

Economics

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Economics is much broader than the study of recessions and inflation or stocks and bonds. Economists study decision making and incentives, such as how taxes create incentives for labor market and savings behavior. Many current public policy debates concern questions of economics, including causes and consequences of inequality and gender and racial wage gaps; how to address poverty; the impact of immigration and trade on the well-being of a country's citizens; the cause of the Great Recession; and how to predict future downturns.

At Yale, economics is regarded and taught as part of a liberal arts education, not as a preparation for any particular vocation. It can, however, provide a good background for several professions. The economics major strengthens critical reasoning skills and gives students experience analyzing data, skills that will serve students well on the job market both inside and outside academia. Recent majors have pursued careers in business, government, and nonprofits. Others have entered law, medical, or business school, or have gone on to graduate work in economics, often after working in related fields for two or three years.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Economics major requirements.

There are no prerequisites for the major. Twelve credits are necessary to complete the major (11 Economics courses and 1 Mathematics course). The required distribution of courses is as follows:

Math requirement This can be fulfilled by MATH 1100/1110, 1120, 1150, 1160, ENAS 1510, or preferably MATH 1180 or 1200. MATH 1180 and 1200 are recommended because they emphasize economics applications. Any Math course numbered 2000 or higher can also be used to fulfill the math requirement. Note that MATH 1100 and 1110 together count as one course toward the economics major.

Introductory microeconomics ECON 1108 or ECON 1110 or ECON 1115. This requirement can be skipped or taken Cr/D/F based on pre-college testing or other circumstances, but an extra elective course is required in this case.

Introductory macroeconomics ECON 1111 or ECON 1116. This requirement can be skipped or taken Cr/D/F based on pre-college testing or other circumstances, but an extra elective course is required in this case.

Intermediate microeconomics ECON 2121 or ECON 2125

Intermediate macroeconomics ECON 2122 or ECON 2126

Econometrics ECON 1117 or ECON 2123 or ECON 2136

Four electives Any Economics course numbered 1159 or above can count as an elective, if not already applied towards the core requirements. With DUS approval, a non-Economics course that is related to economics can be used to fulfill one of the electives.

Senior requirement Two courses numbered ECON 4400–4491 (at least one taken in senior year) are required.

Senior essay Writing a senior essay is optional, but it is necessary to earn distinction in the major.

Distinction in the major To earn Distinction, a student must write a senior thesis earning a grade of A- or better and receive A- or better in three-quarters of the courses that are counted toward the major (not including introductory microeconomics, introductory macroeconomics, the math requirement or courses taken outside of Yale). Economics courses taken beyond the requirements of the major are counted toward the Distinction calculation.

Credit/D/Fail No course taken Cr/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

Note Residential College Seminars and First Year Seminars may not be counted toward the requirements of the major.

INTRODUCTORY COURSES

Many Yale students, regardless of what major they later choose, take introductory courses in economics. The department offers introductory courses in microeconomics, macroeconomics, and econometrics. Microeconomics examines how individuals, firms, markets, and governments allocate scarce resources; macroeconomics studies growth, unemployment, inflation, and international economics; econometrics teaches students statistical fundamentals and how to analyze data to answer economic questions. Students should take introductory microeconomics before taking either introductory macroeconomics or introductory econometrics.

ECON 1115 is concerned with microeconomics and includes such topics as markets, prices, production, distribution, and the allocation of resources. ECON 1116 covers such macroeconomic issues as unemployment, inflation, growth, and international economics. ECON 1117 introduces students to basic aspects of working with data to answer economic questions, as well as to the fundamentals of statistical analysis. ECON 1116 and 1117 have microeconomics as a prerequisite. ECON 1115, 1116, and 1117 are lecture courses with accompanying discussion sections.

ECON 1110 and 1111 are smaller, slightly more discussion-oriented versions of introductory microeconomics and macroeconomics. Those with little or no experience in calculus may be better served by ECON 1108, which covers microeconomics with greater discussion of quantitative methods and examples. ECON 1108, 1110, and 1115 are similar in substance; ECON 1111 and 1116 are similar in substance as well.

The department recommends that students interested in majoring in Economics take at least two introductory economics courses in the first year. To make the introductory

courses available to all first-year students and to students majoring in other subjects, the introductory courses do not have a mathematics requirement.

In the summer before they enter, all first-year students receive, through the University's electronic bulletin board, a personalized recommendation for a first course in economics, based on application data and AP (or equivalent) exam scores. In general, students who receive a score of 5 on the Microeconomics or Macroeconomics AP exam *and* a score of 5 on the AP Calculus BC exam are recommended to place out of the corresponding introductory course and instead enroll in intermediate-level courses (ECON 2121 or 2125 for microeconomics, ECON 2122 or 2126 for macroeconomics).

MATHEMATICS COURSES

Students are advised to meet the mathematics requirement for the major during their first year. To fulfill the requirement, the department recommends that majors take MATH 1180 or MATH 1200, or a higher-level course. Also acceptable, but less preferred, are MATH 1120, 1150, 1160, ENAS 1510, or MATH 1100 and 1110. Students who intend to pursue a graduate degree in economics should take additional math courses, including linear algebra (MATH 2220) or even better, a proof-based course (MATH 2250 or 2260) and a real analysis course (MATH 2550 or 2560).

ECONOMETRICS COURSES

Students are encouraged to take two econometrics courses, especially if they are interested in a research experience on or off campus. Two econometrics courses are required to write a senior essay (see below). The analysis of economic data has become central to the work of economists, and the ability to analyze large data sets is a skill that will serve students in the job market both inside and outside of academia. A natural path is for students to take ECON 1117 followed by 2123. Students with a stronger mathematics background, who prefer a more theoretical treatment of the material or who plan to pursue a graduate degree in economics, are encouraged to take ECON 2135 or S&DS 2410 and S&DS 2420, followed by ECON 2136. Prospective majors planning to take a two-term econometric sequence are urged to start the sequence by the fall of sophomore year.

Note S&DS 2410 and 2420 together count as one course toward the economics major. Further note that neither ECON 2135 nor S&DS 2410 and 2420 fulfill the major's requirement of one econometrics course as they are courses in probability and statistics that are prerequisites for ECON 2136, a course in econometrics. However, either ECON 1117 or ECON 2123 fulfills the econometrics requirement.

INTERMEDIATE MICROECONOMICS AND MACROECONOMICS COURSES

Two course options are available in both microeconomics and macroeconomics. The standard intermediate courses are ECON 2121 and 2122. Students with a stronger mathematics background who are interested in a more theoretical treatment of the material are encouraged to take ECON 2125 and 2126 instead. The intermediate courses need not be taken in sequence: in particular, ECON 2125 is not required for 2126; ECON 2121 is not required for 2122.

ELECTIVES

The department offers a wide selection of courses in a variety of fields that can be used as electives. These courses are numbered ECON 1159 and above. Some of these

courses have no prerequisites or only introductory microeconomics as a prerequisite. Others apply intermediate-level theory or econometrics to economic problems and institutions, and for this reason list one or more of the theory or econometrics courses as prerequisites. With DUS approval, a Yale non-Economics course that is related to economics can be used to fulfill one of the electives. See the Economics department website for more details.

SENIOR REQUIREMENT

Two courses numbered ECON 4400–4491 (at least one taken in senior year) are required.

Advanced lecture courses, generally numbered ECON 4440–4449, are limited-enrollment courses that cover relatively advanced material in more depth than regular field courses. While these courses vary in approach, they share features of other Economics courses: like field courses, they devote some time to traditional lecturing, and like seminars, they emphasize class interaction, the writing of papers, and the reading of journal articles. Advanced lecture courses may be applied toward the senior requirement.

Senior seminars are generally numbered ECON 4450–4490. Although there is diversity in approaches in the various seminars, all have in common an emphasis on class interaction, the writing of papers, and the reading of journal articles. Seminars represent an opportunity for students to apply and extend the economics they have learned through their earlier coursework.

Enrollment in seminars and advanced lecture courses is limited. Senior Economics majors who have not yet completed the senior requirement for the major are given priority for these courses and may enter preference selection before the registration period for these courses; see the department website for instructions. Other majors and non-majors may enroll in Economics seminars and advanced lecture courses as space permits, but they may not enter preference selection.

SENIOR ESSAY

Students have the option to write a Senior Essay; it is not required. There are three types of senior essays: (1) students may write a one-term essay in the fall of the senior year as an independent project on a topic of their own design under the close and regular supervision of a faculty adviser; (2) students may write a two-term essay in their final two terms of the senior year as an independent project on a topic of their own design under the close and regular supervision of a faculty adviser; (3) students may write a two-term essay in consecutive terms, beginning in an advanced course (numbered 4400–4490), and completed in the final term of the senior year as an independent project under supervision of a faculty adviser. Under this final option, the instructor of the advanced course taken in the fall term typically serves as the faculty adviser for the full academic year.

Students are required to complete a second semester of econometrics either before or during the first semester of senior year. Please refer to the Economics department website for information on the courses that qualify.

ADVISING

The Economics department has faculty advisers for each residential college. Students considering a major in economics as well as declared economics majors should consult with an economics adviser for their college during course enrollment. Questions concerning the major may also be directed to the department peer mentors. A list of peer mentors can be found on the department website.

Outside credit

Students who take courses outside of Yale may petition the DUS to count some of them toward the requirements of the major. Students should consult with the DUS before taking such courses. Courses taken outside of Yale may not be counted toward the major requirements in intermediate microeconomics, intermediate macroeconomics, econometrics, mathematics, or the senior requirement. There are also restrictions on the number of credits that can be transferred: see the department website section on transferring credits.

Graduate courses

Well-qualified students who have acquired the requisite background in undergraduate courses may be admitted to graduate courses and seminars. Descriptions of courses are available on the department website.

Students who are planning graduate work in economics should take additional mathematics courses beyond the one-term course required for the major. Many graduate programs in economics require courses in multivariate calculus, linear algebra, and real analysis. Please see the department website on Ph.D. program preparation. Students are urged to discuss their plans for graduate work with the DUS as early in their college careers as possible.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (including math req and senior req)

Distribution of courses Introductory micro and macro; intermediate micro (ECON 2121 or 2125); intermediate macro (ECON 2122 or 2126); econometrics (ECON 1117 or 2123 or 2136); one math course (MATH 1120 or above, see Math requirement options); four electives (see above)

Substitutions permitted 1 non-ECON course related to economics, with DUS approval, can replace an elective course. If you place out of an introductory course you must take an additional elective.

Senior requirement 2 courses numbered ECON 4400–4491 (at least one of which taken in senior year)

FACULTY OF THE DEPARTMENT OF ECONOMICS

Professors Joseph Altonji, Donald Andrews, Costas Arkolakis, Orazio Attanasio, Dirk Bergemann, Steven Berry, Xiaohong Chen, Ray Fair, John Geanakoplos, Pinelopi Goldberg, Philip Haile, Marina Halac, Gerald Jaynes, Amit Khandelwal, Yuichi Kitamura, Alvin Klevorick, Samuel Kortum, Giovanni Maggi, Konstantinos Meghir, Mushfiq Mobarak, Giuseppe Moscarini, Kaivan Munshi, Christopher Neilson, William

Nordhaus, Gerard Padró i Miquel, Rohini Pande, Benjamin Polak, Mark Rosenzweig, Larry Samuelson, Katja Seim, Anthony Smith, Philipp Strack, Aleh Tsyvinski, Edward Vytlačil, Fabrizio Zilibotti

Associate Professors Jose-Antonio Espin-Sanchez, Mira Frick, Zhen Huo, Mitsuru Igami, Ryota Iijima, Ilse Lindenlaub, Michael Peters, Nicholas Ryan

Assistant Professors Lauren Falcao Berquist, Max Cytrynbaum, Eduardo Dávila, Charles Hodgson, John Eric Humphries, Yusuke Narita, Cormac O'Dea, Winnie van Dijk

Senior Lecturers Marnix Amand, Michael Boozer, Evangelia Chalioti, William Hawkins, Tolga Koker, Guillermo Noguera, Soenje Reiche, María Saez Martí, Rebecca Toseland