

# Department of Social and Decision Sciences

Location: Porter Hall 208  
www.cmu.edu/dietrich/sds (<http://www.cmu.edu/dietrich/sds/>)

The Department of Social and Decision Sciences is a multidisciplinary department that offers undergraduate programs that focus on decision making using a broad set of social science approaches. Theoretical and empirical work is seamlessly combined with the practical skills needed to excel in key decision making roles in the public, private, and non-profit sectors and in advanced graduate studies. Our students learn how to combine standards of rationality with the realities of human and organizational behavior and to apply these lessons across a wide variety of endeavors, ranging from government service to leadership positions consulting, marketing, data science, and other sectors.

The department offers undergraduate majors in Behavioral Economics, in Decision Science, and in Policy and Management. Each major includes a distinct set of required and elective courses. Course offerings leverage faculty strength in behavioral decision making, behavioral economics, and behavioral science approaches to public policy to produce a unique curriculum.

Our faculty is committed to the academic success and growth of our students and many of our undergraduates work with faculty on research projects and internships. The directors of the majors are easily accessible and encourage students to talk with them about their curriculum, progress, and available opportunities. Our academic advisors are committed to working with each individual student to help them create, clarify, and meet their goals.

The Department of Social and Decision Sciences has long been recognized as a global nexus of decision science expertise, offering undergraduate programs that are available at few other universities. Our cohesive majors combine theory and practice allowing our graduates to excel in a range of professions or in the pursuit of advanced studies.

## The Major in Behavioral Economics

Peter Schwardmann, *Faculty Director*

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The field of Behavioral Economics (BE) integrates perspectives from Economics and Psychology to better understand how people make consequential decisions and to leverage this understanding to improve the design of the policies, programs, and institutions that govern such behavior. The last decade has witnessed an explosion of interest in BE among governments and organizations, around the world, including here in the United States. On the policy front, this has led to the formation of government “nudge” units charged with applying BE principles to policy areas such as education, criminal justice, taxation, social benefit programs, consumer protection, and unemployment. Organizations have also aggressively sought to apply BE to encourage employee productivity, improve employee health and financial wellness, reshape managerial and hiring decisions, and to better understand and engage consumers.

The faculty in the Department of Social and Decision Sciences (SDS) has long stood at the forefront of research and teaching in BE. Our faculty has developed a reputation for working closely with governments and firms to help apply BE to address a range of issues such as predatory lending and consumer protection, bias among institutional investors, employee reward and incentive programs, behavioral barriers to retirement savings, participation in social service programs, medical adherence, pre-trial detainment of defendants, and gender and racial inequality in the workplace.

The new major of BE-- the first of its kind among US undergraduate institutions--was designed to rigorously train students in the field of Behavioral Economics and to encourage them to critically consider its relevance to policy and organizations. The major emphasizes both theory and the practical promise of BE to solve problems of importance to policy makers and organizations through the largest undergraduate selection of BE courses of any university in the world. Towards this end, students will learn to collect original data, design field and laboratory experiments, analyze data and draw causal inferences, and develop interventions to improve economic outcomes and decisions. The core requirements include

courses in Economics, Psychology, Behavioral Economics, and quantitative methods- including experimental design and econometrics. Students who complete the major will be well positioned to enter the private sector in a role involving data or people analytics, marketing, corporate strategy, or human resources, to enter the public sector, or to enter a wide range of graduate degree programs.

## Prerequisites

All Behavioral Economics majors must complete mathematics and statistics prerequisites (see below), by the end of the sophomore year.

Mathematics Prerequisite	Units
21-111-21-112 Calculus I-II or 21-120 Differential and Integral Calculus	10-20
Statistics Prerequisite	Units
36-200 Reasoning with Data	9

## Curriculum

The core curriculum in Behavioral Economics consists of three Behavioral Economics courses, two Economic courses, two Psychology courses, three quantitative courses, and one project course.

Behavioral Economics Courses	Units
88-360 Behavioral Economics	9
88-365 Behavioral Economics and Public Policy	9
88-367 Behavioral Economics & Field Experiments in Organizations	9
	<b>27</b>

Economics Courses	Units
73-102 Principles of Microeconomics or 73-104 Principles of Microeconomics Accelerated	9
Second-Level Economics Course*	
88-221 Markets, Democracy, and Public Policy or 73-103 Principles of Macroeconomics or 73-155 Models, Math, and Markets or 73-230 Intermediate Microeconomics or 73-328 Health Economics or 73-347 Game Theory Applications for Economics and Business or 73-359 Benefit-Cost Analysis or 73-408 Law and Economics or 73-421 Emerging Markets or 73-427 Sustainability, Energy, and Environmental Economics	9
	<b>18</b>

\* Second-Level Economics course CANNOT double count with the Economics Elective course.

Psychology Courses*	Units
88-120 Reason, Passion and Cognition **	9
88-130 Behavioral Economics for Life or 88-302 Behavioral Decision Making	9
	<b>18</b>

\* Students can elect to take **88-120 Reason, Passion and Cognition & 88-130 Behavioral Economics for Life OR 88-120 Reason, Passion and Cognition & 88-302 Behavioral Decision Making**.  
**PLEASE NOTE:** Students who have completed **88-302 Behavioral Decision Making OR 88-360 Behavioral Economics** cannot take **88-130 Behavioral Economics for Life**.  
\*\* 88-120 Should be taken in the first or sophomore year.

Quantitative Methods Courses	Units
36-202 Methods for Statistics & Data Science	9
88-251 Empirical Research Methods	9

88-252	Causal Inference: from Data to Decisions	9
or 73-274	Econometrics I	

**27**

Senior Project Course	Units	
88-453	Behavioral Economics Capstone	9

**9****ELECTIVES 36 units**

Complete at least 27 units from the following categories. Students MUST take one elective from the Economics category, and another from the Behavioral Economics category. The third elective may be chosen from either the Behavioral Economics or Psychology categories. Note that not all elective courses are offered every year.

Economics*	Units	
88-323	Policy in a Global Economy	9
73-103	Principles of Macroeconomics	9
73-155	Models, Math, and Markets	9
73-230	Intermediate Microeconomics **	9
73-328	Health Economics	12
73-347	Game Theory Applications for Economics and Business	9
73-359	Benefit-Cost Analysis	9
73-408	Law and Economics	9
73-421	Emerging Markets ***	9
73-427	Sustainability, Energy, and Environmental Economics	9

\* ANY 73-3XX or 73-4XX courses be counted as an economic elective course. Consult the Academic Advisor for more information about this process. NOTE: The Economics Elective course CANNOT double count with the Second-Level Economics core requirement.

\*\* Requires additional Math beyond 21-112 or 21-120.

\*\*\*73-421 has a required prerequisite of 73-103 Principles of Macroeconomics, which is NOT a course requirement for the BE major.

Behavioral Economics	Units	
88-234	Negotiation: International Focus	9
88-235	Negotiation: Strategies and Behavioral Insights	9
88-255	Strategic Decision Making	9
88-261	Health Policy and Decision Making	9
88-275	Bubbles: Data Science for Human Minds	9
88-300	Programming and Data Analysis for Social Scientists	9
88-366	Behavioral Economics of Poverty and Development	9

Psychology	Units	
88-230	Human Intelligence and Human Stupidity	9
88-231	Thinking in Person vs. Thinking Online	9
88-285	Deconstructing and Dismantling Discrimination	9
88-290	Confessions, Lies, and Gossip	9
88-344	Systems Analysis: Environmental Policy	9
88-312	Decision Models and Games	9
70-311	Organizational Behavior	9
70-385	Consumer Behavior *	9
70-443	Digital Marketing and Social Media Strategy	9
85-350	Psychology of Prejudice	9
85-358	Pro-Social Behavior	9
85-375	Crosscultural Psychology	9
85-377	Attitudes and Persuasion	9
85-442	Health Psychology	9
85-446	Psychology of Gender	9

\* 70-385 has a required prerequisite of 70-381 Marketing 1, which is NOT a course requirement for the BE major.

Note: Some courses have additional prerequisites.

## Behavioral Economics, B.S. Sample Curriculum

First-Year		Second-Year	
Fall	Spring	Fall	Spring
88-120 Reason, Passion and Cognition*	36-202 Methods for Statistics & Data Science	88-251 Empirical Research Methods	88-252 Causal Inference: from Data to Decisions
21-120 Differential and Integral Calculus	Second-Level Economics Course Pick One (88-221, 73-103, 73-155, 73-230 (requires Math beyond 21-112/21-120), 73-328, 73-347, 73-359, 73-408, 73-421, 73-427)	88-360 Behavioral Economics	88-302 Behavioral Decision Making
36-200 Reasoning with Data	Pick One (Grand Challenge Seminar, First Year Writing, Disciplinary Perspectives: Humanities)	88-365 Behavioral Economics and Public Policy	88-367 Behavioral Economics & Field Experiments in Organizations
73-102 Principles of Microeconomics Or 73-104 Principles of Microeconomics Accelerated	Pick One (Grand Challenge Seminar, First Year Writing, Disciplinary Perspectives: Humanities)	Gen Ed or Elective	Behavioral Economics Elective
Pick One (Grand Challenge Seminar, First Year Writing, Disciplinary Perspectives: Humanities)	Gen Ed or Elective	Gen Ed or Elective	Gen Ed or Elective

Third-Year		Fourth-Year	
Fall	Spring	Fall	Spring
Economics Elective	Behavioral Economics or Psychology Elective	88-453 Behavioral Economics Capstone	Elective or Senior Honors Thesis**
Gen Ed or Elective	Gen Ed or Elective	Elective	Elective
Gen Ed or Elective	Elective	Elective	Elective
Elective	Elective	Elective	Elective
Elective	Elective	Elective	Elective

\* Should be taken as the first course in Behavioral Economics major sequence. It is intended for students in their first or second year. It may be taken as late as the junior year.

\*\* Senior Honors Thesis may be substituted in the Spring term for 88-453 Behavioral Economics Capstone, which is only offered in the Fall term.

This is presented as a recommended plan for completing major requirements. The major can be completed in as few as two years (not that it must be), but students may not have time for other opportunities such as additional majors or study abroad. Students may declare their major as early as the third week of the spring semester in the first-year. Students who are planning to attend the Washington Semester Program, to study abroad, to apply for the Heinz Accelerated Masters Program, or to pursue an additional major/minor may have a very different curriculum map and should consult early – and often – with the Behavioral Economics Academic Advisor.

## Additional Major

Students who elect Behavioral Economics as an additional major must fulfill all of the requirements of the Behavioral Economics major.

Additional majors cannot count BE electives toward simultaneously fulfilling requirements for another major or minor. Students who are interested in an additional major in Behavioral Economics should consult the Behavioral Economics Academic Advisor for guidance.

Students pursuing Decision Science with an additional major in Behavioral Economics may only count 36-202, 73-102, 88-120, 88-251 and 88-302 toward the completion of both majors.

Students pursuing Policy and Management with an additional major in Behavioral Economics may only count 36-202, 73-102 and 88-251 toward the completion of both majors.

## The Major in Decision Science

Peter Schwardmann, *Faculty Director*

Location: Porter Hall 319F  
 schwardmann@cmu.edu (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/departmentofsocialanddecisionssciences/schwardmann@cmu.edu>)

Lizzy Stoye, *Senior Academic Advisor*  
 Advises Primary Majors in Decision Science  
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 Schedule an appointment: <https://go.oncehub.com/LizzyStoye> (<https://go.oncehub.com/LizzyStoye/>)

Connie Angermeier, *Senior Academic Program Manager*  
 Advises BHA, All Transfer Students, Additional Majors, and Minors in Decision Science  
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The interdisciplinary field of Decision Science seeks to understand and improve the judgment and decision making of individuals, groups, and organizations. Qualified graduates can continue to PhD programs in Decision Science or related fields (e.g., psychology, business), pursue professional degrees (e.g., MBA, MD, JD, MPH), or take professional positions in business, government, consulting, or the non-profit sector. Students work with faculty and the Academic Advisor to tailor their education to their personal needs and interest.

Carnegie Mellon is one of the leading centers for the study of Decision Science - and offers the only undergraduate major that integrates analytical and behavioral approaches to decision making. Our faculty are involved in applying Decision Science in a wide variety of areas, allowing them to share practical experiences with students. These applications include use of decision aids (e.g., effects on cognitive processes of using technology), medical decision making (e.g., harnessing decision principles to design interventions to promote healthy behavior), risk management (e.g., assessing and communicating the risks of climate change), marketing (e.g., understanding the effects of inter-temporal choice on purchasing decisions), and business (e.g., identifying unrecognized conflicts of interest).

Decision Science is grounded in theories and methods drawn from psychology, economics, philosophy, statistics, and management science. Courses in the major cover the three aspects of decision science: (a) normative analysis, creating formal models of 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, Decision Science majors gain broadly applicable skills in research design and analysis and in application of research findings to behavioral problems in consumer, organizational, and public policy arenas..

The core courses present fundamental theories and results from the study of decision making, along with their application to real-world problems. They introduce students to methods for collecting and analyzing behavioral data. For example, students learn to conduct surveys (e.g., uncovering consumer or managerial preferences), design experiments (e.g., evaluating theories, comparing ways of presenting information), and evaluate the effectiveness of interventions.

The elective courses provide students with additional knowledge in areas of decision making that meet their personal, intellectual, and career goals. These courses are organized into six clusters: biological and behavioral aspects of decision making, managerial and organizational aspects, philosophical and ethical perspectives, economic and statistical methods, public policy, and research methods. Students can concentrate in one area or spread their studies across them. In addition to coursework, the department offers research opportunities for interested and qualified students. Participating in research helps students to extend their mastery of decision science, discover whether a research career is right for them, and get to know faculty and graduate students better.

## Prerequisites

All Decision Science majors must complete mathematics, statistics, and analytic methods prerequisites (see below), by the end of the sophomore year.

Mathematics Prerequisite	Units
21-111-21-112 Calculus I-II	10-20
or 21-120 Differential and Integral Calculus	
Statistics Prerequisite	Units
36-200 Reasoning with Data	9

Students must take one course from the following set (or an approved alternative). Students may not count a course used to fulfill the Mathematics Prerequisite as also filling the Analytic Methods Prerequisite. Students may not count a course used to fulfill the Analytic Methods Prerequisite as also filling a Decision Science elective.

Analytic Methods Prerequisite	Units
21-122 Integration and Approximation	10
or 21-256 Multivariate Analysis	
or 21-257 Models and Methods for Optimization	
or 36-309 Experimental Design for Behavioral & Social Sciences	
or 36-401 Modern Regression	
or 36-410 Introduction to Probability Modeling	
or 80-210 Logic and Proofs	
or 80-211 Logic and Mathematical Inquiry	
or 80-315 Logics for Knowledge and Belief	
or 88-252 Causal Inference: from Data to Decisions	
or 88-300 Programming and Data Analysis for Social Scientists	

## Curriculum

The core curriculum in Decision Science consists of five courses providing the theoretical perspectives of Decision Science, two courses in research methods, and one capstone.

Theoretical Perspectives	Units
73-102 Principles of Microeconomics	9
or 73-104 Principles of Microeconomics Accelerated	
85-102 Introduction to Psychology	9
88-120 Reason, Passion and Cognition *	9
88-223 Decision Analysis	12
88-302 Behavioral Decision Making	9
	<b>48</b>

\* 88-120 should be taken in the freshman or sophomore year.

Statistical Research Methods (select one course)*	Units
36-202 Methods for Statistics & Data Science	9
or 36-309 Experimental Design for Behavioral & Social Sciences	
or 85-309 Statistical Concepts and Methods for Behavioral and Social Science	

**\* Be sure to consult with your Decision Science advisor to discuss which course will best fit your plans and goals.**

SDS Research Methods	Units
88-251 Empirical Research Methods	9
	<b>9</b>

## Electives 45 units

Complete at least 45 units of courses from the following list. Note that additional courses (most typically 88xxx courses) are occasionally added.

**For the most up to date list of approved electives (and additional information about the courses), see the SDS website (<https://www.cmu.edu/dietrich/sds/undergraduate/>).**

Although the Decision Science major doesn't explicitly require students to take a capstone course, students who want to have real-world, professional experience should register for 88-454 Decision Science Capstone (this will count as one of the electives).

At least three of these courses (27 units) must be Department of Social and Decision Sciences courses (88-xxx) from the approved list.

88-150 Managing Decisions	9
88-221 Markets, Democracy, and Public Policy	9
88-230 Human Intelligence and Human Stupidity	9
88-231 Thinking in Person vs. Thinking Online	9
88-234 Negotiation: International Focus	9
88-235 Negotiation: Strategies and Behavioral Insights	9
88-252 Causal Inference: from Data to Decisions *	9
88-261 Health Policy and Decision Making	9
88-262 Medical Decision Making	9
88-275 Bubbles: Data Science for Human Minds	9
88-285 Deconstructing and Dismantling Discrimination	9
88-290 Confessions, Lies, and Gossip	9

88-300	Programming and Data Analysis for Social Scientists	9
88-312	Decision Models and Games	9
88-342	The Neuroscience of Decision Making	9
88-344	Systems Analysis: Environmental Policy	9
88-360	Behavioral Economics	9
88-365	Behavioral Economics and Public Policy	9
88-366	Behavioral Economics of Poverty and Development	9
88-367	Behavioral Economics & Field Experiments in Organizations	9
88-372	Social and Emotional Brain	9
88-379	Data-Driven Decision Analysis	9
88-451	Policy Analysis Senior Project	12
88-452	Policy Analysis Senior Project	12
88-454	Decision Science Capstone	9
70-311	Organizational Behavior	9
70-332	Business, Society and Ethics	9
70-381	Marketing I	9
70-443	Digital Marketing and Social Media Strategy	9
70-460	Mathematical Models for Consulting	9
73-265	Economics and Data Science	9
80-221	Philosophy of Social Science	9
80-324	Philosophy of Economics	9
84-369	Decision Science for International Relations	9
85-375	Crosscultural Psychology	9
85-442	Health Psychology	9

Note: Some courses have additional prerequisites.

### Decision Science, B.S. Sample Curriculum

First-Year		Second-Year	
Fall	Spring	Fall	Spring
88-120 Reason, Passion and Cognition *	36-202 Methods for Statistics & Data Science	85-102 Introduction to Psychology	88-223 Decision Analysis
36-200 Reasoning with Data	Pick One (Grand Challenge Seminar, FYW, Disciplinary Perspectives: Humanities)	88-251 Empirical Research Methods	88-302 Behavioral Decision Making
21-120 Differential and Integral Calculus (or 21-111, depending on placement)	Pick One (Grand Challenge Seminar, FYW, Disciplinary Perspectives: Humanities)	88-252 Causal Inference: from Data to Decisions or other Analytic Methods course	88-300 Programming and Data Analysis for Social Scientists or other Analytic Methods course
Pick One (Grand Challenge Seminar, FYW, Disciplinary Perspectives: Humanities)	Gen Ed or Elective	Gen Ed or Elective	Decision Science Elective
73-102 Principles of Microeconomics	Gen Ed or Elective	Gen Ed or Elective	Gen Ed or Elective
			Gen Ed or Elective

Third-Year		Fourth-Year	
Fall	Spring	Fall	Spring
Decision Science Elective	Decision Science Elective	Senior Honors Thesis or Elective	Senior Honors Thesis or Elective
Gen Ed or Elective	Gen Ed or Elective	Capstone or Decision Science Elective	Decision Science Elective
Elective	Elective	Elective	Elective
Elective	Elective	Elective	Elective
Elective	Elective	Elective	Elective

\* 88-120 should be taken as the first course in the Decision Science sequence. It is intended for students in their first or second year; it is offered in Fall and Spring semesters. It may be taken as late as the junior year.

This is presented as a recommended plan for completing major requirements. The major can be completed in as few as two years (not that it must be), but students may not have time for other opportunities such as additional majors or study abroad. Students may declare their major as early as the third week of the spring semester in the first year. Students who are planning to attend the Washington Semester Program, to study abroad, to apply for the Heinz Accelerated Masters Program, or to pursue an additional major/minor may have a very different curriculum map and

should consult early – and often – with the Decision Science Academic Advisor.

Students are encouraged to consider the Washington Semester Program as part of their education. Suitable courses will be considered as fulfilling requirements of electives in the major. Please send the course syllabus, along with a note explaining how the course addresses fundamental aspects of decision science in one of the six elective categories.

### Additional Major in Decision Science

Students who elect Decision Science as an additional major must fulfill all of the requirements of the Decision Science major.

Students pursuing Behavioral Economics with an additional major in Decision Science may only count 36-202, 73-102, 88-120, 88-251 and 88-302 toward the completion of both majors.

Students pursuing Policy and Management with an additional major in Decision Science and may only count 36-202, 73-102, 88-223, and 88-251 toward the completion of both majors.

Additional majors cannot count menu electives toward simultaneously fulfilling more than one major or minor. Students who are interested in an additional major in Decision Science should see the Academic Advisor of the Decision Science program.

### The Major in Policy and Management

Peter Schwardmann, *Faculty Director*

Location: Porter Hall 319F

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Connie Angermeier, *Senior Academic Program Manager and Advisor*

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Schedule an appointment: <https://go.oncehub.com/ConnieAngermeier> (<https://go.oncehub.com/ConnieAngermeier>)

The Policy and Management major prepares students for key decision-making and management roles in government, non-profit organizations, and business. The major emphasizes analytical approaches to decision making, practical management skills, and empirical techniques necessary for graduates to excel in the public and private sectors. The multidisciplinary curriculum merges frontier knowledge on the ideals of decision making, policy, and data analysis, as well as the realities of individual behavior within various institutional settings that must be confronted if high-quality outcomes are to be attained.

The major is comprised of three required core areas taken by all Policy and Management majors, a capstone course, plus one of four concentration areas to be chosen by the student.

The three core areas are as follows:

The *Policy Core* gives students applied economic training and policy analysis experience. Students will gain an analytical understanding of some of the biggest domestic and global economic policy challenges, and gain an appreciation of the economic analysis of complex decisions, as well as the trade-off between economic and political-based decision making.

The *Management Core* focuses on real-world applications of decision making. Students will develop an understanding of effective negotiation strategies and tactics, and identify the barriers and the psychological factors that may prevent decision-makers from reaching wise agreements. The courses provide systematic methods for dealing with the complexities that make decisions difficult, ranging from incorporating issues of risk and uncertainty in decision making to dealing with choices that have mutually conflicting objectives. For example, a business or government agency may need to decide on a policy for mitigating the uncertain impacts of air pollution while simultaneously trying to minimize the costs of such a policy on manufacturing. A firm might want to consider the uncertain reductions in security dangers from alternative policies to protect against terrorism.

The *Empirical Core* focuses on key methods for collecting and analyzing data that are needed to make informed decisions. Students learn to use interviews, surveys, experiments, and econometric methods to enhance their ability to test existing, and design new, policies. Students will create statistical models to address questions asked in conceptual, computational, and data-driven investigations.

The required *Capstone* course gives students hands-on experience in a policy-related area. Students work in teams to apply the research and analytical methods learned in their other courses to a real-world problem.

Finally, the *four concentration areas* consist of four courses chosen by the student, in coordination with the Academic Advisor. The concentrations emphasize different aspects of decision making within the major: (1) Analytics, (2) Policy, (3) Management, and (4) Law. Each of the concentration areas draws upon the research and teaching strength of the Department of Social and Decision Sciences. Additionally, select courses from other areas in the University have been identified and approved as fulfilling elective requirements within the concentrations. More detail will be found in the concentration areas below.

The Policy and Management major provides an excellent combination of theoretical and practical skills for students who intend to seek managerial positions. Because of its strong analytic orientation, it is also an excellent major for those who intend to go on to professional school programs in law, business, or public policy. It is also an appropriate choice for students pursuing graduate degrees in economics, political science, or decision science. One such graduate option is the accelerated master's program offered by the H. J. Heinz III School of Public Policy and Management, in which a student earns both a B.S. in Policy and Management and a M.S. in Public Policy and Management in five years.

### Prerequisites

All Policy and Management majors must complete mathematics and statistics prerequisites (see below), by the end of the sophomore year.

Mathematics Prerequisite	Units
21-111-21-112 Calculus I-II or 21-120 Differential and Integral Calculus	10-20
Statistics Prerequisite	Units
36-200 Reasoning with Data	9

### Curriculum

Policy Core	Units
73-102 Principles of Microeconomics or 73-104 Principles of Microeconomics Accelerated	9
88-221 Markets, Democracy, and Public Policy	9
	<b>18</b>
Management Core	Units
88-150 Managing Decisions or 88-255 Strategic Decision Making	9
88-223 Decision Analysis	12
88-235 Negotiation: Strategies and Behavioral Insights or 88-234 Negotiation: International Focus	9
	<b>30</b>
Empirical Core	Units
36-202 Methods for Statistics & Data Science	9
88-251 Empirical Research Methods	9
88-252 Causal Inference: from Data to Decisions or 88-275 Bubbles: Data Science for Human Minds	9
	<b>27</b>
Capstone	
88-451 Policy Analysis Senior Project or 88-452 Policy Analysis Senior Project (88452 is offered in fall, 88451 in spring)	12

### Concentration 36 units

Complete at least 36 units (a minimum of four courses) from the following concentrations of courses. Students are required to declare a concentration before their graduating semester, but are not required to choose a concentration when they initially declare (typically in the freshman or sophomore year). In fact, students are encouraged to take many of the core classes before making their concentration selection so that they can make a well-informed decision.

1. Analytics Concentration (minimum four total courses)	Units
<b>Programming (one course)</b>	<b>9</b>
88-300 Programming and Data Analysis for Social Scientists	9
<b>Analytics/Empirical electives (select any two courses)</b>	<b>18</b>
88-252 Causal Inference: from Data to Decisions (if not taken in Empirical Core)	9

88-275 Bubbles: Data Science for Human Minds (if not taken in Empirical Core)	9
88-312 Decision Models and Games	9
88-379 Data-Driven Decision Analysis	9
36-303 Sampling, Survey and Society	9
36-315 Statistical Graphics and Visualization	9
70-257 Optimization for Business	9
70-374 Data Mining & Business Analytics	9
70-455 Data Management Fundamentals	9
70-460 Mathematical Models for Consulting	9
90-834 Health Care Geographical Information Systems *	12
<b>Analytics concentration breadth elective (select one course from any of the other three concentrations; must be 88xxx)</b>	<b>9</b>

\* other Heinz courses may also be approved. Please talk with the P&M advisor for information about getting approval for Heinz course registration.

2. Policy Concentration (minimum four total courses)	Units
<b>Policy electives (select three courses; at least one of the three must be 88xxx)</b>	<b>27</b>
88-230 Human Intelligence and Human Stupidity	9
88-261 Health Policy and Decision Making	9
88-285 Deconstructing and Dismantling Discrimination	9
88-323 Policy in a Global Economy	9
88-344 Systems Analysis: Environmental Policy	9
88-365 Behavioral Economics and Public Policy	9
88-366 Behavioral Economics of Poverty and Development	9
88-367 Behavioral Economics & Field Experiments in Organizations	9
88-411 Rise of the Asian Economies	9
36-303 Sampling, Survey and Society	9
73-328 Health Economics	12
80-244 Environmental Ethics	9
84-362 Diplomacy and Statecraft	9
84-389 Terrorism and Insurgency	9
90-443 Urban and Regional Economic Development *	12
<b>Policy concentration breadth elective (select one course from any of the other three concentrations; must be 88xxx)</b>	<b>9</b>

\* other Heinz courses may also be approved. Please talk with the P&M advisor for information about getting approval for Heinz course registration.

3. Management Concentration (minimum four total courses)	Units
<b>Management electives (select three courses; at least one of the three must be 88xxx)</b>	<b>27</b>
88-231 Thinking in Person vs. Thinking Online	9
88-234 Negotiation: International Focus (if not taken in Management Core)	9
88-235 Negotiation: Strategies and Behavioral Insights (if not taken in Management Core)	9
88-341 Team Dynamics and Leadership	9
88-411 Rise of the Asian Economies	9
70-311 Organizational Behavior	9
70-332 Business, Society and Ethics	9
70-342 Managing Across Cultures	9
70-371 Operations Management	9
70-381 Marketing I	9
70-430 International Management	9
94-408 Management Consulting	12
94-423 Measuring Social *	12
<b>Management concentration breadth elective (select one course from any of the other three concentrations; must be 88xxx)</b>	<b>9</b>

\* other Heinz courses may also be approved. Please talk with the P&M advisor for information about getting approval for Heinz course registration.

4. Law Concentration (minimum four total courses)	Units
<b>Topics of Law (select one course)</b>	<b>9</b>
88-281 Topics in Law: 1st Amendment	9
88-284 Topics in Law: The Bill of Rights	9
<b>Law electives (select any two courses)</b>	<b>18</b>

88-281	Topics in Law: 1st Amendment (if not used in required)	9
88-284	Topics of Law: The Bill of Rights (if not used in required)	9
70-364	Business Law	6
70-365	International Trade and International Law	9
73-408	Law and Economics	9
76-219	Law & Blame	9
76-450	Law, Culture, and the Humanities	9
76-475	Law, Performance, and Identity	9
79-360	Crime, Policing, and the Law: Historical and Contemporary Perspectives	9
80-447	Global Justice	9
84-373	Emerging Technologies and International Law	9
<b>Law concentration breadth elective (select one course from any of the other three concentrations; must be 88xxx)</b>		<b>9</b>

NOTE: Some courses have additional prerequisites.

### Policy and Management, B.S. Sample Curriculum

First-Year		Second-Year	
Fall	Spring	Fall	Spring
88-150 Managing Decisions or 88-255 in spring	88-255 Strategic Decision Making or 88-150 in fall	88-235 Negotiation: Strategies and Behavioral Insights or 88-234 in spring	88-221 Markets, Democracy, and Public Policy
36-200 Reasoning with Data	36-202 Methods for Statistics & Data Science	88-251 Empirical Research Methods	88-223 Decision Analysis
21-120 Differential and Integral Calculus (or 21-111, depending on placement)	73-102 Principles of Microeconomics	88-252 Causal Inference: from Data to Decisions or 88-275 in spring	88-234 Negotiation: International Focus or 88-235 in fall
Pick One (Grand Challenge Seminar, FYW, Disciplinary Perspectives: Humanities)	Pick One (Grand Challenge Seminar, FYW, Disciplinary Perspectives: Humanities)	Gen Ed or Elective	88-275 Bubbles: Data Science for Human Minds or 88-252 in fall
Gen Ed or Elective	Pick One (Grand Challenge Seminar, FYW, Disciplinary Perspectives: Humanities)	Gen Ed or Elective	Gen Ed or Elective

Third-Year		Fourth-Year	
Fall	Spring	Fall	Spring
Policy & Management concentration elective	Policy & Management concentration elective	88-452 Policy Analysis Senior Project or 88-451 in spring	88-451 Policy Analysis Senior Project or 88-452 in fall
Policy & Management concentration elective	Policy & Management concentration elective	Senior Honors Thesis or Elective	Senior Honors Thesis or Elective
Gen Ed	Elective	Complete remaining gen eds/electives	Complete remaining gen eds/electives
Elective	Elective	additional Policy & Management concentration electives	additional Policy & Management concentration electives
Elective	Elective	additional Policy & Management concentration electives	additional Policy & Management concentration electives
Students may consider the CMU Washington Semester Program or study abroad in this semester	Students may consider the CMU Washington Semester Program or study abroad in this semester		

This is presented as a recommended plan for completing major requirements. Students may declare their major as early as the third week of the spring semester in the first year. Students who are planning to attend the Washington Semester Program, to study abroad, to apply for the Heinz Accelerated Masters Program, or to pursue an additional major/minor may have a very different curriculum map and should consult early - and often - with the Policy and Management Academic Advisor.

Students are encouraged to consider the Washington Semester Program as part of their education. Suitable courses may be considered as fulfilling requirements of concentration electives in the major. Please discuss course selections with the Academic Advisor during the application phase to the program.

### Additional Major

Students who elect Policy and Management as an additional major must fulfill all of the requirements of the Policy and Management major. For additional majors in Policy and Management, courses taken as concentration electives may not count toward the student's primary major or other program.

Students pursuing Behavioral Economics, Policy, and Organizations with an additional major in Policy and Management may only count 36-202, 73-102, and 88-251 (and 88-252, if taken in Empirical Core) toward the completion of both majors.

Students pursuing Decision Science with an additional major in Policy and Management may only count 36-202, 73-102, 88-223, and 88-251 toward the completion of both majors.

Additional majors cannot count menu electives toward simultaneously fulfilling more than one major or minor. Students who are interested in an additional major in Policy and Management should see the Academic Advisor of the Policy and Management program.

### The Minor in Behavioral Economics

Peter Schwardmann, *Faculty Director*

Location: Porter Hall 319F

schwardmann (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/departmentsocialanddecisionsciences/schwardmann@cmu.edu>)@andrew.cmu.edu (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/departmentsocialanddecisionsciences/schwardmann@cmu.edu>)

Lizzy Stoye, *Senior Academic Advisor*

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The minor in Behavioral Economics, provides students with a selective survey of disciplinary perspectives. The field of Behavioral Economics (BE) integrates perspectives from Economics and Psychology to better understand how people make consequential decisions and to leverage this understanding to improve the design of the policies, programs, and institutions that govern such behavior. The core requirements include courses in Economics, Psychology, Behavioral Economics, and quantitative methods- including experimental design and econometrics. Students who elect Behavioral Economics as a minor must complete the six core courses and one elective from the elective set (below).

Students may double-count two courses with another major or minor. 73-102 is excluded from this double count policy. The prerequisite course of 36-200 (or its equivalent) is also excluded.

#### Curriculum

The core curriculum in Behavioral Economics consists of one quantitative course, two Economic courses, one Psychology course, and two Behavioral Economics courses.

## CURRICULUM

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## Core Courses

54

Quantitative Methods Core		Units
36-202	Methods for Statistics & Data Science	9
Economics Core		Units
73-102	Principles of Microeconomics	9
	or 73-104 Principles of Microeconomics Accelerated	
Second-Level Economics Course		
88-221	Markets, Democracy, and Public Policy	9
	or 73-103 Principles of Macroeconomics	

- or 73-155 Models, Math, and Markets
- or 73-230 Intermediate Microeconomics
- or 73-328 Health Economics
- or 73-347 Game Theory Applications for Economics and Business
- or 73-359 Benefit-Cost Analysis
- or 73-408 Law and Economics
- or 73-421 Emerging Markets
- or 73-427 Sustainability, Energy, and Environmental Economics

**18**

Psychology Core	Units
88-120 Reason, Passion and Cognition	9

Behavioral Economics Core	Units
88-360 Behavioral Economics	9
88-367 Behavioral Economics & Field Experiments in Organizations *	9
or 88-365 Behavioral Economics and Public Policy	

**18**

\* Behavioral Economics core courses CANNOT double count with the elective course.

## Elective Courses 9

Complete at least one of the courses (9 units) from the following list. Note: Behavioral Economics core courses CANNOT double count with the elective course.

Elective Courses	Units
88-130 Behavioral Economics for Life *	9
88-221 Markets, Democracy, and Public Policy	9
88-230 Human Intelligence and Human Stupidity	9
88-231 Thinking in Person vs. Thinking Online	9
88-234 Negotiation: International Focus	9
88-235 Negotiation: Strategies and Behavioral Insights	9
88-251 Empirical Research Methods	9
88-252 Causal Inference: from Data to Decisions	9
88-255 Strategic Decision Making	9
88-261 Health Policy and Decision Making	9
88-275 Bubbles: Data Science for Human Minds	9
88-285 Deconstructing and Dismantling Discrimination	9
88-290 Confessions, Lies, and Gossip	9
88-300 Programming and Data Analysis for Social Scientists	9
88-302 Behavioral Decision Making	9
88-312 Decision Models and Games	9
88-323 Policy in a Global Economy	9
88-344 Systems Analysis: Environmental Policy	9
88-365 Behavioral Economics and Public Policy	9
88-366 Behavioral Economics of Poverty and Development	9
88-367 Behavioral Economics & Field Experiments in Organizations	9

Note: Some courses have additional prerequisites.

\* **PLEASE NOTE:** Students who have completed **88-302 Behavioral Decision Making** OR **88-360 Behavioral Economics** cannot take **88-130 Behavioral Economics for Life**.

## The Minor in Decision Science

Peter Schwardmann, *Faculty Director*

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The minor in Decision Science provides students with a selective survey of disciplinary perspectives. The courses present descriptive and normative approaches to judgment and decision making, as well as some application of theories and results to real-world problems. Students who elect Decision Science as a minor must complete the four core courses (below) and two electives from the elective set (below).

Students may double-count two courses with another major or minor.

### Curriculum 57 units

Core Courses	39 units
73-102 Principles of Microeconomics	9
or 73-104 Principles of Microeconomics Accelerated	
88-120 Reason, Passion and Cognition	9
88-223 Decision Analysis	12
88-302 Behavioral Decision Making	9

### Elective Courses 18 units

Complete two courses from the following list. At least one of the courses (9 units) must be a Social and Decision Sciences course (88-xxx) from the approved list. Note that additional courses (most typically 88xxx courses) are occasionally added. For the most up to date list of approved electives (and additional information about the courses), see the SDS website (<https://www.cmu.edu/dietrich/sds/undergraduate/>).

88-150 Managing Decisions	9
88-221 Markets, Democracy, and Public Policy	9
88-230 Human Intelligence and Human Stupidity	9
88-231 Thinking in Person vs. Thinking Online	9
88-234 Negotiation: International Focus	9
88-235 Negotiation: Strategies and Behavioral Insights	9
88-252 Causal Inference: from Data to Decisions	9
88-255 Strategic Decision Making	9
88-261 Health Policy and Decision Making	9
88-262 Medical Decision Making	9
88-275 Bubbles: Data Science for Human Minds	9
88-285 Deconstructing and Dismantling Discrimination	9
88-290 Confessions, Lies, and Gossip	9
88-300 Programming and Data Analysis for Social Scientists	9
88-312 Decision Models and Games	9
88-342 The Neuroscience of Decision Making	9
88-344 Systems Analysis: Environmental Policy	9
88-360 Behavioral Economics	9
88-365 Behavioral Economics and Public Policy	9
88-366 Behavioral Economics of Poverty and Development	9
88-367 Behavioral Economics & Field Experiments in Organizations	9

88-372 Social and Emotional Brain	9
88-379 Data-Driven Decision Analysis	9
88-451 Policy Analysis Senior Project	12
88-452 Policy Analysis Senior Project	12
88-454 Decision Science Capstone	9
70-311 Organizational Behavior	9
70-332 Business, Society and Ethics	9
70-443 Digital Marketing and Social Media Strategy	9
70-460 Mathematical Models for Consulting	9
73-365 Firms, Market Structures, and Strategy	9
80-221 Philosophy of Social Science	9
80-324 Philosophy of Economics	9
84-369 Decision Science for International Relations	9
85-375 Crosscultural Psychology	9

Note: Some courses have additional prerequisites.

## The Minor in Policy and Management

Peter Schwardmann, *Faculty Director*

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Regardless of major, many Carnegie Mellon graduates will face analytical and managerial challenges and responsibilities in their professional lives. Whether these are in their area of expertise or in more general settings, these roles will to some degree require assumption of the responsibility for directing the work of others. The Policy and Management minor is intended for students who expect to need these management concepts and skills.

Students may double-count one course with another major or minor.

### Curriculum 57 units

#### Required Courses 39 units

73-102	Principles of Microeconomics	9
or 73-104	Principles of Microeconomics Accelerated	
88-150	Managing Decisions	9
or 88-255	Strategic Decision Making	
88-221	Markets, Democracy, and Public Policy	9
88-223	Decision Analysis	12

#### 18 units Electives

Complete two courses (at least 18 units) from any of the concentrations (Analytics, Policy, Management, and Law). **Courses do not need to be taken from the same concentration.** The courses are listed by their concentration categories as a way to guide students. At least one of the courses (9 units) must be a Social and Decision Sciences course (88-xxx).

#### Analytics Concentration

88-252	Causal Inference: from Data to Decisions	9
88-275	Bubbles: Data Science for Human Minds	9
88-300	Programming and Data Analysis for Social Scientists	9
88-312	Decision Models and Games	9
88-379	Data-Driven Decision Analysis	9
36-303	Sampling, Survey and Society	9
36-315	Statistical Graphics and Visualization	9
70-257	Optimization for Business	9
70-374	Data Mining & Business Analytics	9
70-455	Data Management Fundamentals	9
70-460	Mathematical Models for Consulting	9
90-834	Health Care Geographical Information Systems *	12

\* other Heinz courses are also approved. Please talk with the P&M advisor for information about getting approval for Heinz course registration

#### Policy Concentration Units

88-230	Human Intelligence and Human Stupidity	9
88-261	Health Policy and Decision Making	9
88-285	Deconstructing and Dismantling Discrimination	9
88-323	Policy in a Global Economy	9
88-344	Systems Analysis: Environmental Policy	9
88-365	Behavioral Economics and Public Policy	9
88-366	Behavioral Economics of Poverty and Development	9
88-367	Behavioral Economics & Field Experiments in Organizations	9
88-411	Rise of the Asian Economies	9
36-303	Sampling, Survey and Society	9
73-328	Health Economics	12
80-244	Environmental Ethics	9
84-362	Diplomacy and Statecraft	9

84-389	Terrorism and Insurgency	9
90-443	Urban and Regional Economic Development	12

\* other Heinz courses are also approved. Please talk with the P&M advisor for information about getting approval for Heinz course registration

#### Management Concentration Units

88-231	Thinking in Person vs. Thinking Online	9
88-234	Negotiation: International Focus	9
88-235	Negotiation: Strategies and Behavioral Insights	9
88-341	Team Dynamics and Leadership	9
88-411	Rise of the Asian Economies	9
70-311	Organizational Behavior	9
70-332	Business, Society and Ethics	9
70-342	Managing Across Cultures	9
70-371	Operations Management	9
70-381	Marketing I	9
70-430	International Management	9
94-423	Measuring Social	12

#### Law Concentration Units

88-281	Topics in Law: 1st Amendment	9
88-284	Topics of Law: The Bill of Rights	9
70-364	Business Law	6
70-365	International Trade and International Law	9
73-408	Law and Economics	9
76-219	Law & Blame	9
76-450	Law, Culture, and the Humanities	9
76-475	Law, Performance, and Identity	9
79-360	Crime, Policing, and the Law: Historical and Contemporary Perspectives	9
80-447	Global Justice	9
84-373	Emerging Technologies and International Law	9

## Faculty

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