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

Kathleen Conway, Academic Advisor
Location: Tepper Quad 2407
kconway@andrew.cmu.edu

The B.S. in Economics and Mathematical Sciences (http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/undergraduateeconomicsprogram/#econmathtext) 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 Politics

Kathleen Conway, Senior Academic Advisor, Economics
Location: Tepper Quad 2407
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Emily Half, Deputy Director, Institute for Politics and Strategy Advising
Location: Baker Hall ASSA
elahalf@andrew.cmu.edu

Politics and economics are deeply interconnected. Political institutions and decision-making impact economic growth, income distribution, and many other aspects of economic life. Both fiscal and monetary policies affect the economy, but these policies are often employed with political considerations in mind and can influence political activity. Conversely, economic outcomes shape political preferences and policy choices. The overlap between these two disciplines is endless. For example, while the United Nations is often thought of in purely political terms, the Security Council can and does impose sanctions on countries— an example of an economic policy used for political change.

The Economics and Politics major (http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/undergraduateeconomicsprogram/#bsineconomicsandpoliticaltext) is offered jointly between the Undergraduate Economics Program (https://www.cmu.edu/tepper/programs/undergraduate-economics/) (UEP) and the Institute for Politics and Strategy (https://www.cmu.edu/ips/) (IPS). Students are equal members of both academic units and receive advising from both units. The major will appeal to any student interested in the design, evaluation, and political implementation of policy. It will be especially attractive to students considering careers in politics, government agencies, political and business consulting, lobbying, or the law.

The B.S. in Economics and Politics is an interdisciplinary major. The major will develop the political context and underpinnings of economic policy making. It will explore how political institutions resolve the tradeoffs and disagreements associated with policymaking and how they can facilitate or impede desirable economic outcomes.

IPS strengths lie in topics like national security, grand strategy, and globalization. Economic policy is just one facet of grand strategy, through which an administration pursues domestic and international goals. This major will also address key issues such as the complementarity between the multilateral economic institutions such as the IMF and World Bank and the use of economic coercion, and enable students to understand economic statecraft more broadly. Whether coercion is successful depends not just on the levers of power but on also on variations in authoritarian regime structure, and complex linkages in the international economy. This is also important for our understanding of the relationship between international economics on human rights practices, extending even to how treaty commitments can facilitate compliance with a global initiative to combat climate change. And, not least important, there is broad recognition that the viability of the “Euro Zone” depends on whether the political-economic agreements necessary to mitigate institutional weaknesses are politically feasible or destined to fail.

Economics and Politics is available as both a primary and additional major.

The Major in Economics and Statistics

Samantha Nielsen, Statistics & Data Science Senior Academic Advisor
Kathleen Conway, Economics Senior Academic Advisor

Carol Goldburg, Executive Director, Undergraduate Economics Program

Statistics & Data Science Location: Baker Hall 132
stataadvising@andrew.cmu.edu (stataadvising@stat.cmu.edu)

Economics Location: Tepper Quad 2400
econprog@andrew.cmu.edu

The B.S. in Economics and Statistics is jointly advised by the Department of Statistics and Data Science and the Undergraduate Economics Program. 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 Statistics and Data Science 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 toward 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:

21-256 Multivariate Analysis 9

21-259 Calculus in Three Dimensions 9

21-268 Multidimensional Calculus 10

Note: Passing the MSC 21-120 assessment test is an acceptable alternative to completing 21-120.

Note: Taking/having credit for both 21-111 and 21-112 is equivalent to 21-120. The Mathematical Foundations total is then 49-49 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
36/70-207 Probability and Statistics for Business Applications 9
36-220 Engineering Statistics and Quality Control 9
36-247 Statistics for Lab Sciences 9

Note: Students who enter the program with 36-225 or 36-226 should discuss options with an advisor. Any 36-300 or 36-400 level course in Data Analysis that does not satisfy any other requirement for the Economics and Statistics Major may be counted as a Statistical Elective.

Intermediate* Choose one of the following courses:
36-202 Methods for Statistics & Data Science ** 9
36-208 Regression Analysis 9
36-290 Introduction to Statistical Research Methodology 9
36-309 Experimental Design for Behavioral & Social Sciences 9

* Or extra data analysis course in Statistics
** Must take prior to 36-401 Modern Regression, if not, an additional Advanced Statistics Elective is required.

Advanced Statistics Elective

Choose two of the following courses:
36-303 Sampling, Survey and Society 9
36-311 Statistical Analysis of Networks 9
36-313 Statistics of Inequality and Discrimination 9
36-315 Statistical Graphics and Visualization 9
36-461 Special Topics: Statistical Methods in Epidemiology 9
36-462 Special Topics: Methods of Statistical Learning 9
36-463 Special Topics: Multilevel and Hierarchical Models 9
36-464 Special Topics: Applied Multivariate Methods 9
36-465 Special Topics: Conceptual Foundations of Statistical Learning 9
36-466 Special Topics: Statistical Methods in Finance 9
36-467 Special Topics: Data over Space & Time 9
36-468 Special Topics: Text Analysis 9
36-469 Special Topics: Statistical Genomics and High Dimensional Inference 9
36-490 Undergraduate Research 9
36-493 Sports Analytics Capstone 9
36-497 Corporate Capstone Project 9

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

Advanced Statistics Electives

Choose three of the following courses:
36-303 Sampling, Survey and Society 9
36-311 Statistical Analysis of Networks 9
36-313 Statistics of Inequality and Discrimination 9
36-315 Statistical Graphics and Visualization 9
36-461 Special Topics: Statistical Methods in Epidemiology 9
36-462 Special Topics: Methods of Statistical Learning 9
36-463 Special Topics: Multilevel and Hierarchical Models 9
36-464 Special Topics: Applied Multivariate Methods 9
36-465 Special Topics: Conceptual Foundations of Statistical Learning 9
36-466 Special Topics: Statistical Methods in Finance 9
36-467 Special Topics: Data over Space & Time 9
36-468 Special Topics: Text Analysis 9
36-469 Special Topics: Statistical Genomics and High Dimensional Inference 9
36-490 Undergraduate Research 9
36-493 Sports Analytics Capstone 9
36-497 Corporate Capstone Project 9

III. Disciplinary Core 126 units

1. Economics Core 45 units

73-230 Intermediate Microeconomics 9
73-240 Intermediate Macroeconomics 9
73-270 Professional Communication for Economists 9
73-265 Economics and Data Science 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 or 36-326 Mathematical Statistics (Honors) 9
36-401 Modern Regression 9
36-402 Advanced Methods for Data Analysis 9

*# It is possible to substitute 36-218 or 36-219 or 21-325 for 36-225. 36-225 is the standard introduction to probability, 36-219 is tailored for engineers and computer scientists, 36-218 is a more mathematically rigorous class for Computer Science students and more mathematically advanced Statistics students (Statistics students need advisor approval to enroll), and 21-325 is a rigorous Probability Theory course offered by the Department of Mathematics.

3. Statistical Computing 9 units

36-350 Statistical Computing 9

4. Advanced Electives 36 units

Students must take two advanced Economics elective courses (numbered 73-300 through 73-495, excluding 73-374 ) and two (or three - depending on previous coursework, see Section 3) advanced Statistics elective courses (numbered 36-303, 36-311, 36-313, 36-315, 36-46x, 36-490, 36-493 or 36-497).

Students pursuing a degree in Economics and Statistics also have the option of earning a concentration area (https://www.cmu.edu/tepper/programs/undergraduate-economics/curriculum/concentrations/) in Economics by completing a set of interconnected electives. While a concentration area is not required for this degree, it is an additional option that allows students to explore a group of aligned topics and/or develop a specialized and advanced skill set appropriate for a desired career path. The electives required for this degree may count towards your concentration area. To fulfill a concentration, students must take four courses from the designated set of electives. 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

While not required, students are strongly encouraged to take advantage of professional development opportunities and/or coursework. One option is 73-210 Economics Colloquium I, a fall-only course that provides information about careers in Economics, job search strategies, and research opportunities. The Department of Statistics and Data Science also offers a series of workshops pertaining to resume preparation, graduate school
applications, careers in the field, among other topics. Students should also take advantage of the Career and Professional Development Center.

Additional Major in Economics and Statistics

Students who elect Economics and Statistics as an additional major must fulfill all Economics and Statistics degree requirements. Majors in many other programs would naturally complement an Economics and Statistics Major, including Tepper's undergraduate business program, Social and Decision Sciences, Policy and Management, and Psychology.

With respect to double-counting courses, it is departmental policy that students must have at least six courses [three Economics (73-xxx) and three Statistics (36-xxx)] that do not count for their primary major. If students do not have at least three ECON and three STA classes, they will need to take additional advanced data analysis or economics electives, depending on where the double-counting issue is.

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 most 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>
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<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
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<tr>
<td>21-120 Differential and Integral Calculus</td>
<td>36-202 Methods for Statistics &amp; Data Science</td>
</tr>
<tr>
<td>36-200 Reasoning with Data</td>
<td>21-256 Multivariate Analysis</td>
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<tr>
<td>73-102 Principles of Macroeconomics</td>
<td>73-103 Principles of Macroeconomics</td>
</tr>
<tr>
<td>73-060 Economics: BaseCamp *not required</td>
<td>73-265 Economics and Data Science</td>
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</tbody>
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<tr>
<th>Junior</th>
<th>Senior</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
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<tr>
<td>36-350 Statistical Computing</td>
<td>36-401 Advanced Methods for Data Analysis</td>
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<tr>
<td>36-401 Modern Regression</td>
<td>Statistics Elective</td>
</tr>
<tr>
<td>73-374 Econometrics II</td>
<td>Economics Elective</td>
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*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.

Prospective PhD students are advised to 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.

The Major in Ethics, History, and Public Policy

Professor Steven Schlossman, Director of Undergraduate Studies, History ssis@cmu.edu, Baker Hall 236A, 412-268-2880
Andrew Ramey, Senior Academic Advisor, History Location: Baker Hall 240B, 412-268-7906 aramey@andrew.cmu.edu https://go.oncehub.com/AndrewRamey (https://go.oncehub.com/AndrewRamey/)
Patrick Doyle, Academic Program Manager, Philosophy Location: Baker Hall 161G, 412-268-3704 pdoyle2@andrew.cmu.edu https://go.oncehub.com/PatDoyle (https://go.oncehub.com/PatDoyle/)

The B.A./B.S. in Ethics, History, and Public Policy, (EHP) is an interdepartmental major offered jointly by the Departments of History and Philosophy. It prepares students for leadership positions by providing them with a rigorous, interdisciplinary humanistic and social-scientific education. It also serves as an excellent springboard for graduate studies in a variety of disciplines such as law, public policy, ethics, and advocacy. The program focuses equally on the historical understanding of how modern-day problems have evolved, and the importance of developing clear criteria for ethical decision-making. The capstone project course provides students with the opportunity to engage with real-world public policy challenges using the methods, theories, and knowledge that they have gained through the major. Offered jointly by the departments of History and Philosophy, the B.A./B.S. in EHPH encourages specialization, internship experiences, and research in a wide range of policy areas.

Curriculum

Students graduating with a primary major in Ethics, History, and Public Policy may elect to receive either a Bachelor of Arts or a Bachelor of Science Degree (additional requirements apply; see below). Basic requirements include 120 units encompassing 9 units in Economics, 36 units in History, 36 units in Philosophy, 27 units of elective courses, and a 12-unit senior capstone course. This program may also be taken as an additional (e.g., second) major. All courses toward the major must be taken for a letter grade and must be passed with a grade of “C” or better. Students can double count any course for the major with another major or minor, with the exception of Social and Political History, for which a student can double count a maximum of two courses.

I. Foundations of Public Policy 9 units

Choose one 9-unit course from the list below.

73-102 Principles of Microeconomics 9
84-104 Decision Processes in American Political Institutions 9
84-110 Foundations of Political Economy 9

II. History Core 36 units

Choose one 9-unit course from each category below:

Policy History (9 units) 36 units

79-300 History of American Public Policy 9

U.S. History (9 units) 9

79-204 American Environmental History 9
79-231 American Civil Rights Movement: From Garveyism to Black Power 9
79-240 Development of American Culture 9
79-242 African American History: Reconstruction to the Present 9
79-244 Women in American History 9
79-245 Capitalism and Individualism in American Culture 9
79-248 U. S. Constitution & the Presidency 9
79-249 Politics and Social Change in 20th Century America 9
79-291 Innovation and Entertainment: A Business History of American Popular Culture 9
79-310 U. S. Business History: 1870 to the Present 9
79-320 Women, Politics, and Protest 9
Non-U.S. History (9 units)

79-202  Flesh and Spirit: Early Modern Europe, 1400-1750
79-203  The Other Europes: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1990
79-205  20th Century Europe
79-223  Mexico: From the Aztec Empire to the Drug War
79-226  African History: Earliest Times to 1780
79-261  The Last Emperors: Chinese History and Society, 1600-1900
79-227  Modern Africa: The Slave Trade to the End of Apartheid
79-229  The Origins of the Palestinian-Israeli Conflict, 1880-1948
79-230  Arab-Israeli Conflict Since 1948
79-237  Comparative Slavery
79-262  Modern China: From the Birth of Mao ... to Now
79-264  Tibet and China: History and Propaganda
79-265  Russian History: Game of Thrones
79-266  Russian History and Revolutionary Socialism
79-307  Religion and Politics in the Middle East

History Elective (9 units)

Take at least 9 additional units in the History Department with course number 79-200 or above. The following courses may not be counted toward the History Core.

History Elective (9 units)

Choose one 9-unit course from each category below. No more than 9 units at the 100 level may be counted toward the History Core.

Ethics (9 units)

80-130  Introduction to Ethics
80-330  Ethical Theory

Political Philosophy (9 units)

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

Foundations of Social Science (9 units)

80-221  Philosophy of Social Science
80-324  Philosophy of Economics

Applied Philosophy (9 units)

80-245  Medical Ethics
80-336  Philosophy of Law
80-348  Health, Human Rights, and International Development
80-447  Global Justice

III. Philosophy Core 36 units
Choose one 9-unit course from each category below. No more than 9 units at the 100 level may be counted toward the Philosophy Core.

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

19-424  Energy and the Environment

Business Administration

70-311  Organizational Behavior
70-321  Negotiation and Conflict Resolution
70-379  Business, Society and Ethics
70-364  Business Law
70-365  International Trade and International Law
70-430  International Management

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

73-352  Public Economics
73-359  Benefit-Cost Analysis
73-365  Firms, Market Structures, and Strategy
73-408  Law and Economics
73-476  American Economic History

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.

79-145  Genocide and Weapons of Mass Destruction
79-189  History of Democracy: Thinking Beyond the Self
79-233  The United States and the Middle East since 1945
79-234  Technology and Society
79-240  Development of American Culture
79-242  African American History: Reconstruction to the Present
79-249  Politics and Social Change in 20th Century America
79-250  Voting Rights: An Unexpected History
79-261  The Last Emperors: Chinese History and Society, 1600-1900
79-265  Russian History: Game of Thrones
79-266  Russian History and Revolutionary Socialism
79-267  The Soviet Union in World War II: Military, Political, and Social History
79-288  Bananas, Baseball, and Borders: Latin America and the United States
79-289  Animal Planet: An Environmental History of People and Animals
79-301  History of Surveillance: From the Plantation to Data Capitalism
79-302  Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems
79-303  Pittsburgh and the Transformation of Modern Urban America
79-305  Moneyball Nation: Data in American Life
79-315  Thirsty Planet: The Politics of Water in Global Perspective
79-320  Women, Politics, and Protest
79-322  Stalin and the Great Terror
79-325  U.S. Gay and Lesbian History
79-331  Body Politics: Women and Health in America
79-334  Climate Change and Climate Justice: Global Perspectives
79-336  Introduction to Environmental Ideas
79-338  History of Education in America
79-339  Juvenile Delinquency & Film: From Soul of Youth (1920) to West Side Story (1961)
79-342  Introduction to Science and Technology Studies
79-343  Education, Democracy, and Civil Rights

V. Elective Courses 27 units
Choose any three courses (at least 27 units) 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 Academic Program Manager.

Education, Democracy, and Civil Rights

27 units
79-349 United States and the Holocaust 6
79-359 Truth, Lies, and Propaganda: A Historical Inquiry 9
79-368 Un-natural Disasters: Societies and Environmental Hazards in Global Perspective 6
79-371 African American Urban History 9
79-370 Technology in the United States 9
79-374 Inequality, Social Justice, and the Black Urban Experience: 1930s to 2010s 9
79-381 Energy and Empire: How Fossil Fuels Changed the World 9

Philosophy
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.
80-130 Introduction to Ethics 9
80-135 Introduction to Political Philosophy 9
80-136 Social Structure, Public Policy & Ethics 9
80-221 Philosophy of Social Science 9
80-244 Environmental Ethics 9
80-245 Medical Ethics 9
80-256 Modern Moral Philosophy 9
80-305 Decision Theory 9
80-330 Ethical Theory 9
80-335 Social and Political Philosophy 9
80-336 Philosophy of Law 9
80-405 Game Theory 9
80-447 Global Justice 9

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

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

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 & Data Science or 36-208 Regression Analysis 9
or 70-208 Regression Analysis 9
36-303 Sampling, Survey and Society 9
36-309 Experimental Design for Behavioral & Social Sciences 9
70-257 Optimization for Business 9
80-305 Decision Theory 9
80-405 Game Theory 9
84-265 Political Science Research Methods 9
88-251 Empirical Research Methods 9
88-221 Analytical Foundations of Public Policy 9
88-223 Decision Analysis 12
88-300 Programming and Data Analysis for Social Scientists 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.

Ethics, History, and Public Policy Sample Curriculum

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Senior Year</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
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<tr>
<td>Core requirement in Economics</td>
<td>Core requirement in History or Philosophy</td>
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<td>Core requirement in History or Philosophy</td>
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<tr>
<td>Core requirement in History or Philosophy</td>
<td>Fifth Course (open)</td>
</tr>
</tbody>
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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
Randy S. Weinberg, Faculty Program Director
Location: Porter Hall 224C, rweinberg@cmu.edu
Carole Young, Program Advisor
Location: 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/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/informationsystems/).

The Major in Linguistics
Patrick Doyle, Academic Program Manager
Location: Baker Hall 161G
pdoyle2@andrew.cmu.edu
https://go.oncehub.com/PatDoyle (https://go.oncehub.com/PatDoyle/)
Linguistics is the scientific study of human language. The central goal of the Linguistics Major is to provide students with the analytical skills and linguistic concepts needed to understand language scientifically, whether formally, as researchers, or informally, as participants in daily linguistic interactions. The foundation of the Linguistics Major is a set of rigorous core courses, informed by contemporary approaches to the study of linguistic form and meaning. The Core courses cover the principal domains of linguistic analysis: phonetics and phonology, syntax, and meaning. Students then move on to the Extended Core, which includes more advanced courses as well as courses on a wider range of topics, such as intonation and language variation. These courses are supplemented by a wide-ranging set of electives including linguistically relevant courses taught in other departments. Primary majors complete their course of study with a Senior Thesis, a semester-long research project carried out independently with one-on-one guidance from a member of the linguistics faculty.

Curriculum
The Linguistics primary major requires a total of 12 courses plus a senior thesis. The Linguistics additional major requires a total of 13 courses (senior thesis not required). This includes 2 semesters of sequential language study for all majors. 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.

Linguistics Core (36 units)
Complete the following requirements.
appropriate courses are offered irregularly or on a one-off basis. The approved by the Academic Program Manager as a linguistics elective. Listed Additional majors choose
Primary majors choose
Electives
Students must successfully complete 2 semesters of foreign language study
in a single language (e.g. 100 & 200 level).

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

**LANGUAGE REQUIREMENT**
Students must successfully complete 2 semesters of foreign language study in a single language (e.g. 100 & 200 level).

**Electives**
Primary majors choose three additional electives (27 or more units). Additional majors choose four additional electives (36 or more units).
Primary majors: see thesis requirement below.
These Electives can be additional courses from the Core or Extended Core courses listed above, the electives list below, or any other course which is approved by the Academic Program Manager 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 Academic Program Manager 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.

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

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

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

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

**Language Technologies Institute**
11-411 Natural Language Processing 12
11-492 Speech Processing 12

**Note:** all 11-xxx courses have significant Computer Science prerequisites. Interested students should check with the course instructor and with the Linguistics Academic Program Manager before registering.

**SENIOR THESIS [PRIMARY MAJORS ONLY]**
Primary majors must complete a senior thesis (a workload equivalent to a 12-semester course). 80-595 Senior Thesis. Topics must be approved by an advisor, who will work with the student and guide the thesis project. Students are responsible for identifying their topic and securing their thesis advisor. Students should work with the Academic Program Manager of the major to begin the process of identifying their thesis topic and advisor during the fall of their senior year. Students will be required to submit a written proposal of their thesis project, signed by their thesis faculty advisor, before the end of the semester preceding that in which the thesis research will be conducted...

**Additional Major in Linguistics**
The Linguistics additional major requires a total of 13 courses. This includes 2 semesters of language study for all majors. At least three courses (not including specific language courses) must be at the 300-level or higher. Additional majors are not required to write a thesis but must take four electives (36 or more units). 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. If you are interested in obtaining an additional major in Linguistics, please reach out to the Academic Program Manager, Philosophy Department.

**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 Psychology.

**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/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/department/psychology/psybiotext) section of the Catalog.

**Student-Defined Major Program**
Joseph E. Devine, Director and Associate Dean for Undergraduate Studies
Location: Baker Hall 154F
jdox@andrew.cmu.edu

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.

**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.