Economics

Department Website: http://economics.uchicago.edu

Program of Study

The program in economics is intended to equip students with the basic tools to understand the operation of a modern economy: the origin and role of prices and markets, the allocation of goods and services, and the factors that enter into the determination of income, employment, and the price level.

The program in economics can be divided into five component parts:

1. **Fundamentals sequence**: provides students with the basic skills required to be successful in the major.
2. **Core curriculum**: consists of three courses designed to introduce students to the "economic approach."
3. **Empirical Methods sequence**: provides students with the fundamental techniques of data analysis.
4. **Economic Policy course**: applies the tools developed in the core curriculum to issues of fiscal policy, monetary policy, and other policy discussions relevant to the current state of the economy.
5. **Electives**: allows students to tailor the economics major to their interests.

Note: The requirements described below apply to students who matriculated at the University of Chicago in the 2016–17 academic year or later. Any possible exceptions will be noted.

Program Requirements

Fundamentals

Students must begin the economics major by demonstrating competence in basic calculus and principles of economics. The fundamentals sequence consists of the following courses. The first two are required; the second two are strongly recommended:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 13300</td>
<td>Elementary Functions and Calculus III</td>
<td>100</td>
</tr>
<tr>
<td>or MATH 15300</td>
<td>Calculus III</td>
<td></td>
</tr>
<tr>
<td>or MATH 16300</td>
<td>Honors Calculus III</td>
<td></td>
</tr>
<tr>
<td>MATH 19520</td>
<td>Mathematical Methods for Social Sciences</td>
<td>100</td>
</tr>
<tr>
<td>or MATH 20400</td>
<td>Analysis in Rn II</td>
<td></td>
</tr>
<tr>
<td>or MATH 20800</td>
<td>Honors Analysis in Rn II</td>
<td></td>
</tr>
<tr>
<td>ECON 19800</td>
<td>Introduction to Microeconomics</td>
<td>100</td>
</tr>
<tr>
<td>ECON 19900</td>
<td>Introduction to Macroeconomics</td>
<td>100</td>
</tr>
</tbody>
</table>

Students who wish to complete the major with more rigorous mathematics may substitute MATH 20400 Analysis in Rn II for MATH 19520 Mathematical Methods for Social Sciences.

Calculus

Students who have an interest in the major should take calculus at the highest level for which they qualify. Students may complete MATH 19520 Mathematical Methods for Social Sciences prior to or concurrently with ECON 20000 The Elements of Economic Analysis I. Students must not postpone completion of MATH 19520 Mathematical Methods for Social Sciences beyond concurrent registration with ECON 20000 The Elements of Economic Analysis I.

1. **MATH 13000s**: Students must complete MATH 13300 Elementary Functions and Calculus III prior to enrolling in ECON 20000 The Elements of Economic Analysis I. Students may find it useful to complete MATH 19520 Mathematical Methods for Social Sciences prior to enrolling in the Elements of Economic Analysis sequence.

2. **MATH 15000s**: Students enrolling in the MATH 15000s sequence must complete MATH 15300 Calculus III before enrolling in ECON 20000 The Elements of Economic Analysis I. However, enrollment in ECON 20000 The Elements of Economic Analysis I concurrently with MATH 15300 Calculus III is allowed if (1) a grade of A- or higher is achieved in both MATH 15100 Calculus I and MATH 15200 Calculus II and (2) competency in microeconomics has been demonstrated (see Core Curriculum for details).

3. **MATH 16000s and 16010s**: Students enrolling in the MATH 16000s sequences must complete MATH 16200 Honors Calculus II or MATH 16210 Honors Calculus II (IBL) before enrolling in ECON 20000 The Elements of Economic Analysis I. Enrollment in ECON 20000 The Elements of Economic Analysis I requires completion or concurrent enrollment in MATH 16300 Honors Calculus III/MATH 16310 Honors Calculus III (IBL) and demonstrated competency in Microeconomics (see "Core Curriculum" section, below, for details).

Students may satisfy the third quarter of calculus requirement by placement (based on the Calculus Accreditation Examination administered by the College in the summer prior to matriculation). In this case, students should continue their mathematics training with the highest mathematics level for which they qualify.

Principles of Economics
Students are expected to begin their study of economics with ECON 19800 Introduction to Microeconomics and ECON 19900 Introduction to Macroeconomics. These courses provide a good overview of basic concepts. These two introductory courses are designed for students with limited or no prior course work in economics. While these two courses provide basic economics knowledge, they are not required in the major. Students who matriculated at the University of Chicago in 2016–17 or later may use ECON 19900 Introduction to Macroeconomics to fulfill one of the economics elective requirements.

Students are strongly encouraged to complete ECON 19800 Introduction to Microeconomics prior to ECON 20000 The Elements of Economic Analysis I (or ECON 20010 The Elements of Economic Analysis: Honors I) and ECON 19900 Introduction to Macroeconomics prior to ECON 20200 The Elements of Economic Analysis III (or ECON 20210 The Elements of Economic Analysis: Honors III).

Core Curriculum

The core curriculum consists of three courses. Students may use the standard or honors sequence to satisfy this requirement. The honors sequence is designed for students interested in economics research and/or use of more sophisticated mathematical models.

<table>
<thead>
<tr>
<th>Standard Core Sequence</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 20000</td>
<td>The Elements of Economic Analysis I</td>
</tr>
<tr>
<td>ECON 20100</td>
<td>The Elements of Economic Analysis II</td>
</tr>
<tr>
<td>ECON 20200</td>
<td>The Elements of Economic Analysis III</td>
</tr>
</tbody>
</table>

or

<table>
<thead>
<tr>
<th>Honors Core Sequence</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 20010</td>
<td>The Elements of Economic Analysis: Honors I</td>
</tr>
<tr>
<td>ECON 20110</td>
<td>The Elements of Economic Analysis: Honors II</td>
</tr>
<tr>
<td>ECON 20210</td>
<td>The Elements of Economic Analysis: Honors III</td>
</tr>
</tbody>
</table>

Most students begin the core curriculum in their second year. Those who wish to begin it during their first year must demonstrate competence with the fundamental skills needed in that sequence in the following ways:

- Students must either pass the economics placement test or complete ECON 19800 Introduction to Microeconomics prior to starting ECON 20000 The Elements of Economic Analysis I (or ECON 20100 The Elements of Economic Analysis II). No standardized external exams (IB, AP, nor A-Levels) will substitute, and they rarely serve as sufficient preparation for the economics placement test. Note that the placement test will only be offered Monday evening of the first week of Autumn Quarter.
- Students must satisfy the calculus requirement as discussed in Calculus.

Note: Students who are completing the previous major requirements and are on track to complete ECON 20300 The Elements of Economic Analysis IV after Autumn Quarter 2017 should take ECON 23950 Economic Policy Analysis in place of ECON 20300, regardless of matriculation date.

Empirical Methods

In the modern economy, quantitative methods are highly valued skills. Students must satisfy the empirical methods component of the economics major in one of two ways, either as a three-quarter sequence or a two-quarter sequence. Note: The two-quarter sequence is only available to students who matriculated in 2016–17 or later. Those who matriculated in 2015–16 or earlier are required to take the standard three-quarter sequence.

Option A: The three-quarter empirical methods sequence is comprised of a course in linear algebra, a course in statistics, and a course in econometrics, and is designed for students who complete the MATH 15000s sequence or higher. This three-quarter empirical methods sequence covers the broad ranges of scope that the disciplines provide, which will be useful for further quantitative training in the major.

Option B: The two-quarter empirical sequence, comprised of an economics statistical methods course and a course in econometrics, is provided as an alternative for students who want to focus only on the relevant materials in linear algebra and statistics that pertain to econometrics. ECON 21010 Statistical Methods in Economics teaches the fundamental methods and materials from linear algebra and statistics that are utilized in many economic applications.

Details about each sequence are below. We strongly encourage students to choose the highest mathematical tracks for which they are qualified. Students unsure of which sequence to choose should consult with the Undergraduate Office in the Department of Economics as well as the Department of Mathematics and Department of Statistics.

**Option A: Three-Quarter Empirical Methods Sequence**

In order to satisfy the empirical methods component of the economics major using a three-quarter sequence, students must complete the following courses. They must be taken in consecutive quarters, beginning with Linear Algebra and concluding with Econometrics:

<table>
<thead>
<tr>
<th>One of the following:</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 19620</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td>or STAT 24300</td>
<td>Numerical Linear Algebra</td>
</tr>
<tr>
<td>or MATH 20250</td>
<td>Abstract Linear Algebra</td>
</tr>
<tr>
<td>or MATH 20700</td>
<td>Honors Analysis in Rn I</td>
</tr>
</tbody>
</table>

One of the following: 100

| STAT 23400 | Statistical Models and Methods |
| or STAT 24400 | Statistical Theory and Methods I |
| or STAT 24410 | Statistical Theory and Methods Ia |

One of the following: 100

| ECON 21020 | Econometrics |
| or ECON 21030 | Econometrics - Honors |

Total Units 300

Students may not use AP Statistics credit to satisfy the statistics requirement. Students with AP credit will need to expand on their training with STAT 23400 Statistical Models and Methods, STAT 24400 Statistical Theory and Methods I, or STAT 24410 Statistical Theory and Methods Ia. Students may not earn credit for both STAT 22000 Statistical Methods and Applications (via course enrollment or AP exam) and STAT 23400 Statistical Models and Methods.

Students who wish to pursue more advanced training in empirical methods may complete STAT 24300 Numerical Linear Algebra or MATH 20250 Abstract Linear Algebra or MATH 20700 Honors Analysis in Rn I; either STAT 24400 Statistical Theory and Methods I or STAT 24410 Statistical Theory and Methods Ia; and ECON 21030 Econometrics - Honors.

**Option B: Two-Quarter Empirical Methods Sequence**

Option B is available only to students who matriculated at the University of Chicago in 2016–17 and later. In order to satisfy the empirical methods component of the economics major using a two-quarter sequence, students must complete the following:

| ECON 21010 | Statistical Methods in Economics 100 |
| ECON 21020 | Econometrics 100 |

Total Units 200

Students should not begin the empirical methods sequence earlier than concurrently with ECON 20100 The Elements of Economic Analysis II and should take ECON 21010 Statistical Methods in Economics and ECON 21020 Econometrics in consecutive quarters. Students must complete the empirical methods sequence by the end of third year.

Students who complete the empirical methods component of the major with just two courses (ECON 21010 Statistical Methods in Economics and ECON 21020 Econometrics) must complete an additional economics elective, as discussed in Electives.

**Economic Policy**

The economic policy requirement provides students the opportunity to apply methods and tools taught in the economics core sequence to analyze current issues centered around monetary and fiscal policy. Most students will complete the economic policy requirement with ECON 23950 Economic Policy Analysis, but students interested in learning more formal approaches may use one of the other macroeconomics courses listed below to satisfy the requirement.

| ECON 23950 | Economic Policy Analysis 100 |
| or ECON 23200 | Topics in Macroeconomics |
| or ECON 23220 | Introduction to Advanced Macroeconomic Analysis |
| or ECON 23330 | Introduction to Dynamic Economic Modeling |

Students who complete more than one of the above courses may apply the additional courses to satisfy the economics elective requirements. ECON 23950 Economic Policy Analysis may not count as an economics elective. Students may not earn credit for both ECON 23950 Economic Policy Analysis and ECON 20300 The Elements of Economic Analysis IV.

**Note:** Students on track to complete ECON 20300 The Elements of Economic Analysis IV after Autumn Quarter 2017 should take ECON 23950 Economic Policy Analysis in place of ECON 20300, regardless of matriculation date.

**Electives**

All students in the economics major must complete a minimum of four additional economics courses to broaden their exposure to areas of applied economics or economic theory. Students who complete the empirical methods component with the two-quarter sequence must complete five economics electives. These courses must have a higher course number than ECON 20200 The Elements of Economic Analysis III, with a couple of exceptions: Neither ECON 21030 Econometrics - Honors nor ECON 23950 Economic Policy Analysis can be used to satisfy the economics elective requirements; students who matriculated in 2016–17 or later may use ECON 19900 Introduction to Macroeconomics to satisfy one of the economics elective requirements.
Only one of a student's electives may come from outside the University of Chicago Department of Economics. One of the following courses may count as an outside elective:

**Computer Science**
- CMSC 10600  
  Fundamentals of Computer Programming II
- CMSC 12100  
  Computer Science with Applications I
- CMSC 12200  
  Computer Science with Applications II
- CMSC 15100  
  Introduction to Computer Science I
- CMSC 15200  
  Introduction to Computer Science II
- CMSC 16100  
  Honors Introduction to Computer Science I
- CMSC 16200  
  Honors Introduction to Computer Science II

**Statistics**
- STAT 24500  
  Statistical Theory and Methods II
- STAT 25100  
  Introduction to Mathematical Probability
- STAT 25300  
  Introduction to Probability Models
- STAT 26100  
  Time Dependent Data

**Mathematics**
- MATH 20500  
  Analysis in Rn III
- MATH 20900  
  Honors Analysis in Rn III
- MATH 27300  
  Basic Theory of Ordinary Differential Equations

Courses in other degree programs may be considered for elective credit through petition. To be considered, these courses must require the equivalent prerequisite course work of ECON 20100 The Elements of Economic Analysis II. Graduate level economics courses will be counted for elective credit, but consultation with the Undergraduate Office in advance of course registration is required.

A University of Chicago Booth School of Business course may be considered for elective credit if the course requires the equivalent of ECON 20100 The Elements of Economic Analysis II as a prerequisite and is numbered as a Chicago Booth 40000 or higher course. Additionally, the course needs to pertain to the application of economic theory to a course subject that is not offered by the Department of Economics. Courses such as accounting, investments, competitive strategy, and entrepreneurship will not be considered for economics elective credit. Consideration for elective credit must be done by petition before a student registers for the course. There will be no retroactive consideration for credit.

**Summary of Requirements**

**TRACK A: Three-Quarter Empirical Methods Sequence**

**GENERAL EDUCATION**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 13100</td>
<td>Elementary Functions and Calculus I-II</td>
</tr>
<tr>
<td>MATH 15100</td>
<td>Calculus I-II</td>
</tr>
<tr>
<td>MATH 16100</td>
<td>Honors Calculus I</td>
</tr>
<tr>
<td>MATH 16110</td>
<td>Honors Calculus I (IBL)</td>
</tr>
<tr>
<td>MATH 16300</td>
<td>and Honors Calculus III</td>
</tr>
</tbody>
</table>

**Total Units**

200

**MAJOR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 13300</td>
<td>Elementary Functions and Calculus III</td>
</tr>
<tr>
<td>MATH 15300</td>
<td>Calculus III</td>
</tr>
<tr>
<td>MATH 16300</td>
<td>Honors Calculus III</td>
</tr>
<tr>
<td>MATH 16310</td>
<td>Honors Calculus III (IBL)</td>
</tr>
</tbody>
</table>

**One of the following:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 20000</td>
<td>The Elements of Economic Analysis I-II-III</td>
</tr>
<tr>
<td>ECON 20100</td>
<td>The Elements of Economic Analysis: Honors I-II-III</td>
</tr>
<tr>
<td>MATH 19520</td>
<td>Mathematical Methods for Social Sciences **</td>
</tr>
<tr>
<td>or MATH 20400</td>
<td>Analysis in Rn II</td>
</tr>
<tr>
<td>or MATH 20800</td>
<td>Honors Analysis in Rn II</td>
</tr>
<tr>
<td>MATH 19620</td>
<td>Linear Algebra</td>
</tr>
</tbody>
</table>

**One of the following:**

200

100

100
or MATH 20250  Abstract Linear Algebra
or STAT 24300  Numerical Linear Algebra
or MATH 20700  Honors Analysis in Rn I
STAT 23400  Statistical Models and Methods
or STAT 24400  Statistical Theory and Methods I
or STAT 24410  Statistical Theory and Methods Ia
ECON 21020  Econometrics
or ECON 21030  Econometrics - Honors
ECON 23950  Economic Policy Analysis
or ECON 23200  Topics in Macroeconomics
or ECON 23220  Introduction to Advanced Macroeconomic Analysis
or ECON 23330  Introduction to Dynamic Economic Modeling
Four electives *
Total Units 1300

* Credit may be granted by examination.
** Students are encouraged to take prior to or concurrently with ECON 20000 or ECON 20010.
+ These courses must include three economics courses numbered higher than ECON 20200 and must follow guidelines in the preceding Electives section. (Note: ECON 19900 may be used to fulfill one economics elective requirement for students who matriculated in 2016–17 or later.)

TRACK B: Two-Quarter Empirical Methods Sequence
Available only to students who matriculated in 2016-17 or later.

GENERAL EDUCATION
One of the following: 200
MATH 13100-13200  Elementary Functions and Calculus I-II
MATH 15100-15200  Calculus I-II *
MATH 16100-16200  Honors Calculus I-II
MATH 16110 & MATH 16210  Honors Calculus I (IBL) and Honors Calculus II (IBL)
Total Units 200

MAJOR
One of the following: 100
MATH 13300  Elementary Functions and Calculus III
MATH 15300  Calculus III *
MATH 16300  Honors Calculus III
MATH 16310  Honors Calculus III (IBL)
One of the following: 300
ECON 20000-20100-20200  The Elements of Economic Analysis I-II-III
ECON 20010-20110-20210  The Elements of Economic Analysis: Honors I-II-III
MATH 19520  Mathematical Methods for Social Sciences **
or MATH 20400  Analysis in Rn II
or MATH 20800  Honors Analysis in Rn II
ECON 21010  Statistical Methods in Economics
ECON 21020  Econometrics
ECON 23950  Economic Policy Analysis
or ECON 23200  Topics in Macroeconomics
or ECON 23220  Introduction to Advanced Macroeconomic Analysis
or ECON 23330  Introduction to Dynamic Economic Modeling
Five electives *
Total Units 1300

* Credit may be granted by examination.
Students are encouraged to take prior to or concurrently with ECON 20000 or ECON 20010. These courses must include four economics courses numbered higher than ECON 20200 and must follow guidelines in the preceding Electives section. For students who matriculated in 2016-17 or later, ECON 19900 may be used to fulfill one economics elective requirement.

Sample Programs

The following is a recommended sample plan of study (excluding four elective courses) for those students entering with the MATH 13000s sequence:

First Year
Autumn Quarter
MATH 13100
Winter Quarter
MATH 13200
Spring Quarter
MATH 13300
ECON 19800

Second Year
Autumn Quarter
ECON 20000
Winter Quarter
ECON 20100
Spring Quarter
ECON 20200
MATH 19520
ECON 19900

Third Year
Autumn Quarter
ECON 23950
Winter Quarter
STAT 23400
Spring Quarter
ECON 21020
MATH 19620

The following is a recommended plan of study (excluding four economics elective courses) for those students entering with the MATH 15000s or MATH 16000s sequence:

First Year
Autumn Quarter
MATH 15100
Winter Quarter
MATH 15200
Spring Quarter
MATH 15300
ECON 19800

Second Year
Autumn Quarter
ECON 20000
Winter Quarter
ECON 20100
Spring Quarter
ECON 20200
MATH 19520
MATH 19620
STAT 23400
ECON 19900
ECON 21010

Third Year
Autumn Quarter
ECON 23950
ECON 21020

The following is a recommended plan of study (excluding five elective courses) for those students completing the two-quarter empirical methods sequence. Note that this plan of study can be used in conjunction with any calculus sequence:

First Year
Autumn Quarter
MATH 13100
Winter Quarter
MATH 13200
Spring Quarter
MATH 13300
ECON 19800

Second Year
Autumn Quarter
ECON 20000
Winter Quarter
ECON 20100
Spring Quarter
ECON 20200
ECON 19900
ECON 21010

Third Year
Autumn Quarter
ECON 23950
ECON 21020

Students wanting to appropriately plan their economics major with the courses MATH 20400 Analysis in Rn II, STAT 24400 Statistical Theory and Methods I, or STAT 24410 Statistical Theory and Methods Ia should consult with the Undergraduate Program Office in the Department of Economics.

Grading

Beginning in autumn 2010, successful completion of the economics major requires both a major GPA of 2.0 or higher and a minimum grade of C- in all courses counted for the major program. In addition, students majoring in economics must receive quality grades in all courses required as part of the major. Non-majors may take economics courses on a P/F basis; only grades of C- or higher constitute passing work.

Honors

To be considered for honors, students must meet the following requirements: (1) a GPA of 3.5 or higher in the major and a GPA of 3.2 or higher overall, (2) participation in the honors workshop and sole authorship of an independent research paper on a topic in economics, and (3) a faculty sponsor’s letter evaluating this independent research paper. For award of
honors, the project must receive a grade of A or A-. At the beginning of the student's fourth year, the economics honors committee must have a letter from an economics faculty sponsor expressing willingness to oversee the student's writing of an independent research paper and recommending the student be admitted into the honors workshop program. Honors papers should be outgrowths of economics electives or research assistant work for the faculty sponsor.

Participation in the ECON 29800 Undergraduate Honors Workshop is mandatory throughout the year. Upon completion of the paper in the Spring Quarter, the student will then be retroactively registered for the course in the fourth-year quarter of the student's choosing. Plan for this retroactive registration with your College adviser.

The research paper, a transcript, and a recommendation letter from the faculty sponsor evaluating the independent research paper must be submitted to the undergraduate economics program office for consideration by the economics honors committee no later than the end of fifth week of the quarter in which the student plans to graduate. Students wishing to qualify for honors should (1) engage in preparatory course work in the area of interest no later than Spring Quarter of their third year and (2) consult with the program advisers no later than Winter Quarter of their third year.

This program may accept a BA paper or project used to satisfy the same requirement in another major if certain conditions are met and with the consent of the other program chair. Approval from both program chairs is required. Students should consult with the chairs by the earliest BA proposal deadline (or by the end of third year, when neither program publishes a deadline). A consent form, to be signed by both chairs, is available from the College adviser. It must be completed and returned to the College adviser by the end of Autumn Quarter of the student's year of graduation.

Preparation for PhD Programs in Economics

Students preparing to pursue a PhD program in economics should complete advanced course work in mathematics, statistics, and computer science. The real analysis sequence offered by the Mathematics Department, MATH 20300-20400-20500 Analysis in Rn I-II-III (or its honors variant MATH 20700-20800-20900 Honors Analysis in Rn I-II-III) contains material that is particularly important for economics graduate school. Students who used MATH 13300 Elementary Functions and Calculus III or MATH 15300 Calculus III to fulfill the calculus requirement will need to take MATH 15910 Introduction to Proofs in Analysis to transition into the real analysis sequence. Completion of this course work allows students to participate in higher level electives that may also be helpful for their chosen path of study in graduate school.

Completion of either STAT 24400 Statistical Theory and Methods I or STAT 24410 Statistical Theory and Methods Ia and either MATH 20250 Abstract Linear Algebra or STAT 24300 Numerical Linear Algebra will allow students to continue their training in statistics and econometrics at an advanced level.

Increasingly, graduate programs expect students to have sophisticated programming skills. Completion of CMSC 15100-15200 Introduction to Computer Science I-II is strongly encouraged.

In addition, students who are interested in pursuing graduate study are encouraged to take appropriate courses from other departments in the social sciences to obtain a well-rounded perspective of their areas of interest.

Students are encouraged to seek research assistant jobs and may self-subscribe to the Research Assistant Jobs (https://lists.uchicago.edu/web/info/chicago_economics-researchasst) listhost to receive updates on job postings.

It is important that such students consult early in the second year with one of the directors of the undergraduate program to design a plan of course work and research. Contact juliew@uchicago.edu for appointments.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

- Times was used instead of Trajan.
- Times was used instead of Palatino.

The editor may contact Leepfrog for a draft with the correct fonts in place.