

# Department of Social and Decision Sciences Courses

## Note on Course Numbers

Each Carnegie Mellon course number begins with a two-digit prefix which designates the department offering the course (76-xxx courses are offered by the Department of English, etc.). Although each department maintains its own course numbering practices, typically the first digit after the prefix indicates the class level: xx-1xx courses are freshmen-level, xx-2xx courses are sophomore level, etc. xx-6xx courses may be either undergraduate senior-level or graduate-level, depending on the department. xx-7xx courses and higher are graduate-level. Please consult the Schedule of Classes (<https://enr-apps.as.cmu.edu/open/SOC/SOCServlet>) each semester for course offerings and for any necessary pre-requisites or co-requisites.

### 88-120 Reason, Passion and Cognition

Fall: 9 units

This course will introduce students to major concepts and theories in the social and decision sciences, focusing in particular on how cognition and emotion shape judgment and choice. We will address such questions as: In what ways do emotions influence judgments and choices? What are some common mistakes in judgment and decision making? Can information shape our choices even if we do not consciously recognize the information? Throughout the course, the emphasis will be on understanding: (1) basic theories and research findings of decision science and psychology, and (2) the relevance of research findings to everyday life.

### 88-125 Freshman Seminar: Forecasting Uncertainty

Intermittent: 9 units

Whenever you make a plan, you have to think about the future. Sometimes you know a lot, sometimes you know very little, and sometimes you know very little but think you know a lot. Amazingly, the same types of errors that you make every day are made by policymakers planning multi-billion dollar options. In this course, we will explore these errors and methods for reducing them. Examples will be drawn from many hot topics including climate change, health care, and government regulation.

### 88-126 Freshman Seminar: Modeling Complex Systems

Intermittent: 9 units

Most of the major issues confronting humanity—such as climate change, financial collapse, ecosystem survival, terrorism, and disease epidemics—are the result of complex systems where the interactions of the pieces of the system create a whole that is rather different than any of its parts. Unfortunately, traditional scientific methods that focus on reducing systems to their parts and then analyzing each part provide little insight into such systems. This seminar explores the behavior of complex systems as well as how to model and understand them using both traditional tools and computer-based approaches.

### 88-150 Managing Decisions

Fall: 9 units

This course will introduce the major concepts behind "good" decision making. Future employers will pay handsomely for decisions that are well thought out, defensible, and understandable. Being able to organize decision processes in a way that will achieve these goals is not trivial. Biases brought on by emotions and heuristic shortcuts often jeopardize the quality of a decision. Multiple levels of "good" decision making will be investigated ranging from life choices to national climate policies. Techniques that account for uncertainty and time preferences will be introduced.

### 88-198 Research Training: Social and Decision Sciences

Fall and Spring

This course is part of a set of 100-level courses offered by H&SS departments as independent studies for second-semester freshmen, and first- or second-semester sophomores, in the College. In general, these courses are designed to give students some real research experience through work on a faculty project or lab in ways that might stimulate and nurture subsequent interest in research participation. Faculty and students devise a personal and regularized meeting and task schedule. Each Research Training course is worth 9 units, which generally means a minimum for students of about 9 work-hours per week. These courses are offered only as electives; i.e., they cannot be applied toward a college or major requirement, although the units do count toward graduation as elective units. Additional details (including a roster and descriptions of Research Training Courses available in any given semester) are available in the H&SS Academic Advisory Center. Prerequisites/ restrictions: for H&SS students only; only for second-semester freshmen, or first- or second-semester sophomores; minimum cumulative QPA of 3.0 (at the time of registration) required for approved entry; additional prerequisites (e.g., language proficiency) may arise out of the particular demands of the research project in question.

### 88-220 Policy Analysis I

Fall: 9 units

This course provides an introduction to theories and methods for policy analysis. The main focus of the course is to develop an understanding of how theories from social science, such as economics, can help us understand policy issues such as allocation, regulation, and welfare. Throughout the course we analyze outcomes produced by private markets, by examining consumer choice, the supply and demand of factors and produced goods, and general and partial equilibrium. We also analyze the efficiency and welfare properties of such outcomes, paying special attention to the role of policy in influencing market outcomes. We consider how policy can address the efficiency and welfare shortcomings of markets that may result from informational asymmetries, industrial organization, moral hazard, transactions costs, and bounded rationality. Markets are compared in this light with organizational, governmental, and other modes of resource allocation. Grading will be based mainly on 3 exams. Homework assignments and/or quizzes will comprise a smaller part of the grade.

### 88-221 Analytical Foundations of Public Policy

Spring: 9 units

In this course, students will achieve an analytical understanding of some of the most pressing policy challenges of our day. The focus of the course lies in the interaction between markets and government. The course will first introduce analytical foundations of how markets, voting and governments work, and important shortcomings of each. The course will briefly touch on a comparative cross-national perspective on the balance between markets and government pursued in different countries. The second part of the course focuses on a substantive understanding of current policy issues, including health care, inequality, economic conditions of the politically pivotal middle class, resource constraints, globalization, technological change, and the role of all of these topics in political debates, and voter demands. A pre-requisite for this course is 73-102 Principles of Microeconomics.

Prerequisites: 73-102 or 88-220

### 88-223 Decision Analysis

Spring: 9 units

This course offers practical guidance about how to make better decisions and teaches students how to use modeling to do decision analysis. We analyze decisions involving uncertainty, risk, and time delay. In addition to methods of decision analysis, the course will also emphasize sensitivity analysis and communication of recommendations.

Prerequisites: 36-217 or 36-220 or 36-225 or 36-247 or 70-207 or 36-211 or 36-201 or 36-207

**88-230 Human Intelligence and Human Stupidity**

Fall: 9 units

By some standards, humans are an incredibly intelligent species. We have set foot on the moon, split the atom, and produced extraordinary works of art and literature (including the complete works of Shakespeare, which, despite theoretical accounts to the contrary, no amount of monkeys on typewriters has ever been able to duplicate). And yet, we are also the species that has brought about the Darwin Awards, spent \$125 million sending a probe to Mars which was unable to function because engineers failed to convert inches to centimeters, and produced cringe-worthy works of art and literature (including the 1964 movie "Santa Claus Conquers the Martians" which no amount of monkeys on typewriters would ever want to duplicate.). What is intelligence and how does it vary across individuals and over our lifespans? What are we good at, and what are we bad at, and why? Are there things that make us dumber? Are there things we can do to make ourselves smarter? How should what we know about the range of human intellectual abilities guide policy, education, law, medicine, and business; what implications does this have regarding the tasks/jobs that humans should be doing and the tasks/jobs that machines ought to do? Using cutting edge research from psychology and decision science, this course will explore the strange contradiction that defines the human experience: How are we simultaneously so smart and so dumb?

**88-251 Empirical Research Methods**

Fall: 9 units

This course teaches students how to evaluate and conduct original research regarding human behavior, whether it be in economic, social, or political settings. The course gives students practical experience in many of the most commonly used research techniques, including surveys, experiments, and quasi-experimental analysis. Although the course focuses primarily on the relationship between formulating research questions and implementing the appropriate methods to answer them, students can expect regularly to apply the statistical techniques learned in the course prerequisites, including regression.

Prerequisites: 36-200 or 36-201 or 36-247 or 36-207

**88-252 Causal Inference in the Field: Using Data to Study Crime, Love, Sports & More**

Spring: 9 units

Causal questions are pervasive in the social and behavioral sciences, and empirical researchers often use regression analysis as a tool for tackling such questions. This course focuses on the scientific problem of analyzing causal hypotheses in real-world settings, not on the mathematical details of regression. After clearly distinguishing prediction from causation, we discuss how to represent causal hypotheses and how to use regressions to analyze both predictive and causal hypotheses. Using in-class data exercises throughout, we will examine how to move from an interesting but somewhat vague question about the world (e.g., do police discriminate based on race and gender, do NFL athletes choke under high pressure, does parenthood improve happiness) to a clear statistical model that, when estimated, meaningfully addresses the question asked. The course emphasizes causal analysis as the main research goal and multivariate linear regression as the main statistical tool. After mastering basic techniques, we will introduce students to more advanced econometric approaches such as panel regressions and instrumental variables to deal with trickier settings in which causal inference is more challenging (e.g., do more guns lead to more violence?). In keeping with the hands-on philosophy of the course, a central focus of the semester will be a group research paper/presentation where students will have the opportunity to formulate and empirically test a research question of their choosing. Students will learn how to find, clean, and analyze a new dataset, and then concisely communicate their findings in the form of a scientific paper (and accompanying presentation). The research project makes this course excellent preparation for any student who hopes to ultimately write an undergraduate thesis.

Prerequisites: 36-200 or 36-201 or 70-207 or 36-207

**88-255 Behavioral and Applied Game Theory**

Fall: 9 units

When should a person cooperate and when should a person be selfish in an ongoing social interaction? How can a business establish strategic partnerships when it comes to creating a pie and at the same time battle with competitors when it comes to dividing up the pie? Strategic decision making requires a framework to think through the implications of cooperation and of competition. Game theory is a systematic approach to understanding how people, firms, or countries interact with one another to achieve their own goals. It combines mathematics and social science and is used in economics, political science, psychology, philosophy, and business. In this course students will learn to apply game theory to analyze strategic situations arising in the business world as well as in politics, international relations, and everyday life. Our focus will be on practical applicability rather than abstract theorizing. Readings will focus on real-life stories accompanied by a full analysis of the principles involved. The class will be organized as a seminar, centered around discussion, not lecture. Students will also be placed in the role of strategist in occasional simulations in class.

**88-257 Experimental Economics**

Intermittent: 9 units

This course will focus on the experimental literature studying decision-making and strategic interactions. We will explore both seminal and ongoing experimental work on risk, time and social preferences, as well as how these preferences are affected by emotions and other visceral factors. The course will focus on laboratory experiments. The last section of the class will focus on the use of experiments to test economic theory (both standard and behavioral). The class is meant to be interactive, and students will have many opportunities to critically discuss existing experimental research, as well as to present their own research ideas.

**88-260 Organizations**

Spring: 9 units

Even in a "market" economy, the preponderance of economic activity is carried out through firms and other organizations. The course begins by examining economic theories of the firm, and explores some of the canonical questions, such as why are there firms, how the separation of ownership and control of a firm shapes decision making, what determines the boundary between organizations and markets (e.g., make-or-buy decisions), what types of firms are most innovative, and how new technologies affect organizational structure. A second set of issues concerns how various organizational forms motivate, or fail to motivate, employees. The central concepts will be fleshed out by examining business firms, as well as not-for-profit enterprises, political parties, and government agencies.

**88-275 Bubbles: Big Data for Human Minds**

Fall: 9 units

Open discussions turn into echo chambers; optimistic traders pump good money into bad stocks; we fail to see, or sympathize, beyond the limits our culture, upbringing, or education prescribe. These bubbles — information bubbles, market bubbles, social bubbles — drive us to ask some of the most basic questions in the social sciences: Why do we believe the things we do? Where do our ideas come from, and how can we measure the consequences of their conjecture, spread, and evolution? How can we design systems to make us better thinkers? In this introduction to the "big data" study of human behavior, we'll learn some key concepts and simple computational tools for studying how people gain and share information, with a focus on what they say and write. And we'll apply these tools to social behaviors from the writing of Harry Potter fan fiction to online trolling, to science, markets, and liberal democracy itself. The class will include conceptual, computational, and data-driven investigations; students in social science, humanities, engineering and the sciences are equally welcome. At the end of this course, students will be able to build models for how people think and talk to each other, to see how thinking and talking work in both the past and present, and to imagine, and even design, systems that might help us think, and talk, together more effectively in the future. Pre-requisites: willingness and initiative to work with real-world data.

**88-281 Topics in Law: 1st Amendment**

Fall: 9 units

In their firm desire to perfect the new Constitution, which defined and limited the powers and roles of their new government, the founding fathers insisted on explicit statements that would protect the rights of the new nation's citizens. Indeed, the protection of these essential rights in many ways drove and defined their successful rebellion from Britain. This impulse resulted in ten amendments to the Constitution, which we have come to know as the Bill of Rights. The very first (and arguably considered at the time as the most essential) of these was the First Amendment, which we sometimes call the "free speech" amendment to the Constitution. This amendment guarantees every U.S. citizen five freedoms: freedom of religion, speech, press, peaceable assembly, and the freedom to petition the government for redress of grievances. This course examines the historical and philosophical roots of this key constitutional amendment, how it has been fleshed out and defined over time through case law, and the bases of some more recent critics of this amendments and current interpretations.

**88-284 Topics of Law: The Bill of Rights**

Spring: 9 units

This course examines the history and place of the Bill of Rights in our nation's constitutional framework. It focuses on the historical origins of the U.S. Constitution, of each of the first ten amendments to the Constitution (that we refer to as the "Bill of Rights"), how the meanings and interpretations of these have evolved over time, and what they mean to us today. Each article of the Bill of Rights will be examined in terms of its original intentions, and then through cases that have challenged and been interpreted through the Bill's articles.

**88-300 Programming and Data Analysis for Social Scientists**

Spring: 9 units

tba

**88-302 Behavioral Decision Making**

Fall: 9 units

Behavioral decision making is the study of how people make decisions, in terms that can eventually help them to make better decisions. It draws together research from psychology, economics, political science, and management, among other fields. It has applications that range from managing potentially hazardous technologies, to involving patients more fully in the choice of medical procedures, to the design of computer-interactive systems. The course covers behavioral theories of probabilistic inference, intuitive prediction, preference, and decision making. Topics include heuristics and biases in inference and prediction, risk perceptions and attitudes, strategies for combining information from different sources and dealing with conflicting objectives, and the roles of group and emotional processes in decision making. The course emphasizes the mutually reinforcing relationship between theory and application.

Prerequisites: (36-225 or 36-247 or 36-217 or 36-200 or 36-201 or 36-207 or 36-211 or 70-207 or 36-220) and 88-120

**88-315 Entrepreneurial Decision Making**

Intermittent: 9 units

This course is focused on application of social and psychological research and theory to entrepreneurship. Some of the decisions that entrepreneurs make seem to show a pattern of being less than optimal from an economic perspective. In this course, we examine how suboptimal choice and judgment by entrepreneurs result in anomalies that are commonly observed in decisions of entrepreneurs. We discuss economic, organizational, and personal consequences of such entrepreneurial decisions, methods to improve entrepreneurial decisions (when possible), and implications for policy.

Prerequisite: 36-201

**88-316 Game Theory**

Intermittent: 9 units

Game theory is the branch of decision theory in which decision problems interact. Due to its flexibility and strategic nature, game theory is used heavily in other academic areas such as economics, political science, biology, and even competitive sports. This course will cover those parts of game theory of special interest to social scientists. We will discuss specific elements of the formal theory of games as well as experimental results. Throughout the course we will examine applications of game theory to problems across the social sciences.

**88-319 Large-scale social phenomenon**

Spring: 9 units

tba

**88-341 Organizational Communication**

Fall: 9 units

Much of the work in groups and organizations consists of communication. You communicate to get information that will be the basis of decisions, to provide a vision for the people who work for and with you, to coordinate activity, and to sell yourself and your work. The goal of this course is to identify sources of communication problems within an organization and ways to overcome them. To do this requires that we know how communication normally works, what parts are difficult, and how to fix it when it goes wrong. The focus of this course is on providing you with a broad understanding of the way communication operates within dyads, work groups, and organizations. This course is not a practicum in public speaking or writing, although you will get some experience writing, speaking and managing impressions. Rather the intent is to give you theoretical and empirical underpinnings for the communication you will undoubtedly do when you return to work. Readings come from both the research and the managerial literatures. Among the topics considered are managerial communication, persuasion and conformity, self presentation and person perception, social networks. Cases and group projects give you an opportunity to apply what you've learned.

Prerequisites: 36-225 or 36-217 or 36-207 or 36-200 or 36-201 or 36-247 or 36-220 or 70-207

**88-342 The Neuroscience of Decision Making**

Intermittent: 9 units

Because we are human, feelings provide the basis for reason and rational decision-making. Consider for example, that brain-damaged patients left devoid of emotion struggle to make the most elementary decisions: while they are able layout the pros and cons of a decision, but they are unable to make the final choice. This course will discuss seminal discoveries in affective neuroscience underlying decision-making.

Prerequisites: 85-211 or 88-120

**88-345 Perspectives on Industrial Research and Development**

Intermittent: 9 units

Incandescent and fluorescent electric lights; nylon and Kevlar; the atomic bomb; the transistor and integrated circuits; Post-it; Teflon; Silly Putty; GameBoys; and biopharmaceuticals (from Viagra; and Levitra; to Paxil; and Enbrel;), among a panoply of other consumer and industrial goods, are all products that emerged from organized industrial research and development (R&D) programs. The beginnings of this new institution in the late 19th century, its rapid rise in the first third of the 20th century, its flourishing in the middle third of the 20th century, and its decline and reorganization in the last decades of the 20th century and first decade of the 21st century are the principal focus of this advanced reading seminar. What factors led to the establishment of modern R&D? Why did industrial R&D laboratories appear in the US and other industrialized nations? How did their creation change the character of science, technology, and business? How did the institutionalization of R&D affect the work of individual inventors, engineers, and scientists? Does big business now dominate R&D in the United States, or does "the little guy" (including university-based "start ups") still play an important role in technological innovation? What about the interaction of universities and industrial R&D programs? How has industrial R&D been "managed"? How has federal science and technology policy affected industrial R&D? With the globalization of business, is industrial R&D also becoming global, and if so, how does industrial R&D work on a global scale? Why did the last decade of the 20th century see the decline or disappearance of numerous prestigious industrial research organizations? What is the future of industrial R&D in the 21st century? These are some of the questions explored in this course, which is open to serious students from all colleges.

**88-352 Environmental Economics and Policy**

Fall: 9 units

The course will introduce students to the economic analysis of problems associated with private and collective use of environmental resources and to the analysis of public policy options to environmental problems. Policy relevant examples will be used throughout the course. When thinking about protecting nature environmental economics has traditionally focused on the idea that market failure (externalities, non rival goods, asymmetric information) is the critical source of economic inefficiency. Based on this idea economists have designed policies for environmental protection, which include Pigouvian taxes, marketable permits, liability rules and mechanisms design. We will start from the theories of externalities, market failure and mechanism design, and we shall explore the causes of these problems and some of the potential remedies using the competing/complementary lenses of traditional and behavioral economics. To organize and evaluate alternative environmental policy options environmental economics has traditionally used rational choice theory. According to rational choice theory, people respond to policy instruments in their own self-interests and take all possible consequences into account. Behavioral economics has emerged to challenge this traditional view by documenting how people make choices and state values that deviate from the conventional rationality model. We will try to understand the behavioral economics underpinnings of environmental policy and how understanding the success and failure of conventional economic theory can help make good environmental policy better.

Prerequisites: 73-150 or 88-220

**88-355 Social Brains: Neural Bases of Social Perception and Cognition**

Intermittent: 9 units

By some accounts, the large expansion of the human brain evolved due to the complex demands of dealing with social others?competing or cooperating with them, deceiving or empathizing with them, understanding or misjudging them. This discussion-based seminar surveys the emerging field of social cognitive neuroscience and its multi-level approach to understanding the brain in its social context. We will review current theories and methods guiding the field and recent research examining the neural bases of social processes, including: theory of mind, empathy, emotion, morality, among others. We will also discuss broader questions that apply to the specific topics that the course covers, including: What are appropriate levels of description for the target phenomena? How can different disciplines in neuroscience and the social sciences contribute to social neuroscience research? What can we learn from animals? behavior about human social cognition? Do neural systems exist that are specialized for social cognition, or do the systems that participate in social cognition have more general cognitive functions?

Prerequisites: 85-310 or 85-340 or 85-355 or 88-251

**88-360 Behavioral Economics**

Fall: 9 units

This course introduces students to behavioral economics, an emerging subfield of economics that incorporates insights from psychology and other social sciences into economics. We will examine evidence on how human behavior systematically departs from the standard assumptions of economics, and then investigate attempts by behavioral economists to improve economic analyses.

Prerequisites: (21-112 or 21-120) and (73-100 or 73-102 or 88-220)

**88-365 Behavioral Economics and Public Policy**

Fall: 9 units

Economics has up to now been the social science that has been most broadly and deeply involved in public policy. With its rational choice perspective, the economic perspective has tended to favor certain types of policies namely those that enhance the efficiency of market mechanisms and lower the cost of information. In this course we will spend the first several classes reviewing the assumptions, implications for public policy and limitations of the rational choice perspective. The remainder of the course will then be devoted to examining different public policy issues, including saving, health care, crime and drug abuse, through the competing lenses of traditional and behavioral economics.

Prerequisites: 88-220 or 73-100 or 73-102

**88-366 Behavioral Economics of Poverty and Development**

Intermittent: 9 units

tba

**88-367 Behavioral Economics in the Wild**

Spring: 9 units

Behavioral Economics is a sub-field of economics that, relying on insights from psychology and decision-making, aspires to describe actual behavior with greater empirical accuracy and psychological realism than that implied by the standard neoclassical model. In this course, we will investigate the success of this approach in explaining ostensible anomalies in the "wild" such as under-savings for retirement, over-consumption of unhealthy food, extreme aversion to losses among investors, workers, and home-owners, the over-confidence of corporate CEOs and NFL general managers, and the influence of emotions on domestic violence, stock market activity, and risk-taking. We will first document and review the underlying theory for three conceptual departures from the standard model -non-standard preferences (e.g., present-bias, reference dependence), non-standard beliefs (e.g., overconfidence, gambler's fallacy), and non-standard decision-making (e.g., heuristics, emotions, framing effects)-and then quickly move to assess the evidence for these claims in field settings. We will additionally explore how markets respond to behavioral biases, and discuss recent research in behavioral policy with an emphasis on policies aimed at increasing savings, improving food choice, and heightening program take-up and compliance. The course will be paper-centric and we will review a variety of popular empirical methods from field experiments to quasi-experimental approaches (e.g., estimation through regression-based panel analyses, difference-in-differences, and instrumental variables). Student evaluation will be based on performance on problem sets, an exam, as well as a short class presentation of an empirical paper of choice.

Prerequisite: 36-202

**88-371 Entrepreneurship, Regulation and Technological Change**

Intermittent: 9 units

There is a growing interest in understanding the interrelationships between regulatory institutions and innovations. Certainly, opportunities for innovative activities take place in the context of the extant public policy institutions (e.g., entry restrictions in telecommunications, environmental performance standards, intellectual property protections). Consequently, entrepreneurial activity plays a key role in identifying and exploiting these opportunities. In this course, we examine the role that entrepreneurs play in the interrelationships between regulation and technological change. The objectives are to develop and articulate an understanding of the theory, nature, and role of entrepreneurship in the American economy; the theory, nature, and role of regulation in the American economy; and the theory, nature, and role of the dynamic interaction of entrepreneurship and regulation in the American economy. Students will evaluate historical cases in which new or changing regulation presents opportunity for entrepreneurial entry in business, as well as historical cases in which entrepreneur activity (in the form of innovation) presents new needs or opportunities for regulation, thereby presenting-or constraining-further opportunities for entry. The course is broken into a series of blocks, and each week there will be a set of readings posted on Blackboard. Blackboard will be used to facilitate communication, including announcements, readings, lectures, and assignments.

Prerequisites: 88-202 or 88-220 or 73-150 or 79-300

**88-380 Dynamic Decisions**

Intermittent: 9 units

Decisions we make every day may range from simple and routine to novel and highly complex. For example, decisions while driving (judging the distance to the front car, the speed, the directions, and making choices accordingly) seem effortless and routine after some experience, while triaging patients in an emergency room under scarce resources may be quite overwhelming for everyone. Both types of decisions however, have something in common: they are made in the presence of change and in the absence of explicit information of probabilities, possible alternatives, and outcomes. Our decisions in such situations are the result from the interaction between the dynamic environmental demands and our cognitive processes. In this course you will learn how decisions are made in different dynamic situations and how our cognitive processes (e.g., attention, experience, risk tendencies, and other factors) influence the way those decisions are made. Students will be introduced to different aspects of decision processes by analyzing the sources of error in complex problems, such as cases of accidents and disasters (natural or man-made), in multiple disciplines (e.g., aviation, management, military strategy, and others). The course will also use simulation-based representations of dynamic decision making situations (e.g., microworlds) to illustrate relevant cognitive processes needed for learning, adaptation and choice. Finally, students will learn how to construct mathematical/computational models of dynamic systems, be able to interpret simulation results and to explore scenarios regarding effects of variables in the models and the predictions that the models can make.

Prerequisites: 36-201 and 85-211



### **88-384 Conflict and Conflict Resolution in International Relations**

Intermittent: 9 units

Course will introduce students to concepts of conflict, conflict resolution, and peace in international relations. Causes of war, alliances, and role of non-state actors in conflict will be examined. There will be also discussion on foreign policy decision making, mediation, negotiation and international law. The following specific cases will be discussed the Middle East Peace Process (Security Council Resolution 242, Camp David, Oslo Agreement and Geneva Accord); Indo-Pakistan dispute (Lahore Declaration 1999); War in Bosnia and Herzegovina and the Dayton Peace Accords; El Salvador Peace Agreement (between the Government of El Salvador and the Frente Farabundo Marti para la Liberacion Nacional); and the Algiers Agreement between Eritrea and Ethiopia. Globalization, terrorism, and conflict resolution will also be covered.

### **88-385 Managerial Decision Making**

Intermittent: 9 units

People in organizations make decisions, with important consequences, every day. Therefore, an understanding of decision-making is important in any education in management or economics. However, while a large number of courses in these curricula expose students to how decisions should be made, very few focus on how people actually make choices. This course addresses this topic by focusing on how decisions made by real people - and in particular decisions in business contexts - differ from the theoretical predictions of rational decision-making. We specifically focus on common areas of biased decision-making, their basis, and how they might be corrected. The focus of the course is on both individual and competitive decision-making.

### **88-387 Social Norms and Economics**

Intermittent: 9 units

Social norms play an important role in individual economic decisions and influence economic exchange outcomes. This raises several important questions. What mechanisms are effective in enforcing social norms? To what extent and in what contexts might we expect norm obedience absent external economic incentives? How should we take into account the role of social norms when designing economic institutions? This course discusses experimental research in economics, law and psychology that takes steps towards answering these and other related questions.

### **88-388 Psychological Models of Decision Making**

Intermittent: 9 units

This course provides an introduction to several techniques and theories for modeling psychological processes and decision making. The topics covered include: signal detection theory, individual decision modeling, and multidimensional scaling. The course will include an introduction to the theory behind the models as well as "hands on" computational applications of the models with data. The topics covered in this course can be used in a variety of applied settings-ranging from medical and public policy to marketing and psychological research-to produce simplified representations of seemingly complex phenomena.

Prerequisites: 36-201 and (21-112 or 21-120)

### **88-398 Independent Study**

Fall and Spring

Students conduct independent academic study under the supervision of a Social & Decision Sciences faculty member. Students who wish to engage in an independent study should seek out a faculty member whose interests are appropriate to the topic. Students must also complete an "Independent Study/Research for Credit" form, available from the SDS Coordinator of Student Programs in Porter 208A and 208G. Prerequisite: Permission of a faculty sponsor.

### **88-399 Undergraduate Research**

Fall and Spring

Students conduct research under the supervision of a Social & Decision Sciences faculty member. Students who wish to engage in research should seek out a faculty member whose interests are appropriate to the research. Prerequisite: Students must also complete an "Independent Study/Research for Credit" form, available from the SDS Coordinator of Student Programs in Porter 208A and 208G. Permission of a faculty sponsor.

### **88-402 Modeling Complex Social Systems**

9 units

Many of the biggest challenges facing modern societies—maintaining global political and financial stability, protecting against terrorist acts, cooperating to solve collective problems such as climate change or corruption—are complex. They are not simply complicated; they arise as interacting agents create various feedbacks that result in, often unintentional, emergent phenomena. Confronting these challenges requires an understanding of the properties of complex systems. In this course, we will provide an overview of complex systems theory and concepts. You will learn the fundamental properties of complex adaptive systems and how to apply these insights to a variety of key social science problems. We will introduce and analyze computational and mathematical models, as well as qualitative models, so you should have some familiarity with basic probability and algebra. We will explore topics such as inequality, networks, information spread, community formation, the evolution of cooperation, and the stabilization of financial markets. We will cross traditional disciplinary boundaries and venture into economics, political science, sociology, finance, cognitive science, computer science, physics, statistics, and mathematics as needed. Students will be expected to think critically about how to apply modeling insights to the real world, taking account of the social, political, and economic implications of proposed policies. They will express their ideas in class discussions, presentations, and written reports. The course will culminate with students engaging in a research project to model a complex social system of their choice.

Prerequisites: 36-225 or 36-247 or 70-207 or 36-201 or 36-207 or 36-217 or 36-220

### **88-405 Risk Perception and Communication**

9 units

Throughout their lives, people make decisions about risks that may potentially affect their health, safety, finances, use of technology, and effects on the environment. This course will review the risk perception and communication literature, focusing on theoretical and methodological issues as well as practical implications for educators, public health officials, engineers, economists, and other experts who aim to teach people about risks. We will discuss how to design surveys to increase our understanding of the problems people face when making decisions about specific risks, and how to design communication materials that help people to improve their decisions. We will highlight examples and applications taken from multiple disciplines, including health psychology, adolescent decision making, environmental science, and engineering.

Prerequisites: 36-247 or 70-207 or 36-225 or 36-201 or 36-207 or 36-217 or 36-220

### **88-406 Behavioral Economics in Organizations**

Fall: 9 units

Non-profit organizations and businesses are increasingly incorporating insights from behavioral economics and other behavioral sciences into their strategies. This course provides an overview of psychological and economic factors that affect the choices and behavior of individuals within organizations. The course will review empirical research on applications of behavioral insights to a wide range of organizational areas including product pricing, marketing, designing incentives schemes, motivating employees, fundraising, and behavior change. In-class exercises and group projects will supplement the lectures and provide students with hands-on experience in designing solutions to organizations challenges based on behavioral insights. The course emphasizes experimentation as a primary tool for informing organizations decision-making and accurately measuring the effectiveness of behavioral interventions.

Prerequisites: 73-102 or 73-100 or 88-220

### **88-409 Behavioral Economics Perspectives on Ethical Issues**

Intermittent: 9 units

tba

### **88-411 Rise of the Asian Economies**

Intermittent: 9 units

For most of the past quarter century, no region of the world has been more economically dynamic than Asia. This course is designed to provide students with the essential knowledge necessary to evaluate opportunities and risks in Asia. The course will use analytical tools drawn from economics and finance, business cases, and guest lectures to focus on the key strengths that sustained economic growth in East Asia for decades, the weaknesses that undermined that growth in the late 1990s, and what lies ahead. The course will also examine Indian economic growth since the early 1980s, and compare India's experience with that of the East Asian economies. A special focus will be placed on recent developments in India and China and the prospects for continued growth in those countries over the next decade.

Prerequisites: 73-150 or 88-220 or 73-102 or 73-100

**88-412 Energy, Climate Change, and Economic Growth in the 21st Century**

Spring: 9 units

The scientific community has concluded that human industrial activities are causing global temperatures to increase. Coping with the environmental, economic, and political consequences of this change is considered by many to be the preeminent public policy challenge of the 21st century. In this course, we will investigate the basic science of climate change, the prospective economic impact of global warming, the uncertainty involved in long-run climate forecasting, and the technological alternatives available to us as we seek to mitigate the impact of human industrial activity on global warming. The heart of this course will be an in-depth analysis of the policy options available to the United States and the global community. We will investigate the economic costs of these options and the way political realities are likely to shape and constrain policy at the national and international levels.

Prerequisites: 73-150 or 88-220 or 73-100

**88-417 Scientific Integrity and Communication**

Intermittent: 9 units

Recently, numerous failures to replicate highly influential scientific findings have raised concerns about whether many scientific claims are true. Several problems have been identified in the way research is conducted and reported that challenge the validity and credibility of scientific conclusions. These threats to the integrity of the scientific enterprise include a variety of common practices in designing, conducting, analyzing, interpreting, and reporting research. In this course, we will discuss these problematic research practices, why they occur, their impact on science and society, and possible solutions to address them. Because discussions of scientific validity and integrity have focused on psychology and biomedicine, many readings will be drawn from these disciplines; however, we will consider the generalizability of these issues across the sciences. This course will be reading, writing, and discussion intensive with a strong emphasis on statistics and research methods.

Prerequisites: 36-201 and (51-208 or 85-314 or 33-104 or 09-221 or 09-207 or 03-127 or 03-343 or 84-265 or 85-340 or 85-330 or 85-320 or 88-251 or 85-310)

**88-418 Domestic Negotiation**

Fall: 9 units

Negotiation is the art and science of securing an agreement between two or more interdependent parties. Decision-makers use negotiation to reach agreements with co-workers, bosses, clients, subordinates, firms, family and friends. Hence, the ability to negotiate effectively is a critical skill. In this course, students will develop a systematic and insightful approach to negotiation. Students will learn to analyze the features of the negotiation environment, 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. Considerable emphasis will be placed on negotiation exercises and role-playing. In-class discussions and lectures will supplement the exercises. This course will focus on negotiations in a wide variety of context: public policy negotiations, business negotiations, salary negotiations, and inter-personal negotiations.

**88-419 International Negotiation**

Fall: 9 units

Negotiation is a process in which two or more parties undertake a process to resolve conflicting interests. Decision makers use negotiation in a variety of circumstances to reach agreements among countries, among employers and employees, among firms, and among family and friends. International section: The objective of this course is to understand the process of negotiations and how the structure of the negotiation environment affects the outcomes achieved. Students will learn to analyze the features of the negotiation environment, develop an understanding of effective negotiation strategies, and identify the barriers to reaching wise agreements. This course will focus on negotiations in primarily international contexts.

**88-430 Methods of Policy Analysis**

Spring: 12 units

This course will introduce students to both the theory and the practice of international trade and trade policy. We will do so by first reviewing the basic economics of international commerce, then by examining the complex structure of federal government agencies working on trade and international investment issues. It will outline some of the major trade conflicts, negotiations, and international economic policy debates in which the U.S. federal government is currently engaged. Most importantly, the course will involve students directly in the work of these agencies by allowing Carnegie Mellon students to work on analyses and background research connected to a current policy issue. This undertaking will involve direct connection with U.S. federal policymakers.

**88-435 Decision Science and Policy**

Spring: 9 units

Research in the social sciences has extensively investigated how decision makers behave when they encounter many different and difficult decision scenarios. This course serves as an introduction to how relevant research from decision and social sciences can be applied to policy questions encountered by governments (intelligence and policy analysts) and private industry (business strategists and information officers). Topics of operations research, game theory, signal detection theory, and decision theory (heuristics and biases) will be discussed with respect to the application of these theories to improve the performance of individuals and groups within these organizations.

**88-442 Decision Science in Intergroup Conflict**

Intermittent: 9 units

A conventional course on decision science tackles the biases and heuristics that affect individual decision-making. This course will highlight biases and heuristics in an intergroup rather than individual context, and in times of uncertainty or insecurity (e.g. conflict) rather than times of stability. Themes to be covered include: intergroup identities, perceptions, emotions, attributions, empathy, moral judgments, sacred values and parochial altruism. The course will draw on a variety of scientific methods (e.g. field & lab experiments, fMRI, and psychophysiology) and disciplinary approaches (e.g. decision science, anthropology, social/cognitive/cultural psychology, and political science). Emphasis will be placed on understanding the relevance of research findings for everyday life.

**88-444 Public Policy and Regulation**

Intermittent: 9 units

Regulations are a significant policy tool of government. How society and the economy will react to new regulations can be hard to predict. Unintended side effects sometimes occur resulting in costs exceeding estimates and/or benefits never being realized. This course will review the basics of regulatory policy and using historical examples, will explore the reasons why past regulations have succeeded and failed. The second half of the course will involve 2-3 detailed case studies. Quantitative methods will be used to evaluate several pending regulations for real-world clients from both government and industry perspectives.

**88-451 Policy Analysis Senior Project**

Spring: 12 units

Students in this course apply the research and analytical methods learned in their other courses to a real-world problem. Students decide how to structure the problem, divide into teams responsible for its different parts, identify and analyze relevant literature, collect data, synthesize their results, and present their conclusions in oral and written form to a review panel of individuals concerned with the problem. Faculty members help them along the way. Performance is based on students' contribution to the process and substance of the class, as observed by the faculty and by their fellow students. One or two such projects is offered every term. A complete list of previous topics is available from the department. Course is open only to seniors in SDS.

**88-452 Policy Analysis Senior Project**

Fall: 12 units

Students in this course apply the research and analytical methods learned in their other courses to a real-world problem. Students decide how to structure the problem, divide into teams responsible for its different parts, identify and analyze relevant literature, collect data, synthesize their results, and present their conclusions in oral and written form to a review panel of individuals concerned with the problem. Faculty members help them along the way. Performance is based on students' contribution to the process and substance of the class, as observed by the faculty and by their fellow students. One or two such projects is offered every term. A complete list of previous topics is available from the department. Course is open only to seniors in SDS.

**88-453 Behavioral Economics, Policy, and Organizations Capstone**

Spring: 9 units

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**88-499 Advanced Undergraduate Research**

Fall and Spring

Students conduct research at an advanced level under the supervision of a Social & Decision Sciences faculty member. Students who wish to engage in advanced research should seek out a faculty member whose interests are appropriate to the research. Students must also complete an "Independent Study/Research for Credit" form, available from the SDS Coordinator of Student Programs in Porter 208A as well as 208G. Prerequisite: Permission of a faculty sponsor.

**88-505 Undergraduate Internship**

All Semesters

An internship is an approved and monitored work experience that can be related to an academic field of study through active reflection and specific learning goals. Students must work at least 10 hours per week for the semester at the internship. Additionally, students will also keep in regular contact with a faculty member in Social and Decision Sciences, who will assign and evaluate academic work. Internships are available for 1-9 units, depending on the type and amount of academic work produced. Students are responsible for finding their own internships and faculty sponsors, although assistance is available in the department.