The Department of Economics offers programs designed to improve the understanding of important economic problems and to provide the tools needed for the critical analysis of these problems and for dealing with them in practice.

On the undergraduate level, the department provides both for those who want to become professional economists and for those interested in a specialty related to economics, such as business, law, government, history, health care management, or environmental engineering. Still other students are simply interested in improving their understanding of society or making informed assessments of economic policies as citizens or making wise decisions about personal finances.

On the graduate level, the department provides advanced training for students preparing for careers as professional economists. The program encompasses such fields as macroeconomics, microeconomic theory, econometrics, labor economics, international economics, industrial organization, economic development, and finance, with an emphasis on the application of economic theory and quantitative methods. Because of the small number of graduate students admitted, they can work closely with faculty in graduate courses and seminars, and have easy and informal access to faculty members.

**Undergraduate Program**

The introductory courses AS.180.101 Elements of Macroeconomics and AS.180.102 Elements of Microeconomics are open to all students. Courses at the 200-level have Elements of Economics (AS.180.101 and AS.180.102) as prerequisites.

AS.180.301 Microeconomic Theory (or AS.180.401 see below) and AS.180.302 Macroeconomic Theory courses have AS.180.101 and AS.180.102 as well as Calculus I (AS.110.106 or equivalent) as prerequisites. All 300-level courses above 301 and 302 have Microeconomic and/or Macroeconomic Theory (AS.180.301, AS.180.302) as prerequisites (or, with permission of the instructor, corequisites), as well as Elements of Economics and Calculus. Some 300-level courses have additional prerequisites; see individual course listings. Independent study is available, subject to the consent of the department and of the faculty member with whom the student wants to work.

Subject to the consent of the instructor, graduate courses at the 600-level are open to qualified undergraduates. The 600-level courses for which advanced undergraduates are most likely to be qualified are AS.180.601 Consumer & Producer Theory and AS.180.603 Macroeconomic Theory I.

**Requirements for the B.A. Degree**

(Also see Requirements for a Bachelor’s Degree. (http://e-catalog.jhu.edu/undergrad-students/academic-policies/requirements-for-a-bachelors-degree))

For both the economics major and minor, a minimum grade of C- or better is required for all courses meeting the requirements and courses may not be taken satisfactory/unsatisfactory. Courses from study abroad or taken at other universities may count towards requirements only if they are approved by the department’s director of undergraduate studies. Internships, independent studies, and intersessions courses do not apply towards major or minor requirements. Summer courses at universities other than Johns Hopkins DO NOT count toward the major or minor, except with prior approval of the Director of Undergraduate Studies for Economics.

**Economics Electives**

Three 200- or 300-level economics courses ** 9
Two 300-level economics courses 6

**Mathematics**

AS.110.106 Calculus I (Biology and Social Sciences) 4
or AS.110.108 Calculus I

**Statistics**

EN.553.111 Statistical Analysis I 4
or EN.553.112 Statistical Analysis II
or EN.553.211 Probability and Statistics for the Life Sciences
or EN.553.310 Probability & Statistics
or EN.553.311 Probability and Statistics for the Biological Sciences and Engineering
or EN.553.420 Introduction to Probability
or EN.553.430 Introduction to Statistics
or AS.280.345 Public Health Biostatistics

* Students who use exam credits to satisfy the AS.180.101 Elements of Macroeconomics and/or AS.180.102 Elements of Microeconomics requirements must take additional courses in the department to reach a total of 10 courses in the department.

** Please note: 180.203 "Faculty Research in Economics", a S/U one-credit course, does not count as one of these three courses.

*** AS.180.401 Advanced Microeconomic Theory is a faster-paced and more intensive version of Microeconomic Theory AS.180.301. You can use either AS.180.301 or AS.180.401 to satisfy the requirement for the economics major. Both AS.180.301 and AS.180.401 will be offered during the same time slot, so the logistics of switching from AS.180.301 to AS.180.401 should be seamless, should you decide to make the switch. The prerequisites for AS.180.401, like the prerequisites for AS.180.301, are AS.180.102 and one semester of calculus. Note: you may not take both AS.180.301 and AS.180.401.

**** AS.180.434 Advanced Econometrics is a faster-paced and more intensive version of Econometrics AS.180.334. You use can either AS.180.334 or AS.180.434 to satisfy the requirement for the economics major. Both AS.180.334 and AS.180.434 will be offered during the same time slot, so the logistics of switching from AS.180.334 to AS.180.434 should be seamless, should you decide to make the switch. Note: You may not take both AS.180.334 and AS.180.434.

Also Note: In Spring 2018 we will again offer both AS.180.334 and AS.180.434.
Additional Notes for Students

- EN.553.111 (p. 1) Statistical Analysis I or equivalent (any of the Statistics courses listed above) is a prerequisite for Econometrics.
- The Senior Honors Thesis sequence (AS.180.521 (p. 1) Research in Economics and AS.180.522 (p. 1) Senior Thesis) cannot be used to satisfy any of the requirements for the major.

Sample Program

A typical program might include the following sequence of courses:

### Freshman

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.101</td>
<td>3</td>
<td>AS.180.102</td>
<td>3</td>
</tr>
<tr>
<td>Elements of Macroeconomics</td>
<td></td>
<td>Elements of Microeconomics</td>
<td></td>
</tr>
<tr>
<td>AS.110.106</td>
<td>4</td>
<td>EN.553.111</td>
<td>4</td>
</tr>
<tr>
<td>Calculus I (Biology and Social Sciences)</td>
<td></td>
<td>Statistical Analysis I</td>
<td></td>
</tr>
</tbody>
</table>

7 7

### Sophomore

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.301</td>
<td>4.5</td>
<td>AS.180.302</td>
<td>4.5</td>
</tr>
<tr>
<td>Microeconomic Theory</td>
<td></td>
<td>Macroeconomic Theory</td>
<td></td>
</tr>
<tr>
<td>200 level elective</td>
<td>3</td>
<td>200 or 300 level elective</td>
<td>3</td>
</tr>
</tbody>
</table>

7.5 7.5

### Junior

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.334</td>
<td>3</td>
<td>300 level elective</td>
<td>3</td>
</tr>
</tbody>
</table>

3

### Senior

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 level elective</td>
<td>3</td>
<td>200 or 300 level elective (optional)</td>
<td>0</td>
</tr>
</tbody>
</table>

3 0

Total Credits: 41

* Total Credits of 41 include AS.180.106 Calculus and EN.550.111 Statistical Analysis.

** Students trying to take these courses after freshman or sophomore year are likely to run into serious schedule conflicts in the junior and senior years because of the need to fulfill the prerequisites for advanced courses. Consult with faculty at an early stage.

Honors Program in Economics

Departmental honors are awarded to those students who satisfy the following requirements:

- All economics courses applied to the major have been taken in the department.

  - AS.180.521 Research in Economics and AS.180.522 Senior Thesis. The thesis may not be counted as one of the five economics electives.
  - A grade point average of at least 3.5 for all economics courses.

Minor in Economics

Students with a major in another department may be awarded a minor in economics with satisfactory work in the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.101</td>
<td>Elements of Macroeconomics 3</td>
</tr>
<tr>
<td>AS.180.102</td>
<td>Elements of Microeconomics 3</td>
</tr>
</tbody>
</table>

Four economics courses at the 200- or 300-level (not including 180.203) 12

No substitution of courses in other departments for economics electives may be made. Students who use exam credits to satisfy the AS.180.101 (http://e-catalog.jhu.edu/departments-program-requirements-and-courses/arts-sciences/economics) Elements of Macroeconomics and/or AS.180.102 (http://e-catalog.jhu.edu/departments-program-requirements-and-courses/arts-sciences/economics) Elements of Microeconomics requirements must take additional courses in the department to reach a total of 6 courses.

Center for Financial Economics (CFE)

Founded in 2008 and housed in the Economics Department in the Krieger School of Arts and Sciences at Johns Hopkins, the Center for Financial Economics blends the study of finance and economics, providing in-depth training and cutting-edge research in both. The dual research and teaching missions of the Center are premised on the belief that a deep understanding of modern economies requires an integrated treatment of finance and the broader economic forces driving economic progress. The recent financial crisis vividly illustrates the vital need for improved understanding of these issues on the part of practitioners, policymakers, and academics.

The CFE offers an undergraduate minor, producing expertise in finance within the context of a top-notch liberal arts education. The minor will equip students with a thorough foundation in the workings of financial markets and their role in the broader economy, providing a foundation for careers in finance, business, academics, and government. The Center is working toward offering a financial economics major and a Ph.D. in financial economics.

The Minor in Financial Economics

The main objective of the minor is to provide students with training in the conceptual framework, guiding concepts, and technical tools of modern finance. The broader goal is to provide insights into the large and the small—the macro and micro—of how this framework helps us understand the workings of the economy. The minor in financial economics includes four required courses and two elective courses chosen from the list below.

### Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.101</td>
<td>Elements of Macroeconomics 3</td>
</tr>
<tr>
<td>AS.180.102</td>
<td>Elements of Microeconomics 3</td>
</tr>
<tr>
<td>AS.180.263</td>
<td>Corporate Finance 3</td>
</tr>
<tr>
<td>AS.180.367</td>
<td>Investment-Portfolio Management 3</td>
</tr>
</tbody>
</table>

### Elective Courses (Select two of the following)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.263</td>
<td>Corporate Finance 3</td>
</tr>
</tbody>
</table>
The minor is open to all majors. A minimum grade of C- or better is required for all courses and they may not be taken satisfactory/unsatisfactory. One cannot take both the economics and financial economics minor. For economics majors, there is a restriction on double-counting: the two elective courses counting toward the minor cannot also count toward the economics major.

### Graduate Programs

#### Requirements for Admission

The admission of each applicant is decided by the Department as a whole and rests upon his/her academic record (especially economics and mathematics courses), GRE test scores, recommendations of scholars and instructors, and other pertinent information including a match between the research interests of the applicant and the faculty.

To apply for admission, applicants are required to upload unofficial transcripts of all previous college and university study to their online application. Failure to upload unofficial transcripts will result in an inability to complete and submit the online application. In addition, we require at least two letters of recommendation. These recommendation letters should come from individuals who can comment on your scholarly skills. All applicants must submit scores from the Graduate Record Examination. Admitted students nearly always have very high quantitative GRE scores. Foreign applicants, who have not earned a degree in a university where English is the sole language of instruction, must take the TOEFL to satisfy the department that they are fluent in English. The department requires the TOEFL with a minimum score of 100 (internet based), 600 (paper based) or 250 (computer based), or IELTS with a bandscore of 7 in place of the TOEFL.

Students should have a knowledge of economic theory and statistics and a strong background in mathematics including differential and integral calculus and linear algebra. Almost all of our students enter with at least two semesters of calculus and linear algebra. In admissions decisions, we like applicants to have taken other mathematics courses as well, including more advanced calculus, differential equations, probability, and real analysis. We especially welcome applications from under-represented minorities, as diversity is important in our graduate program.

#### Requirements for the M.A. Degree

The department does not admit students from outside Johns Hopkins University who intend to work only for an M.A. However, it does offer this degree as an intermediate step toward the Ph.D. or as a final degree to some of those who do not complete their doctoral work.

Beyond the general university requirements, the department requires for the master's degree either two years of satisfactory graduate course work or one year of satisfactory graduate course work and an acceptable master's essay.

### Requirements for the Ph.D. Degree

#### Basic Course Work

Students take two years of course work. The first year is comprised of two semesters each of microeconomic theory, macroeconomic theory, and mathematical methods, and one-semester courses in statistics and econometrics. In the second year, students take electives—four in the fall semester and three in the spring semester. Students may also take relevant courses in related departments, such as Mathematics, Applied Mathematics and Statistics, Political Science, Public Health, Sociology and Anthropology.

#### Comprehensive Exam

This exam is administered by the department and consists of two written examinations designed to test the candidate's knowledge of both microeconomics and macroeconomics. The written examinations are taken before the beginning of the third term.

#### Research Paper

A research paper is submitted at the end of the fourth term.

#### Dissertation

This should be an original investigation worthy of publication, prepared under the supervision of three members of the faculty. A dissertation proposal is due during the sixth term. The candidate must submit the dissertation in final typed form at least three weeks before the date of the Graduate Board Oral Examination. The committee that administers the examination includes faculty from outside the department. Though it is feasible to finish in four years, it is typical to complete the Ph.D. in five or six years.

#### Financial Aid

The department offers a Departmental Fellowship to all enrolled students. This fellowship covers full tuition costs plus an annual stipend of $29,000 and full student health insurance coverage. During a student’s first year of study, this fellowship support is provided with no teaching assistantship duties. Beginning in the second year of study, students who are performing satisfactorily, will again receive the same Departmental Fellowship coverage as in their first year. In addition, during years 2, 3, 4 and 5, this will involve a teaching or research assistantship assignment. The department guarantees financial support for a minimum of five years of graduate study, conditional on satisfactory performance and potentially a sixth year as well depending on student performance and the availability of funds.

#### Carl Christ Fellowship

In the academic year 1989–90, the department established the Carl Christ Fellowship fund to honor one of its faculty members for his distinguished service and achievements. The proceeds of the fund are used to support outstanding graduate students at the dissertation stage of their research.

For further information about graduate study in economics, contact the director of graduate admissions, Department of Economics at econadmissions@jhu.edu.

For current faculty and contact information go to http://econ.jhu.edu/directoryindex/faculty/

#### Faculty

**Chair**
Laurence M. Ball
Research Interest: Macroeconomics

**Professors**
Christopher Carroll

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS.180.242</td>
<td>International Monetary Economics</td>
</tr>
<tr>
<td>or AS.180.238</td>
<td>Rethinking Economics After the Great Recession</td>
</tr>
<tr>
<td>or AS.180.244</td>
<td>Financial Writing and Analysis</td>
</tr>
<tr>
<td>or AS.180.268</td>
<td>Monetary Analysis</td>
</tr>
<tr>
<td>or AS.180.266</td>
<td>Financial Markets and Institutions</td>
</tr>
<tr>
<td>or AS.180.288</td>
<td>The History and Future of the Hedge Fund Industry</td>
</tr>
<tr>
<td>or AS.180.308</td>
<td>Topics in International Macroeconomics and Finance</td>
</tr>
<tr>
<td>or AS.180.311</td>
<td>Economics of Fixed Income Instruments</td>
</tr>
<tr>
<td>or AS.180.331</td>
<td>Macroeconomic Strategies</td>
</tr>
<tr>
<td>or EN.660.208</td>
<td>Financial Accounting</td>
</tr>
</tbody>
</table>

Total Credits 18
Research Interests: Macroeconomics, Public Finance
Brendan Daley
Research Interest: Finance

Gregory Duffee
Carl Christ Professor of Economics. Research Interest: Finance

Mark Gersovitz
Research Interests: Economic Development, Public Finance

Bruce Hamilton

Yingyao Hu
Research Interests: Econometrics, Empirical Industrial Organization, Labor Economics

Olivier Jeanne
Research Interests: International Macroeconomics, Monetary Policy

Edi Karni
Scott and Barbara Black Professor of Economics. Research Interests: Economics of Uncertainty and Information, Decision Theory, Microeconomic Theory

M. Ali Khan
Abram Hutzler Professor of Political Economy. Research Interests: Mathematical Economics, Economic theory, History of Economic Thought, International and Development Economics

Robert Moffitt

John K. H. Quah
Research Interest: Microeconomic Theory

Richard Spady
Research Interests: Econometrics, Industrial Organization.

Jonathan Wright
Research Interests: Time Series Econometrics, Empirical Macroeconomics, Finance

Associate Professors
Ying Chen
Research Interests: Game Theory, Information Economics, Political Economy

Elena Krasnokutskaya
Research Interests: Industrial Organization, Applied Microeconomics, Applied Econometrics

Assistant Professors
Marcelo Fernandez
Research Interest: Economic Theory

Nicholas Papageorge
Broadsus Mitchell Assistant Professor. Research Interests: Health, Labor and the Economics of Innovation

Professors Emeriti
Louis Maccini
Research Interests: Macroeconomic Theory, Money, Econometrics

H. Peyton Young
Research Interests: Game Theory, Evolutionary Economics, Microeconomic Theory

Fellows
Robert Barbera
Co-Director of the Center for Financial Economics. Research Interests: Real Interest Rate/Real Growth Linkages, Global Energy Supply/Demand Issues

Barclay Knapp
Research Interests: Managerial Economics, Business Strategy

Lecturers
Somasree Dasgupta
Research Interests: International Trade, Economic Growth, Macroeconomics

Kevin Heerd
Research Interests: Derivatives, Corporate Governance, Role of Speculation, Alternative Investment Industry, The Financial Industry

Muhammad Husain
Research Interests: Microeconomic Theory, Labor Economics, Econometrics

Lauren Liu
Research Interest: Microeconometrics

Barbara Morgan
Research Interests: Labor Economics, Public Policy

Ludmila Poliakova
Research Interests: Macroeconomics, Development Economics

Joint Appointments
David Bishai
Professor (Bloomberg School of Public Health) Research Interest: Health Economics.

Filipe Campante
Research Interests: Political Economy and Development

Itay Fainmesser
Assistant Professor (Carey School of Business) Research Interest: Business Economics

Steve H. Hanke
Professor (Department of Environmental Health and Engineering) Research Interests: Applied Economics, Microeconomics, Macroeconomics, Finance.

Pravin Krishna
Professor (SAIS) Research Interest: International Trade

Jian Ni
Associate Professor (Carey Business School) Research Interests: Pricing Strategy, Industrial Organization, Healthcare

Mitsukuni Nishida
Assistant Professor (Carey Business School) Research Interest: Industrial Organization

Alessandro Rebucci
Area: Social and Behavioral Sciences.

Prerequisites: AS.180.101 AND AS.180.102

process.

on their transformation into market economies. We also analyze the contributed to their exceptional growth rates, with particular emphasis BRIC countries for the past 50 years. We discuss the reasons that have run, and have emerged as the biggest and fastest growing emerging acronym BRIC to identify the four large emerging economies, Brazil, In 2001, Jim O'Neill, the Chief Economist at Goldman Sachs, coined the AS.180.214. The Economic Experience of the BRIC Countries. 3.0 Credits. Instructor(s): B. Hamilton.

Area: Social and Behavioral Sciences.

For current course information and registration go to https://sis.jhu.edu/
classes/

Courses

AS.180.101. Elements of Macroeconomics. 3.0 Credits.
An introduction to the economic system and economic analysis, with emphasis on total national income and output, employment, the price level and inflation, money, the government budget, the national debt, and interest rates. The role of public policy. Applications of economic analysis to government and personal decisions. Prerequisite: basic facility with graphs and algebra. Instructor(s): R. Barbera
Area: Social and Behavioral Sciences.

AS.180.102. Elements of Microeconomics. 3.0 Credits.
An introduction to the economic system and economic analysis with emphasis on demand and supply, relative prices, the allocation of resources, and the distribution of goods and services, theory of consumer behavior, theory of the firm, and competition and monopoly, including the application of microeconomic analysis to contemporary problems. Instructor(s): B. Hamilton
Area: Social and Behavioral Sciences.

AS.180.203. Faculty Research in Economics. 1.0 Credit.
This course will consist of a series of informal lectures by various professors in the Department of Economics. Each lecture will consist of a description of a professional research project which he/she/has undertaken over the course of his/her profession career. S/U grading only. Prerequisites: AS.180.101 AND AS.180.102 Instructor(s): B. Hamilton.

AS.180.217. Game Theory in Social Sciences. 3.0 Credits.
Game Theory is the study of multiple person decision problems in which the well-being of a decision maker depends not only on his own actions but also on those of others. Such problems arise frequently in economics, political science, business, military science and many other areas. In this course, we will learn how to model different social situations as games and how to use solution concepts to understand players' behavior. We will consider various examples from different fields and will play several games in class. The emphasis of the class is on the conceptual analysis and applications and we will keep the level of mathematical technicalities at the minimum -- high school algebra and one term of calculus will be sufficient. Students who took AS.180.117 are not eligible to take AS.180.217.
Prerequisites: Students may not have previously taken AS.180.117; AS.180.102 or instructor permission Instructor(s): Y. Chen
Area: Social and Behavioral Sciences.

AS.180.228. Economic Development. 3.0 Credits.
A comprehensive survey of economic behavior by households, farms and firms in poor countries and the role of and for governments. Discussions include measurement of income levels, economy-wide equilibrium, sources of growth, agriculture and industry, international trade and investment, savings, population, fertility, education, health, income distribution and public finances. Applies economic theory rigorously to interpret and evaluate the economic experience of poor countries. Diagnostic test on Elements of Economics is required in the second week. Grading based on 3 exams and one paper. Prerequisites: AS.180.101 AND AS.180.102 Instructor(s): M. Gersovitz
Area: Social and Behavioral Sciences.

AS.180.238. Rethinking Economics After the Great Recession. 3.0 Credits.
The financial crisis that began in the United States in 2007 threw virtually the entire world into recession. This class will look at the causes of the crisis and at how it unfolded. It will look into the conventional wisdom of economists, circa 2006, and why that wisdom proved to be so wrong. It will examine the financial innovations that contributed to the crisis, at the reasons financial regulators were blindsided, and at the reforms enacted after the crisis. Prerequisites: AS.180.101 AND AS.180.102 Instructor(s): F. Norris
Area: Social and Behavioral Sciences Writing Intensive.

AS.180.240. JHU Bologna: History of Banking. 3.0 Credits.
Economics course offered on the JHU Summer Program in Bologna. Permission required. Must be taken for a letter grade. Open to students on the JHU/Bologna summer program only. Instructor(s): J. Faust; R. Barbera
Area: Social and Behavioral Sciences.

AS.180.241. International Trade. 3.0 Credits.
Theory of comparative advantage and the international division of labor: the determinants and pattern of trade, factor price equalization, factor mobility, gains from trade and distribution of income, and theory and practice of tariffs and other trade restrictions. Recommended Course Background: AS.180.101.
Prerequisites: AS.180.101 AND AS.180.102 Instructor(s): S. Dasgupta
Area: Social and Behavioral Sciences.
AS.180.242. International Monetary Economics. 3.0 Credits.
This course presents International Monetary Economics theory and applies it towards gaining an understanding of recent events and current policy issues. The theory presented in this course covers a broad range of topics including exchange rate determination, monetary and fiscal policy in an open economy, balance of payments crises, the choice of exchange rate systems, and international debt. The insights provided by these theoretical frameworks will enable us to discuss topics such as the current global financial crisis, global financial imbalances, the Chinese exchange rate regime, and proposed changes in the international financial architecture.
Prerequisites: AS.180.102
Instructor(s): F. Norris
Area: Social and Behavioral Sciences.

AS.180.248. Financial Writing and Analysis. 3.0 Credits.
There is an immense chasm between economic and financial commentary in academic discussions and that provided by private sector analysts and the press. Some of the difference is merely semantic, but much of the difference has real substance. Academic and nonacademic commentators tend to simply write off the other as being clueless in some way. Sorting out which bits of each style of analysis are most valuable and synthesizing them into a coherent commentary is a rare and valuable skill. This is a hands-on course with a goal of building skills reading and writing commentary in financial economics. The course begins critically studying commentary regarding prominent topics in the news over the recent months and then moves to writing "explainer" pieces for publication on the Center for Financial Economics blog.
Students will work in teams both analyzing commentary, and writing and critiquing the work of fellow students.
Prerequisites: AS.180.101 AND AS.180.102
Instructor(s): F. Norris
Area: Social and Behavioral Sciences
Writing Intensive.

AS.180.252. Economics of Discrimination. 3.0 Credits.
This course examines labor market discrimination by gender, race and ethnicity in the United States. What does the empirical evidence show, and how can we explain it? How much of the difference in observed outcomes is driven by differences in productivity characteristics and how much is due to discrimination? How have economists theorized about discrimination and what methodologies can be employed to test those theories? What has been the impact of public policy in this area; how do large corporations and educational institutions respond; and what can we learn from landmark lawsuits? The course will reinforce skills relevant to all fields of applied economics, including critical evaluation of the theoretical and empirical literature, the reasoned application of statistical techniques, and analysis of current policy issues. Seniors by Permission Only.
Prerequisites: AS.180.102
Instructor(s): B. Morgan
Area: Social and Behavioral Sciences
Writing Intensive.

AS.180.261. Monetary Analysis. 3.0 Credits.
This course analyzes the financial and monetary system of the U.S. economy and the design and implementation of U.S. monetary policy. Among other topics, we will examine the role of banks in the economy, the term structure of interest rates, the stock market, the supply of money, the role of the Federal Reserve in the economy, the objectives of monetary policy in the United States and current monetary policy practice.
Prerequisites: AS.180.101 and AS.180.102
Instructor(s): L. Poliakova
Area: Social and Behavioral Sciences.

AS.180.263. Corporate Finance. 3.0 Credits.
This course is an introduction to the financial management of a corporation. Students study the following broad questions. How should a firm decide whether to invest in a new project? How much debt and equity should a firm use to finance its activities? How should a firm pay its investors? How do taxes affect a firm’s investment and financing decisions? What determines the value of a firm? The emphasis throughout the course is on the economic principles that underlie answers to these questions.
Prerequisites: AS.180.101 AND AS.180.102
Instructor(s): G. Duffee
Area: Social and Behavioral Sciences.

AS.180.266. Financial Markets and Institutions. 3.0 Credits.
Understanding design and functioning of financial markets and institutions, connecting theoretical foundations and real-world applications and cases. Basic principles of asymmetric information problems, management of risk. Money, bond, and equity markets; investment banking, security brokers, and venture capital firms; structure, competition, and regulation of commercial banks. Importance of electronic technology on financial systems.
Prerequisites: AS.180.101 AND AS.180.102
Instructor(s): J. Wright
Area: Social and Behavioral Sciences.

AS.180.268. Seminar on Financial Regulation. 3.0 Credits.
This course examines regulation of the financial system in the United States and its effects on the economy. It considers proposals for reform and the ongoing implementation of the Dodd-Frank Act of 2010. A major part of the course will be student research projects and class discussion of the projects.
Prerequisites: AS.180.261
Instructor(s): L. Ball
Area: Social and Behavioral Sciences.
AS.180.280. The History and Future of the Hedge Fund Industry. 3.0 Credits.
The precursors to modern hedge funds began more than 50 years ago, but in the 1990s the hedge fund, or alternative investments, industry began a period of rapid growth and evolution. With growth came controversy. Some argue that hedge funds, by allowing immense amounts of capital to be rapidly and freely deployed, play a vital role in pushing prices toward the efficient markets ideal. Others claim that hedge funds may accentuate speculative price dynamics, threatening the stability of the financial sector. While many hedge funds claim to offer outstanding returns to investors, data suggest that many clients end up paying high fees for unspectacular results. This course examines these and other controversies, while tracing the history of the alternative investments industry over the last 25 years.
Prerequisites: AS.180.101 AND AS.180.102 AND (AS.180.266 OR AS.180.263 OR AS.180.367)
Instructor(s): K. Heerdt
Area: Social and Behavioral Sciences.

AS.180.289. Economics Of Health. 3.0 Credits.
Application of economic concepts and analysis to the health services system. Review of empirical studies of demand for health services, behavior of providers, and relationship of health services to population health levels. Discussion of current policy issues relating to financing and resource allocation.
Prerequisites: AS.180.102
Instructor(s): D. Bishai
Area: Social and Behavioral Sciences.

AS.180.301. Microeconomic Theory. 4.5 Credits.
An introduction to the modern theory of allocation of resources, starting with the theories of the individual consumer and producer, and proceeding to analysis of systems of interacting individuals, first in the theory of exchange, then to systems which include production as well.
Prerequisites: AS.180.102 AND (AS.110.106 OR AS.110.107 OR AS.110.108 OR AS.110.109) OR equivalent.; AS.180.101 may be taken concurrently.
Instructor(s): M. Husain
Area: Social and Behavioral Sciences.

AS.180.302. Macroeconomic Theory. 4.5 Credits.
The course provides a treatment of macroeconomic theory including a static analysis of the determination of output, employment, the price level, the rate of interest, and a dynamic analysis of growth, inflation, and business cycles. In addition, the use and effectiveness of monetary and fiscal policy to bring about full employment, price stability, and steady economic growth will be discussed.
Prerequisites: AS.180.101 and (AS.110.106 or AS.110.107 or AS.110.108 or AS.110.109); AS.180.102 can be taken at the same time as AS.180.302.
Instructor(s): L. Poliakova
Area: Social and Behavioral Sciences.

AS.180.303. Topics in International Macroeconomics and Finance. 3.0 Credits.
The course will review selected topics in international macroeconomics and finance. The topics for the Fall of 2015 include: financial globalization; international portfolio diversification; the problems posed by “sudden stops” in capital flows to emerging markets; global imbalances and global demand rebalancing; how different exchange rate regimes have fared in the global financial crisis; sovereign default in the light of the Argentine experience; and the ongoing Russian currency and financial crisis. The course involves mathematical modeling as well as data analysis.
Prerequisites: Pre-reqs: AS.180.101 AND AS.180.102 AND AS.180.302
Instructor(s): O. Jeanne
Area: Social and Behavioral Sciences.

AS.180.309. Economics Of Uncertainty and Information. 3.0 Credits.
In this course we’ll discuss the theory of decision making in the face of risk, the theory of risk aversion and its applications to financial and insurance markets. Building on the theory of individual decision making under risk, we will study the economic implications of asymmetric information, the type of market failures produced by adverse selection and moral hazard problems, and the models that were advanced to analyze these problems, including incentive contracts, screening and signaling equilibria.
Prerequisites: AS.180.301
Instructor(s): E. Karni.

AS.180.310. Economics Of Antitrust. 3.0 Credits.
This course explores the economic rationale for, and consequence of, antitrust laws. In addition to economic analysis we will study landmark antitrust cases.
Prerequisites: AS.180.301 OR AS.180.401
Instructor(s): B. Hamilton
Area: Social and Behavioral Sciences
Writing Intensive.

AS.180.312. Evaluating Public Policy: Experimental and Quasi-Experimental Research Design in Social Science. 3.0 Credits.
The purpose of the course is to show how experimental, quasi-experimental and non-experimental methods can be used to advance scientific knowledge about topics in economics. It will teach students the empirical techniques required to analyze experimental and non-experimental data to draw causal inference. The course will begin with a primer on the use of experimental methods in economics, specifically in the context of evaluating welfare programs and labor market policies. Students will then proceed to learn the empirical methods that can be employed to establish cause and effect, both when data is obtained through a randomized control trial (experimental data), or when randomization occurs naturally (quasi-experimental data). The tools and topics that are covered will not only be relevant to economics students, but will also be of interest to students from other social science departments.
Prerequisites: AS.180.301 AND (EN.550.420 OR EN.550.310 OR EN.550.112 OR EN.550.113 OR EN.550.211 OR EN.550.311 OR EN.550.430 OR EN.550.435 OR EN.550.111 OR AS.280.345)
Instructor(s): S. Qayyum
Area: Social and Behavioral Sciences
Writing Intensive.
AS.180.314. Mathematical Economics. 3.0 Credits.
This course traces the extent to which modern economic theory, particularly as it pertains to pure competition in market and non-market games under the rationality postulate.
Instructor(s): M. Khan
Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences.

AS.180.317. Economics of Fixed Income Instruments. 3.0 Credits.
Students study economic principles and state-of-the-art mathematical models used to value fixed income securities and their derivatives. The course emphasizes advanced practical applications as well as theory. Students will develop their own computer code to price fixed-income instruments and evaluate their risks. Students must be familiar with both statistics and differential equations.
Prerequisites: AS.180.301 AND (EN.550.111 OR EN.550.112 OR EN.550.310 OR EN.550.420 OR EN.550.430 ) AND (AS.110.302 OR EN.550.291 or permission of the instructor)
Instructor(s): G. Duffee
Area: Social and Behavioral Sciences.

AS.180.334. Econometrics. 3.0 Credits.
Introduction to the methods of estimation in economic research. The first part of the course develops the primary method employed in economic research, the method of least squares. This is followed by an investigation of the performance of the method in a variety of important situations. The development of a way to handle many of the situations in which ordinary least squares is not useful, the method of instrumental variables, concludes the course.
Prerequisites: AS.180.301 OR AS.180.401, may be taken concurrently; One semester of calculus, AS.280.345 OR EN.540.305 OR EN.550.211 OR EN.550.111 OR EN.550.310 OR EN.550.311 OR EN.550.420 OR EN.560.435.
Instructor(s): M. Husain
Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences.

AS.180.336. Macroeconomic Strategies. 3.0 Credits.
Will sketch out a strategy for anticipating economic turning points. Business cycle basics, monetary policy/financial market/real economy interactions will be reviewed. Long-term growth issues will be explored.
Prerequisites: AS.180.101 AND AS.180.102 AND AS.180.302 or instructor permission.
Instructor(s): R. Barbera
Area: Social and Behavioral Sciences.

AS.180.345. Rationality: Meaning and Measurement. 3.0 Credits.
Economists generally work with a number of classic models of how people behave in different contexts. These models (such as utility maximization and expected utility maximization) are widely used because they are tractable and elegant, but are they also accurate models of human behavior? In this course, we will examine the axiomatic foundations of these models, explore their implications for choice behavior, and discuss the empirical and experimental strategies economists have developed to test these models.
Prerequisites: AS.180.301
Instructor(s): K. Quah
Area: Social and Behavioral Sciences.

AS.180.351. Labor Economics. 3.0 Credits.
The course discusses various issues in labor markets from the perspective of economic theory. We first study the major forces at work that shape labor market behavior; firms’ labor demand and workers’ labor supply. Then we discuss the equilibrium behavior of employment and wages. Using these tools, we also cover various applied topics in labor economics, such as minimum wage regulations, male-female wage differentials, human capital investment, worker mobility, and unemployment.
Prerequisites: AS.180.301
Instructor(s): R. Moffitt
Area: Social and Behavioral Sciences.

AS.180.352. Public Economics. 3.0 Credits.
This course explores issues related to expenditure and tax policies of governments, as well as views regarding the purpose of government and criteria for evaluating government actions. The course also includes a discussion of how group or collective choices are made within society, how environmental policies affect the level of pollution, and the importance of public debt.
Prerequisites: AS.180.301 OR AS.180.401
Instructor(s): M. Husain
Area: Social and Behavioral Sciences.

AS.180.354. Econometrics of Unobservables. 3.0 Credits.
Empirical data may not contain all the variables suggested by economic theories. This course introduces methodologies to identify and estimate economic models containing unobservables. Recommended Course Background: AS.180.301 and AS.180.334.
Instructor(s): Y. Hu
Area: Social and Behavioral Sciences.

AS.180.355. Economics of Poverty/Inequality. 3.0 Credits.
This course focuses on the economics of poverty and inequality. It covers the measurement of poverty and inequality, facts and trends over time, the causes of poverty and inequality with a focus on those related to earnings and the labor market, and public policy toward poverty and inequality, covering both taxation and government expenditure and programs. By the nature of the material, the course is fairly statistical and quantitative. Students should have an intermediate understanding of microeconomic concepts. Basic knowledge of regression analysis is also helpful.
Prerequisites: AS.180.301
Instructor(s): R. Moffitt
Area: Social and Behavioral Sciences.

AS.180.361. Rich Countries, Poor Countries. 3.0 Credits.
Why are some countries rich while some other countries poor? Why does a country’s income per person generally grow over time? We try to analyze these questions using the theoretical and empirical growth literature. We will study seminal growth models, and also try to explain cross-country income differences in terms of factors like geography, institutions and global integration. Knowledge of regression analysis (including instrumental variables estimation) is required.
Prerequisites: AS.180.302 AND (AS.180.334 OR AS.180.434)
Instructor(s): S. Dasgupta
Area: Social and Behavioral Sciences.
AS.180.363. Sex, Drugs and Dynamic Optimization: The Economics of Risky Behavior. 3.0 Credits.
We apply the tools of economic analysis to understand behaviors that are enjoyable today, but may have negative consequences in the future.
Prerequisites: (AS.180.301 OR AS.180.401) AND AS.180.302; AS.180.334 can be taken concurrently.
Instructor(s): N. Papageorge
Area: Social and Behavioral Sciences.

AS.180.365. Topics in Macroeconomics. 3.0 Credits.
This course builds on AS.180.302 (Macroeconomic Theory) to consider the leading macroeconomic controversies of today (such as the appropriate monetary and fiscal policies of the Federal Reserve and U.S. Government). The classes will include frequent student presentations.
Prerequisites: AS.180.302
Instructor(s): L. Ball
Area: Social and Behavioral Sciences.

AS.180.367. Investment-Portfolio Management. 3.0 Credits.
Prerequisites: (AS.180.301 OR AS.180.401) AND (EN.550.111 OR EN.550.112 OR EN.550.310 OR EN.550.311 OR EN.550.420 OR EN.550.430)
Instructor(s): J. Wright
Area: Social and Behavioral Sciences.

AS.180.368. Managerial Economic and Business Strategies. 3.0 Credits.
Seminar on quantitative concepts, decision-making, and strategy in business organizations. Overall context is 'value' – how it is measured and maximized long term. Microeconomic theory of the firm, competitive analysis, corporate finance.
Prerequisites: (AS.180.301 OR AS.180.401) AND (EN.550.111 OR AS.180.367 OR AS.180.263) or permission of the instructor.
Instructor(s): J. Knapp
Area: Social and Behavioral Sciences.

AS.180.371. Industrial Organization. 3.0 Credits.
Investigation of firm behavior in markets characterized by imperfect competition. Imperfect competition lies in between monopoly and perfect competition and characterizes most major industries in modern capitalist economies. Central issues to be covered in the course include what determines the intensity of competition? What determines the extent of entry and exit? How is it that some firms consistently dominate their industries?
Prerequisites: AS.180.301 OR AS.180.401
Instructor(s): E. Krasnokutskaya
Area: Social and Behavioral Sciences.

AS.180.389. Social Policy Implications of Behavioral Economics. 3.0 Credits.
Economists increasingly incorporate insights from psychology into models of rational decision-making. Known as “behavioral economics”, this line of research considers how, for example, emotions, rules-of-thumb, biased beliefs and time-inconsistent preferences influence how we make choices. Behavioral economics increasingly pervades policy discussions on topics as diverse as: obesity, the role of media, subprime mortgages and voting patterns. Behavioral models are certainly novel, but do they help us to design superior social policies? With the goal of preparing students to address this question, this course (1) provides a thorough overview of the main contributions of behavioral economics, highlighting departures from more traditional economic models and (2) emphasizes how behavioral economic models might (or might not) improve how we think about social policy.
Prerequisites: AS.180.301 OR AS.180.401; AS.180.334 OR AS.180.434 can be taken concurrently.
Instructor(s): N. Papageorge
Area: Social and Behavioral Sciences.

AS.180.390. Health Economics & Developing Countries. 3.0 Credits.
Prerequisites: AS.180.301 OR AS.180.401; Students may not take AS.180.390 if they took AS.180.391.
Instructor(s): M. Gersovitz
Area: Social and Behavioral Sciences
Writing Intensive.

AS.180.391. Economics of China. 3.0 Credits.
Discussion of the economic experience of Post-War China, primarily emphasizing topics rather than historical narrative: agriculture, industry including corporate governance and public enterprises, international trade, population, migration, education, health, public finances among other topics.
Prerequisites: AS.180.301 OR AS.180.401; Students may not take AS.180.390 if they took AS.180.391.
Instructor(s): M. Gersovitz
Writing Intensive.

AS.180.401. Advanced Microeconomic Theory. 3.0 Credits.
This course covers roughly the same material as Microeconomic Theory 180.301 but in a more formal and mathematically rigorous way. You can use either 180.301 or 180.401 to satisify the requirement for the Economics major. 180.301 and 180.401 are offered during the same time slot, so the logistics of switching from 180.301 to 180.401 should be seamless, should you decide to make the switch. This course is suitable for those students who prefer a more formal treatment of economic theory and who are planning to take some of the more technically demanding electives in economics at a later stage. NOTE: you may not take both 180.301 and 180.401.
Prerequisites: You may not take both AS.180.401 and AS.180.301; AS.180.102 and any two semesters of calculus (or equivalent)
Instructor(s): K. Quah
Area: Social and Behavioral Sciences.
AS.180.434. Advanced Econometrics. 3.0 Credits.
This is a faster-paced and more intensive version of Econometrics 180.334. You can use either 180.334 or 180.434 to satisfy the requirement for the economics major. This course is suitable for those students who prefer a more technical treatment of econometric methodologies. NOTE: you may not take both 180.334 and 180.434.

Prerequisites: Students may only receive credit for either AS.180.334 or AS.180.434, AS.180.301 or AS.180.401, one semester of linear algebra, one semester of calculus, AS.280.345 or EN.580.305 or EN.550.211 or EN.550.111 or EN.550.310 or EN.550.311 or EN.550.420 or EN.560.435.
Instructor(s): Y. Hu
Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences.

AS.180.501. Independent Study. 0.0 - 3.0 Credits.
Instructor(s): Staff.

AS.180.502. Independent Study. 0.0 - 3.0 Credits.
Instructor(s): Staff.

AS.180.521. Research in Economics. 2.0 Credits.
The assignment in this course is to complete the initial stages of research for the Senior Honors Thesis in Economics. Students will work independently under the supervision of a research/thesis advisor. The contact (in spring of Junior year) should be the course instructor listed for this course. He/she will coordinate registration and grade-reporting, and will also be available to discuss research ideas and to help put students in touch with possible thesis advisors. Open to Senior and Junior Economics majors. Note: This course can not be counted as one of the five elective economics courses required for the Economics major.
Instructor(s): M. Gersovitz.

AS.180.522. Senior Thesis. 3.0 Credits.
Students enrolled in this course will complete the Senior Honors Thesis under the supervision of a thesis advisor (who will have been chosen by the student prior to registration for AS.180.521). The formal course instructor will be in charge of overseeing registration and submitting grades. He/she will also be available for discussions of progress or problems on the thesis. Please note that your thesis advisor can be any faculty member in the Department of Economics, and need not be the same person as the course instructor. (This course cannot be counted as one of the 5 elective economics courses required for the Economics Major.)
Prerequisites: AS.180.521
Instructor(s): Staff
Writing Intensive.

AS.180.595. Economic Internship. 1.0 Credit.
Instructor(s): L. Ball.

AS.180.597. Research. 3.0 Credits.
Instructor(s): N. Papageorge.

AS.180.599. Independent Study. 3.0 Credits.
Instructor(s): E. Krasnokutskaya; N. Papageorge; S. Dasgupta.

The mathematical theory of general static equilibrium. The course will emphasize the formal mathematical expression of economic ideas and the ability to give a loose economic intuition a coherent logical meaning. Different mathematical structures in general equilibrium theory will be isolated and discussed. The text will be Debreu's book "Theory of Value". Recommended Course Background: AS.110.106, AS.180.301, and AS.180.302 or permission of the instructor.
Instructor(s): M. Khan
Area: Social and Behavioral Sciences.
AS.180.607. Macroeconometrics I.
The course is an attempt to provide a framework for discussing the techniques that are used in macroeconomic analysis. Generally the bias that it has is one of looking at these from the perspective of someone analyzing macroeconomic data for policy analysis. Consequently, many of the applications considered are drawn from the type of research conducted in central banks and finance ministries. Its emphasis is therefore upon the issues raised by the analysis of time series of macro-economic data. Today there is an emerging literature that looks at micro-economic data as well as conducting cross-country studies. We will tend to ignore that material as the methods used in such research are essentially those of micro-econometrics, although sometimes with adjustments made to reflect the nature of macro-economic time series.

Prerequisites: AS.180.633
Instructor(s): J. Wright.

AS.180.608. Macroeconometrics II.
This course will cover a range of topics in time series econometrics and empirical macroeconomics and finance that arise in current research and policy analysis. Key topics include GMM estimation, filtering, forecasting, structural VARs, and modeling stock and bond returns. It assumes a knowledge of the basics of time series econometrics. Both theoretical and empirical work will be included. Bayesian simulation methods that are very important in current research methods will be emphasized. This course should be taken by people with an interest in either empirical macro or empirical finance and may be helpful in searching for a dissertation topic.

Instructor(s): J. Wright.

AS.180.609. Core Mathematics for Economics.
This course will develop the necessary mathematical language and tools that are to be regarded as a prerequisite for graduate study in economics at Johns Hopkins. Specifically, the course will focus on set theory, linear algebra and real analysis.

Instructor(s): M. Khan
Area: Social and Behavioral Sciences.

AS.180.611. Economics of Uncertainty.
This course offers a review of subjective expected utility theory of decision making under uncertainty and choice based subjective probabilities. It also explores the motivation for the recent developments of non-expected utility theories under risk and under uncertainty. It examines the role of completeness and awareness in these theories as well as the theories of menu choice and random choice behavior.

Instructor(s): E. Karni
Area: Social and Behavioral Sciences.

This course traces the extent to which modern economic theory, particularly as it pertains to pure competition in market and non-market games under the rationality postulate, is grounded in the language of probability and measure theory. Special attention will be paid to the formal expression of ideas such as economic and numerical negligibility, on the one hand, and diffuseness and conditional independence of information, on the other. Towards this end, the course will develop rigorous formulations of basic ideas of (conceptual rather than computational) probability and apply them: first, to develop the fundamental theorems of welfare economics, including the core theorems; and second, to large anonymous and non-anonymous games as well as to finite-agent games with private information. The course will be self-contained from the technical point of view but will presuppose a level of mathematical maturity that ought typically to be achieved by taking courses such as AS.180.615 and AS.180.601

Instructor(s): M. Khan.

This course concerns dynamic optimization in both continuous and discrete time. More specifically, it develops Pontryagin's maximum principle and the Euler-Lagrange conditions in the calculus of variations, on the one hand, and the basic tools of deterministic dynamic programming, on the other. The course will be self-contained from the technical point of view but will presuppose a level of mathematical maturity that ought typically to be achieved by taking a course such as AS.180.600.

Instructor(s): M. Khan.

AS.180.622. Game Theory.
This course only runs the first half of the semester but is as challenging as a full semester course. Students registering for this doubly intensive course also need to register for the equally intensive course of AS.180.623, Economics of Information, that is also as challenging as a full semester course and runs the second half of the semester. These courses complement each other and should be taken together in one semester.

Corequisites: AS.180.623
Area: Social and Behavioral Sciences.

AS.180.623. Economics of Information.
This course only runs the second half of the semester but is as challenging as a full semester course. Students registering for this doubly intensive course also need to register for the equally intensive course of AS.180.622, Game Theory, that is also as challenging as a full semester course and runs the first half of the semester. These courses complement each other and should be taken together in one semester.

Prerequisites: AS.180.600 AND AS.180.601
Corequisites: AS.180.622
Instructor(s): E. Karni
Area: Social and Behavioral Sciences
Writing Intensive.
AS.180.626. Computational Methods.
This class will introduce students to the computational tools that are used to get things done in scientific research. Such tools include, but are not limited to, unix bash shell scripting, Latex/Beamer, virtual machines, git and github, tools for parallel computation, cloud services, and others. Brief treatments of special-purpose tools (like Mathematica for symbolic math) will conclude this part of the class. After this introduction, the course will involve an intensive introduction to the use of the Python language for scientific computation purposes, including a discussion of why Python dominates other choices like Matlab and Julia. The final third of the course will apply the tools in a practical application to a specific problem identified jointly between the instructor and the student. There is no required text; readings will be assigned in class. (The characteristic that distinguishes this class from alternatives is that this class will not teach specific algorithms nor frontier computational techniques; rather, it aims to expose students to a broad set of tools that they will use regularly thereafter).
Instructor(s): C. Carroll
Area: Social and Behavioral Sciences.

AS.180.632. Topics in Applied Microeconometrics.
This course teaches methods for using micro-data to recover structural parameters of microeconomic models. We cover static models, but focus largely on single-agent dynamic programming, including “full solution” methods along with innovations that permit circumvention of daunting computational tasks. Additional topics will be partially based on students’ interests, but will likely include: general equilibrium models, static and dynamic games, matching models, unobserved heterogeneity, structural methods with experimental data and biased expectations. The goal is to teach students to use structural methods in their own research, and so we will delve into the nuts and bolts of structural work, examining how researchers actually get from raw data to results. This includes: how the sub-sample for analysis is chosen, how the model is specified, how the programming problem is solved, which moments are generated, how these are matched to the analogous moments in the data and, importantly, how identification is established.
Instructor(s): N. Papageorge.

Mathematical models of economic behavior and the use of statistical methods for testing economic theories and estimating economic parameters. Subject matter will vary from year to year; statistical methods, such as linear regression, multivariate analysis, and identification, estimation and testing in simultaneous equation models, will be stressed.
Prerequisites: AS.180.636
Instructor(s): Y. Hu.

AS.180.634. Panel Data Models & Applications.
This course is a reading course for the panel data models in the economics department. We will focus on econometric theories that are commonly used in panel data analysis, although many of these techniques can be applied to other areas as well. In addition, we will discuss applications of these theories. The course material will start form chapter 10 & 11 in Wooldridge’s book which covers linear panel data models. And then we discuss the discrete choice models from chapter 7 of Hsiao’s book. After these, we will try to read papers related to panel data models.
Instructor(s): Staff.

AS.180.636. Statistical Inference.
Theory and applications of statistical inference. Topics include probability and sampling, distribution theory, estimation, hypothesis testing, and simple regression analysis. Statistical applications will be drawn from economics. Limited to graduate students in Economics except by permission of the chair. Recommended Course Background: AS.110.201, AS.110.302
Instructor(s): Staff.

AS.180.637. Microeconometrics I.
This is an advanced graduate course on major econometric techniques and models that are used in empirical microeconomics. The first half of the course introduces econometric theories of nonlinear extremal estimation, nonparametric estimation, and semiparametric estimation. The second half of the course illustrates applications of these theories to limited dependent variable models, selection models, and endogenous treatment models with unobserved heterogeneity.
Prerequisites: AS.180.601 AND AS.180.622 AND AS.180.633 AND AS.180.636
Instructor(s): L. Liu.

AS.180.638. Microeconometrics II.
This course is the second in the micro-econometrics sequence in the Economics Department. It will introduce a selection of models and techniques that are useful when a researcher wants to estimate a structural model, i.e. a model derived from economic theory. Structural models that try to incorporate restrictions derived from economic theory are used in empirical IO, but also in quantitative marketing research, labor economics and other fields that consider individual decision making. No attempt will be made to be comprehensive. Instead we will focus on a few areas that have been well-researched in recent years: dynamic discrete choice, microeconomic models with latent variables, program evaluation, the empirical analysis of auctions and non-separable models. Some topics will be included only if time permits. The models and methods developed for these areas are relevant for other cases. The emphasis is on the interaction between economic theory and econometrics. Basic issues are specification and (nonparametric) identification, computational problems and the use of simulation, semi-parametric estimation to avoid functional form and distributional assumptions that cannot be derived from economic theory.
Prerequisites: AS.180.601 AND AS.180.622
Instructor(s): Y. Hu.

AS.180.640. Topics in Economic Theory.
In this course we will discuss a variety of topics in Economic Theory that are either not covered or only partially covered in the regular courses. Topics may include Individual and Social Choice Theory, Auctions Theory, Medical Decision Making. For each subject there will be introductory lectures followed by readings and students’ presentations of recent contributions.
Prerequisites: AS.180.601 AND AS.180.602
Instructor(s): E. Karni
Area: Social and Behavioral Sciences.

This is a graduate course in international trade. It will develop basic analytical tools and frameworks used in the general equilibrium analysis of international trade. Recent research topics will be discussed in the second half of the course.
Prerequisites: AS.180.601 AND AS.180.603
Instructor(s): P. Krishna.
**AS.180.642. International Monetary Economics.**
A link between the balance of payments and asset accumulation/decumulation, microeconomics of international finance and open-economy macroeconomics. The section on open-economy macroeconomics covers approaches to balance-of-payments adjustments, theories of exchange rate determination and monetary, fiscal, and exchange-market policies under fixed and flexible rate regimes.
Instructor(s): O. Jeanne.

**AS.180.643. Topics of Game Theory.**
This course covers topics such as repeated games, dynamic games, bargaining and strategic communication.
Prerequisites: AS.180.622
Instructor(s): Y. Chen
Area: Social and Behavioral Sciences.

**AS.180.645. Topics in Economic Theory.**
This course will cover two topics in economic theory. We will cover the theory of monotone comparative statics and supermodular games; this topic will be useful to students doing research in theory or in structural econometrics, where comparative statics tools/insights are often needed for model building. The other half of the course will cover matching markets, which typically deal with assignment problems without the use of transfers. Examples of these include school choice, course allocation, and organ exchange. We will cover the theoretical underpinnings, field applications, and empirical evaluations of these markets.
Instructor(s): K. Quah; M. Fernandez
Area: Social and Behavioral Sciences.

**AS.180.646. Revealed Preference and Comparative Statics.**
The overall theme of this course is the observable implications of optimizing choice. We will cover the theory of monotone comparative statics and supermodular games. We also discuss results in the revealed preference literature, such as Afriat’s Theorem, that deal with the consistency of data with different canonical models. The course is useful to students doing research in pure or applied theory, where comparative statics tools/insights are often needed for model building. It could also be interesting to those with an empirical focus who would like to know more about revealed preference approaches to testing models and drawing inferences from them.
Instructor(s): K. Quah
Area: Social and Behavioral Sciences.

**AS.180.651. Labor Economics I.**
Theories of the allocation of time and supply of labor, human capital, demand for labor, market equilibrium, and income distribution. As time allows, other topics, such as unemployment, unions, and compensating differences are discussed. Corequisite: AS.180.601
Instructor(s): R. Moffitt.

**AS.180.653. Numerical Methods in Economics.**
The course covers a set of numerical methods that are used to compute and estimate economic models, such as solution methods for non-linear equation systems, numerical integration, approximation, and optimization. As examples, we discuss dynamic models and their applications in IO and labor economics, including dynamic discrete choice, dynamic games, two-step methods (CCP-based methods), and general equilibrium models.
Instructor(s): Y. Takahashi.

**AS.180.662. Asset Pricing.**
This course is an introduction and guide to the most important issues in asset pricing. It begins with classic concepts such as the Capital Asset Pricing Model and the Arbitrage Pricing Theory and continues through continuous-time dynamic no-arbitrage models. It covers both basic theory and classic empirical research. Recommended Course Background: AS.180.604, AS.180.633, AS.180.636 or instructor’s permission.
Instructor(s): G. Duffee.

**AS.180.672. Industrial Organization.**
First term: This course covers methods in applied empirical Industrial Organization. The focus will be on the use of econometric analysis and data both for descriptive and measurement purposes, and to test the predictions of economic theories. The course will cover demand estimation, cost and production function estimation, and estimation of auction models. Second term: The emphasis in this course is on empirical analysis of firm behavior. The first part of the course focuses on models of the internal organization of the firm. The second part considers empirical analysis of firm behavior in markets, with an emphasis on the "new industrial economics."
Instructor(s): E. Krasnokutskaya.

**AS.180.673. Advanced Economics of Labor.**
This course is for graduate students at the 3rd year and above who wish to participate in a semester in-depth readings and discussion topics in labor economics and in econometric methods typically used in labor economics and in many other applied microeconomics fields. Students will have to participate in discussions of materials in each class. The topics covered in each semester are partly a function of student interest and their dissertation topics.
Instructor(s): R. Moffitt
Area: Social and Behavioral Sciences.

**AS.180.690. Advanced Econometrics.**
Advanced econometric techniques are often essential to innovative empirical work, but finding and implementing the right methods for a particular problem poses formidable challenges. This course/seminar aims to address these challenges by combining lectures and discussions of foundational econometric methods in areas of student interest (whether those interests be specific for thesis work or more speculative) with examples of implementation, including software development, in more of a ‘workshop’ environment. The emphasis will be on drawing on the resources of econometric theory to address specific empirical issues while at the same time developing implementation skills.
Instructor(s): R. Spady.

**AS.180.691. Dissertation Research.**
This course is for students working on the dissertation for the Ph.D. in Economics. It is graded pass-fail
Instructor(s): G. Duffee
Area: Social and Behavioral Sciences.

**AS.180.694. Applied Microeconomics Workshop.**
This is a weekly seminar series that brings in speakers from other universities to present their research in the field of applied microeconomics. Graduate Students only.
Instructor(s): Y. Hu
Writing Intensive.

**AS.180.695. Microeconomic Theory Workshop.**
This is a seminar series devoted to the presentation of research in microeconomic theory, typically by speakers from outside the department. Graduate students only.
Instructor(s): M. Khan.
This course features lectures by economists from other universities. They present research findings at the frontier of the field. Graduate students only.
Instructor(s): C. Carroll.

The purpose of this seminar is to train students to do research in economics. This course is for second year graduate students in the Ph.D program in Economics. Graduates Students Only.
Instructor(s): E. Karni.

AS.180.698. Research/Teaching Practicums.
The purpose of the Ph.D. program in economics is to train students to teach and to do research in economics. This course is for graduate students in the Ph.D. program in economics to obtain graduate credit for work off campus that provides training and the development of skills in teaching and/or research. Before the practicum is begun, the graduate student must identify a sponsoring faculty member or seek permission from the student’s faculty adviser. The faculty member or adviser must sign a form that certifies that graduate credit will be granted, verifies the nature of the work to be performed by the student, and explains how the practicum helps to fulfill a degree requirement. Once completed, the sponsoring faculty member or adviser submits a grade of pass or fail for the student. The course may be used for curricular practical training. Economic majors /Graduate students only.
Instructor(s): Staff.

AS.180.899. Independent Study.
Instructor(s): Staff.

Cross Listed Courses
Sociology
AS.230.374. Poverty and Public Policy. 3.0 Credits.
This course examines the causes and consequences of U.S. urban poverty, its implications for health and wellbeing, and explores strategies for addressing it. We cover the major theoretical explanations scholars have advanced to explain the persistence of urban poverty including labor markets, residential segregation, welfare policy, family structure, and the criminal justice system. Within each topic area, students are introduced to a range of interventions aimed at alleviating urban poverty. Students will conduct a formal policy analysis of 20 pages and participate in a mock congressional hearing. Enrollment restricted to Social Policy minors only.
Prerequisites: Students that took AS.360.372 may not take AS.230.374.
Instructor(s): K. Edin
Area: Social and Behavioral Sciences
Writing Intensive.

Interdepartmental
AS.360.247. Introduction to Social Policy: Baltimore and Beyond. 3.0 Credits.
This course will introduce students to basic concepts in economics, political science and sociology relevant to the study of social problems and the programs designed to remedy them. It will address the many inequalities in access to education and health care, unequal treatment in the criminal justice system, disparities in income and wealth, and differential access to political power. The focus will be on designing effective policies at the national and local level to address these pressing issues. This course is open to all students, but will be required for the new Social Policy Minor. The course is also recommended for students who are interested in law school, medical school, programs in public health, and graduate school in related social science fields. This course does not count as one of the required courses for the Economics major or minor, but it is required for the Social Policy Minor. Cross list with Sociology, Economics and Political Science. Freshman, Sophomore and Juniors only.
Instructor(s): B. Morgan; D. Schlozman; S. Deluca
Area: Social and Behavioral Sciences
Writing Intensive.

AS.360.372. Poverty and Public Policy. 3.0 Credits.
This course examines the causes and consequences of U.S. urban poverty, its implications for health and wellbeing, and explores strategies for addressing it. We cover the major theoretical explanations scholars have advanced to explain the persistence of urban poverty including labor markets, residential segregation, welfare policy, family structure, and the criminal justice system. Within each topic area, students are introduced to a range of interventions aimed at alleviating urban poverty. Students will conduct a formal policy analysis of 20 pages and participate in a mock congressional hearing. Permission of instructor required.
Instructor(s): K. Edin
Area: Social and Behavioral Sciences
Writing Intensive.

AS.360.380. Making America Social Policy. 3.0 Credits.
This course will introduce students to basic concepts in economics, political science and sociology relevant to the study of social problems and the programs designed to remedy them. It will address the many inequalities in access to education and health care, unequal treatment in the criminal justice system, disparities in income and wealth, and differential access to political power. The focus will be on designing effective policies at the national and local level to address these pressing issues. This course is open to all students, but will be required for the new Social Policy Minor. The course is also recommended for students who are interested in law school, medical school, programs in public health, and graduate school in related social science fields. This course does not count as one of the required courses for the Economics major or minor, but it is required for the Social Policy Minor. Cross list with Sociology, Economics and Political Science. Freshman, Sophomore and Juniors only.
Instructor(s): B. Morgan; D. Schlozman; S. Deluca
Area: Social and Behavioral Sciences
Writing Intensive.

AS.360.372. Poverty and Public Policy. 3.0 Credits.
This course examines the causes and consequences of U.S. urban poverty, its implications for health and wellbeing, and explores strategies for addressing it. We cover the major theoretical explanations scholars have advanced to explain the persistence of urban poverty including labor markets, residential segregation, welfare policy, family structure, and the criminal justice system. Within each topic area, students are introduced to a range of interventions aimed at alleviating urban poverty. Students will conduct a formal policy analysis of 20 pages and participate in a mock congressional hearing. Permission of instructor required.
Instructor(s): K. Edin
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Instructor(s): B. Morgan; D. Schlozman; S. Deluca
Area: Social and Behavioral Sciences
Writing Intensive.

AS.360.372. Poverty and Public Policy. 3.0 Credits.
This course examines the causes and consequences of U.S. urban poverty, its implications for health and wellbeing, and explores strategies for addressing it. We cover the major theoretical explanations scholars have advanced to explain the persistence of urban poverty including labor markets, residential segregation, welfare policy, family structure, and the criminal justice system. Within each topic area, students are introduced to a range of interventions aimed at alleviating urban poverty. Students will conduct a formal policy analysis of 20 pages and participate in a mock congressional hearing. Permission of instructor required.
Instructor(s): K. Edin
Area: Social and Behavioral Sciences
Writing Intensive.
AS.360.528. Problems in Applied Economics. 2.0 Credits.
This course focuses on a monetary approach to national income determination and the balance of payments. Money and banking, as well as commodity and financial markets, are dealt with under both central banking, as well as alternative monetary regimes. Particular emphasis is placed on currency board systems. Students learn how to properly conduct substantive economic research, utilizing primary data sources, statistical techniques and lessons from economic history. Findings are presented in the form of either memoranda or working papers of publishable quality. Exceptional work may be suitable for publication through the Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise. Advanced excel programming skills are required and students are expected to be pre-screened for research at the Library of Congress in Washington, D.C.. Bloomberg certification is a requisite.
Prerequisites: EN.660.203
Instructor(s): S. Hanke
Writing Intensive.

EN.570.428. Problems in Applied Economics. 3.0 Credits.
This course focuses on a monetary approach to national income determination and the balance of payments. Money and banking, as well as commodity and financial markets, are dealt with under both central banking, as well as alternative monetary regimes. Particular emphasis is placed on currency board systems. Students learn how to properly conduct substantive economic research, utilizing primary data sources, statistical techniques and lessons from economic history. Findings are presented in the form of either memoranda or working papers of publishable quality. Exceptional work may be suitable for publication through the Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise. Advanced excel programming skills are required and students are expected to be pre-screened for research at the Library of Congress in Washington, D.C.. Bloomberg certification is a pre-requisite.
Prerequisites: EN.660.203 AND AS.180.101 AND AS.180.102
Instructor(s): S. Hanke
Area: Social and Behavioral Sciences
Writing Intensive.

EN.570.470. Applied Economics & Finance. 3.0 Credits.
This course focuses on company valuations, using a Probabilistic Discounted Cash Flow Model. Students use the model and primary data from financial statements filed with the Securities and Exchange Commission to calculate the value of publically-traded companies. Using Monte Carlo simulations, students also generate forecast scenarios, project likely share-price ranges and assess potential gains/losses. Stress is placed on using these simulations to diagnose the subjective market expectations contained in current objective market prices, and the robustness of these expectations. During the weekly seminar, students company valuations are reviewed and critiqued. A heavy emphasis is placed on research and writing. Exceptional work may be suitable for publication through the Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise. Advanced excel programming skills are required and students are expected to be pre-screened for research at the Library of Congress in Washington, D.C.. Bloomberg certification is a pre-requisite.
Prerequisites: EN.660.203 AND (EN.570.428 OR AS.360.528)
Instructor(s): S. Hanke
Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences
Writing Intensive.

EN.570.504. Financial Market Research. 3.0 Credits.
This course investigates the workings of financial, foreign exchange, and commodity futures markets. Research is focused on price behavior, speculation, and hedging in these markets. Extensive research and writing of publishable quality are required. Exceptional work may be suitable for publication through the Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise. An approved research proposal is a pre-requisite.
Instructor(s): S. Hanke
Writing Intensive.