
Economics

[2009-10 update to the *General Catalog*, changes highlighted]

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<http://economics.ucsc.edu>

Program Description

An understanding of economics is a vital component of a liberal arts education and a necessity for anyone interested in such areas as business, environmental policy, welfare reform, unemployment, international competitiveness and trade, or transformations in the global economy.

The programs offered by the UCSC Economics Department are designed to acquaint students with the broad range of issues studied by economists and with the tools they use. The department offers three majors:

- Economics B.A.
- Business management economics B.A.
- Global economics B.A.

~~A minor in economics is also available, as well as the following combined majors:~~

The department also offers the following combined majors:

- Environmental studies/Economics B.A.
- Latin American and Latino studies/ Global economics B.A.
- ~~Mathematical e~~Economics/Mathematics B.A.

A minor in economics is also available.

Students majoring in other subjects will find that economics courses help them understand current affairs and satisfy their curiosity about the ways society allocates resources. The department provides topical courses in the 80 series for students who are interested in economics or business but do not plan to become majors.

The economics curriculum begins at the introductory level; no specific high school preparation is required. All economics majors study a substantial core of economic theory and mathematical and statistical methods, and then choose among a wide variety of upper-division electives.

Economics majors may combine their upper-division elective choices in a variety of ways to achieve specialization in a number of possible areas, including environmental economics, public policy, political economy, international economics, economic development, and quantitative methods. Highly qualified seniors may take

appropriate graduate courses and earn an M.S. as well as a B.A. degree in five years.

General Requirements

Admission into an Economics Major and Minor

The Economics Department administers ~~three~~ **four**- undergraduate majors: economics, business management economics, ~~and~~ global economics, **and mathematical-economics/mathematics**. The admission requirements are the same for ~~the all three~~ **four**.

Students must take two courses prior to petitioning for entry to an economics major: Economics 1 (*Introductory Microeconomics*) and Economics 2 (*Introductory Macroeconomics*). **Equivalent courses may be taken at other universities or community colleges. Students should check on assist.org for already established equivalency agreements. Transfer students may have these requests reviewed by the department prior to matriculation at UCSC.**

Students may petition for admission to the major by filling out the UCSC declaration of major form and by supplying evidence of their ~~performance~~ **grades** in the two pre-major courses. ~~Equivalent courses may be taken at other universities or at community colleges. Transfer students may have these requests reviewed by the department prior to matriculation at UCSC.~~

All students with a combined grade point average (GPA) of at least 2.8 in courses 1 and 2 will be allowed to declare the major. To be considered for the major, students with a GPA below 2.8 in these courses must submit a GPA letter of appeal. Letters of appeal should describe any extenuating circumstances that might affect the student's record. GPA appeals will be reviewed three times per quarter; the third, the fifth, and the seventh week of instruction with a four-day turnaround. Please come by the Economics Office, Engineering 2, Room 401, to receive guidelines on the appeal process.

Students should take courses 1 and 2 for letter grades. In the case of courses taken on a Pass/No Pass basis, the department will use unofficial grades assigned by the instructor but not reported to the Office of the Registrar, in its assessment of eligibility for the major.

Courses for which the grade of W (withdraw) is given are not counted in the computation of the GPA. If courses 1 or 2 are repeated, the department will consider the grades from the first attempt in determining whether students qualify for admittance into the major.

For purposes of advising, students who are interested in pursuing an economics major are encouraged to declare the pre-economics major with the understanding that this does not automatically provide entry to the economics major.

Major Disqualification Policy

Students are expected to maintain good academic standing in the major. Only courses with a grade of P or a ~~minimum~~ letter grade of C or better will satisfy the major requirements. Students who fail any of the upper-division core courses (Economics 100A (or 100M), 100B (~~for 100N~~), and 113) twice will be disqualified from the major. ~~Students who are disqualified~~ **Disqualified students** will be notified by the first day of instruction in the subsequent quarter following the

disqualifying failure. The Office of the Registrar and the student's college will be notified of the disqualification.

Students may appeal their disqualification by submitting a letter to the Economics Department. This appeal must be filed no later than 15 days after the disqualification notification was mailed, or the 10th day of classes in the quarter of their disqualification, whichever is later.

Core Requirements for All Economics Majors

Economics 1 and 2, 11A, 11B, 100A (or 100M), 100B (or 100N), 113, and Applied Mathematics and Statistics 5 are required for all economics majors and are prerequisites for most upper-division courses. Students are strongly urged to complete these courses as soon as possible. Students who are committed to the major early in their academic career, or who are considering the combined B.A./M.S. program, should plan to complete at least Economics 1, 2, 11A, and 11B by the end of their sophomore year.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement will normally be met within one to three courses already required for the major. For detailed information on this major's DC requirement, consult your major adviser or see the 2010-11 general catalog.

Mathematics and Statistics Content Requirement

Mathematics: Successful completion of Economics 11A and 11B, also offered as Applied Mathematics and Statistics 11A and 11B, (or equivalent) is required of all economics majors and is prerequisite to Economics 100A (or 100M), 100B (or 100N), and 113. (Economics 11B can be taken concurrently with Economics 100A (or 100M) and 100B (or 100N).) Therefore, students are advised to take Economics 11A and 11B or their equivalent as early as possible in their undergraduate career. Mathematics 11A-B and 22 or 23A, or 19A-B and 22 or 23A, are acceptable equivalents to Economics 11A and 11B. Students planning to do graduate work in economics or business should seriously consider more intensive mathematical training; consult an adviser.

Statistics: ~~Applied Mathematics and Statistics-AMS 5 Statistics.~~

Comprehensive Requirement

The comprehensive requirement may be satisfied in one of the following ways: (1) by passing the ~~intermediate final exams in all three upper-division~~ core courses ~~with grades of C or better~~ (Economics 100A or 100M, 100B or 100N, 113); (2) with consent of an instructor, by completion of a senior thesis.

Note that item 2-~~(above)~~, ~~Senior Thesis~~ has been ~~quite rare in recent years~~. Most students who write a senior thesis have already met the comprehensive requirement. ~~Also note that passing the final exam does not always guarantee passing a course.~~

Minor Requirements

Students earn a minor in economics by completing all of the requirements for the major with the following differences:

The number of additional upper-division courses is reduced from five to three.

There is no comprehensive requirement.

Economics 191, 192, 193, 193F, 198, and 198F may not be used to meet minor requirements.

Economics 199 may be counted only once toward the upper-division minor requirements.

Independent Study

Students are encouraged to petition for independent study on topics of special interest to them. Economics 199, *Tutorial*, may be used as only one of the upper-division courses required for the major. The department encourages group tutorial study in which a small number of students join together in a seminar to pursue a common interest with faculty assistance. Such enterprises make economical use of faculty resources, and they also make it possible for students to learn from each other.

Field-Study Program

The Economics Department offers its majors the opportunity to integrate their academic knowledge with career-related work. The field-study program places students in internships under the supervision of a faculty sponsor and a professional at the workplace. Students can select from a wide variety of field placements such as accounting firms, community non-profits, government agencies, brokerage firms, marketing agencies, banks, and businesses in Santa Cruz and beyond. Students apply ~~and prepare~~ for field study a quarter in advance. ~~Acceptance~~ ~~Participation into~~ the field-study program is determined by ~~academic standing~~, class level, ~~and~~ successful completion of courses 100A (or 100M), 100B (or 100N), and 113 ~~and good academic standing~~. Students may earn a maximum of 10 academic credits and complete up to two quarters in a field placement. A field study requires 12 hours per week spent working on internship duties. Time spent toward the academic requirements set by the faculty sponsor is not included in the 12 hours spent at the field placement.

Along with the training and supervision by a professional at the workplace, students receive guidance from a faculty sponsor who directs their academic project. Students earn credit through the completion of this project and the job supervisor's evaluation of performance. Economics field-study courses (193 and 198) do not satisfy any upper-division requirements for the major and are available as Pass/No Pass only.

Interested students should make an appointment or stop by the Economics Field Study office at 401B Engineering 2; or call (831) 459-2028; or e-mail econintern@ucsc.edu. Web address: <http://econ.ucsc.edu>.

Transfer Students

A student transferring to UCSC may fulfill some of the requirements for the major by completing equivalent courses, with a grade of C or better, at another recognized institution. **Students should check on assist.org for already established equivalency agreements between UC and the California community colleges.** Transfer students must present their Transfer Credit Summary (available on the student portal) and course syllabi or descriptions to an Economics Department adviser. The department approves courses applicable for economics prerequisites and major requirements. All transfer students must complete the comprehensive requirement at UCSC. Economics and global economics majors must take at least three of their upper-division economics electives at UCSC. Business management economics majors must take at least four of their upper-division economics electives at UCSC, one of which must be 101, 133, or 135. Courses taken for credit elsewhere may not be repeated for credit here.

Combined Majors

The Economics Department offers a combined major in environmental studies/economics. Global economics is offered in a combined major with Latin American and Latino studies. Requirements for these majors may be reviewed under their separate entries in this catalog.

Economics Program Description

Economics is the study of a vast range of human behavior and its social implications, ranging from how individuals and businesses make financial and consumption decisions to how society organizes production and makes allocation decisions over time and place.

Economics majors study a substantial core of economic theory and mathematical and statistical methods. Focusing on these two areas provides the foundation for graduate studies in economics. The required core courses may also be combined with electives in a general economics major program especially suitable for students who plan either to enter law school or to go into more specialized programs emphasizing areas such as applied economics, environmental economics, public policy, political economy, international economics, ~~third world issues and~~ economic development, and quantitative methods.

Economics Major Requirements

Students who major in economics are required to take the following courses:

- 1 *Introductory Microeconomics: Resource Allocation and Market Structure*
- 2 *Introductory Macroeconomics: Aggregate Economic Activity*
11A *Mathematical Methods for Economists I* **s** (or equivalent)
11B *Mathematical Methods for Economists II* **s** (or equivalent)
100A *Intermediate Microeconomics*
(or 100M) *Math Intensive Intermediate Microeconomics*)
100B *Intermediate Macroeconomics*
(or 100N) *Math Intensive Intermediate Macroeconomics*)
113 *Introduction to Econometrics*

~~Applied Mathematics and Statistics~~ AMS 5 –Statistics

and five additional upper-division economics courses, at least three of which must be selected from the following:

- 104 *Is There Truth in Numbers: The Role of Statistics in Economics*
- 105 *Macroeconomic Theory*
- 106 *Evolutionary Thought in the Social Sciences*
- 107 *Economic Justice*
- 108 *Business and Society*
- 109 *Business Ethics*
- 114 *Advanced Quantitative Methods*
- 120 *Economic Development*
- 121 *Economic Growth*
- 125 *Economic History of the U.S.*
- 126 *Why Economies Succeed or Fail*
- 128 *Poverty and Public Policy*
- 130 *Money and Banking*
- 137 *Performing Arts in the Public and Private Economy*
- 140 *International Trade*
- 141 *International Finance*
- 142 *Advanced Topics in International Finance*
- 143 *Policy Issues in the International Economy*
- 148 *Latin American Economies*
- 149 *The Economies of East and Southeast Asia*
- 150 *Public Finance*
- 152 *Setting Domestic Priorities*
- 153 *Cost-Benefit Analysis*
- 156 *Health Care and Medical Economics*
- 157 *Economics of Aging*
- 160A *Industrial Organization*
- 160B *Government and Industry*
- 165 *Economics as an Experimental Science*
- 166A *Game Theory and Applications I*
- 166B *Game Theory and Applications II*
- 169 *Economic Analysis of the Law*
- 170 *Environmental Economics*
- 171 *Natural Resource Economics*
- 175 *Energy Economics*
- 183 *Women in the Economy*
- 184 *Labor Wars in Theory and Film*
- 185 *The Value and Support of the Arts: Challenges and Opportunities in American Society*
- 189 *Political Economy of Capitalism*
- 190 Senior ~~Proseminar~~ *Proseminar*

Courses 191, 192, 193, 193F, 198, and 198F may not be used to meet major requirements. Either course 195 or 199 may be used to fill one of the five upper-division major requirements. Other electives are listed under the Business Management Economics program description.

Business Management Economics Program Description

The business management economics major provides students who are interested in careers in business or management with a foundation in economics and a selection of applied fields related to business management. Particular areas of strength of the program are accounting, finance, and technology management. This course of study prepares students for entrance into the business world or admission to graduate programs—either the master’s program in applied economics and finance at UCSC or graduate programs in business and management at other universities.

The program provides a business and management education embedded within a broader economics and liberal arts context and is closely related to the economics and global economics majors and the information systems management major (page 239).

The UCSC business management economics curriculum begins at the introductory level; no specific high school preparation is required. All majors study a substantial core of economic theory and mathematical and statistical methods, and they are then able to choose among a wide range of business and management electives.

This major has several important elements. First, it combines the strong analytic approach of economics with the technical aspects of management. Second, it recognizes that computing is intrinsic to business and is an essential skill for those who wish to enter this field. Students in this major gain knowledge about using computing as a tool of analysis for economic, statistical, and financial data. Third, the major offers field placements (arranged with the economics field-study program coordinator) which provide an excellent way to apply academic economics, business, and management to issues and problems in the real world; they provide marketable skills as well as important job contacts.

In cooperation with the UC Education Abroad Program (EAP), opportunities are available for students to take some business courses (taught in English) in Europe, Mexico, and Hong Kong. Students should ask the Economics Department for additional information about these programs.

Students who are committed to the major early in their academic career or who are considering the combined B.A./M.S. program should plan to complete Economics 1, 2, 10A, 10B, 11A, and 11B no later than the end of their sophomore year.

Business Management Economics Major Requirements

Introductory and core requirements. Students who major in business management economics are required to take the following courses:

- 1 *Introductory Microeconomics: Resource Allocation and Market Structure*
- 2 *Introductory Macroeconomics: Aggregate Economic Activity*
- 10A *Economics of Accounting* (or equivalent, see under General Requirements)
- 10B *Economics of Accounting* (or equivalent, see under General Requirements)
- 11A *Mathematical Methods for Economists I* (or equivalent)

11B *Mathematical Methods for Economists II* (or equivalent)

100A *Intermediate Microeconomics*

(or 100M *Math Intensive Intermediate Microeconomics*)

100B *Intermediate Macroeconomics*

(or 100N *Math Intensive Intermediate Macroeconomics*)

113 *Introduction to Econometrics*

~~Applied Mathematics and Statistics~~-AMS 5 –*Statistics*

Computer literacy requirement. Students must complete a minimum of two courses from the following list (with department approval, a student may substitute other computing courses):

Computer Engineering

12/L ~~Computer Organization~~ *Computer Systems and Assembly Language*

80N *Introduction to Networking and the Internet*

Computer Science

10 *Introduction to Computer Science*

12A/L *Introduction to Programming*

5C *Introduction to Programming in C++* (formerly CMPS 60 ~~G/N~~)

5J *Introduction to Programming in Java* (formerly CMPS 60 ~~G/N~~)

5P *Introduction to ~~P~~programming in Python*

~~(formerly CMPS 60 G/N)~~

80B *Systems and Simulation*

Information Systems Management

50 *Business Information Systems*

58 *Systems Analysis and Design*

Linguistics

80G *Introduction to Unix*

Economics

216 *Applied Econometric Analysis I* (with permission of instructor)

Note: ~~CMPS 5J and CMPS 11 are equivalent to CMPS 12A/L and this is the recommended route for students with no prior programming experience.~~ Students with no prior programming experience are encouraged to take CMPS 5J and CMPS 11 rather than CMPS 12A/L.

Upper-division electives. Students are required to take six additional courses: four in business management and two other economics electives. Students must choose four courses from the following list; at least one of these four must be a course designated with an asterisk (*).

*101 *Managerial Economics*

102 *Forecasting*

110 *Managerial Cost Accounting and Control*

111A *Intermediate Accounting I*

111B *Intermediate Accounting II*

112 Auditing and Attestation

115 *Introduction to Management Sciences*

117A *Tax Factors of ~~Business and Investment~~ for Individuals*

117B *Tax Factors for Business and Investment*

118 *Fraud Examination*

119 *Advanced Accounting*

131 *International Financial Markets*

*133 *Security Markets and Financial Institutions*

*135 *Corporate Finance*

136/L *Business Strategy*

138 *The Economics and Management of Technology and Innovation*

139A *Economics of Electronic Commerce*

139B *E-Commerce Strategy*

161A *Marketing*

161B *Marketing Research*

162 *Legal Environment of Business*

164 *Economics and the Telecommunications Industry*

180 *Labor Economics*

181 *Economics of Real Estate*

188 *Management in the Global Economy*

194 *Advanced Topics in Management*

Students must choose the remaining two courses from the upper-division economics electives listed for the economics major (see page 181).

Courses 191, 192, 193, 193F, 198, and 198F may not be used to meet major requirements. Either course 195 or 199 may be used to fill one of the six upper-division major requirements.

Field study. One quarter of field study is strongly recommended. Placements and credit for course 193 or 198 are arranged through the economics field-study coordinator. See above under Field-Study Program description.

Global Economics Program Description

Global economics is an interdisciplinary major designed to prepare students to participate in the global economy; the program aims to deepen the student's knowledge of economics within a culturally and linguistically diverse world. The major is particularly useful to students contemplating careers at home or overseas in international relations, in international business, or with international organizations. Hence the major requires overseas study, regional area study, and second-language proficiency in addition to the basic economics requirements.

The UCSC global economics curriculum begins at the introductory level; no specific high school preparation is required. The global economics major program is closely related to the economics major program. See above under the general economics program description for more information.

Global Economics Major Requirements

Introductory and core requirements. Students who major in global economics are required to take the following courses:

1 *Introductory Microeconomics: Resource Allocation and Market Structure*

2 *Introductory Macroeconomics: Aggregate Economic Activity*

11A *Mathematical Methods for Economists* (or equivalent)

11B *Mathematical Methods for Economists* (or equivalent)

100A *Intermediate Microeconomics*

(or 100M *Math Intensive Intermediate Microeconomics*)

100B *Intermediate Macroeconomics*

(or 100N *Math Intensive Intermediate Macroeconomics*)

113 *Introduction to Econometrics*

~~Applied Mathematics and Statistics~~ AMS 5 – *Statistics*

Students are strongly ~~urged~~ **recommended** to complete courses 100A (or 100M), 100B (or 100N), and 113 prior to study abroad. In addition, majors must have language study, area study, and overseas study, as described below.

Courses 191, 192, 193, ~~193F~~, ~~and~~ 198 **and** 198F may not be used to meet major requirements. Either course 195 or 199 may be used to fill one of the five upper-division major requirements.

Upper-division requirements. Five additional upper-division courses are required. Please see courses listed under the Economics and Business Management majors as well. These may include approved courses offered by other departments.

At least one of the five courses must be selected from the following three:

120 *Economic Development*

140 *International Trade*

141 *International Finance*

In addition, at least one course must be chosen from one of the following lists:

Economics

120 *Economic Development*

126 *Why Economies Succeed or Fail: Lessons from Western and Japanese History*

131 *International Financial Markets*

140 *International Trade*

141 *International Finance*

142 *Advanced Topics in International Economics*

148 *Latin American Economies*

149 *The Economies of East and Southeast Asia*

188 *Management in the Global Economy*

Latin American and Latino Studies

140 *Rural Mexico in Crisis*

168 *Economic History of Latin America*

169 *Latin American Industrialization in a Global Perspective: Past, Present, Future*

Politics

140B *Comparative Post-Communist Politics*

~~175~~ ~~*The New Europe*~~

176 *International Political Economy*

Sociology

163 *Global Corporations and National States*

167 *Development and Underdevelopment*

The other three required upper-division electives are determined by the student's interests.

The global economics major has three additional elements:

1. **Foreign Language Study:** The global economics major requires a foreign language since students who plan to work in the larger world must have fluency in a language other than English. This language should be relevant to their regional area of interest. Students can meet this requirement by completing two years of university-level language courses or by demonstrating an equivalent level of competence through a recognized language test.
2. **Area Study:** The major requires students to take two additional courses selected from the offerings of departments other than economics in order to learn about the history, political economy, or culture of some other part of the world. These can be lower- or upper-division courses; the courses should focus on the area of the student's language study and overseas study. The Economics Department provides a list of approved courses; substitute courses are welcomed when they are part of the student's overseas program or from other UCSC departments, but must be approved by the adviser for the global economics major.
3. **Study Abroad:** All students are required to spend at least one term abroad in an approved course of study in their regional area of concentration; students may also choose a year-long program. Typically, a student will do this through the UC Education Abroad Program (EAP). Numerous overseas study sites are available through EAP. Students desiring to fulfill their required study abroad through EAP must apply directly to the EAP office for the selected program and are subject to the admission requirements determined by UC EAP. In countries and at universities where EAP programs are not available, students may make their own arrangements for study with the permission of the director of the program. Students may use the time abroad to further their language study, to meet the area study course requirements, to meet some of the upper-division economics course requirements, or to take courses unrelated to the major. Students who are not accepted to an overseas program or who cannot meet the language or area course requirements are advised to complete the general economics major as an alternative.

Combined Economics/Mathematics ~~Mathematical Economics~~ Program Description

The major in Economics and Mathematics is designed to meet the needs of undergraduate students who plan to pursue doctoral study in economics or business, or who wish to pursue a career as an actuary or other professional requiring a sophisticated understanding of economics and mathematics. The major combines the main undergraduate content of both Economics and Mathematics within a programmatic structure that joins the two disciplines. It provides a coursework combination required to prepare for a modern Economics

PhD program, or for a group of technically demanding professional careers.

~~Mathematical~~ Economics/Mathematics Major Requirements

In addition to completing the University's general education requirements, students must complete 17 courses: 12 required (60 units) and 5 electives (25 units). The 17 courses include:

Economics Required Courses

1, *Intro to Microeconomics*

2, *Intro to Macroeconomics*

100A or 100M, *Intermediate Microeconomics*

100B or 100N, *Intermediate Macroeconomics*

113, *Intro to Econometrics*, and ~~—AND~~

~~Applied Mathematics and Statistics~~ MSAMS 5, *Statistics*

Economics eElective eCourses

(choose 3three from the following list)

101, *Managerial Economics*

102, *Forecasting*

104, *Is There Truth in Numbers: The Role of Statistics in Economics*

106, *Evolutionary Thought in the Social Sciences*

107, *Economic Justice*

114, *Advanced Quantitative Methods*

115, *Intro to Management Science*

120, *Economic Development*

125, *Economic History of the U.S.*

126, *Why Economies Succeed or Fail*

128, *Poverty and Public Policy*

130, *Money and Banking*

131, *International Financial Markets*

133, *Security Markets and Financial Institutions*

135, *Corporate Finance*

136, *Business Strategy*

137, *Performing Arts in the Public and Private Economy*

138, *Economics and Management of Technology and Innovation*

139A, *Economics of Electronic Commerce*

139B, *E-Commerce Strategy*

140, *International Trade*

141, *International Finance*

142, *Advanced Topics in International Finance*

148, *Latin American Economies*

149, *The Economies of East and Southeast Asia*

150, *Public Finance*

152, *Setting Domestic Priorities*

153, *Cost-Benefit Analysis*

156, *Health Care and Medical Economics*

160A, *Industrial Organization*

161A, *Marketing*

162, *Legal Environment of Business*

164, *Economics and the Telecommunications Industry*

165, *Economics as an Experimental Science*

169; *Economic Analysis of the Law*
170; *Environmental Economics*
171; *Natural Resource Economics*
175; *Energy Economics*
180; *Labor Economics*
181; *Economics of Real Estate*
183; *Women in the Economy*
184; *Labor Wars in Theory and Film*
188; *Management in the Global Economy*
189; *Political Economy of Capitalism*

Mathematics ~~R~~required ~~C~~ourses

Math 19A; *Calculus for Science, Engineering and Mathematics*
Math 19B; *Calculus for Science, Engineering and Mathematics*
Math 21; *Linear Algebra*
Math 22; *Calculus of Several Variables or 23A-B, Multivariable Calculus*
Math 100; *Mathematical Proof*
Math 105A; *Real Analysis*

Mathematics ~~E~~lectives

(choose ~~2~~two from the following list)

Math 106; *Systems of Ordinary Differential Equations*
Math 107; *Partial Differential Equations*
Math 114; *Introduction to Financial Mathematics*
Math 117; *Advanced Linear Algebra*
Math 145/L *Chaos Theory*
Math 194; *Senior Seminar*

Applied Mathematics and Statistics~~MS~~ 114; *Introduction to Dynamical Systems*

Applied Mathematics and Statistics~~MS~~ 131; *Introduction to Probability Theory*

Applied Mathematics and Statistics~~MS~~ 132; *Statistical Inference*

Applied Mathematics and Statistics~~MS~~ 147; *Computational Methods and Applications*

Applied Mathematics and Statistics~~MS~~ 162; *Design and Analysis of Computer Simulation Experiments*

Comprehensive Requirement

In addition to successfully completing program requirements, students need to satisfy the comprehensive requirement for this major; this can be satisfied by one of the following options:

- a. ~~math~~Mathematics 194 or 195;
- b. ~~,(b)~~ by passing the three intermediate core courses with grades of C or better: (Economics 100A or 100M, 100B or 100N, and 113); or ~~;~~ or ~~(e)~~ with consent of an instructor, by completion of a senior thesis in economics.
- c.

Major Admission ~~r~~Requirements

Although there are no specific requirements, high school students are encouraged to take four years of high school mathematics and an economics class. Transfer students are encouraged to complete as many lower-division (mathematics and economics) courses as they can at their junior college.

The admission requirements for the economics/mathematics major are the same as for the other economics major programs.

Major Disqualification Policy

Students are expected to maintain good academic standing. Only courses with a grade of P or a letter grade of C or better will satisfy the major requirements; students who receive a lower grade in upper-division core courses (Economics 100A (or 100M), 100B (or 100N), and 113; and Mathematics 100 and 105A) twice will be disqualified from the major. Students who are disqualified will be notified by the first day of instruction in the subsequent quarter, as well as the student's college and the Office of the Registrar's ~~office~~.

Students may appeal their disqualification by submitting a letter to the Economics Department. This appeal must be filed no later than 15 days after the disqualification notification was mailed, or the 10th day of classes in the quarter of their disqualification, whichever is later.

Additional Preparation for the ~~m~~Major~~s~~

Students interested in the combined major must meet a minimum GPA requirement in ~~econ~~Economics 1 and 2. Transfer students should check assist.org for agreements with California community colleges about economics and math courses.

~~;~~Students who have met all articulations before transferring will need at least ~~6~~six economics and ~~4~~four to five ~~5~~ mathematics classes at UCSC to complete the major.

Honors in the ~~m~~Major

The Economics Department considers for Honors and Highest Honors students who have completed a major program with superior or exceptional work. Honors decisions are made by the department's Honors and Scholarship Committee.

At the end of each quarter, faculty teaching the upper-division core courses submit to the department a list of students in their respective classes whose performance is at the honors level. At the time of graduation, the files of students who received an honors designation in one or more of these courses is pulled, narrative evaluations are included, and the department's faculty honors committee review all files. The faculty committee looks for a record of excellence in courses offered towards the major, with a strong performance in the upper-division core (theory and econometrics—Econ courses 100A/M, 100B/N, and 113) being a necessary condition for honors. While not computing a grade point average for the economics courses, in general highest honors are awarded to students who have received a grade of at least an "A" throughout their economics program. Honors are awarded to students who have no more than two courses with grades of less than an "A-". Students who have completed a portion of the major at another institution may be asked to submit a transcript for evaluation.

Students interested in being reviewed for honors may request that the department conduct a review, and such requests are always granted.

In general, honors have been awarded to between 10 and 15 percent of each year's graduating class.

Graduate Programs

Master's Program in Applied Economics and Finance

The master of science program in applied economics and finance is designed for students who wish to supplement their undergraduate work in economics with analytical graduate training that prepares them for careers in business, government, international and domestic banking, consulting firms, and nonprofit organizations. The program is unique in its focus on graduate-level economics training for practical application and its emphasis on communication skills. The curriculum stresses the application of micro and macro concepts, statistical techniques, finding and using data sources, working out substantial practical applications, developing writing and reporting skills, and presenting material orally before an audience. The program differs from typical M.B.A. programs by preparing students to meet the increasing technical demands of private and public sector employers through comprehensive course work in economic analysis.

Requirements for admission include an undergraduate degree in economics or successful completion of undergraduate courses in intermediate microeconomics, macroeconomics, and statistics and adequate preparation in mathematics. At least two quarters of calculus and one of linear algebra are strongly recommended. Students are also expected to have basic computer skills.

Students normally complete the master's program in two years. All students must complete 12 courses (60 credits) of graduate study, including the following core courses which are taken in the first year:

200 *Microeconomic Analysis*

201 *Applications in Microeconomics*

202 *Macroeconomic Analysis*

216 *Applied Econometric Analysis I*

217 *Applied Econometric Analysis II*

233 *Finance*

In addition, first-year students take a two-unit workshop (course 294) in fall. Students normally enroll for 15 units. The minimum for full-time is 12 units.

In the fourth and fifth quarters, students must take at least four elective courses numbered 200 or higher. Students may choose from among the following courses: finance (courses 234, 235, 236, and 239), international economics (courses 249A, 249B), public economics (courses 250, 259A, 259B), accounting (courses 209A, 209B), or any economics Ph.D. course. Note that these courses are not offered each year; elective courses vary from year to year and are dependent on the staffing capabilities of the Economics Department.

Second-year master's students may count no more than two upper-division economics courses toward the elective requirements.

Students may also satisfy elective requirements by taking relevant courses from another discipline. Students will need to file a departmental petition for review and approval of either their upper-division economics courses and/or courses from a related discipline. Please see the graduate adviser for the pre-approved list. Students should begin the approval process at least one quarter in advance.

In the final quarter, each candidate completes a major project in conjunction with course 291, Workshop in Applied Economics, and 10 units of course 297, Independent Study. Students with graduate credit from other institutions may submit a written request for course substitution and/or credit to the graduate committee for review.

Applied Economics and Finance B.A./M.S. Dual-Degree Program for Undergraduates

Students entering UCSC as undergraduates may complete a combined B.A./M.S. in applied economics and finance in five years. To qualify for this program, students must complete all of the core courses for their specific major: courses 1, 2, 11A, 11B, 100A (or 100M), 100B (or 100N), and 113. Business management economics majors must also complete 10A and 10B. In addition, students are strongly advised to complete a minimum of three upper-division economics electives (business management economics majors must complete four) as well as the general education requirements before the end of their junior year. Students are also advised to take a course in linear algebra (Mathematics 21). Students majoring in business management economics or global economics should refer to those sections for the respective dual-degree requirements.

Students must also take the Graduate Record Examination General Test during the fall quarter of their junior year. Advance planning for

the program is essential, and interested students should consult with a faculty adviser well in advance of applying to the dual-degree program.

A student in the program begins the first-year M.S. courses in the senior year while continuing to maintain undergraduate status. In the fifth year, the student is officially enrolled as a graduate student and completes the remaining graduate course work, culminating in the M.S. degree.

Admission to the dual-degree program is by formal application directly to the Department of Economics; the application deadline is February 15 of the junior year. Undergraduates who plan to apply to quantitative-oriented Ph.D. programs at other institutions may take some of the first-year M.S. classes with the permission of the instructor.

Ph.D. Program in International Economics

The Ph.D. program in international economics provides students with training in modern microeconomics, macroeconomics, and econometrics, combined with specialized training in the fields of international finance and international trade. Students learn to bring an international perspective to all areas of economics and to conduct research on current and emerging international economic issues. The program offers more intensive course work in international trade and finance, as well as greater faculty depth in various aspects of international economics, than do traditional Ph.D. programs in economics that offer international economics as a single subfield. The large number of internationally recognized faculty in the department who are actively engaged in research in international economics provides a unique focus to the program and the department. While the core emphasis is on international trade and finance, the program also offers courses in economic development and in special topics, and students in the program have conducted research on a wide variety of topics in other areas; examples include monetary economics, experimental economics, environmental economics, and economic growth and development. This makes graduates of the program particularly well prepared for academic careers and for research careers in both domestic and international policy institutions.

Courses and Program Requirements

YEAR	FALL	WINTER	SPRING
1st	204A <i>Advanced Micro Theory</i> 205A <i>Advanced Macro Theory</i> 210B <i>Math Methods Econ Analysis</i> 211 A <i>Advanced Econometrics</i>	204B <i>Advanced Micro Theory</i> 205B <i>Advanced Macro Theory</i> 211B <i>Advanced Econometrics</i>	204C <i>Advanced Micro Theory</i> 205C <i>Advanced Macro Theory</i> 211C <i>Advanced Econometrics</i> <i>212 Empirical Project</i> Micro & Macro Prelim

			Exams
2nd	240A <i>Advanced International Trade</i> 241A <i>Advanced International Finance</i> 220A <i>Development Economics</i> 212 <i>Empirical Project</i>	240B <i>Advanced International Trade</i> 241B <i>Advanced International Finance</i> 243* <i>History of International Economy</i> 220B <i>Development Economics</i> 212 <i>Empirical Project</i>	240C <i>Advanced International Trade</i> 241C <i>Empirical Applications Trade & Finance</i> 212 <i>Empirical Project</i> Field Exams Field Paper
3rd	295A <i>Directed Reading</i> 296A <i>Third Year Seminar</i> 212 <i>Empirical Project</i> Qualifying Exam (QE)	295B <i>Directed Reading</i> 296B <i>Third Year Seminar</i>	295C <i>Directed Reading</i> 296C <i>Third Year Seminar</i>
4th	298 <i>Dissertation Research</i> 297A <i>Independent Study</i>	298 <i>Dissertation Research</i> 297B <i>Independent Study</i>	298 <i>Dissertation Research</i> 297C <i>Independent Study</i> Last qtr to challenge QE without academic probation

*Economics 243 is not offered every year; it may be taken in the 2nd or 3rd year.

Course requirements are satisfied by a letter grade of B or better or a grade of S (satisfactory).- A letter grade of C in a course is not satisfactory for meeting a course requirement for the Ph.D. program.

Preliminary Requirements

Preliminary examinations are given in two parts: one test in micro theory and one test in macro theory. Students are expected to pass both exams before the beginning of their second year. Preliminary exams are currently offered in June and September, although scheduling is subject to change.

~~Field examinations are given in two parts: one test in international trade and one test in international finance. These exams are roughly based on the courses Econ 240A, B, C and 241A, B, C, but they are not restricted to only material taught in a particular year at UCSC. The purpose of the exams is to test adequate knowledge of international economics as a qualification for the Ph.D. program. Students are expected to pass both exams by the beginning of their~~

~~third year. Field exams are currently offered in June and September, although scheduling is subject to change.~~

~~An econometrics paper is due at the end of the first full week of fall quarter of the third year. In the winter and spring quarters of the second-first year and again in the fall quarter of the third-second year, each student must enroll in Economics 212. with the faculty adviser.~~

An econometrics paper is due at the end of the first full week of fall quarter of the second year. A field paper in international economics is due by the end of June in the second year of the program. -The graduate handbook of the department details the evaluation procedure for the econometrics and the field paper-s.

Students who do not pass both preliminary exams, ~~both field exams and~~ the econometrics paper ~~requirement~~ and the field paper requirements will not be allowed to continue in the Ph.D. program.

Qualifying Examination

Advancement to candidacy for the Ph.D. degree requires completion with satisfactory grades or better of the required coursework, preliminary examinations, ~~field examinations,~~ the econometrics paper, the field paper and the ~~an~~ oral examination. -The oral examination is taken after all ~~of the~~ other requirements have been completed. -A student cannot advance to candidacy before clearing any incomplete grades from their record.

Dissertation

The final requirement for the Ph.D. degree is acceptance of the student's dissertation under the rules of the Academic Senate. -A three-member dissertation advisory committee, headed by the student's research advisor, evaluates the dissertation for the department. The dissertation advisory committee must be approved by both the Economics Ph.D. Committee and the Graduate Council. -The committee may require a formal public defense of the dissertation.