Dietrich College Interdisciplinary Majors

When addressing complex issues, we often rely on approaches that take advantage of a variety of relevant disciplines. The college houses the special category of “interdepartmental majors” for programs where this interdisciplinary approach is most pronounced and in which the varied disciplinary perspectives are most fully integrated. These majors are presented here separately, rather than as departmentally-based options, to reflect and underscore their sponsorship by more than one academic department and the unique features that follow from this structure.

Interdepartmental majors are administered by the academic department of the major’s faculty advisor.

The Major in Economics and Mathematical Sciences

Academic Advisor: Kathleen Conway
Office: GSA 131
Email: kconway@andrew.cmu.edu

The B.S. in Economics and Mathematical Sciences (http://coursecatalog.web.cmu.edu/dietrichcollegeofhumanitiesandsocialsciences/undergraduateeconomicscurriculum) is a collaborative effort between the Department of Mathematical Sciences and the Undergraduate Economics Program. Combining advanced mathematics with advanced economic theory is the hallmark of this curriculum. The curriculum provides students with courses that complement and develop depth of understanding of economic theory, applied economics, and applied mathematics. This major offers an integrated curriculum, guiding students through a program of coursework that exploits and builds upon the synergies between mathematics and economics. This degree program equips students with the mathematical tools that are essential for success in Ph.D. programs in economics, mathematics, and key functional areas of business including finance, accounting, marketing, and information systems. Students pursuing this degree will be well prepared for the beginning of their research careers in academia, government, and industry. There are a limited number of student slots in this program; interested students may apply as early as their sophomore year.

The Major in Economics and Statistics

Academic Advisor: Samantha Nielsen
Faculty Advisors: Rebecca Nugent and Edward Kennedy
Executive Director, Undergraduate Economics Program: Carol Goldburg
Associate Director, Undergraduate Economics Program: Kathleen Conway
Office: Baker Hall 132
Email: statadvising@stat.cmu.edu

The Major in Economics and Statistics provides an interdisciplinary course of study aimed at students with a strong interest in the empirical analysis of economic data. With joint curriculum from the Department of Mathematical Sciences and the Undergraduate Economics Program, the major provides students with a solid foundation in the theories and methods of both fields. Students in this major are trained to advance the understanding of economic issues through the analysis, synthesis and reporting of data using the advanced empirical research methods of statistics and econometrics. Graduates are well positioned for admission to competitive graduate programs, including those in statistics, economics and management, as well as for employment in positions requiring strong analytic and conceptual skills - especially those in economics, finance, education, and public policy.

All economics courses counting towards an economics degree must be completed with a grade of “C” or higher.

The requirements for the B.S. in Economics and Statistics are the following:

I. Prerequisites 38-39 units

1. Mathematical Foundations 38-39 units

   **Calculus**

   - 21-120 Differential and Integral Calculus 10
   - and one of the following three:
     - 21-122 Integration and Approximation 10
     - 21-127 Concepts of Mathematics 10
   - 21-257 Models and Methods for Optimization 9
   - and one of the following:
     - 21-256 Multivariate Analysis 9
     - 21-259 Calculus in Three Dimensions 9
   
   **Note:** Passing the MSC 21-120 assessment test is an acceptable alternative to completing 21-120.
   
   **Note:** Taking both 21-111 and 21-112 is equivalent to 21-120. The Mathematical Foundations total is then 48-49 units. The Economics and Statistics major would then total 201-211 units.

   **Linear Algebra**

   One of the following three courses:

   - 21-240 Matrix Algebra with Applications 10
   - 21-241 Matrices and Linear Transformations 10
   - 21-242 Matrix Theory 10

   **Note:** 21-241 and 21-242 are intended only for students with a very strong mathematical background.

II. Foundations 18-36 units

2. Economics Foundations 18 units

   - 73-102 Principles of Microeconomics 9
   - 73-103 Principles of Macroeconomics 9

3. Statistical Foundations 9-18 units

   **Sequence 1 (For students beginning their freshman or sophomore year)**

   **Beginning**

   Choose one of the following courses:

   - 36-200 Reasoning with Data 9
   - 36-201 Statistical Reasoning and Practice 9
   - 36-207 Probability and Statistics for Business Applications 9
   - 36-220 Engineering Statistics and Quality Control 9
   - 36-247 Statistics for Lab Sciences 9

   *Or extra data analysis course in Statistics

   **Intermediate**

   Choose one of the following courses:

   - 36-202 Methods for Statistics and Data Science ** 9
   - 36-208 Regression Analysis 9
   - 36-309 Experimental Design for Behavioral and Social Sciences 9

   *Or extra data analysis course in Statistics

   **Must take prior to 36-401

   **Sequence 2 (For students beginning later in their college career)**

   **Advanced**

   Choose one of the following courses:

   - 36-303 Sampling, Survey and Society 9
   - 36-305 Statistical Graphics and Visualization 9
   - 36-461 Special Topics: Statistical Methods in Epidemiology 9
   - 36-462 Special Topics: Data Mining 9
   - 36-463 Special Topics: Multilevel and Hierarchical Models 9
   - 36-464 Special Topics: Applied Multivariate Methods 9
   - 36-490 Undergraduate Research 9

   **Special Topics rotate and new ones are regularly added.
III. Disciplinary Core 126 units

1. Economics Core 45 units
   73-230 Intermediate Microeconomics 9
   73-240 Intermediate Macroeconomics 9
   73-270 Strategic Professional Communication for Economists 9
   73-274 Econometrics I 9
   73-374 Econometrics II 9

2. Statistics Core 36 units
   36-225 Introduction to Probability Theory * 9
   36-226 Introduction to Statistical Inference * 9
   36-326 Mathematical Statistics (Honors) * 9
   and both of the following two courses:
   36-401 Modern Regression * 9
   36-402 Advanced Methods for Data Analysis * 9

*In order to be a major in good standing, a grade of C or better is required in 36-225 (or equivalents), 36-226 or 36-326 and 36-401. Otherwise you will not be allowed to continue in the major.

#It is possible to substitute 36-217 or 21-325 for 36-225. (36-225 is the standard introduction to probability, 36-217 is tailored for engineers and computer scientists, and 21-325 is a rigorous Probability Theory course offered by the Department of Mathematics.)

3. Computing 9 units
   36-350 Statistical Computing * 9
   *In rare circumstances, a higher level Statistical Computing course, approved by your Statistics advisor, may be used as a substitute.

4. Advanced Electives 36 units
   Students must take two advanced Economics elective courses (numbered 73-300 through 73-495, excluding 73-374) and two advanced Statistics elective courses (numbered 36-303, 36-315, or 36-410 through 36-495).

   Students pursuing a degree in Economics and Statistics also have the option of earning a concentration area by completing a set of interconnected electives. While a concentration area is not required for this degree, this is an additional option that allows students to pursue courses that are aligned with a particular career path. The two electives that are already required for this degree could count towards your concentration area, please make sure to consult an advisor when choosing these courses.

Total number of units for the major 191-201 units
Total number of units for the degree 360 units

Professional Development

Students are advised to begin planning their curriculum with appropriate advisors as soon as possible. This is particularly true if the other major has a complex set of requirements and prerequisites or when many of the other major’s requirements overlap with the requirements for a Major in Economics and Statistics.

Many departments require Statistics courses as part of their Major or Minor programs. Students seeking transfer credit for those requirements from substitute courses (at Carnegie Mellon or elsewhere) should seek permission from their advisor in the department setting the requirement. The final authority in such decisions rests there. The Department of Statistics and Data Science does not provide approval or permission for substitution or waiver of another department’s requirements.

If a waiver or substitution is made in the home department, it is not automatically approved in the Department of Statistics and Data Science. In many of these cases, the student will need to take additional courses to satisfy the Economics and Statistics major requirements. Students should discuss this with a Statistics advisor when deciding whether to add an additional major in Economics and Statistics.

Sample Program

The following sample program illustrates one way to satisfy the requirements of the Economics and Statistics Major. Keep in mind that the program is flexible and can support other possible schedules (see footnotes below the schedule).

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Sophomore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
</tr>
<tr>
<td>21-120 Differential and Integral Calculus</td>
<td>36-102 Methods for Statistics and Data Science</td>
</tr>
<tr>
<td>36-200 Reasoning with Data</td>
<td>21-256 Multivariate Analysis</td>
</tr>
<tr>
<td>......</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior</th>
<th>Senior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
</tr>
<tr>
<td>36-403 Modern Regression</td>
<td>73-270 Strategic Professional Communication for Economists</td>
</tr>
<tr>
<td>73-374 Econometrics II</td>
<td>.....</td>
</tr>
</tbody>
</table>

*In each semester, ----- represents other courses (not related to the major) which are needed in order to complete the 360 units that the degree requires.

** Students can also take 21-127 or 21-257. Students should consult with their advisor.

Prospective PhD students might add 21-127 fall of sophomore year, replace 21-240 with 21-241, add 21-260 in spring of junior year and 21-355 in fall of senior year.

Additional Major in Environmental Policy

Faculty Advisor: Professor Abigail E. Owen, aewen@andrew.cmu.edu, Wean Hall 3709
Academic Advisor: Dr. Andrew Ramey; aramey@andrew.cmu.edu, Baker Hall 240, 412/268-2880

The additional major in Environmental Policy 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. The total units required are 121.

Note that some courses carry prerequisites and/or reserve seats for primary majors. Students interested in pursuing the additional major must meet beforehand with the Faculty Advisor and their home unit academic advisor in order to evaluate the feasibility of completing the additional major and to map out a course of study. Double counting follows guidelines set by the Dietrich College. 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 Advisor.

Prerequisites (55-57 units)

Complete ALL of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-111</td>
<td>Differential Calculus (or equivalent)</td>
<td>10</td>
</tr>
<tr>
<td>36-201</td>
<td>Statistical Reasoning and Practice</td>
<td>9</td>
</tr>
<tr>
<td>36-202</td>
<td>Methods for Statistics and Data Science</td>
<td>9</td>
</tr>
</tbody>
</table>

Complete THREE of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-121</td>
<td>Modern Biology</td>
<td>9</td>
</tr>
<tr>
<td>03-124</td>
<td>Modern Biology Laboratory (03-121 is corequisite)</td>
<td>9</td>
</tr>
<tr>
<td>03-125</td>
<td>Evolution</td>
<td>9</td>
</tr>
<tr>
<td>09-103</td>
<td>Atoms, Molecules and Chemical Change</td>
<td>9</td>
</tr>
<tr>
<td>09-105</td>
<td>Introduction to Modern Chemistry I</td>
<td>10</td>
</tr>
<tr>
<td>09-106</td>
<td>Modern Chemistry II</td>
<td>10</td>
</tr>
</tbody>
</table>

Disciplinary Perspectives: Complete TWO of the following courses (18 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-510</td>
<td>Chemistry and Sustainability</td>
<td>9</td>
</tr>
<tr>
<td>73-148</td>
<td>Environmental Economics</td>
<td>9</td>
</tr>
<tr>
<td>76-319</td>
<td>Environmental Rhetoric</td>
<td>9</td>
</tr>
<tr>
<td>79-374</td>
<td>American Environmental History: Critical Issues</td>
<td>9</td>
</tr>
</tbody>
</table>

Thematic Electives: Complete TWO of the following courses (18 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-100</td>
<td>Introduction to Civil and Environmental Engineering</td>
<td>12</td>
</tr>
<tr>
<td>19-101</td>
<td>Introduction to Engineering and Public Policy</td>
<td>12</td>
</tr>
<tr>
<td>19-424</td>
<td>Energy and the Environment</td>
<td>9</td>
</tr>
<tr>
<td>60-203</td>
<td>Concept Studio: EcoArt</td>
<td>10</td>
</tr>
<tr>
<td>76-395</td>
<td>Science Writing</td>
<td>9</td>
</tr>
<tr>
<td>79-372</td>
<td>Cities, Technology, and the Environment</td>
<td>6</td>
</tr>
<tr>
<td>80-348</td>
<td>Health Development and Human Rights</td>
<td>9</td>
</tr>
<tr>
<td>88-223</td>
<td>Decision Analysis</td>
<td>9</td>
</tr>
<tr>
<td>88-302</td>
<td>Behavioral Decision Making</td>
<td>9</td>
</tr>
<tr>
<td>88-412</td>
<td>Energy, Climate Change, and Economic Growth in the 21st Century</td>
<td>9</td>
</tr>
<tr>
<td>90-765</td>
<td>Cities, Technology and the Environment</td>
<td>6</td>
</tr>
<tr>
<td>90-798</td>
<td>Environmental Policy &amp; Planning</td>
<td>12</td>
</tr>
<tr>
<td>90-808</td>
<td>Energy Policy</td>
<td>6</td>
</tr>
</tbody>
</table>

(90-xxx Heinz College courses open only to seniors)
Director.

concentration may be allowed after consultation with and approval from the

Substitution of elective courses that cohere with a student's interest or

Choose any three courses from any category or categories shown below.

V. Elective Courses 27 units

Choose any three courses from any category or categories shown below. Substitution of elective courses that cohere with a student's interest or concentration may be allowed after consultation with and approval from the Director.

Engineering and Public Policy (some courses have prerequisites; see EPP catalog listing)

19-424 Energy and the Environment 9

Business

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

70-430 International Management 9

Economics (some courses have prerequisites; see Economics catalog listing)

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

History

Courses from the EHPP History Core (above) may be taken as electives only if they are not being used to fulfill the core requirement. Double counting is not permitted.

79-217 The War in Vietnam 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
79-253 American Massacres in History and Memory 9
79-267 The Soviet Union in World War II: Military, Political, and Social History 9
79-288 Bananas, Baseball, and Borders: Latin America and the United States 9
79-298 Mobile Phones & Social Media in Development & Human Rights: A Critical Appraisal 9
79-299 From Newton to the Nuclear Bomb: History of Science, 1750-1950 9
79-301 History of Surveillance: From the Plantation to Edward Snowden 9
79-303 Pittsburgh and the Transformation of Modern Urban America 9
79-305 Moneyball Nation: Data in American Life 9
79-310 Modern U. S. Business History: 1870 to the Present 9
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 9
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 9
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
Courses from the EHPP Philosophy Core (above) may be taken as electives only if they are not being used to fulfill the core requirement. Double counting is not permitted.

80-256 Modern Moral Philosophy 9
80-305 Choices, Decisions, and Games 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
88-281 Topics in Law: 1st Amendment 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

VI. Bachelor of Science Option
Students may elect to earn a Bachelor of Science rather than a Bachelor of Arts degree by completing two courses from the list below, or by petitioning the Director of EHPP to accept equivalent courses as substitutions.

21-257 Models and Methods for Optimization 9
36-202 Methods for Statistics and Data Science 9
or 36-208 Regression Analysis
or 70-208 Regression Analysis 9
36-207 Probability and Statistics for Business Applications 9
36-303 Sampling, Survey and Society 9
36-309 Experimental Design for Behavioral and Social Sciences 9
80-305 Choices, Decisions, and Games 9
84-265 Political Science Research Methods 9
88-251 Empirical Research Methods 9

Additional Major
The B.A./B.S. in Ethics, History, and Public Policy may be scheduled as an additional major in consultation with the Director of Ethics, History, and Public Policy, Professor Alex John London, ajlondon@andrew.cmu.edu.

Ethics, History, and Public Policy Sample Curriculum

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
</tr>
<tr>
<td>Core requirement in Economics</td>
<td>Core requirement in History or Philosophy</td>
</tr>
<tr>
<td>Core requirement in History or Philosophy</td>
<td>Core requirement in History or Philosophy</td>
</tr>
<tr>
<td>Core requirement in History or Philosophy</td>
<td>Core requirement in History or Philosophy</td>
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<tr>
<td>Core requirement in History or Philosophy</td>
<td>Core requirement in History or Philosophy</td>
</tr>
<tr>
<td>Core requirement in History or Philosophy</td>
<td>Fifth Course (open)</td>
</tr>
</tbody>
</table>

The above sample program is presented as a two-year (junior-senior year) plan for completing EHPP major requirements. Its purpose is to show that this program can be completed in as few as two years; not that it must be. Students may enter the EHPP major, and begin major course requirements, as early as the start of the sophomore year, or even in the first year. Students should consult their advisor when planning their program.

The Major in Information Systems
Faculty Program Director: Randy S. Weinberg
Office: Porter Hall 224C, rweinberg@andrew.cmu.edu
Program Advisor: Carol Young
Office: Porter Hall 222F, caroly@cmu.edu
Faculty: C.F. Larry Heimann, Jeria Quesenberry, Raja Sooriamrthi

Information Systems (IS) is a unique and innovative undergraduate interdisciplinary program, drawing on a wide range of exciting college and university strengths. IS is an internationally recognized undergraduate major for students who want to design and implement effective solutions to meet organizational and management needs for information and decision support. IS majors learn how elements of organizations, technology, economics, social aspects and human interaction work together to create effective computer-based information systems to affect real outcomes. Graduates of the Program are ideally situated to take a leading role in managing and shaping our information-based future.

For full program information, go to The Major in Information Systems (http://coursecatalog.web.cmu.edu/dietrichcollegeofhumanitiesandsocialsciences/informationsystems).

The Major in Linguistics
Tom Werner, Director
Office: Baker Hall 155F
Email: twerner@andrew.cmu.edu

http://www.cmu.edu/dietrich/linguistics/

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.

The major in Linguistics reflects the multidisciplinary character of the field and of the Linguistics faculty here at Carnegie Mellon, offering a program which provides students with the fundamental tools of linguistic analysis while maintaining a focus on the human context in which language is learned and used. The major is available as either a primary major or an additional major. It is an ideal choice for students with a general interest in their own or other languages, and combines well thematically with studies in any of the departments represented in the major.

Curriculum
The Linguistics major requires a total of 12 courses, which includes 2 semesters of language study. In addition, primary majors in Linguistics are required to write a Senior Thesis in their final year. At least three courses (not including specific language courses) must be at the 300-level or higher. All courses counted towards the major must be taken for a letter grade and passed with a grade of ‘C’ or above. Students may double count any course for the major simultaneously with another major or minor.

Introductory course
80-180 Nature of Language 9

Fundamental Skills
Take one course from each of the following core subject areas:

Sounds
80-282 Phonetics and Phonology I 9

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

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

Breadth
Take one course from each of the following breadth subject areas:

Area 1: 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
College of Sciences receive a Bachelor of Science in Biological Sciences and in Psychology and Biological Sciences. Students entering from the Mellon College of Humanities and Social Sciences will earn a Bachelor of Science in the social and natural sciences. Students entering from the Dietrich College will earn a Bachelor of Science in Psychology and Biological Sciences. This unified major is intended to reflect the interdisciplinary nature of our current research in the fields of psychology and biology, as well as the national trend in some professions to seek individuals broadly trained in both the social and natural sciences. Students entering from the Dietrich College of Humanities and Social Sciences will earn a Bachelor of Science in Psychology and Biological Sciences. Students entering from the Mellon College of Sciences receive a Bachelor of Science in Biological Sciences and Psychology. Students entering from the Science and Humanities Scholars (SHS) program can complete the SHS educational core and choose either departmental order for their diploma.

Pre-Major Requirements

The unified major specifies particular pre-major requirements in the areas of mathematical sciences and statistics, natural science, and computational reasoning. Particular courses are specified in these areas because they are prerequisites for courses required in the major and therefore they are the most efficient way to complete the general education requirements for either Dietrich College or SHS. All other general education categories can be filled in any way that satisfies the requirements of the student’s college or of the SHS program.

The major in Psychology and Biological Sciences is offered only as a B.S. degree. Full curriculum requirements can be viewed under the Department of Psychology (http://coursecatalog.web.cmu.edu/dietrichcollegeofhumanitiesandsocialsciences/departmentofpsychology/#psybiotext) section of the Catalog.

Student-Defined Major Program

Joseph E. Devine, Director; Associate Dean for Undergraduate Studies
Office: Baker Hall 154F
Email: jd0x@andrew.cmu.edu
http://www.hss.cmu.edu/studentdefinedmajor.html

For Dietrich College students whose educational goals cannot be as adequately served by the curricula of existing majors, the college offers the opportunity to self-define a major. The procedure for establishing such a major centers on a written proposal, submitted to the Dietrich College Dean’s Office. This proposal consists of two parts:

Major description and rationale. A description of the components of the proposed program of study; a presentation of the objectives of the program of study, how it represents a coherent and (given available faculty, courses, and other resources) viable course of study, and the reason(s) why these objectives cannot be accomplished within one or more of the college’s existing majors.

The curriculum. Presentation of a complete outline of all courses that will comprise the requirements for the major. These courses should be categorized in two ways: first, according to that component of the major program to which each belongs (e.g., mathematical prerequisites; research methods; theoretical perspectives; etc.); and second, a semester-by-semester outline that indicates when each course is to be taken (or, for any already taken, when taken and grade received). In addition to courses taken at Carnegie Mellon, the major’s curriculum may include courses taken (or to be taken) at other schools, related projects or internships, or programs of study abroad. The minimum requirements for graduation is, as with all majors in the college, 360 units of credit and completion of the Dietrich College general education program.

Proposals and curricula are evaluated for clarity of focus, coherence and depth in related areas, and viability. Proposals should generally be developed no later than the sophomore year, and approved majors begin their program generally no later than the junior year.

The student-defined option is also possible to propose as an additional major or minor. These options extend to undergraduates from all Carnegie Mellon colleges.

Electives

Take four additional electives. These can be additional courses from the Fundamental Skills courses or Breadth courses listed above, or any other course which is 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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-378</td>
<td>Literacy: Educational Theory and Community Practice</td>
<td>9</td>
</tr>
<tr>
<td>76-451</td>
<td>Language and Globalization</td>
<td>9</td>
</tr>
<tr>
<td>80-284</td>
<td>Invented Languages</td>
<td>9</td>
</tr>
<tr>
<td>80-286</td>
<td>Words and Word Formation: Introduction to Morphology</td>
<td>9</td>
</tr>
<tr>
<td>80-287</td>
<td>Historical and Comparative Linguistics</td>
<td>9</td>
</tr>
<tr>
<td>80-380</td>
<td>Philosophy of Language</td>
<td>9</td>
</tr>
<tr>
<td>80-382</td>
<td>Phonetics and Phonology</td>
<td>9</td>
</tr>
<tr>
<td>80-384</td>
<td>Linguistics of Turkic Languages</td>
<td>9</td>
</tr>
<tr>
<td>80-385</td>
<td>Linguistics of Germanic Languages</td>
<td>9</td>
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<tr>
<td>82-373</td>
<td>Structure of the Japanese Language</td>
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<td>11-411</td>
<td>Natural Language Processing</td>
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<td>11-492</td>
<td>Speech Processing</td>
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<td>11-716</td>
<td>Graduate Seminar on Dialog Processing</td>
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<td>11-721</td>
<td>Grammars and Lexicons</td>
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<td>11-722</td>
<td>Grammar Formalisms</td>
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<td>11-761</td>
<td>Language and Statistics</td>
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<tr>
<td>11-762</td>
<td>Language and Statistics II</td>
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Language Requirement

Students must successfully complete two semesters of consecutive language courses. (Note that 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.)

Senior Thesis [primary majors only]

Primary majors must complete a senior thesis (a workload equivalent to a 12-unit course) during their senior year. Topics must be approved by an advisor, who will work with the student and guide the thesis project.

Note

• All 11-xxx courses have significant Computer Science prerequisites. Interested students should check with the course instructor before registering.

The Major in Psychology and Biological Sciences

This unified major is intended to reflect the interdisciplinary nature of our current research in the fields of psychology and biology, as well as the national trend in some professions to seek individuals broadly trained in both the social and natural sciences. Students entering from the Dietrich College of Humanities and Social Sciences will earn a Bachelor of Science in Psychology and Biological Sciences. Students entering from the Mellon College of Sciences receive a Bachelor of Science in Biological Sciences and