224	Mayan America	9
79-233	The United States and the Middle East since 1945	9
79-237	Comparative Slavery	9
79-251	India/America: Democracy, Diversity, Development	9
79-273	Jews and Muslims in History: From the Time of Muhammad to the Present	9
79-276	Beyond the Border	6
79-295	Race Relations in the Atlantic World	9
79-282	Europe and the World since 1800	9
79-283	Hungry World: Food and Famine in Global Perspective	9
79-288	Bananas, Baseball, and Borders: Latin America and the United States	9
79-289	Animal Planet: An Environmental History of People and Animals	6
79-315	The Politics of Water: Global Controversies, Past and Present	9
79-333	Sex, Gender & Anthropology	9
79-385	The Making of the African Diaspora	9
80-348	Health Development and Human Rights	9
80-447	Global Justice	9
82-283	Language Diversity & Cultural Identity	9
82-304	The Francophone World	9
82-345	Introduction to Hispanic Literary and Cultural Studies	9
84-315	Contemporary Debates in Human Rights	9
84-319	U.S. Foreign Policy and Interventions in World Affairs	9
84-322	Nonviolent Conflict and Revolution	9
84-326	Theories of International Relations	9
84-389	Terrorism and Insurgency	9

Regional Courses:

Africa		
79-215	The End of Colonialism and the Birth of Modern Africa, 1945-1975	6
79-225	West African History in Film	9
79-226	African History: Earliest Times to 1780	9
79-227	African History: Height of Trans-Atlantic Slave Trade to the End of Apartheid	9
79-291	Globalization in East African History	6
79-386	Entrepreneurs in Africa, Past, Present and Future	9
84-312	Gender and Development in Sub-Saharan Africa	6
Eastern and Southern Asia and the Pacific		
76-354	South Asian Literature	9
79-211	Introduction to Southeast Asia	9
79-264	Tibet and China: History and Propaganda	6
82-431	China and the West	9
88-411	Rise of the Asian Economies	9
Europe		
79-202	Flesh and Spirit: Early Modern Europe, 1400-1750	9
79-203	Social and Political Change in 20th Century Central and Eastern Europe	9
79-205	20th/21st Century Europe	9
79-207	Development of European Culture	9
79-268	World War I: The Twentieth Century's First Catastrophe	9

79-270	Anti-Judaism and Antisemitism in Europe: From the Middle Ages to the Present	6
79-323	Family, Gender, and Sexuality in European History, 500-1800	9
79-353	Religious Identities and Religious Conflicts in 19th Century Europe	9
82-320	Contemporary Society in Germany, Austria and Switzerland	9
82-415	Topics in French and Francophone Studies	9
82-441	Studies in Peninsular Literature and Culture	9
The Middle East		
79-229	Origins of the Arab-Israeli Conflict, 1880-1948	9
79-230	Arab-Israeli Conflict and Peace Process since 1948	9
79-307	Religion and Politics in the Middle East	9
79-336	Oil & Water: Middle East Perspectives	6
79-398	Documenting the 1967 Arab-Israeli War	9
The Americas		
79-222	Between Revolutions: The Development of Modern Latin America	9
79-223	Mexico: From the Aztec Empire to the Drug War	9
79-235	Caribbean Cultures	9
82-245	Bodies of Conflict: Gender, Violence, and Protest in Latin America	9
82-343	Latin America: Language and Culture	9
82-451	Studies in Latin American Literature and Culture	9
82-455	Topics in Hispanic Studies	9

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

57-306	World Music	9
70-365	International Trade and International Law	9
76-241	Introduction to Gender Studies	9
76-386	Language & Culture	9
76-450	Space and Mobilities Studies	9
79-201	Introduction to Anthropology	9
79-284	Introduction to Archaeological Methods: The Social Life of Things	9
79-330	Medicine and Society	9
79-349	The Holocaust in Historical Perspective	9
80-244	Environmental Ethics	9
80-247	Ethics and Global Economics	9
80-335	Deliberative Democracy: Theory and Practice	9
82-215	Arab Culture Through Film and Literature	9
82-311	Advanced Arabic I	9
82-541	Special Topics: Hispanic Studies	Var.
84-275	Comparative Politics	9
84-310	International Political Economy and Organizations	9
84-311	International Development: Theory and Praxis	6
84-362	Diplomacy and Statecraft	9
88-412	Energy, Climate Change, and Economic Growth in the 21st Century	9

Nation-based Courses

76-337	Representations of Islam in Early Modern England	9
79-231	American Foreign Policy: 1945-Present	9
79-254	1968: The Year Everything Changed (in the U.S. and around the world)	9
79-320	Women, Politics, and Protest	9
79-331	Body Politics: Women and Health in America	9
82-344	U.S. Latinos: Language and Culture	9
82-420	The Crucible of Modernity:Vienna 1900	9
79-269	London and the Birth of Modern Britain, 1800 to the Present	6
79-261	The Last Emperors: Chinese History and Society, 1600-1900	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-263	Mao and the Chinese Cultural Revolution	9
79-309	The Chinese Revolution Through Film (1949-2000)	9
82-333	Introduction to Chinese Language and Culture	Var.
82-433	Topics in Contemporary Culture of China	9
82-434	Studies in Chinese Traditions	9
82-440	Studies in Chinese Literature & Culture	9
79-258	French History: From the Revolution to De Gaulle	9
79-259	France During World War II	9
82-303	Introduction to French Culture	9
82-305	French in its Social Contexts	9
79-256	20th Century Germany	9
79-257	Germany and the Second World War	9
79-326	German History through Film	9
82-327	The Emergence of the German Speaking World	9
82-425	Topics in German Literature and Culture	9
82-427	Nazi and Resistance Culture	9
82-428	History of German Film	9
82-361	Italian Language and Culture I	9
82-273	Introduction to Japanese Language and Culture	9
82-278	Japanese Film and Literature: The Art of Storytelling	9
82-473	Topics in Japanese Studies	9
82-253	Korean Culture Through Film	9
82-254	World of Korea, Then and Now	9
79-265	Russian History: From the First to the Last Tsar	9
79-266	Russian History: From Communism to Capitalism	9
79-267	The Soviet Union in World War II: Military, Political, and Social History	9
79-389	Stalin and Stalinism	9
82-293	Introduction to Russian Culture	9
82-294	Topics in Russian Language and Culture	9
82-342	Spain: Language and Culture	9

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 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.

The name of the concentration signifies that those studying IRP learn about international relations and domestic politics from the standpoint of the discipline of political science. Thus, IRP preserves and expands CMU's tradition in political science. At the same time, IRP taps into and contributes to CMU's strengths in other social sciences that combine analytical and empirical methods. IRP has recently launched an innovative initiative to incorporate decision science in international relations. It will enable students to learn and apply the burgeoning science of judgment and decision making to understanding political actors' strategies and foibles, the strengths and weaknesses of formal methods of policy analysis (e.g., cost, risk, benefit, analysis), and the factors shaping public responses to politics and policies.

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.

Pre-requisites

36-200	Reasoning with Data	9
or 36-201	Statistical Reasoning and Practice	
73-102	Principles of Microeconomics	9

Core Courses (6 courses, 54 units)

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

Language Requirement

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

Electives (3 courses, 27 units minimum)

International Relations and Politics BHA students will either:

Option 1

Take 27 units (three courses) from the elective lists below. At least two courses (18 units) must be from the Institute for Politics and Strategy (84-xxx).

Grand Strategy and Political Institutions

66-221	Topics of Law: Introduction to Intellectual Property Law	9
79-203	Social and Political Change in 20th Century Central and Eastern Europe	9
79-231	American Foreign Policy: 1945-Present	9
79-298	Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal	6
79-301	History of Surveillance: From the Plantation to Edward Snowden	6
79-302	Drone Warfare and Killer Robots: Ethics, Law, Politics, and Strategy	9
79-389	Stalin and Stalinism	9
80-135	Introduction to Political Philosophy	9
80-321	Causation, Law, and Social Policy	9
80-335	Deliberative Democracy: Theory and Practice	9
84-309	Political Behavior	9
84-319	U.S. Foreign Policy and Interventions in World Affairs	9
84-320	Domestic Politics and International Affairs	9
84-321	Autocrats and Democrats	9
84-322	Nonviolent Conflict and Revolution	9
84-323	War and Peace	9
84-324	Democracies and War	9
84-362	Diplomacy and Statecraft	9
84-363	Comparative Legal Systems	9
84-366	Presidential Politics: So, You Want to Be President of the United States	9
84-380	Grand Strategy in the United States	9
84-386	The Privatization of Force	9
84-387	Technology and Policy of Cyber War	6
84-388	Concepts of War and Cyber War	6
84-389	Terrorism and Insurgency	9
84-393	Legislative Decision Making: US Congress	9
84-402	Judicial Politics and Behavior	9
84-405	Future of Warfare: Cyber, Violent Non-State Actors & Conflict in the Gray Zone	9
84-414	International and Subnational Security	9
88-281	Topics in Law: 1st Amendment	9
88-284	Topics of Law: The Bill of Rights	9

Economics and Society

19-452	EPP Projects	12
70-342	Managing Across Cultures	9
70-365	International Trade and International Law	9
70-430	International Management	9
73-103	Principles of Macroeconomics	9
73-148	Environmental Economics	9
73-328	Health Economics	12
73-331	Political Economy of Inequality and Redistribution	9
73-394	Development Economics	9
79-386	Entrepreneurs in Africa, Past, Present and Future	9
80-136	Social Structure, Public Policy & Ethics	9
80-244	Environmental Ethics	9
80-247	Ethics and Global Economics	9
80-348	Health Development and Human Rights	9
80-447	Global Justice	9
84-310	International Political Economy and Organizations	9
84-311	International Development: Theory and Praxis	6
84-312	Gender and Development in Sub-Saharan Africa	6
84-315	Contemporary Debates in Human Rights	9
88-411	Rise of the Asian Economies	9
88-412	Energy, Climate Change, and Economic Growth in the 21st Century	9
88-430	Methods of Policy Analysis	12

International Cultures

76-318	Communicating in the Global Marketplace	9
76-322	Global Masala: South Asians in the Diaspora	9
76-386	Language & Culture	9
79-205	20th/21st Century Europe	9
79-221	Development and Democracy in Latin America	9
79-222	Between Revolutions: The Development of Modern Latin America	9
79-223	Mexico: From the Aztec Empire to the Drug War	9
79-224	Mayan America	9
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
79-233	The United States and the Middle East since 1945	9
79-251	India/America: Democracy, Diversity, Development	9
79-256	20th Century Germany	9
79-257	Germany and the Second World War	9
79-259	France During World War II	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-264	Tibet and China: History and Propaganda	6
79-265	Russian History: From the First to the Last Tsar	9
79-266	Russian History: From Communism to Capitalism	9
79-267	The Soviet Union in World War II: Military, Political, and Social History	9
79-275	Introduction to Global Studies	9
79-288	Bananas, Baseball, and Borders: Latin America and the United States	9
79-291	Globalization in East African History	6
79-307	Religion and Politics in the Middle East	9
79-314	The Politics and Culture of Memory	9
79-318	Sustainable Social Change: History and Practice	9
79-320	Women, Politics, and Protest	9
79-338	History of Education in America	9
79-342	Introduction to Science and Technology Studies	9
79-377	Food, Culture, and Power: A History of Eating	9
79-381	Energy and Empire: How Fossil Fuels Changed the World	9
79-385	The Making of the African Diaspora	9
79-398	Documenting the 1967 Arab-Israeli War	9
85-375	Crosscultural Psychology	9
300 or 400- level language course		

Option 2

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 (84-xxx) elective list.

The Washington Semester Program (CMUWSP) Public Policy Elective Sequence includes:

• Policy Forum (This course will count as the Policy Forum (84-450) Core Course Requirement)	12
• Internship Seminar	12
• CMU/WSP Elective Seminars (24 units total)	12 + 12

A list of CMU/WSP Core and Elective Seminars may be found in the CMU/WSP section of the undergraduate catalog (<http://coursecatalog.web.cmu.edu/dietrichcollegeofhumanitiesandsocialsciences/instituteofpoliticsandstrategy/#carnegiemellonuniversitywashingtonsemesterprogram>).

Japanese Studies Concentration (81 units minimum)

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

Prerequisites

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

Core Courses in Japanese (36-39 units)

82-272	Intermediate Japanese II *	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	9
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
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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
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Structure

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

Meaning

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

Breadth Courses (2 courses, 18 units)

Take one course from each of the following two areas:

Language Learning and Language Cognition

76-420	The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process	9
80-281	Language and Thought	9
82-280	Learning About Language Learning	9
82-383	Second Language Acquisition: Theories and Research	9

82-388	Understanding Second Language Fluency	9
82-585	Topics in Second Language Acquisition	9
85-354	Infant Language Development	9
85-421	Language and Thought	9

Discourse, Society and Culture

76-385	Introduction to Discourse Analysis	9
or 76-484	Discourse Analysis	
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
11-762	Language and Statistics II	12
76-378	Literacy: Educational Theory and Community Practice	9
80-284	Invented Languages	9
80-286	Words and Word Formation: Introduction to Morphology	9
80-287	Historical and Comparative Linguistics	9
80-380	Philosophy of Language	9
80-382	Phonetics and Phonology II	9
80-384	Linguistics of Turkic Languages	9
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 Concentration (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
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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
80-327	Philosophy of Neuroscience	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
80-214	Computing, AI, and Philosophy	9
80-220	Philosophy of Science	9
80-221	Philosophy of Social Science	9
80-222	Measurement and Methodology	9
80-223	Causality and Probability	9
80-226	Revolutions in Science	9
80-305	Choices, Decisions, and Games	9
80-321	Causation, Law, and Social Policy	9
80-322	Philosophy of Physics	9
80-323	Philosophy of Biology	9
80-324	Philosophy of Economics	9
80-327	Philosophy of Neuroscience	9
80-405	Game Theory	9
80-515	Seminar on the Foundations of Statistics	9
80-516	Causality and Learning	Var.
80-520	Seminar on Philosophy Science	9
80-521	Seminar on Formal Epistemology	Var.

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

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

Area 6: Electives (3 courses, 27 units)

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

Professional Writing Concentration (81 units minimum)

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

Foundation Courses (4 courses, 36 units)

76-26x	Survey of Forms (Nonfiction, Fiction, Poetry, or Screenwriting)	9
76-271	Introduction to Professional and Technical Writing	9
76-373	Argument	9
76-390	Style	9

Rhetoric/Language Studies Course (1 course, 9 units)

Students with a concentration in Professional Writing complete one course from designated Rhetoric courses offered and advertised each semester by the English Department. Rhetoric courses focus on understanding the role of language and language practices in both personal and professional contexts. Courses emphasize the relationships between texts and their contexts and pay particular attention to textual features, meaning, processes of reading and writing, and the ways in which language practices vary over time and across situations and cultures. The courses also equip students with explicit techniques for analyzing, understanding, and exploring language practices. The Rhetoric/Language Studies courses may also be taken as part of the concentration requirements for three additional, Advanced Writing/Rhetoric courses and include but are not limited to the following list.

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

Advanced Writing/Rhetoric Courses (3 courses, 27 units minimum)

Students with a concentration in Professional Writing complete three Advanced Writing/Rhetoric courses at the 300- or 400-level. Options for these courses include all of the Rhetoric/Language Studies courses listed above plus the writing-focused courses listed below. Additional courses that fulfill these requirements are advertised on a semester-by-semester basis.

For help in choosing which of the possible options are most appropriate for various professional goals – journalism, writing for new media, editing and publishing, public relations/corporate communications, or science and technical writing – consult your English Department advisor and the “Selected Core Courses & Electives for PW Majors” advising sheet available through the English Department. All students with a concentration in PW, regardless of their career focus, are encouraged to take 76-391 Document & Information Design and 76-487 Web Design (in conjunction with the 3-unit 76-488 Web Design Lab) to extend their skills in writing for print to include information design for digital media. Both courses focus on the role of the writer in these specializations and provide lab instruction in the relevant software and related computer skills.

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

Prerequisite English Elective

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

English Elective (1 course, 9 units)

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
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Survey Courses

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

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

Research Methods and Statistics (2 courses, 18 units)

Students complete one course in Research Methods (9 units). The corresponding survey course is a prerequisite for this course.

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	9
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Advanced Courses (3 courses, 27 units)

Complete any three advanced courses or seminars in Psychology numbered higher than 85-341 (excepting 85-480, 85-482, 85-484,85-505, 85-506, 85-507, 85-508).

Social & Political History Concentration (81 units minimum)

The BHA concentration in Social & Political History focuses on new ways to understand the past and new ways to use what we know, as well as on connections between past and present and on how historical knowledge facilitates understanding of social, cultural, and policy change. The History concentration emphasizes empirical methods and conceptual analysis, as well as specific research skills relevant to many types of jobs and further professional training. The History concentration combines a structured sequence of courses, training in research methods, theoretical concepts, and analytical writing skills, plus a considerable array of electives.

The BHA concentration in Social & Political History emphasizes broad-based, cumulative knowledge and interpretive skills in the study of the past. Offerings at the 200- and 300-level are designed to allow maximum flexibility in meeting requirements and maximum choice in focusing on particular themes, places, or eras. Upper-level courses aim to give students majoring in History more time together in smaller classes and more experience working with primary and secondary sources. The senior capstone seminar, Advanced Studies in History, provides training and experience in conducting original research and in interpretive, analytical writing—skills that prepare graduates for professional careers as well as for graduate or law school.

Required History Courses (2 courses, 21 units)

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

79-200	Introduction to Historical Research & Writing -Sophomore or Junior year	9
79-420	Historical Research Seminar -Fall, Senior year	12

Required Survey Courses (2 courses, 18 units)

79-202	Flesh and Spirit: Early Modern Europe, 1400-1750	9
79-203	Social and Political Change in 20th Century Central and Eastern Europe	9
79-205	20th/21st Century Europe	9
79-207	Development of European Culture	9
79-211	Introduction to Southeast Asia	9
79-221	Development and Democracy in Latin America	9
79-222	Between Revolutions: The Development of Modern Latin America	9

79-223	Mexico: From the Aztec Empire to the Drug War	9
79-225	West African History in Film	9
79-226	African History: Earliest Times to 1780	9
79-227	African History: Height of Trans-Atlantic Slave Trade to the End of Apartheid	9
79-229	Origins of the Arab-Israeli Conflict, 1880-1948	9
79-230	Arab-Israeli Conflict and Peace Process since 1948	9
79-233	The United States and the Middle East since 1945	9
79-240	Development of American Culture	9
79-241	African American History: Africa to the Civil War	9
79-242	African American History: Reconstruction to the Present	9
79-245	Capitalism and Individualism in American Culture	9
79-249	20th/21st Century U.S. History	9
79-251	India/America: Democracy, Diversity, Development	9
79-252	Recent U.S. History: 1945-Present	9
79-256	20th Century Germany	9
79-258	French History: From the Revolution to De Gaulle	9
79-261	The Last Emperors: Chinese History and Society, 1600-1900	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-265	Russian History: From the First to the Last Tsar	9
79-266	Russian History: From Communism to Capitalism	9

Social & Political History Elective Courses (5 courses, 42 units minimum)

A minimum of 42 additional History units must be approved with the History advisor. Any History courses not fulfilling another major requirement may be chosen as an elective.

Statistics Concentration (81 UNITS MINIMUM)

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

Mathematics Pre-requisites

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

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

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

Statistics Pre-requisite

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

36-200	Reasoning with Data	9
or 36-201	Statistical Reasoning and Practice	

Statistics Core (6 courses, 54 units)

36-202	Methods for Statistics and Data Science	9
36-225	Introduction to Probability Theory	9

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

Special Topics and Electives (3 courses, 27 units)

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

Statistics & Machine Learning (81 UNITS MINIMUM)

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

Mathematics Pre-requisites

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

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

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

Statistics Pre-requisite

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

36-200	Reasoning with Data	9
or 36-201	Statistical Reasoning and Practice	

Statistics Core (5 courses, 45 units)

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

Machine Learning Core (3 courses, 34 units)

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

Machine Learning Electives (1 courses, 9-12 units)

Students will consult with the Statistics & Machine Learning advisor to choose an elective from Statistics, Data Analysis, Probability Theory, or Computing. This course may have additional pre-requisites.

Technical Writing Concentration (81 units minimum)

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

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

Prerequisite Courses

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

Technical Writing Core Courses (5 courses, 51 units)

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

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

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

Recommended Options

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

Additional Options

Include but are not limited to the following:

76-301	Internship	Var.
76-302	Writing in the Disciplines	9
76-318	Communicating in the Global Marketplace	9
76-319	Environmental Rhetoric	9
76-325	Intertextuality	9
76-340	American English	9
76-351	Rhetorical Invention	9
76-355	Leadership, Dialogue, and Change	9
76-360	Literary Journalism Workshop	9
76-361	Topics in Digital Humanities: Corpus Rhetorical Analysis	9
76-372	News Writing	9
76-375	Magazine Writing	9
76-378	Literacy: Educational Theory and Community Practice	9
76-386	Language & Culture	9
76-389	Rhetorical Grammar	9
76-391	Document & Information Design	12
76-395	Science Writing	9
76-396	Non-Profit Advocacy: Genres, Methods, and Issues	9
76-420	The Cognition of Reading and Writing: Introduction to a Social/Cognitive Process	9

76-425	Science in the Public Sphere	9
76-428	Visual Verbal Communication	9
76-472	Multimedia Storytelling in a Digital Age	9
76-474	Software Documentation	9
76-475	Law, Performance, and Identity	9
76-476	Rhetoric of Science	9
76-481	Introduction to Multimedia Design	12
76-484	Discourse Analysis	9
76-487	Web Design	12
76-491	Rhetorical Analysis	9
39-605	Engineering Design Projects	12

Electives (2 courses, 12 units minimum)

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

III. 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)

48-100	Architecture Design Studio: Foundation I - Fall, Freshman year	10-12
or 48-095	Spatial Concepts for Non-Architects I	
48-120	Digital Media I -Fall, Freshman year	6
48-121	Drawing I -Fall, Freshman year	6
48-125	Digital Media II -Spring, Freshman year	6
48-126	Drawing II -Spring, Freshman year	6
48-240	Historical Survey of World Architecture and Urbanism I -Spring, Freshman year	9
48-241	Modern Architecture -Fall, Sophomore year	9

Architecture Electives (56 units minimum)

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

Art Concentration (108 units minimum)

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

60-130-60-130	3-D Media Studio I-I (complete two minis, 5 units each)	10
60-131-60-131	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 (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 (DP3)	10
60-499	Studio Independent Study (one only)	10

Art History/Theory (2 courses, 18 units)

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

Review Requirement (complete 2 required reviews, 0 units)

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

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

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	
Choose Two Corresponding Labs:		
51-227	Prototyping Lab I: Communications -Fall, Sophomore year	4.5, 4.5
or 51-247	Prototyping Lab I: Products	
or 51-267	Prototyping Lab I: Environments	
51-271	How People Work -Fall, Sophomore year	9
51-371	Futures -Fall, Junior year or later	9

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

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

Required Courses for All Concentration Options (20 units)

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

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

Design Required Courses (26 units)

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

Directing Required Courses (52 units)

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

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

Dramaturgy Required Courses (53 units minimum)

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

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

Music Concentration (108 units minimum)**AUDITION REQUIRED FOR PERFORMANCE CONCENTRATION OPTION. PORTFOLIO REVIEW/INTERVIEW REQUIRED FOR COMPOSITION, MUSICOLOGY, AUDIO RECORDING & PRODUCTION, OR SOUND THEORY & PRACTICE CONCENTRATION OPTION.**

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

Required Course for All Concentration Options (9 units)

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

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

Performance and Composition Required Courses (76 units)

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

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

Musicology Required Courses (45 units)

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

Audio Recording & Production Required Courses (40 units)

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

Choose 59 units from:

57-153	Harmony II -Spring	9
or 57-150	Basic Harmony II	
57-182	Solfege II	3
or 57-186	Advanced Solfege II	
15-104	Introduction to Computing for Creative Practice	10
18-090	Twisted Signals: Multimedia Processing for the Arts	10
33-114	Physics of Musical Sound	9
54-166	Introduction to Sound Design for Theatre	6
54-275	History of Sound Design	3

54-666	Production Audio	6
57-344	Experimental Sound Synthesis	9
57-421	The Exploded Ensemble	6
57-425	Expanded Music Performance	9
57-427	Advanced Seminar in Film Musicology	9
57-478	Survey of Historical Recording	6
57-622	Independent Study in Sound Recording Production	3
60-131	3D Media Studio II	5
60-210	Electronic Media Studio: Introduction to Interactivity	10

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

Sound Theory & Practice Required Courses (47 units)

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

Choose 52 units from:

57-153	Harmony II -Spring	9
or 57-150	Basic Harmony II	
57-182	Solfege II	3
or 57-186	Advanced Solfege II	
15-104	Introduction to Computing for Creative Practice	10
15-322	Introduction to Computer Music (pre-requisite: 15-112)	9
15-323	Computer Music Systems and Information Processing (pre-requisite: 15-122)	9
33-114	Physics of Musical Sound	9
57-337	Sound Recording	6
57-343	Interdisciplinary Studies in Listening, Culture, and Technology	9
57-344	Experimental Sound Synthesis	9
57-347	Electronic and Computer Music (pre-requisite: 57-101 or 57-171)	6
57-421	The Exploded Ensemble	6
57-425	Expanded Music Performance	9
57-438	Multitrack Recording	9
57-829	Contemporary Soundscapes	9
60-131	3D Media Studio II	5
60-210	Electronic Media Studio: Introduction to Interactivity	10

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

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 QPA.

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

	Units
I. BSA General Education	129
II. MCS Concentration	114-134
III. CFA Concentration	108
IV. Free Electives	9-29
Total BSA Degree Requirements	380

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 or 33-151 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/melloncollegeofscience/#forstudentsenteringinthefallof2015andbeyond>).

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
or 33-151	Matter and Interactions I	

Nontechnical Breadth Requirements (8 courses, 42 units)

MCS aspires for all of our undergraduates to leave our campus with a strong sense of personal integrity, social responsibility, ethics, working with diverse others, global engagement, and personal health and well-being. 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
(various topics by section) www.cmu.edu/hss/english/first_year/index.html		
99-101	Computing @ Carnegie Mellon	3
or 99-102	Computing @ Carnegie Mellon	

ENGAGE (3 courses, 3 units)

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

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

Cultural/Global Understanding (1 course, 9 units)

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

57-173	Survey of Western Music History	9
57-209	The Beatles	9
57-306	World Music	9
70-342	Managing Across Cultures	9
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
79-207	Development of European Culture	9
79-221	Development and Democracy in Latin America	9

79-229	Origins of the Arab-Israeli Conflict, 1880-1948	9
79-230	Arab-Israeli Conflict and Peace Process since 1948	9
79-240	Development of American Culture	9
79-241	African American History: Africa to the Civil War	9
79-242	African American History: Reconstruction to the Present	9
79-255	Irish History	9
79-261	The Last Emperors: Chinese History and Society, 1600-1900	9
79-265	Russian History: From the First to the Last Tsar	9
79-266	Russian History: From Communism to Capitalism	9
79-275	Introduction to Global Studies	9
79-297	Dilemmas and Controversies in Anthropology	9
79-307	Religion and Politics in the Middle East	9
79-345	Roots of Rock & Roll	9
79-349	The Holocaust in Historical Perspective	9
79-350	Early Christianity	9
79-357	History of Black American Music	6
79-377	Food, Culture, and Power: A History of Eating	9
80-100	Introduction to Philosophy	9
80-250	Ancient Philosophy	9
80-251	Modern Philosophy	9
80-253	Continental Philosophy	9
80-254	Analytic Philosophy	9
80-255	Pragmatism	9
80-276	Philosophy of Religion	9
82-xxx	Any course from Modern Languages	
99-241	Revolutions of Circularity	9
99-3xx	Any of the Country Today courses	3

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.

52-190	BXA Seminar I: Building the Wunderkammer	9
or 52-291	BXA Seminar II: Transferring Knowledge	
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. Mellon College of Science Concentration

(number of courses vary, 114-134 units)

BSA students choose one of the following concentrations:

- Biological Sciences (114 units)
- Chemistry (121 units)
- Mathematical Sciences (123 units)
- Neurobiology (114 units)
- Physics (134 units)

Biological Sciences Concentration (114 units minimum)

Biological Sciences Required Courses (96 units minimum)

03-201/202	Undergraduate Colloquium for Sophomores	2
03-220	Genetics (co-requisite: 03-343)	9
03-231	Biochemistry I	9
or 03-232	Biochemistry I	
03-320	Cell Biology - Fall, Junior year	9
03-343	Experimental Techniques in Molecular Biology - Fall, Junior year	12
09-106	Modern Chemistry II	10
09-207	Techniques in Quantitative Analysis	9
09-208	Techniques for Organic Synthesis and Analysis	9
or 03-344	Experimental Biochemistry	
or 03-345	Experimental Cell and Developmental Biology	
or 03-346	Experimental Neuroscience	
09-217	Organic Chemistry I	9
09-218	Organic Chemistry II	9
33-122	Physics II for Biological Sciences & Chemistry Students	9

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)

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

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

Advanced Chemistry Electives (2 courses, 18 units)

May be any upper level chemistry course, 09-3xx or higher, or Biochemistry I, 03-231 or 03-232, with the exception of 09-435 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)

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

15-110	Principles of Computing	10
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21-127	Concepts of Mathematics	10
or 21-128	Mathematical Concepts and Proofs	
21-228	Discrete Mathematics	9
21-241	Matrices and Linear Transformations	10
or 21-242	Matrix Theory	
21-259	Calculus in Three Dimensions	9
or 21-268	Multidimensional Calculus	
21-260	Differential Equations	9
or 21-261	Introduction to Ordinary Differential Equations	
or 33-231	Physical Analysis	
21-355	Principles of Real Analysis I	9
21-373	Algebraic Structures	9
33-142	Physics II for Engineering and Physics Students	12
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	
03-201	Undergraduate Colloquium for Sophomores	2
03-220	Genetics - Fall, Sophomore year	9
03-231	Biochemistry I - Spring, Sophomore year	9
03-320	Cell Biology - Fall, Junior year	9
03-342	Introduction to Biological Laboratory Practices - Fall, Junior year	1
03-343	Experimental Techniques in Molecular Biology - Fall, Junior year	12
03-362	Cellular Neuroscience	9
03-363	Systems Neuroscience	9
09-217	Organic Chemistry I	9
33-122	Physics II for Biological Sciences & 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	
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
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Physics Electives (2 courses, 18 units)

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

33-xxx	Two Physics Electives	18
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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	10-12
or 48-095	Spatial Concepts for Non-Architects I	
48-120	Digital Media I -Fall, Freshman year	6
48-121	Drawing I -Fall, Freshman year	6
48-125	Digital Media II -Spring, Freshman year	6
48-126	Drawing II -Spring, Freshman year	6
48-240	Historical Survey of World Architecture and Urbanism I -Spring, Freshman year	9
48-241	Modern Architecture -Fall, Sophomore year	9

Architecture Electives (56 units minimum)

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

Art Concentration (108 units minimum)

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
60-130-60-130	3-D Media Studio I-I (complete two minis, 5 units each)	10
60-131-60-131	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 (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 (DP3)	10
60-499	Studio Independent Study (one only)	10

Art History/Theory (2 courses, 18 units)

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

Review Requirement (Complete 2 required reviews, 0 units)

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

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

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	
Choose Two Corresponding Labs:		
51-227	Prototyping Lab I: Communications -Fall, Sophomore year	4.5, 4.5
or 51-247	Prototyping Lab I: Products	
or 51-267	Prototyping Lab I: Environments	
51-271	How People Work -Fall, Sophomore year	9
51-371	Futures -Fall, Junior year or later	9

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

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

Required Courses for All Concentration Options (20 units)

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

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

Design Required Courses (26 units)

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

Directing Required Courses (52 units)

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

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

Dramaturgy Required Courses (53 units minimum)

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

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

Music Concentration (108 units minimum)

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

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

Required Course for All Concentration Options (9 units)

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

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

Performance and Composition Required Courses (76 units)

57-161	Eurhythmics I -Fall (recommended co-requisite: 57-181)	3
57-181	Solfège I -Fall	3

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

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

Musicology Required Courses (45 units)

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

Audio Recording & Production Required Courses (40 units)

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

Choose 59 units from:

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

60-210	Electronic Media Studio: Introduction to Interactivity	10
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Note: Students completing an IDEATe minor may double-count up to two of the IDEATe minor courses towards the Audio Recording & Production concentration.

Sound Theory & Practice Required Courses (47 units)

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

Choose 52 units from:

57-153	Harmony II -Spring	9
or 57-150	Basic Harmony II	
57-182	Solfege II	3
or 57-186	Advanced Solfege II	
15-104	Introduction to Computing for Creative Practice	10
15-322	Introduction to Computer Music (pre-requisite: 15-112)	9
15-323	Computer Music Systems and Information Processing (pre-requisite: 15-122)	9
33-114	Physics of Musical Sound	9
57-337	Sound Recording	6
57-343	Interdisciplinary Studies in Listening, Culture, and Technology	9
57-344	Experimental Sound Synthesis	9
57-347	Electronic and Computer Music (pre-requisite: 57-101 or 57-171)	6
57-421	The Exploded Ensemble	6
57-425	Expanded Music Performance	9
57-438	Multitrack Recording	9
57-829	Contemporary Soundscapes	9
60-131	3D Media Studio II	5
60-210	Electronic Media Studio: Introduction to Interactivity	10

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

IV. Free Electives

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

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

Bachelor of Computer Science and Arts Degree Program

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

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

Students choose their fine arts concentration from among the 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 BCSA Program, a student may change their CFA concentration only if they pass all admission requirements for that particular school.

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

BCSA Curriculum

	Units
I. BCSA General Education	121
II. SCS Concentration	111
III. CFA Concentration	108
IV. Free Electives	40
Total BCSA Degree Requirements	380

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)

Writing (1 course, 9 units)

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

76-101	Interpretation and Argument (various topics by section) www.cmu.edu/hss/english/first_year/index.html	9
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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.

57-173	Survey of Western Music History *	9
60-205	Critical Theory in Art III	9
70-342	Managing Across Cultures	9
76-221	Books You Should Have Read By Now	9
76-227	Comedy	9
76-232	Introduction to African American Literature	9
76-239	Introduction to Film Studies *	9
76-241	Introduction to Gender Studies *	9
79-104	Global Histories	9
79-201	Introduction to Anthropology	9

79-202	Flesh and Spirit: Early Modern Europe, 1400-1750	9
79-207	Development of European Culture	9
79-222	Between Revolutions: The Development of Modern Latin America	9
79-226	African History: Earliest Times to 1780	9
79-229	Origins of the Arab-Israeli Conflict, 1880-1948	9
79-230	Arab-Israeli Conflict and Peace Process since 1948	9
79-240	Development of American Culture	9
79-241	African American History: Africa to the Civil War	9
79-242	African American History: Reconstruction to the Present	9
79-255	Irish History	9
79-261	The Last Emperors: Chinese History and Society, 1600-1900	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-265	Russian History: From the First to the Last Tsar	9
79-282	Europe and the World since 1800	9
79-316	Photography, the First 100 Years, 1839-1939	9
79-345	Roots of Rock & Roll	9
79-350	Early Christianity	9
79-395	The Arts in Pittsburgh	9
79-396	Music and Society in 19th and 20th Century Europe and the U.S.	9
80-100	Introduction to Philosophy	9
80-250	Ancient Philosophy	9
80-251	Modern Philosophy	9
80-253	Continental Philosophy	9
80-254	Analytic Philosophy	9
80-255	Pragmatism	9
80-261	Empiricism and Rationalism	9
80-276	Philosophy of Religion	9
82-273	Introduction to Japanese Language and Culture	9
82-293	Introduction to Russian Culture	9
82-303	Introduction to French Culture *	9
82-304	The Francophone World *	9
82-327	The Emergence of the German Speaking World	9
82-333	Introduction to Chinese Language and Culture *	Var.
82-342	Spain: Language and Culture	9
82-343	Latin America: Language and Culture	9
82-344	U.S. Latinos: Language and Culture	9
82-345	Introduction to Hispanic Literary and Cultural Studies	9

* Indicates co-requisites and/or prerequisites required.

Mathematics & Probability (3 courses, 29 units minimum)

Choose two mathematics courses (20 units):

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

Choose one probability course (9 units minimum):

15-359	Probability and Computing	12
21-325	Probability	9
36-225	Introduction to Probability Theory	9

Science & Engineering (2 courses, 18 units minimum)

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

02-223	Personalized Medicine: Understanding Your Own Genome	9
02-250	Introduction to Computational Biology	12
02-261	Quantitative Cell and Molecular Biology Laboratory	9
03-121	Modern Biology	9
03-124	Modern Biology Laboratory	9
03-125	Evolution	9
03-132	Basic Science to Modern Medicine	9
06-100	Introduction to Chemical Engineering	12
09-105	Introduction to Modern Chemistry I	10
09-106	Modern Chemistry II	10
09-221	Laboratory I: Introduction to Chemical Analysis	12
12-100	Introduction to Civil and Environmental Engineering	12
12-201	Geology	9
18-100	Introduction to Electrical and Computer Engineering	12
21-259	Calculus in Three Dimensions	9
24-101	Fundamentals of Mechanical Engineering	12
27-100	Engineering the Materials of the Future	12
33-104	Experimental Physics	9
33-114	Physics of Musical Sound	9
33-120	Science and Science Fiction	9
33-121	Physics I for Science Students	12
or 33-151	Matter and Interactions I	
33-142	Physics II for Engineering and Physics Students	12
or 33-152	Matter and Interactions II	
33-224	Stars, Galaxies and the Universe	9
42-101	Introduction to Biomedical Engineering	12
42-202	Physiology	9
42-203	Biomedical Engineering Laboratory	9
85-219	Biological Foundations of Behavior	9
85-310	Research Methods in Cognitive Psychology	9
85-314	Cognitive Neuroscience Research Methods	9

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

Economic, Political & Social Institutions

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

19-101	Introduction to Engineering and Public Policy	12
36-303	Sampling, Survey and Society	9
70-332	Business, Society and Ethics	9
73-102	Principles of Microeconomics	9
73-103	Principles of Macroeconomics	9
79-299	From Newton to the Nuclear Bomb: History of Science, 1750-1950	9
79-300	History of American Public Policy	9
79-320	Women, Politics, and Protest	9
79-331	Body Politics: Women and Health in America	9
80-135	Introduction to Political Philosophy	9
80-136	Social Structure, Public Policy & Ethics	9
80-243	Ethics of Leadership	9
80-244	Environmental Ethics	9
80-245	Medical Ethics	9
80-324	Philosophy of Economics	9
80-334	Social and Political Philosophy	9
80-341	Computers, Society and Ethics	9
84-104	Decision Processes in American Political Institutions	9
84-275	Comparative Politics	9
84-310	International Political Economy and Organizations	9
84-320	Domestic Politics and International Affairs	9
84-322	Nonviolent Conflict and Revolution	9

84-324	Democracies and War	9
84-362	Diplomacy and Statecraft	9
84-380	Grand Strategy in the United States	9
84-386	The Privatization of Force	9
84-389	Terrorism and Insurgency	9
84-393	Legislative Decision Making: US Congress	9
84-402	Judicial Politics and Behavior	9
84-414	International and Subnational Security	9
88-220	Policy Analysis I	9
88-257	Experimental Economics	9

Cognition, Choice, and Behavior

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

70-311	Organizational Behavior	9
80-130	Introduction to Ethics	9
80-150	Nature of Reason	9
80-180	Nature of Language	9
80-221	Philosophy of Social Science	9
80-230	Ethical Theory	9
80-241	Ethical Judgments in Professional Life	9
80-242	Conflict and Dispute Resolution	9
80-270	Philosophy of Mind	9
80-271	Philosophy and Psychology	9
80-275	Metaphysics	9
80-281	Language and Thought	9
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

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	3
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	9
or 52-291	BXA Seminar II: Transferring Knowledge	
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
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Computer Science Core Requirements (56 units)

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

Concepts of Mathematics (10 units)

21-127	Concepts of Mathematics (co-requisite for 15-122; prerequisite for 15-150)	10
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Applications Courses or CS Electives (5 courses, 45 units minimum)

Choose a minimum of five courses from SCS beyond the core requirements, 200-level or higher, not including 02-201, 02-223, 02-250, 02-261, 08-200, 08-532, 15-351, 16-223. 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
08-540	Green Computing	9
11-291	Applied Computational Intelligence Lab	9
11-344	Machine Learning in Practice	12
11-411	Natural Language Processing	12
15-214	Principles of Software Construction: Objects, Design, and Concurrency	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
15-451	Algorithm Design and Analysis	12
15-458	Discrete Differential Geometry	12
15-462	Computer Graphics	12
15-463	Computational Photography	12
15-464	Technical Animation	12
15-465	Animation Art and Technology	12
15-466	Computer Game Programming	12
15-491	Special Topic: CMRoboBits: AI and Robots for Daily-Life Problems	12
15-494	Cognitive Robotics: The Future of Robot Toys	12
16-264	Humanoids	12
16-362	Mobile Robot Programming Laboratory	12
16-374	IDeATe: Art of Robotic Special Effects	12
16-384	Robot Kinematics and Dynamics	12
16-385	Computer Vision	9
16-423	Designing Computer Vision Apps	12
16-455	Human-Machine Virtuosity	12
16-465	Game Engine Programming	10
16-467	Human Robot Interaction	12

III. College of Fine Arts Concentration

(number of courses vary, 108 units minimum)

BCSA students choose one of the following concentrations:

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

Architecture Concentration (108 units minimum)

Architecture Required Courses (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	Digital Media I -Fall, Freshman year	6
48-121	Drawing I -Fall, Freshman year	6
48-125	Digital Media II -Spring, Freshman year	6
48-126	Drawing II -Spring, Freshman year	6
48-240	Historical Survey of World Architecture and Urbanism I -Spring, Freshman year	9
48-241	Modern Architecture -Fall, Sophomore year	9

Architecture Electives (56 units minimum)

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

Art Concentration (108 units minimum)

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
60-130-60-130	3-D Media Studio I-I (complete two minis, 5 units each)	10
60-131-60-131	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 (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 (DP3)	10
60-499 Studio Independent Study (one only)	10

Art History/Theory (2 courses, 18 units)

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

Review Requirement (complete 2 required reviews, 0 units)

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

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

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	

Choose Two Corresponding Labs:

51-227 Prototyping Lab I: Communications -Fall, Sophomore year	4.5, 4.5
or 51-247 Prototyping Lab I: Products	
or 51-267 Prototyping Lab I: Environments	
51-271 How People Work -Fall, Sophomore year	9
51-371 Futures -Fall, Junior year or later	9

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

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

Required Courses for All Concentration Options (20 units)

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

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

Design Required Courses (26 units)

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

Directing Required Courses (52 units)

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

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

Dramaturgy Required Courses (53 units minimum)

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

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

Music Concentration (108 units minimum)

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

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

Required Course for All Concentration Options (9 units)

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

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

Performance and Composition Required Courses (76 units)

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

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

Musicology Required Courses (45 units)

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

Audio Recording & Production Required Courses (40 units)

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

Choose 59 units from:

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

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

Sound Theory & Practice Required Courses (47 units)

57-101	Introduction to Music Technology	6
or 57-171	Introduction to Music Technology (self-paced)	

57-181	Solfege I -Fall	3
or 57-180	Basic Solfege I	
or 57-185	Advanced Solfege I	
57-173	Survey of Western Music History -Fall (co-requisite: 57-188)	9
57-188	Repertoire and Listening for Musicians	1
18-090	Twisted Signals: Multimedia Processing for the Arts	10
57-911	Music Since 1945	9
57-616	Independent Study in Sound Studies	9

Choose 52 units from:

57-153	Harmony II -Spring	9
or 57-150	Basic Harmony II	
57-182	Solfege II	3
or 57-186	Advanced Solfege II	
15-104	Introduction to Computing for Creative Practice	10
15-322	Introduction to Computer Music (pre-requisite: 15-112)	9
15-323	Computer Music Systems and Information Processing (pre-requisite: 15-122)	9
33-114	Physics of Musical Sound	9
57-337	Sound Recording	6
57-343	Interdisciplinary Studies in Listening, Culture, and Technology	9
57-344	Experimental Sound Synthesis	9
57-347	Electronic and Computer Music (pre-requisite: 57-101 or 57-171)	6
57-421	The Exploded Ensemble	6
57-425	Expanded Music Performance	9
57-438	Multitrack Recording	9
57-829	Contemporary Soundscapes	9
60-131	3D Media Studio II	5
60-210	Electronic Media Studio: Introduction to Interactivity	10

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

IV. Free Electives

(approximately 4 courses, 40 units minimum)

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

Academic Standards

Academic Actions

The academic performance of each student is reviewed at the end of each semester. Academic actions are initiated by the Director of the BXA Intercollege Degree Programs when students have not met minimum academic progress standards. A recommendation is presented to the associate deans of the appropriate colleges and Academic Actions Committee of the College of Fine Arts for confirmation. An appeals process is available to the student. The academic actions listed below do not follow a particular sequence; any of these actions may be imposed at any time.

BHA Academic Actions

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

If a student has two consecutive semesters with a QPA below 3.0, the Director will meet with the student and carefully evaluate the situation in consultation with the student's advisors in DC and CFA. If it seems in the

best interest of the student, the student may be advised to transfer out of the BHA Program and into DC or CFA.

Warning

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

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

Probation

Probation is imposed when a student receives a "D" or "R" grade in a required CFA concentration course, or an "R" in a required DC course, or if the student's semester QPA is below a 2.0.

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

Final Probation

Final Probation is imposed when a student receives two or more "D" or "R" grades in required H&SS or CFA concentration courses, or if the student's semester QPA is below 2.0 (1.75 for freshmen) for the second consecutive semester.

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

Drop from the BHA Program

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

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

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

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

BSA Academic Actions

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

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

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

Warning

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

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

Probation

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

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

Final Probation

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

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

Drop from the BSA Program

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

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

If a student is dropped from BSA, they may be able to successfully transfer into MCS or

CFA as a traditional full major, depending on their academic performance. If the student is doing poorly in both MCS and CFA courses, then the student should consider the following options:

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

BCSA Academic Actions

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

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

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

Warning

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

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

Probation

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

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

Final Probation

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

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

Drop from the BCSA Program

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

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

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

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

School Suspension

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

University Suspension

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

Study Abroad While on Academic Action

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

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

Disabilities

Students with a learning disability or a physical disability are encouraged to email access@andrew.cmu.edu. The circumstances will remain confidential to the extent desired. The university has a formal procedure for documenting disabilities, notifying advisors and faculty, and making arrangements to utilize university resources in support of expressed needs,

but will take no action until contacted by the student. The BXA Academic Advisors will work with the student to coordinate assistance.

Grading Policies

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

Intercollege Deans' List

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

Intercollege Honors

BHA, BSA, and BCSA students who successfully complete a BXA Capstone Project under the guidance of a faculty member will graduate with BHA, BSA, or BCSA Intercollege Honors if all of the following conditions are met:

- grade of "A" achieved in 401 and 52-402
- overall QPA of 3.25 or higher
- research results presented at Meeting of the Minds Undergraduate Research Symposium

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

University Honors

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

BXA Internal Transfer Process

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

Withdrawal or Leave of Absence

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

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