

# AS.440 ( APPLIED ECONOMICS)

## Courses

### AS.440.601. Microeconomic Theory. 3 Credits.

Corequisite: AS.440.304, Math Methods for Economists This course offers a systematic presentation of consumer theory, theory of the firm, and market equilibrium. Topics covered include constrained optimization, preferences and utility, exchange, production, pricing, market structures, and welfare economics.

### AS.440.602. Macroeconomic Theory. 3 Credits.

Corequisite: AS.440.304, Math Methods for Economists This course provides a systematic overview of the theory of aggregate output and employment, the rate of interest, and price level determination. Coverage includes the theories of consumption and investment, the demand and supply of money, inflation, unemployment, and economic growth. These topics are discussed in the context of contemporary empirical work on aggregative relationships.

### AS.440.606. Econometrics. 3 Credits.

This course focuses on the application of statistical methods to the testing and estimation of economic relationships. After developing the theoretical constructs of classical least squares, common problems encountered when applying this approach, including serial correlation, heteroscedasticity, and multicollinearity, are discussed. Techniques for dealing with these problems are then examined. Models with lagged variables are considered, as is estimation with instrumental variables and two-stage least squares.

### AS.440.614. Macroeconometrics [Time-Series Analysis]. 3 Credits.

This course focuses on the practical uses of time-series econometrics in a macroeconomic context. The topics covered include autoregressive-moving average processes, non-stationary time series models, unit root tests, vector autoregression models, and cointegration analysis. Prerequisites: 440.606 Econometrics. Corequisites: 440.602 Macroeconomic Theory.

**Prerequisite(s):** You must take AS.440.602 AND AS.440.606 prior to enrolling in AS.440.614. 440.602 can be taken concurrently.; You must take AS.440.602 AND AS.440.606 prior to enrolling in AS.440.614. 440.602 can be taken concurrently.

### AS.440.615. Macroeconomic Forecasting [Time Series Analysis]. 3 Credits.

This course examines econometric approaches to forecasting macroeconomic activity. The approaches covered span single equation time series to large, complex, simultaneous equations systems. Different measures to assess the forecasting accuracy of these approaches are addressed. A discussion of these approaches and their relevance for policy recommendations is also covered. Prerequisites: 440.606 Econometrics. Corequisites: 440.602 Macroeconomic Theory.

**Prerequisite(s):** You must take AS.440.602 AND AS.440.606 prior to enrolling in AS.440.615. AS.440.602 can be taken concurrently.; You must take AS.440.602 AND AS.440.606 prior to enrolling in AS.440.615. AS.440.602 can be taken concurrently.

### AS.440.616. Bayesian Econometrics. 3 Credits.

The main goal of this course is to provide the students the alternative viewpoint of the Bayesian approach vis-à-vis the classical econometric approach based on the frequentist perspective. The course will present the basic principles of Bayesian inference, Bayesian Analysis of the linear regression model and extensions of the regression model, and the numerical methods used for Bayesian implementation. Modern Bayesian econometrics relies heavily on numerical simulation methods and computational algorithms. With the advancement of computing power and the advent of new simulation methods, simulation based Bayesian methods have become increasingly popular in practice with a large and growing number of applications. A significant part of the course will be devoted to explaining and demonstrating how numerical Bayesian methods, particularly, Markov Chain Monte Carlo (MCMC) methods, such as the Gibbs sampling and the Metropolis-Hastings algorithm, can be applied to estimate various interesting models in economics and finance. Students will develop practical experience with posterior simulation through hands on computer exercises involving computer programming. Prerequisites: 440.606 Econometrics.

**Prerequisite(s):** AS.440.606 must be taken before you can register for AS.440.616.

### AS.440.617. Financial Econometrics [Time-Series Analysis]. 3 Credits.

[formerly 440.647] This course introduces students to the methods most commonly used in empirical finance. Key models and methods are ARCH, GMM, Regime-Switching Models, test of CAPM (Capital Asset Pricing Model), term structure models, and volatility models (implied, stochastic volatility). Students will also learn aspects of time series econometrics for both stationary and non-stationary variables at different time frequencies, with emphasis on financial variables. Prerequisites: 440.606 Econometrics; 440.614 Macroeconometrics is recommended.

**Prerequisite(s):** You must take AS.440.606 prior to enrolling in AS.440.617; 440.614 Macroeconometrics is recommended..

### AS.440.618. Microeconometrics [Cross-Section and Panel Analysis]. 3 Credits.

[formerly 440.648] This course covers a number of advanced techniques frequently encountered in applied microeconomic analysis. Topics include generalized method of moments estimation, nonlinear regression, estimation with panel data, systems of regression equations and simultaneous equation models, maximum likelihood estimation and likelihood ratio tests, and limited dependent variable analysis (i.e. Logit, Probit, Tobit, etc.). Prerequisites: 440.606 Econometrics. Corequisites: 440.601 Microeconomic Theory and Policy

**Prerequisite(s):** Must take AS.440.601 prior to AS.440.618 or concurrently.; AS.440.606 must be taken prior to AS.440.618.

### AS.440.622. Cost-Benefit Analysis. 3 Credits.

[formerly 440.632] The objective of this course is to develop and apply an analytical framework for evaluating projects with an emphasis on publicly funded projects. Coverage includes the evaluation of benefits and costs over time, including in the presence of uncertainty, in the absence of market prices, and when income distribution objectives need to be incorporated into a project's evaluation. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** AS.440.606 must be completed before enrolling in AS.440.622 or taken at the same time as AS.440.622.; You must take AS.440.601 prior to enrolling in AS.440.622.

**AS.440.624. Computable General Equilibrium Modeling. 3 Credits.**

This course will provide an understanding of how to independently develop, modify, run and interpret Computable General Equilibrium (CGE) models. CGE models are widely used in the analysis of International Trade, Taxation, Environmental Policy, and other subjects. The specific objectives of this course are as follows: Students will (1) gain an understanding of the underlying economic theory behind CGE modeling; (2) learn how to gather data sources from publicly available information to build CGE models; (3) gain an understanding of the software General Algebraic Modeling Software (GAMS) to run the models; (4) learn how use and modify existing CGE programs for research purposes; (5) be able to write simple CGE programs in GAMS; (6) be able to analyze public policy with CGE models; (7) how to interpret results from CGE models; (8) understand possible extensions of CGE models for potential future research purposes. Analytical skills developed through this class will assist you in building your careers as researchers, public managers, and policy analysts. Prerequisites: 440.601 Microeconomic Theory, 440.602 Macroeconomics Theory. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** AS.440.606 must be completed before enrolling in AS.440.624 or taken concurrently.; You must take AS.440.601 AND AS.440.602 prior to enrolling in AS.440.624.

**AS.440.625. Machine Learning in Statistics. 3 Credits.**

This course focuses on the use of machine learning methods for in-sample and out-of-sample prediction. The topics include regression, classification, random trees (forests, boosting, and pruning), regularization, Bayesian estimation, neural networks, support vector machines, model selection and ensemble learning. Prerequisite 440.606 Econometrics.

**Prerequisite(s):** AS.440.606 must be completed before you can take AS.440.625.

**AS.440.630. Monetary Economics. 3 Credits.**

This course is designed as a survey of the basic theories in monetary economics for masters level students. The main objective of the course is to help students understand the core aspects of monetary economics: how monetary phenomena and policies are determined, and how they interact with the rest of the macro economy. Several key theoretical frameworks will be constructed, and various monetary economics phenomena, including monetary policy actions, will be analyzed within such frameworks. Among the topics to be covered include: neutrality and super-neutrality of money, money demand and money supply, consumption CAPM and equity premium puzzle, inflation and the optimal inflation rate, public finance and inflation, (new Keynesian) Phillips curve, monetary policy transmission mechanisms, the term structure of interest rates, strategy of monetary policy and optimal monetary policy, the time inconsistency problem in monetary policy, monetary policy targets and rules, monetary policy at ZLB, and non-conventional monetary policies. Prerequisites: 440.602 Macroeconomic Theory and Policy. Corequisites: 440.601 Microeconomic Theory and Policy; 440.606 Econometrics

**Prerequisite(s):** AS.440.606 and AS.440.601 must be completed before enrolling in AS.440.630 or taken concurrently.; You must take AS.440.602 before you can take AS.440.630.

**AS.440.632. Topics in Macroeconomics and Finance. 3 Credits.**

[This course aims to develop a better understanding of the linkages between the banking system and the broader macroeconomy. Particular attention will be paid to the role of banks and the banking system in propagating and perpetuating the recent financial crisis. Specific topics include the functioning of the banking system in a basic general equilibrium macro model, the Diamond-Dybvig model of bank runs; an empirical look into the economic cost of banking crises, central bank intervention in the face of a banking failure, the link between sovereign debt and the banking system, and the European debt crisis and the response of the ECB. Prerequisites: 440.602 Macroeconomic Theory. Corequisites: 440.601 Microeconomic Theory; 440.606 Econometrics; 440.640 Financial Economics

**Prerequisite(s):** AS.440.601, AS.440.606, and AS.440.640 must be taken prior to AS.440.632 or taken concurrently.; You must take 440.602 prior to enrolling in AS.440.632

**AS.440.634. Economic Growth. 3 Credits.**

[formerly 440.624] Examines contemporary theories of economic growth and empirically applies them to panels of present day developing and industrialized countries, and to the historical evolution of individual countries and groups of countries. Topics include neoclassical growth models, population and growth, the economics of ideas, endogenous growth models, aid and growth, and policy and growth. Prerequisites: 440.602 Macroeconomic Theory and Policy. Corequisites: 440.606 Econometrics; 440.601 Microeconomic Theory and Policy.

**Prerequisite(s):** AS.440.601 and AS.440.606 must be completed before enrolling in AS.440.634 or taken concurrently.; You must take AS.440.602 prior to enrolling in AS.440.634.

**AS.440.639. International Finance (Open Economy Macro). 3 Credits.**

[formerly 440.619] This course provides an overview of open economy macroeconomics, and international financial markets and policies. The focus is on exchange rate determination, the importance of the balance of payments for both the domestic economy and the economies of other countries, international capital flows, the impact of internal debt on the balance of trade, and the interaction and potential conflicts between domestic and international economic policy objectives. Prerequisite: 440.602 Macroeconomic Theory. Corequisite: 440.601 Microeconomic Theory; 440.606 Econometrics.

**Prerequisite(s):** AS.440.601 and AS.440.606 must be completed before AS.440.639 or taken concurrently.; You must take AS.440.602 prior to enrolling in AS.440.639 or take it concurrently.

**AS.440.640. Financial Economics. 3 Credits.**

[formerly 440.642] Finance treats the transfer of resources across time and the transfer of risk among economic entities. The aim of this course is to develop the microeconomic theory relevant to these types of transactions. A set of underlying economic principles is applied to the determination of the value of basic financial instruments such as stocks and bonds, as well as to more complicated derivative securities, such as futures and options. Valuation concepts, in turn, allow for the analysis of various issues of interest to policy makers as well as portfolio managers and investors, such as the term structure of interest rates, portfolio theory, the capital structure of the firm, and risk management. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** AS.440.606 must be completed before enrolling in AS.440.640 or taken concurrently.; You must take AS.440.601 prior to enrolling in AS.440.640

**AS.440.641. Financial Intermediation & Financial Markets. 3 Credits.**  
[formerly 440.620] Examines why financial intermediaries exist, how they co-exist with financial markets, and how they have been forced to switch from accepting deposits and making loans to using derivatives to manage risk. Shows how risk management differs between bank-based and market-based economies. Analyzes the economic consequences of financial market imperfections, especially for credit market equilibrium and rationing. theories of bank runs and systemic risk; and how different financial systems and governments can cope with financial crises, financial fragility, and credit market frictions. Corequisite: 440.640 Financial Economics.

**Prerequisite(s):** You must take AS.440.640 prior to taking AS.440.641 or take it concurrently.

**AS.440.643. Economics of Investments and Financial Management. 3 Credits.**

This course develops a deeper understanding of financial markets in the context of portfolio theory. In addition to understanding how financial markets operate and relate to the broader economy, students will develop skills to analyze investment decisions and manage investment portfolios. Students will learn the efficient market hypothesis (EMH), criticisms and implications of EMH for investment strategies, modern portfolio theory and practice, and tools for evaluating performance. Throughout the course, several financial models will be analyzed especially as they relate to real-world asset allocation decisions. Corequisites: 440.640 Financial Economics.

**Prerequisite(s):** You must complete AS.440.640 before enrolling in AS.440.643 or take it concurrently.

**AS.440.645. Behavioral Economics & Finance. 3 Credits.**

This course treats key topics in behavioral economics and finance theoretically and empirically. We analyze the efficient markets hypothesis and its potential weaknesses, the role of noise trading, consumer choice anomalies and perception biases, and serial correlation in stock prices, as well as other topics in behavioral economics and finance. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must first complete AS.440.601 prior to enrolling in AS.440.645; You must complete AS.440.606 before enrolling in AS.440.645 or take it concurrently.

**AS.440.646. Economics of Derivatives. 3 Credits.**

This course provides students a thorough introduction to the theoretical and practical aspects of forwards, futures, options, and swaps. Derivatives are important tools in financial markets, and students will learn how to price, value, and use them from a practical perspective. This course is particularly important for students seeking to work in finance. Topics covered include no arbitrage-based pricing, the pricing of forwards and futures, interest rate products and commodities, valuation based on market prices, and option pricing and strategies. Corequisites: 440.640 Financial Economics.

**Prerequisite(s):** You must take AS.440.640 prior to enrolling in AS.440.646 or take it concurrently.

**AS.440.650. Environmental & Resource Economics. 3 Credits.**  
[formerly 440.640] Beginning with the concept of sustainability, the course develops a framework for an economic assessment of environmental problems including the notion of market failure, valuation of environmental resources, and policy design issues associated with using alternative economic incentives and instruments. The second part of the course examines principles of the economically efficient management of non-depletable and depletable (e.g., fossil fuels, natural ecosystems) resources. Various applied settings are used to demonstrate the principles developed in the course. Prerequisites: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must take AS.440.606 prior to enrolling in AS.440.650 or take it concurrently; You must take AS.440.601 prior to enrolling in AS.440.650

**AS.440.653. Economics of the Labor Market. 3 Credits.**

This course develops the theory and empirics of labor markets by focusing on several leading institutional structures of both labor supply and labor demand. This theory is then applied to issues such as wage determination, wage rigidity, training and retraining programs, and the skills and wage distribution, as well as government policies that correct inefficiencies in labor markets. Prerequisites 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must complete AS.440.606 prior to enrolling in AS.440.653 or take it concurrently; You must take AS.440.601 prior to enrolling in AS.440.653

**AS.440.656. Political Economy. 3 Credits.**

[formerly 440.616] This course examines how rational choice methodology (including Game Theory and Neoclassical Economics) can be applied to analyze issues related to political economy. Topics include the origin of state, economic origins of political regimes, different models of voting and their outcomes and different aspects of federalism. This course also explores how political economy influences economic development and public debt. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must complete AS.440.606 prior to enrolling in AS.440.656 or take it concurrently; You must take AS.440.601 Microeconomic Theory prior to enrolling in AS.440.656 Political Economy.

**AS.440.658. Industrial Organization. 3 Credits.**

[formerly 440.638] In this course, the focus is on the study of markets and the laws and regulations used to ameliorate some of their imperfections, especially the problems caused by market structure and market power. Many economic models used to explain how markets work and what is necessary for market power to exist are investigated. Subsequently, the course explores how regulators and private litigants try to eliminate or control market power, particularly through antitrust law, with respect to price fixing, mergers, and market dominance. Regulatory issues pertaining to such industries as telecommunication, transportation, electrical power, health, safety, and the environment are covered. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must complete AS.440.606 prior to enrolling in AS.440.658 or take it concurrently; You must take AS.440.601 prior to enrolling in AS.440.658

**AS.440.661. Public Economics. 3 Credits.**

This course analyzes the determinants and properties of government expenditures and social regulation. The first part of the course is generic: It addresses efficiency and equity in income redistribution; the provision of public goods; coping with externalities, addiction and risk; and voting and bureaucracy, and taxation. The second part of the course is particular. It examines health policy, education policy, statutory pensions, and welfare policy in a comparative international context. Prerequisites: 440.601 Microeconomic Theory Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must take AS.440.606 prior to enrolling in AS.440.661 or take it concurrently.; You must take AS.440.601 prior to taking AS.440.661

**AS.440.663. Development Microeconomics. 3 Credits.**

[formerly 440.623] This course analyzes the constraints on households and policy makers in developing countries using econometric tools. Empirical micro-economic studies of behavior and policy outcomes under different types of market failures are drawn upon. Topics include inter alia inequality, fertility, education, health, poverty, nutrition, and failures in land, labor, credit and insurance markets. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must take AS.440.606 prior to enrolling in AS.440.663 or take it concurrently.; You must take AS.440.601 prior to enrolling in AS.440.663

**AS.440.665. International Trade (Open Economy Micro). 3 Credits.**

The first part of the course examines the causes of trade, the sources of the gains from trade, and the domestic and international distribution of those gains. In addition, it introduces the politico-economic causes of trade policy and addresses the theory and empirics of trade and growth. The second part examines in detail the instruments and consequences of trade policy, namely tariffs and quantitative restrictions, and their modern manifestation as anti-dumping and safeguard measures. The causes and consequences of trade policy, too, are linked to contemporary empirical evidence. Prerequisites: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must take AS.440.606 prior to enrolling in AS.440.665 or take it concurrently.; You must take AS.440.601 prior to enrolling in AS.440.665

**AS.440.666. Regional Economics. 3 Credits.**

Regional economics is a relatively new formal branch of economics which recognizes the crucial importance of geography in the workings of a market economy. By incorporating variables of space and geography into traditional economic models, it has great relevance to real world phenomena and policy questions. We examine the effects of market forces on spatial variables such as the location choices of households and firms; land use policy; labor market agglomeration; urban poverty; the development of transportation infrastructure; and urban and rural housing markets. The roles of natural resources, demographic base, location of industries, and factors determining regional growth and development will also be considered. Prerequisite: 440.601 Microeconomic Theory and Policy. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must take AS.440.606 prior to enrolling in AS.440.666 or take it concurrently.; You must take AS.440.601 prior to enrolling in AS.440.666

**AS.440.667. Urban Economics. 3 Credits.**

This course develops a framework to analyze how cities operate and how to improve them. The first part of the course addresses basic questions about cities: Why do cities exist? What makes some cities more costly than others? What determines housing prices? The second part of the course examines specialized topics including residential segregation, economic development programs, and suburbanization. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**Prerequisite(s):** You must complete AS.440.606 prior to enrolling in AS.440.667 or take it concurrently.; You must complete AS.440.601 prior to enrolling in AS.440.667.

**AS.440.672. Economics of Health Care. 3 Credits.**

This course introduces you to the application of economic models and empirical principles related to health and health care. Topics include demand for health and health care, supply of health care, information economics, economics of health innovation, health policy, and public health economics. It is also designed to a general audience who is interested in health insurance markets and health policy debates in the U.S., and around the world. Prerequisite: Microeconomic Theory (AS.440.601) and Econometrics (AS.440.606).

**Prerequisite(s):** You must complete AS.440.606 prior to enrolling in AS.440.672 or take it concurrently.; You must take AS.440.601 prior to enrolling in AS.440.672

**AS.440.684. Game Theory. 3 Credits.**

[formerly 440.644] Game theory is a mathematical tool developed for the purpose of understanding not only the interaction of economic market participants, but overall observed social phenomena as well. This course provides an introduction to game theory with applications to economics. Moreover, the course presents an approach to modeling a social situation as a game and develops techniques for solving the game in order to gain insight into individual behavior. Topics include repeated games, games with incomplete information, and the experimental testing of hypotheses. Prerequisite: 440.601 Microeconomic Theory.

**Prerequisite(s):** You must take AS.440.601 prior to enrolling in AS.440.684

**AS.440.692. Thesis. 3 Credits.**

<p> Students may undertake their own research project as an 11th program course for three additional credits at full tuition. Prior to proposing a project, interested students must have clearly identified a research topic, and submit a formal proposal for review and approval to the Thesis Research Committee, to be received no later than two months prior to the beginning of the term in which the student plans to enroll in the course. The proposal must follow the Applied Economics Thesis Guidelines, which can be obtained by contacting the Program Director. </a> <o:p></o:p></span></p><p>The committee will help identify a mentor who is familiar with their prospective inquiry, and is willing to provide guidance and oversee the project. The mentor must be faculty teaching at the Johns Hopkins University, but the availability of a mentor cannot be guaranteed. Students must meet with the mentor periodically for discussion of the project's progress, on-site or on-line, and must complete a research paper, to be approved by the mentor and the Committee.

<o:p></o:p></span></p><p>Enrollment of the student is undertaken by the Program Director. Candidates must plan on using one semester to successfully complete Thesis <o:p></o:p></span></p><p>Prerequisites: All four Core courses and Microeconometrics or Macroeconometrics, and one or more Applied Economics courses in the substantive area of the proposed research, plus a strong academic record (at least B+ average) in at least eight program courses, are absolute minima.<o:p></o:p></span></p>

**AS.440.801. Independent Study. 3 Credits.**

This course focuses on the practical uses of time-series econometrics in a macroeconomic context. The topics covered include autoregressive-moving average processes, non-stationary time series models, unit root tests, vector autoregression models, and cointegration analysis. Prerequisites: 440.602 Macroeconomic Theory and Policy; 440.606 Econometrics.

**AS.440.888. Continuation (Applied Economics).**

[formerly 440.656] Students not finishing their paper during the term in which they enroll must register for Continuation in every ensuing semester (including Summer) until their papers are accepted, but Continuation does not count as a separate course. Such students must pay a continuation-of-enrollment fee of \$500 for each subsequent term until a final grade has been submitted. In Applied Economics, taking Continuation once may be considered the norm. Prerequisite: 440.692 Thesis