

# Undergraduate Economics Program 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.

## 73-101 Freshman Seminar

Fall and Spring: 9 units

A topics-based course for first-year students. This course is not a supplement nor a replacement for either Principles of Microeconomics or Principles of Macroeconomics. Instead, it meant to introduce students to how social scientists (particularly economists) examine governments, societies, markets, and organizations. Subjects discussed vary from year-to-year and from instructor-to-instructor; recent subjects include behavioral economics, environmental policy, defining progress, and more. (Seminar, 3 hours)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73101/freshman-seminar-in-economics>

## 73-102 Principles of Microeconomics

All Semesters: 9 units

A one-semester course that teaches the fundamentals of microeconomics. Students will learn how microeconomic analysis can explain market successes, market failures, and how government intervention might improve outcomes. In addition to an investigation of firm behavior and consumer behavior, attention will be paid to: Game Theory, Behavioral Economics, Economics of Time and Risk, Economics of Information, Experimental Economics, and Auctions and Market Design. Students will also learn how to integrate basic data analysis and statistics. Not open to students who have received credit for 73-100. (Lecture, 2 hours; Recitation, 1 hour).

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73102/principles-of-microeconomics>

## 73-103 Principles of Macroeconomics

All Semesters: 9 units

A one-semester course that teaches the fundamentals of macroeconomics. Students will learn how macroeconomic analysis can explain national economic activity and how government intervention might stabilize an economy. Topics include: defining and measuring national wealth, economic growth, credit markets, unemployment, interest rates, inflation, and the monetary system. Additional emphasis will be paid to: long-term economic development, political economy, financial crises and topics that are central to contemporary macroeconomic debates such as the impact of technological change, migration, and trade on the macroeconomy. Students will access macroeconomic databases, and then use basic statistics to describe and isolate empirical patterns in macro-data. Not open to students who have received credit for 73-100. (Lecture, 2 hours; Recitation, 1 hour).

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73103/principles-of-macroeconomics>

## 73-148 Environmental Economics

Intermittent: 9 units

A course for non-majors which explores the interplay between economics and environmental issues. Topics include: market failures and environmental problems, economically efficient allocations of environmental resources, and the intended and unintended consequences of public policies designed to improve the environment. Practical issues surrounding the feasibility of implementing theoretically efficient principles and policies are analyzed, and alternative policies that might achieve better results in practice are investigated. (Lecture, 3 hours).

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73148/environmental-economics>

## 73-160 Foundations of Microeconomics: Applications and Theory

Spring: 9 units

The theory of resource allocation and its application: how consumers and firms interact through markets. Topics include theory of choice, consumer theory, theory of the firm, profit maximizing behavior in differing market structures, distortions in competitive markets, market failures, game theory. Elementary techniques from multivariate calculus are introduced and applied, but prior knowledge is not assumed. (Lecture, 3 hours; Recitation: 1 hour). Minimum grade of "C" required in all economics pre-requisite courses. Prerequisites: 21-120 and (73-100 Min. grade C or 73-102 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73160/foundations-of-microeconomics-applicati>

## 73-210 Economics Colloquium I

Fall: 3 units

Economics majors meet weekly for discussions about current research by faculty or students, presentations on economics from economists outside academia, and expository talks on selected economics topics not part of the usual curricula. The colloquium provides students with opportunities to grow personally and intellectually by introducing them to campus resources (including special interest to undergraduates such as preparation for graduate school) and using the economic toolbox to examine current economic topics in the press. It is recommended that students take this course during the sophomore year so that economics majors realize the range of resources that exist on campus. (Colloquium, 1 hour)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73210/economics-colloquium-i>

## 73-230 Intermediate Microeconomics

Fall and Spring: 9 units

This course is a calculus-based study of microeconomics. Topics in partial equilibrium analysis include supply and demand, consumer theory, theory of the firm, profit maximizing behavior, monopoly theory, and perfect competition. The course concludes with an introduction to general equilibrium analysis and the welfare laws. (Lecture, 3 hours; Recitation, 1 hour). Minimum grade of "C" required in all economics pre-requisite courses. Prerequisites: (21-256 or 21-269 or 21-268 or 21-259) and (73-100 Min. grade C or 73-102 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73230/intermediate-microeconomics>

## 73-240 Intermediate Macroeconomics

Fall and Spring: 9 units

Through macroeconomic models built upon microeconomic foundations, insights are developed into economic growth processes and business cycles. Topics include aggregation and measurement, national income, business cycle measurement, economic welfare theorems and social inefficiencies, the effect of government fiscal policy upon employment and productivity, and the relationship between investment, interest rates and economic growth. (Lecture, 3 hours; Recitation, 1 hour). Minimum grade of "C" required in all economics pre-requisite courses. Prerequisites: (21-256 or 21-268 or 21-269 or 21-259) and (73-103 Min. grade C or 73-100 Min. grade C) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73240/intermediate-macroeconomics>

## 73-255 Independent Study in Economics

Fall and Spring

The Independent Study course in economics allows students to pursue their own research interests in any of a variety of topics in economics. A typical independent study course involves a semester long project under the supervision of an appropriate faculty advisor. The nature and scope of the project are determined by the student and faculty advisor; the project proposal must be approved by an Undergraduate Economics Program staff member. Minimum grade of "C" required in all economics pre-requisite courses. Prerequisites: 21-120 and 73-160 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73255/independent-study-in-economics>

**73-265 Economics and Data Science**

All Semesters: 9 units

This course is at the intersection of economic analysis, computing and statistics. It develops foundational skills in these areas and provides students with hands-on experience in identifying, analyzing and solving real-world data challenges in economics and business. Students will learn the basics of database and data manipulation, how to visualize, present and interpret data related to economic and business activity by employing statistics and statistical analysis, machine learning, visualization techniques. Students will also be taught a programming language suitable for data science/analysis. Databases will include leading economic indicators; emerging market country indicators; bond and equity returns; exchange rates; stock options; education and income by zip code; sales data; innovation diffusion; experimental and survey data and many others. Applications will include analyzing the effectiveness of different Internet pricing strategies on firm sales, the impact of taking online classes on a worker's earnings, the relationship between regional employment and trade policies; constructing investment risk indices for emerging markets; predicting employee productivity with machine learning tools; assessing health (sleep and exercise) improvements associated with wearable technologies (e.g. FitBit). Additionally, the course will provide students with communication skills to effectively describe their findings for technical and non-technical audiences. Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: 21-120 and (36-202 or 36-220 or 36-208 or 70-208 or 36-309) and 73-102 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73265/economics-and-data-science>

**73-270 Strategic Professional Communication for Economists**

Fall and Spring: 9 units

A writing course specifically designed for third-year Economics majors and additional majors. Students gain experience with technical writing techniques and skills needed for both their senior thesis and their eventual professional careers. The course emphasizes both individual and group projects. (Seminar, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: 76-101 and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73270/strategic-professional-communications-f>

**73-274 Econometrics I**

Spring: 9 units

This course will provide an introduction to the analysis of economic field data. The first part of the course will discuss how data is generated and how this affects the inferences we can make. In particular, we will look at the difficulties of working with field data and learn how non-random sampling leads to poor inferences. We will then move on to some simple statistical techniques, in particular OLS and its extensions as well as Maximum Likelihood Estimators. We will also learn about the large sample properties of these estimators. At the end of the course, students should be able to understand what inferences can be made with field data and some basic statistical techniques that can be used to uncover patterns in the data. (Lecture, 3 hours; Recitation, 1 hour). Minimum grade of "C" required in all economics and statistics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-269 or 21-256) and (36-217 Min. grade C or 36-225 Min. grade C) and 73-230 Min. grade C

Course Website: [http://tepper.cmu.edu/prospective-students/course-page/73274/econometrics\\_i](http://tepper.cmu.edu/prospective-students/course-page/73274/econometrics_i)

**73-315 Market Design**

Spring: 9 units

The market design class is going to cover three main subjects: matching, auctions, and, time allowing, marketplaces. Matching topics may include: Two-Sided Matching and Medical Residents House Allocation and Kidney Exchange School Choice Law Clerks and College Early Admission Auction/ Marketplace topics may include: Designing Optimal Auctions Common Value Auctions Multi-Unit Auctions and Treasury Auctions Multi-Item Auctions and The Assignment Model Sponsored Search Auctions The FCC and Simultaneous Ascending Auctions Package Auctions and Radio Spectrum Introduction to the Economics of Platforms Internet Platforms: e-Commerce Internet Markets: Advertising (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-268 or 21-257 or 21-269) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73315/market-design>

**73-327 Advanced Topics In Macroeconomics And Real Business Cycles**

Intermittent: 9 units

For analysts and decision makers in a variety of positions, such as business managers and government policy makers, a thorough understanding of the economy as a whole helps to make well-informed decisions. Examples of important knowledge about the economy are its sources of growth, the main impulses that cause the economy to fluctuate over time and enter into booms and recessions, the way in which these impulses propagate over time, and the state of the economy in general. The main objective of this course is to lay the foundation for such an understanding and present a framework within which we can (and will) evaluate a variety of aggregate phenomena. Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and 73-230 Min. grade C and 73-240 Min. grade C

**73-328 Health Economics**

Fall: 12 units

This course will teach the student to use economic analysis to understand critical issues in health care and health policy. We will address issues such as the following: 1. What factors best explain the level and rate of growth of U.S. health expenditures? 2. Does the recent high rate of growth of U.S. health care expenditures make U.S. firms less competitive in international markets? 3. What are some of the likely consequences (intended and unintended) of the proposed reforms to Medicare? 4. Can physicians induce demand for their services? 5. What are the impacts of managed care on the health care system? 6. Do strong affiliations between physicians and health plans hurt competition? (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses. Junior standing required.

Prerequisites: 21-120 and (73-160 Min. grade C or 73-230 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73328/health-economics>

**73-331 Political Economy of Inequality and Redistribution**

Intermittent: 9 units

Three basic types of institution - markets, communities, and states (i.e. public governments) - determine the distribution of economic resources and opportunities in societies. The balance between these governing institutions has changed dramatically over time, at very different rates across societies. This course will begin with economic and political theory on why these differences over time and across countries may exist. Then it will survey some of these differences across both industrialized and pre-industrial societies and investigate their causes and consequences. Some of the questions the course will ask include the following: In the industrialized world, the public sector (government) plays a much larger role in Europe than in the United States. Why is this so? How does this affect the quality of everyday life for different classes of people? How have globalization and technological change affected the distribution of income and social policy in industrialized countries, and how does this affect the public sector? In some tribal societies, people have no access to markets at all. How does this affect distributive behavior within communities? Finally, what might be the ultimate causes of income inequality on a global scale? Are there prehistoric and environmental roots in the ways peoples of different societies live today? This course will examine these questions by studying theoretical and empirical research conducted by economists, economic anthropologists, political economists, and economic geographers on these questions. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73270/strategic-professional-communications-f>

**73-338 Financial Crises and Risk**

Spring: 9 units

This course provides an in-depth examination of the causes of financial crises as well as what governments can do to prevent them or at least reduce their cost. The course is designed to provide an understanding of individual attitudes towards risk and individual decision making about savings and investment under uncertainty, and to use this understanding to evaluate the various economic roles played by financial institutions in helping individuals manage risk, especially those roles which may lead to economic instability and crises. In addition, the course may cover bubbles and swindles, especially when these spillover to the broader macroeconomy; the role of information in banking in normal times and in bank runs; crisis resolution techniques; and the extensive history of attempts to improve regulation so as to reduce the frequency and cost of crises. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-269 or 21-256) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73338/financial-crises-and-risk>

**73-341 Within the Firm: Managing through Incentives**

Spring: 9 units

We are living in an exciting age of information and knowledge when inspiring employees with a firm becomes increasingly more important. Aligning the objectives of workers, managers, and owners by providing them with appropriate incentives becomes an emerging paradigm in the modern business world. In this course we learn how to reason about incentives both between managers and employees, managers and owners, and within a team of co-workers. We cover a broad range of topics including principle-agent problem, moral hazard, asymmetry of information, incentive in teams, collective decision making, and repeated interactions. These theoretical underpinnings will be illustrated with actual business experience and case studies. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-269 or 21-256) and (36-201 or 36-202 or 36-217 or 36-225 or 36-226 or 70-207 or 70-208) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73341/within-the-firm-managing-through-incent>

**73-347 Game Theory for Economists**

Fall: 9 units

An introduction to the theory of non-cooperative games with an emphasis on economic applications. After an initial examination of two-person, zero-sum games, the notion of a Nash equilibrium in an n-person, non-cooperative game is considered. Existence of and refinements to the equilibrium concept are discussed in the context of both normal and extensive form games. Economic applications may include various topics, including Cournot and Bertrand oligopoly models, general competitive exchange equilibrium, and free rider problems. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-269 or 21-268) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73347/game-theory-for-economists>

**73-348 Behavioral Economics**

Spring: 9 units

This course introduces students to behavioral economics which is a subfield of economics that incorporates insights from other social sciences, such as psychology, into economic models and aims to explain the anomalies challenging some of the classical economic models. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-268 or 21-259 or 21-256 or 21-269) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73348/behavioral-economics>

**73-352 Public Economics**

Fall: 9 units

In this course, students analyze the role of governments in market economies and their impact on the behavior and welfare of citizens. Reasons for government intervention in markets are examined in light of some of the economic challenges faced by modern societies in an increasingly globalized marketplace. Topics include: taxation and expenditure policies, externalities and market failure, social security, public assistance and income redistribution programs. There will also be some coverage of the role of local governments in the economy with respect to such issues as crime, urban development and education. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-268 or 21-269 or 21-259 or 21-256) and 73-230 Min. grade C

**73-353 Economic Foundations of Regulation: Applications to Financial Markets**

Intermittent: 9 units

The financial crisis has focused attention on the role of regulation for our financial system and the broader economy. The course will address the foundations of regulation (why regulate?) from various perspectives within the context of a market economy, highlighting the sources of market failure? (such as externalities, adverse selection, and natural monopoly) and potential remedies (such as taxes and fees, disclosure, price regulation, guarantees). The conflicting goals among regulators (and why we have multiple regulators) and their impact on the meaning of regulation will be considered along with regulatory competition/arbitrage. Portions of the course will tackle relatively broad questions such as: Why regulate? What is the law of unintended consequences? What is the objective of a policy advocate? Are regulators and regulatory policies a systemic risk? Are our markets rigged? How can regulators enhance the predictability and credibility of their policies? How costly were government guarantees during the financial crisis? Should we ban insider trading? Should regulations be determined and motivated based upon cost-benefit analysis? How can we evaluate the success or failure of particular regulations and whether they have achieved their objectives? How does the Dodd-Frank Act promote financial stability? What basic aspects of the financial crisis did Dodd-Frank not address? (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-269 or 21-268) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73353/economic-foundations-of-regulation-with>

**73-358 Economics of the Environment and Natural Resources**

Intermittent: 9 units

An advanced course on the allocation of environmental and natural resources. Topics include: externalities and the misallocation of resources, examining the efficiency/inefficiency of markets for non-renewable resources, intended and unintended consequences of regulatory and tax policies, and modern alternative to regulation such as the creation of new markets and property rights for environmental resources. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-256 or 21-269) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73358/economics-of-the-environment-and-natura>

**73-359 Benefit-Cost Analysis**

Spring: 9 units

The evaluation of public private sector projects. The theory of benefit-cost analysis and related techniques, such as cost-effectiveness analysis. Attention is given to such issues as valuing goods and services that are not normally traded in the marketplace (e.g., the value of an individual's life) and the social rate of discount. Applications are considered in detail. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-268 or 21-269 or 21-256 or 21-259) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73359/benefit-cost-analysis>

**73-365 Firms, Market Structures, and Strategy**

Fall: 9 units

This course is concerned with the economic analysis of industrial markets that are not perfectly competitive. The effects of imperfect competition on firms' decisions (pricing, location, advertising, research and development, among others) are reviewed. Implications of these effects in terms of public policy are also discussed from a variety of perspectives. Finally, applications to actual markets are considered. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-269 or 21-268 or 21-256) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73365/firms-market-structures-and-strategy>

**73-366 Designing the Digital Economy**

Fall: 9 units

This class analyzes the economics of e-commerce and technology. It will identify the critical features that differentiate the technology firms from traditional industries, and examine the implications for business strategy. The class will discuss topics such as network effects, switching costs, and platform markets. To complement the economic theory, we will also consider a case study of a firm each week. These have three aims: to provide applications for the concepts developed in the lectures; to inform you about different industries; and to help develop your written, rhetorical and presentation skills. Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-269 or 21-256 or 21-259 or 21-268) and 73-230 Min. grade C and (36-220 or 36-226 or 73-265 Min. grade C or 73-274 Min. grade C or 73-374 Min. grade C or 73-407 Min. grade C or 70-208 or 36-202 or 36-208)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73366/designing-the-digital-economy>

**73-367 Technology Jobs and the Future of Work**

Spring: 9 units

The aim of this course to provide students with an in-depth analysis of the US labor market and what role technology has in shaping labor market outcomes. This course will look at the factors influencing wage returns, the outcomes of job-search and also require students to undertake a hands-on analysis of data. Topics of interest are as follows: 1. What affects wage outcomes of workers? 2. What's happening to the labor share and what are the reasons for its decline? 3. What is the role of comparative advantage and how has increasing automation changed the returns to job-search for some individuals? 4. What is job polarization and what are the factors affecting the mobility of workers between occupations and jobs? (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-268 or 21-256 or 21-269 or 21-259) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73367/technology-jobs-and-the-future-of-work>

**73-372 International Money and Finance**

Intermittent: 9 units

The course introduces students to a micro-founded model of the global monetary system. The model is employed to assess the roles of money, banking, and central banking in the management of inflation, employment, and financial stability. Interest rates, the international exchange rate, the trade balance, and international capital flows are explored in terms of the model. The model is used to address controversial issues in international trade and financial relations, as well as current macroeconomic stabilization problems in China, the Euro area, the United States, and elsewhere.

Theoretical points are illustrated with references to historical central bank practices from around the world in recent decades. The course concludes with student briefings on current central bank policies from around the world. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73372/international-money-and-finance>

**73-374 Econometrics II**

Fall: 9 units

The material covered in this course extends from the material covered in Econometrics I (73-274). The course will include both the theory behind the methods and a hands-on analysis of actual data, providing students the tools for both research and industry jobs. Theories and methodologies covered will include: nonlinear regression models, qualitative response regression models, panel data estimators, simultaneous-equation models, and time series. (Lecture, 3 hours; Recitation, 1 hour). Minimum grade of "C" required in all economics and statistics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and (36-217 Min. grade C or 36-225 Min. grade C) and 73-230 Min. grade C and 73-274 Min. grade C

Course Website: [http://tepper.cmu.edu/prospective-students/course-page/73374/econometrics\\_ii](http://tepper.cmu.edu/prospective-students/course-page/73374/econometrics_ii)

**73-394 Development Economics**

Intermittent: 9 units

This course will explore issues relating to economic development in low and middle-income countries. We will discuss topics such as economic growth and inequality, education, health, the family, and the markets for land, labor, and credit. We will study how market failures can potentially prevent economic growth in the developing world. Also we explore the effectiveness of different types of policies in promoting development. The course will use both economic theory and empirical methods to answer these questions. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73394/development-economics>

**73-395 Independent Study in Economics**

Fall and Spring

The Independent Study course in economics allows the student to pursue his or her own research interests in any of a variety of topics in economics. A typical independent study course involves a semester long project under the supervision of an appropriate faculty advisor. The nature and scope of the project are determined by the student and faculty advisor; the project proposal must be approved by an Undergraduate Economics Program staff member. Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-269 or 21-256) and (73-230 Min. grade C or 73-240 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73395/independent-study-in-economics>

**73-408 Law and Economics**

Intermittent: 9 units

This course will provide a broad overview of the scholarly field known as "law and economics." The focus will be on how legal rules and institutions can correct market failures. We will discuss the economic function of contracts and, when contracts fail or are not feasible, the role of legal remedies to resolve disputes. We will also discuss at some length the choice between encouraging private parties to initiate legal actions to correct externalities and governmental actors, such as regulatory authorities. Extensive attention will be given to the economics of litigation, and to how private incentives to bring lawsuits differ from the social value of litigation. The economic motive to commit crimes, and the optimal governmental response to crime, will be studied in depth. Specific topics within the preceding broad themes include: the Coase Theorem; the tradeoff between the certainty and severity of punishment; the choice between ex ante and ex post sanctions; negligence versus strict liability; property rules; remedies for breach of contract; and the American rule versus the English rule for allocating litigation costs. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: 21-120 and (73-160 Min. grade C or 73-230 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73408/law-and-economics>

**73-415 Data Driven Business and Public Policy Decision Making**

Intermittent: 9 units

In this course students will learn to leverage data to inform business and policy decisions. The course will teach students various methods for data description, including techniques of data visualization and statistical techniques. Students will learn how to assess the precision of estimation techniques. The final part of the course covers examples taken from epidemiology, economics, business and public policy. (Lecture, 3 hours; Recitation: 1 hour). Minimum grade of "C" required in all economics and statistics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-256 or 21-269) and 73-230 Min. grade C and (73-265 Min. grade C or 73-274 Min. grade C or 36-220 Min. grade C or 36-225 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73415/data-driven-business-and-public-policy->

**73-421 Emerging Markets**

Fall: 9 units

The aim of the course is to understand the economic, political and institutional forces that spur or hinder business activity and success in emerging economies. The course is designed to provide an overview of fiscal, monetary, trade and labor market policies adopted in emerging economies and how these policies have impacted and continue to impact small and large businesses, investment opportunities and the growth potential of these countries. The course will focus on successful emerging economies such as India, China, Chile, Brazil, with broader lessons and comparisons drawn from developed countries, as well as from failures in other developing nations. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-256 or 21-269 or 21-268) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73421/emerging-markets>

**73-433 Environmental Policy and Economics**

Intermittent: 9 units

The primary objective of this course is to encourage students to apply the tools of microeconomic analysis (and to a lesser degree, macroeconomics) to the problems of environmental protection, natural resource management, and energy production and use. The course will begin by introducing students to how an economist approaches problems of market failure commonly found in environmental contexts. Next, we will explore models that characterize solutions to such environmental issues. We will then address questions regarding measurement, the design of environmental regulations, and, finally, we will apply the tools that we have developed during the semester to the problems of climate change, and the optimal management of forests, water resources, and land use. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-269 or 21-268 or 21-256) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73433/environmental-policy-and-economics>

**73-449 Social, Economic and Information Networks**

Fall: 9 units

Interaction is a fundamental part of social science: firms market products to consumers, people share opinions and information with their friends, workers collaborate on projects, agents form alliances and coalitions. In this course, we will use the emerging field of social networks to put structure on this diverse mass of connections. Using a mixture of theoretical, empirical, and computational methods, we will learn about the structure and function of social networks. We will look at how an individual's position in a social network reflects her role in the community. We will learn to identify tastemakers and trendsetters by looking at how information moves through our increasingly connected society. We will consider how our own position in the social network affects our behavior, opinions, and outcomes. And we will explore where social networks come from, and what affects their structure. The material in this course will be interdisciplinary, drawn from the fields of math, computer science, physics, sociology, political science, and economics. By the end of the course, you will have the tools and knowledge needed to analyze social networks on your own. The course is capped with a project where you will use your skills to answer your own questions. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-268 or 21-269 or 21-259 or 21-256) and 73-230 Min. grade C and (36-220 or 36-217 or 36-201 or 70-207 or 36-225)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73449/social-economics-and-information-networ>

**73-465 Technology Strategy**

Spring: 9 units

This course is about business strategy for technology-intensive industries. Examples of such industries are computer hardware and software, media and entertainment, telecommunications and e-commerce. We will explore the unique economic circumstances facing firms in these industries and identify strategies that enable firms to succeed given these circumstances. You will learn to analyze pricing strategies including versioning and bundling; product standardization decisions; managing product complements; exploiting network effects; managing platform competition. This course will help you understand the unique economic characteristics seen in today's technology-intensive markets and how they impact the strategic interactions among firms and consumers. We will study, for example: Why firms in the IT industry give away their best products for free. Why makers of video gaming consoles subsidize end users (but tax game developers) while computer operating system makers subsidize software developers (but overcharge end users). Why Sony won the Blu-Ray format war against HD-DVD which was sponsored by a whole array of companies. In order to understand how firms strategically interact with consumers in technology-intensive industries this course will use a combination of simple but rigorous analytical models, emerging theories, and formal case studies. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-256 or 21-269) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73465/technology-strategy>

**73-469 Global Electronic Markets: Economics and the Internet**

Fall: 9 units

The information revolution brought about by the Internet is having a dramatic impact on the organization of economic activity. Long-term contractual relationships that once governed corporate procurement are being dismantled as manufacturers use the Internet to market directly to the public. New transportation networks that used to simply move goods from point A to point B are evolving into dynamic inventory pipelines that allow manufacturers to track and even reroute shipments in real time. At the same time, individuals are making use of sophisticated search engines to comparison shop at a scale that would have been physically exhausting even five years ago. We will use the basic tools of economic analysis to understand how and why the changes in information technology are reshaping the economic landscape. (Lecture, 3 hours). Minimum grade standard of "C" applies only to economics courses.

Prerequisites: (21-268 or 21-269 or 21-259 or 21-256) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73469/global-electronic-markets>

**73-474 The Economics of Ideas: Growth, Innovation and Intellectual Property**

Intermittent: 9 units

Healthy economies in many way resemble healthy people they are alive and vibrant, growing and adjusting in response to changing circumstances and what fuels economic growth and innovation are ideas. This course explores the role of ideas in the modern economy. Topics include: models of economic growth, economic efficiency and development, innovation and human capital, intellectual property and public policy issues. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-256 or 21-259 or 21-269 or 21-268) and 73-230 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73474/economics-of-ideas-growth-innovation-an>

**73-476 American Economic History**

Fall: 9 units

The study of economic history provides important perspective on current economic institutions and policies. A failure to understand the historical evolution of economic institutions or the variety of past economic experience is perhaps the worst shortcoming of many economists. The study of economic history provides an opportunity to test currently fashionable theories against data different from those used in their construction. In fact, this is a course in applied economics. The theories developed in the intermediate courses will be applied to episodes from the past in ways that increase understanding both of the specific historical episodes considered and the economic theories employed. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: 21-120 and (73-160 Min. grade C or 73-230 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73476/american-economic-history>

**73-497 Senior Project**

Fall: 9 units

A fourth-year project course, open only to Economics primary and additional majors with Senior standing. The senior project is a capstone course in economics. The purpose of the course is to showcase the analytical and quantitative skills that you have acquired as an undergraduate at Carnegie Mellon. The course project should reflect some independent applied research that is genuinely your own work. Thus a "book report" or a "literature review" are not sufficient exercises to satisfy this requirement. The following research approaches are acceptable for the research project: an empirical study based on a data set that you put together, an experimental study based on an experiment that you conducted, an analysis of survey data based on a survey that you conducted, a theoretical analysis based on a model that you have developed, based on your own algorithm. Students who write an honor thesis are exempted from this class. (Lecture, 3 hours). Minimum grade of "C" required in all economics pre-requisite courses.

Prerequisites: (21-259 or 21-268 or 21-269 or 21-256) and (36-226 or 73-265 Min. grade C or 73-274 Min. grade C or 73-374 Min. grade C or 73-407 Min. grade C or 36-303) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73497/senior-project>

**73-500 Tepper College Honors Thesis I**

Fall and Spring

Economics majors with outstanding academic records and intellectual promise will be given the opportunity to undertake original research under the direction of individual faculty members. Research topics are selected by students and approved by faculty. Prerequisites: Senior standing in the Economics Program and permission of the Economics faculty. Minimum grade of "C" required in all economics and statistics pre-requisite courses. Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and (73-265 Min. grade C or 73-274 Min. grade C or 36-226 Min. grade C) and 73-230 Min. grade C and 73-240 Min. grade C

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73500/tepper-senior-honors-thesis-i>

**73-501 Tepper College Honors Thesis II**

Fall and Spring

Economics majors with outstanding academic records and intellectual promise will be given the opportunity to undertake original research under the direction of individual faculty members. Research topics are selected by students and approved by faculty. Prerequisites include: Senior standing in the Economics Program and permission of the Economics faculty. Minimum grade of "C" required in all economics and statistics pre-requisite courses, and a minimum grade of "B" required in Tepper College Honors Thesis I. Prerequisites: (21-256 or 21-259 or 21-268 or 21-269) and 73-230 Min. grade C and 73-240 Min. grade C and 73-500 Min. grade B and (73-265 Min. grade C or 73-374 Min. grade C)

Course Website: <http://tepper.cmu.edu/prospective-students/course-page/73501/tepper-senior-honors-thesis-ii>