I. INTRODUCTION .................................................................................................................. 1
II. WHY STUDY ECONOMICS? ............................................................................................... 1
III. THE ECONOMICS MAJOR ............................................................................................. 2
   A. Declaring an Economics Major
   B. Major Requirements
   C. Typical Academic Plans for Economics Majors
   D. Certificate in Financial Economics

IV. ECONOMICS DEPARTMENT – GRADUATING WITH HONORS ........................................... 4
V. THE ECONOMICS MINOR .................................................................................................... 8
   A. Declaring an Economics Minor
   B. Minor Requirements

VI. STUDY ABROAD .................................................................................................................. 9

VII. TRANSFER CREDIT FOR COURSEWORK TAKEN OUTSIDE THE WASHINGTON
     UNIVERSITY ECONOMICS DEPARTMENT .................................................................. 10
     A. Students Entering WU as Freshmen
     B. Transfer Students

VIII. PRE-MATRICULATION CREDIT: AP, IB, BRITISH A-LEVEL ........................................... 12

IX. THE 5-YEAR ACCELERATED A.M. IN ECONOMICS ....................................................... 13

X. OPPORTUNITIES FOR INDEPENDENT STUDY AND RESEARCH ............................... 14

XI. INTERNSHIP OPPORTUNITIES ......................................................................................... 14

XII. CAREER PLANNING ASSISTANCE ................................................................................ 15
     A. Beginning a Career with an A.B. Degree
     B. Professional Degree Programs Linked to Economics
     C. Graduate Study in Economics

XIII. THE ECONOMICS CURRICULUM: CONCENTRATIONS & COURSE DESCRIPTIONS .. 18
     A. Economics Concentrations
     B. Undergraduate Course Descriptions

XIV. ECONOMICS FACULTY ................................................................................................... 27

Revised 26 March 2018
I. INTRODUCTION

This pamphlet provides detailed information about the economics major and minor. Section II briefly describes the usefulness of an economics degree. Section III details courses required for an A.B. in Economics, the steps for declaring a major and the Certificate in Financial Economics. The Honors Program and the Minor in Economics are outlined in Sections IV and V, respectively. A variety of topics of interest to economics students follow, including study abroad, AP (and IB and British A-level) policies, transfer credit, the A.B./A.M. (5-year) degree, and internship and career-planning information. We conclude with a list of faculty and course descriptions. The schedule of course offerings for the coming semester can be found on the department web site (http://economics.wustl.edu/).

If you have questions about a departmental policy or questions about how to get started in economics, please contact Ms. Jessica Cain in the economics office, Seigle Hall, room 307, 935-5670, or jcain@wustl.edu. You may also contact Dorothy Petersen, the Academic Coordinator in Economics. Her office is in Seigle Hall, room 307E, and her email address is dottie@wustl.edu. The Director of Undergraduate Studies is Professor Bruce Petersen, and his email address is petersen@wustl.edu.

Follow the Undergraduate Program:
- Twitter: WUSTLEconAC
- Facebook page: WUSTL Undergrad Econ
- LinkedIn group: WUSTL Undergrad Economics
- Instagram: wustl_econac

II. WHY STUDY ECONOMICS?

Many, if not most, of the nation's and the world's most significant social problems have an economic dimension. Microeconomics provides the tools to analyze the trade-offs that individuals, firms, and governments confront because of limited resources. It considers the choices that are made, the social context in which they take place and the implications for human welfare. Economists apply these tools to study a wide range of controversial public policy questions, including environmental regulation, government restrictions on domestic and international markets, the structure of the legal system and the design of tax policy. Macroeconomics explores the sources of economic growth and the causes of recessions and inflation. Macroeconomic analysis assesses monetary policy, explains the performance of financial markets, and considers international trade and financial links.

The study of economics is an excellent way to acquire problem-solving skills and develop a logical, ordered way of looking at problems. It leads naturally to careers in business, law, and in economics research and consulting.

Economics is a standard pre-business major, because it provides insight into the operation of individual markets for goods and services, financial markets, and the global economic system, and because it provides the quantitative and analytical skills that enable students to succeed in a wide variety of business activities. Indeed, many of our majors take jobs in finance or business consulting after graduation. Economics provides a solid foundation for students who will pursue an M.B.A. degree.

Many law schools view economics as one of the best undergraduate majors because of its disciplined approach to the analysis of social issues. Some of our economics courses also relate specifically to legal issues. Again, many economics majors enter Law School directly after (or soon after) obtaining their undergraduate degree. Feedback from alumni suggests the relevance of their economics coursework as preparation for their legal studies.

Careers in economics research require graduate work leading to either an M.A. or (more usually) a Ph.D. More than half of all economists with graduate training teach at the college level. The remainder is employed either in the business sector or in government. The demand for economists in the business and government sector is strong. Graduate work in economics requires extensive course work in mathematics and statistics to complement the economics major. See further discussion in Section XII.C below.
III. The Economics Major

A. Declaring an Economics Major

Students may select Economics as a (first or second) major via the “Academics/Major Programs” link on the student’s WebStac home page. Students may select an advisor from the available list of faculty members when completing the online major declaration request, and the student normally retains the same advisor in subsequent years. If a student wishes to switch advisors after the major declaration request has been approved, s/he should email the Academic Coordinator with that request. The Department will try to meet this request. Students declaring a major in Economics must complete a pre-test (for University assessment/accreditation purposes) in order to finalize the major declaration. Information on how to complete the pre-test is provided via an automated message when the major is declared.

Changing the designation of Economics from a minor to a major or switching the “prime”/second major status of Economics is also accomplished via the “Academics/Major Programs” link on WebStac. Please see the Academic Coordinator for assistance, as needed.

B. Major Requirements

The requirements for a major in economics are:

1. **Math 2200**, or a pre-approved substitute statistics, such as Math 3200 or ESE 326. (Students “prime” in Olin should refer to Note (xi), below.) Math 2200 is a prerequisite for Econ 413, a required course for the major. Students interested in the Latin Honors Program in Economics should review the “Honors Program” section, below, to determine their best choice for meeting the statistics requirement for the major. See Section VII (Transfer Credit) and Section VIII (Pre-matriculation Credit) for the transfer credit and AP (etc.) polices regarding Math 2200.

2. **Math 132** (Calculus II). Math 132 is a prerequisite for Econ 4011. See Section VII (Transfer Credit) and Section VIII (Pre-matriculation Credit) for the transfer credit and AP (etc.) polices regarding calculus. Note: the Economics department recommends that majors interested in a Ph.D. in Economics or Finance complete additional mathematics courses.

3. **Econ 493** (Mathematical Economics, a 1-credit, 5-week course), to be taken concurrently with Econ 4011. (Majors may instead complete Math 233 – Calculus III, again, prior to, or concurrently with, Econ 4011.)

4. **Econ 1011, Introduction to Microeconomics** and **Econ 1021, Introduction to Macroeconomics**. These introductory courses can be taken in any order (or concurrently), typically during a student’s freshman or sophomore year.

5. Seven upper-level economics courses which must include:
   a) **Econ 4011, Intermediate Microeconomic Theory**, and **Econ 4021, Intermediate Macro-economic Theory**. (Econ 4011 is a prerequisite to Econ 4021.) These two courses are the foundation of any economic study. They introduce the student to the basic theoretical framework of economics.
   b) **Four 300- and 400-level elective classes** (3 units each). At least two of these classes must have Econ 4011 and/or Econ 4021 as a prerequisite.
   c) **Econ 413, Introduction to Econometrics**, or **Econ 413W, Introduction to Econometrics with Writing**.

6. A capstone, assessment test administered in the semester of graduation (beginning with students graduating in May 2019). Logistical information will be provided closer to the testing date.

**Notes (Please read carefully):**

i. Majors must take all required courses, including calculus and statistics, for a letter grade, not Credit/No Credit. To count toward the major, students must receive a grade of C- or better in all courses required for the major. Students who have taken Econ 1011 or 1021 with the Credit/No Credit option prior to deciding on an economics major should consult with the department’s Academic Coordinator.

ii. Students are advised to take statistics (e.g., Math 2200) before they start taking advanced economics beyond Econ 4011 and 4021.
iii. Arts & Sciences policy on double counting for the Class of 2018 and earlier:
   - If a student has two majors, each major must have at least 18 upper-level units of credit independent of the other major. Individual academic departments may enforce stricter rules regarding double-counting of courses between majors, second majors and minors.
   - If a student has a major and a minor, the major must have at least 18 upper-level units independent of the minor. The minor must have at least 12 units independent of the major.

iv. Arts & Sciences policy on double counting for the Class of 2019 and later:
   - If a student has two majors, each major’s upper-level units of credit must be independent of the other (i.e., no double counting of upper-level units required for the majors is permitted). Prerequisite courses at the 100- or 200-levels may count for both majors.
   - If a student has a major and a minor, the upper-level credits for the major must be independent of the upper-level units counted toward the minor. Prerequisite courses at the 100- and 200-level may count for both minors.
   - Should the same upper-level course satisfy a requirement in more than one of a student’s major/minor programs, a departmentally-sanctioned upper-level elective must be chosen to replace the course in one of the programs.
     - One obvious consideration is the statistics requirement for double majors. As noted below, ESE 326, Math 3200, PolSci 363, and Psych 300 are approved substitutions for the statistics requirement of the Economics major for students with double-majors in the respective departments. Majors will have to complete an additional elective in Economics or in the other major department and notify the relevant administrators in both departments (e.g. the Academic Coordinator in Economics) in order to comply with the “no double counting” rule.
       - AP credit for Math 2200 meets the statistics requirement of the Economics major, and so there is no conflict if an Econ major takes one of the above statistics classes for her/his second major.

v. 200-level economics courses, Econ 490, Econ 493, Econ 494, Econ 496, Econ 497, Econ 498 and Econ 499 may not be used to satisfy major requirements.

vi. With the prior approval of the Academic Coordinator, Economics courses from University College may be used to satisfy major requirements. The exception to this is that University College’s Econ 1011 and Econ 1021 will transfer for Arts & Sciences’ Econ 1011 and Econ 1021, respectively, with no prior approval required. See the Academic Coordinator for further clarification, as necessary. Note that majors need to be mindful of the maximum allowable transfer credits. See the discussion of transfer credit in Section VII for more information.

vii. Econ 4011, Econ 4021 and the two required Econ 4011/4021 prerequisite electives must be taken through the Washington University Economics department during the regular academic year (i.e., Fall and Spring semesters). University College and Washington University Summer School courses may not be used to fulfill the requirements for Econ 4011, Econ 4021 or the two courses with Econ 4011/4021 prerequisites.

viii. Transfer courses from other schools (and AP/IB/British A-Level credit) that qualify for Arts and Sciences credit may be used to replace Economics 1011, 1021, Math 2200 and Math 131/132; but majors need to be mindful of the maximum allowable transfer credits. See the discussion of transfer credit in Section VII for more information.

ix. Transfer courses may be used to satisfy advanced economics requirements (300-level or above) only with the written approval of the Academic Coordinator. Majors need to be mindful of the maximum allowable transfer credits. See the discussion of transfer credit in Section VII for more information. See also Section VI for a discussion about coordinating an economics major with study abroad.

x. Students from the John M. Olin School of Business who are completing a second major in Economics may use MEC 290 to replace Econ 1011 and MEC 292 to replace Econ 1021. However, majors need to be mindful of the maximum allowable transfer credits. See the discussion of transfer credit in Section VII for more information.

xi. For Olin students, QBA 120 and 121 can be used to fulfill the statistics requirement (i.e., Math 2200).
C. Typical Academic Plans for Economics Majors

Most students find it straightforward to fulfill the economics major requirements in their four undergraduate years by following a simple four-year plan such as the following.

- **Freshman year**: Econ 1011 and Econ 1021; Math 131; Math 132.
- **Sophomore year**: Econ 4011 and Econ 493 in the fall semester; Econ 4021 in the spring semester. Math 2200 (statistics) should be taken this year or during the junior year.
- **Junior and Senior years**: Complete Econ 413 (or Econ 413W) and the four, economics electives. Ideally, students should complete their economics electives by the fall semester of the senior year.

A student who has special circumstances, such as anticipated participation in the Honors Program, study abroad, application to the five-year A.B./A.M. program or to a Ph.D. program, or a late start in economics should consult with their economics advisor and/or the Academic Coordinator for appropriate course sequencing. Additional information can be found in the following Sections: **IV** (honors), **VI** (study abroad), **IX** (A.B./A.M.), and **XII.C** (graduate school).

The Department of Economics recommends that its majors complete courses in complementary disciplines. These include, but are not limited to: Computer Science (CSE 131, at a minimum); University College (Math 133 – Programming with Python); 1-2 semesters of accounting (ACCT 2610, ACCT 2620); and possibly applied statistical coursework in Political Science. Additional recommendations can be found in Section **XII** (Career Planning Assistance).

D. Certificate in Financial Economics

The Department of Economics has extensive course breadth and faculty expertise in the area of Financial Economics. By completing a specialized set of electives, majors can earn the “Certificate in Financial Economics.” This will be a permanent notation on your academic record.

The requirements for the milestone “Certificate in Financial Economics” are listed below:

1. Completion of a total of **ten** (3-unit) economics courses (versus 9 courses required for the major).
2. The required math and core economics courses are the same as in the major: Econ 1011, Econ 1021, Econ 413 (or Econ 413W), Econ 4011, Econ 4021, Math 131, Math 132, Math 2200 and Econ 493 (or Math 233).
3. Of the **five** electives required for the Certificate (versus 4 for the major), a minimum of three electives must come from the following list:

- Econ 3311: Financial Markets & Analysis
- Econ 428: Capital Market Imperfections & Entrepreneurial Finance
- Econ 4301: Understanding Financial Crises
- Econ 437: The Economics of Financial Intermediation
- Econ 335: Money & Banking
- Econ 429: Decision Under Risk & Time
- Econ 435: Open Economy Macroeconomics
- Econ 477: Topics in Financial Economics: Asset Pricing
- Econ 477: Topics in Financial Economics: Investments

Majors interested in completing the Certificate in Financial Economics should complete the form available at this link (http://economics.wustl.edu/certificate-financial-economics-0). Majors are encouraged to complete the form as early as possible, and the form must be completed no later than the deadline to file the Intent to Graduate: Oct. 1 for Fall graduates; Dec. 20 for Spring graduates; Aug. 1 for Summer graduates.

IV. ECONOMICS DEPARTMENT – GRADUATING WITH HONORS

There are three types of academic recognition that an Arts & Sciences student may receive upon graduation: College Honors, Latin Honors and/or “English” honors. Below is a brief description of these designations:
- **College Honors**: This designation is noted on a student’s transcript and is automatically awarded to all Arts & Sciences students who graduate with an 8th-semester, **overall** GPA of 3.60 or higher and who **have not** participated in a department's Latin Honors program. In other words, it is not possible for a student to receive both the “College Honors” designation and (a level of) Latin Honors.

- **Latin Honors** (*cum laude, magna cum laude, or summa cum laude*) are phrases that Washington University grants for undergraduate work that deserves special recognition. Latin Honors are awarded by the college (Arts & Sciences, Olin…) and are, therefore, **attached to the degree, not to the major**. These honors are printed on the diploma and on the transcript (with the degree information). The College of Arts & Sciences requires a recommendation from the student's major department as part of the decision to award Latin Honors, and each department sets its own requirements for making such a recommendation.
  - In the Economics Department, students can participate in one of two tracks of the Latin Honors Program. Further information about these two tracks appears below. The student’s transcript will indicate whether Latin Honors was achieved “with Thesis” or “by Coursework.”

- **“English” Honors**: awarded at the department’s discretion as an acknowledgment of exemplary work in the major. This notation will appear on the transcript, but not the diploma.
  - There are three categories of English Honors: Distinction in Economics, High Distinction in Economics, Highest Distinction in Economics.
  - It is possible for a student to receive combinations of College-English or Latin-English honors, and a student may receive “English” honors without participating in the Latin Honors program.

Economics (second) majors who’re “prime” in the other undergraduate colleges (e.g., Business, Engineering, Art & Architecture) may earn “Distinction in Economics.” Non-Arts & Sciences majors are encouraged to contact their “prime” college for further information regarding their college-specific types of academic recognition.

*Please refer to the table on the next page for a summary of the types of Honors designations. The table also explains how the GPA cut-offs for the levels of Latin Honors are determined.*

**Latin Honors**

“Latin Honors” (*summa cum laude, magna cum laude, cum laude*) is an award attached to the degree rather than to the major. Therefore the student's undergraduate school, not the major department, awards Latin Honors, and students with a second major in Economics cannot participate in the Economics Honors Program if their “prime” major is not in Arts & Sciences. Students are permitted to participate in only one department’s Latin Honors program. In other words, if you have two majors (within Arts & Sciences) and you’re eligible to participate in each department’s Latin Honors program, you must select one.

An invitation to the Economics Department’s Latin Honors Program will occur if, by the mid-point of the junior year, a major has an overall and within-major GPA of at least 3.65 and if s/he has completed: Econ 1011, 1021, 4011, 4021, 413, and one elective having Econ 4011 and/or 4021 as a prerequisite. A student may take Econ 413 or an advanced (Econ 4011/4021 prerequisite) elective in the spring of the junior year and still be admitted to the Honors Program, but this requires a petition to the Academic Coordinator. Petitions will also be accepted from students whose GPAs are below 3.65. In early February of the major’s junior year, the Academic Coordinator will email all majors with instructions for the petition process.

In the Department of Economics, a student selects one honors “track” and completes 9 units (3 classes) of additional coursework, over-and-above the major requirements. The two “tracks” are: “Latin Honors with Thesis” and “Latin Honors by Coursework.”
# Comparison of the types of Honors designations

<table>
<thead>
<tr>
<th>Eligibility/participation</th>
<th>Arts &amp; Sciences “College Honors”</th>
<th>Arts &amp; Sciences “Latin Honors”</th>
<th>Economics Majors “English Honors”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Awarded automatically upon graduation – no application; no invitation</td>
<td>• Must be invited; petitions permitted • Two tracks: “Latin Honors with Thesis” and “Latin Honors by Coursework”</td>
<td>No formal application; however, students seeking “High” or “Highest Distinction in Economics” must complete the requirements of the Department’s Latin Honors program (either track).</td>
</tr>
<tr>
<td>GPA requirements</td>
<td>Must have an overall GPA ≥ 3.60 at the time of graduation and cannot be participating in a Latin Honors program.</td>
<td>• Invitation to the Honors Program requires overall and within-major GPA ≥ 3.65 • Must maintain overall GPA ≥ 3.65 through the final semester of study</td>
<td>• <strong>Distinction in Economics:</strong> awarded to a student possessing an 8th-semester, <strong>within-major GPA</strong> of 3.65 or higher, when that student has not participated in the department’s Latin Honors program. • <strong>High Distinction in Economics:</strong> awarded to a student possessing an 8th-semester, <strong>within-major GPA</strong> of 3.65 to 3.85, when that student has participated in the department’s Latin Honors program. • <strong>Highest Distinction in Economics:</strong> awarded to a student possessing an 8th-semester, <strong>within-major GPA</strong> of 3.86 and above, when that student has participated in the department’s Latin Honors program.</td>
</tr>
<tr>
<td></td>
<td>Cannot earn both College Honors and a level of Latin Honors</td>
<td>Level of Latin Honors received will depend upon GPA cut-offs at the College level.³</td>
<td>Can earn both College Honors and “Distinction in Economics,” subject to meeting the requirements of both designations.</td>
</tr>
<tr>
<td>Other</td>
<td>Cannot earn both College Honors and a level of Latin Honors</td>
<td>Can earn both Latin Honors and “High Distinction in Economics” or “Highest Distinction in Economics,” subject to meeting the requirements of both designations.</td>
<td>Can earn both College Honors and “High Distinction in Economics” or “Highest Distinction in Economics,” subject to meeting the requirements of both designations.</td>
</tr>
</tbody>
</table>

¹ Upon certification by the Economics Department of completion of the Honors program, students will be awarded the A.B. *cum laude, magna cum laude* or *summa cum laude* according to the following proportions: the top 15 percent in overall grade point average of Latin honors candidates who complete the necessary requirements of their major departments will graduate *summa cum laude*; the next 35 percent *magna cum laude*; the next 50 percent *cum laude*.

² At the discretion of the Economics Department’s Honors Committee, **very rare** exceptions may be made to the criteria involved in the awarding of “High Distinction in Economics” and “Highest Distinction in Economics.”
In addition to the major requirements, students electing the “Latin Honors with Thesis” track must successfully complete the following:

1. One of: Econ 4151 or Math 3200 or Math 493. (Note: Math 493 is different from Econ 493.) The department prefers completion of Econ 4151, ideally during the junior year, but not later than the fall semester of the senior year.
2. The thesis, via enrollment in Econ 498 (Fall) and Econ 499 (Spring).
3. The thesis defense, which will be scheduled in the spring of the senior year.

Thesis candidates are expected to participate in the department’s Honors Conference and/or the Undergraduate Research Symposium. Ideally, the Economics major is completed during, or before, the fall semester of the senior year. Note that the “Latin Honors with Thesis” requirements cannot be completed in time for December graduation. Participants must, therefore, graduate in May.

The Department awards (monetary) prizes for excellence in economics to students who write a high quality thesis. If you win a prize, this becomes a part of your permanent academic record – noted on your transcript.

Alternatively, a student may select the “Latin Honors by Coursework” track. In addition to the major requirements, students selecting this track must successfully complete the following:

1. One of: Econ 4151 or Math 3200 or Math 493. (Note: Math 493 is different from Econ 493.)
2. Two economics electives having Econ 4011 and/or Econ 4021 as a prerequisite.
   a. The major requirements and (at least) one of the two additional Econ 4011/4021 prerequisite electives should be completed by the end of the fall semester of the senior year.
   b. One of the additional advanced electives must be: Econ 4111, Econ 4151, Econ 429, Econ 452, Econ 467, Econ 472, Econ 4721, Econ 477, Econ 501, Econ 502, Econ 503, or Econ 504.
      i. Students who select Econ 4151 to meet item #1, above, may not “double count” the course as one of the additional advanced electives. In this case, students must select a different course from the list, above, as one of the “required” additional advanced electives.
      ii. Students selecting Econ 501 or 503 should meet with the Academic Coordinator in the semester prior to their anticipated enrollment.

Notes (Please read carefully):

(i) Students not formally admitted to the Latin Honors Program by September 5 of the senior year will not be awarded Latin Honors.

(ii) The department requests completion of the major requirements and at least one of the additional Econ 4011/4021 prerequisite electives by the end of the fall semester of the senior year for “Latin Honors by Coursework” participants. If this requirement will not be met, students must notify the Academic Coordinator.

(iii) The department requests completion of the major requirements by the end of the fall semester of the senior year for “Latin Honors with Thesis” participants. If this requirement will not be met, students must notify the Academic Coordinator.

(iv) It is possible for a student electing the “Latin Honors by Coursework” track to graduate in December of the senior year.

(v) Students invited to participate in the Honors Program will be invited to join the National Honorary Society in economics, Omicron Delta Epsilon. Membership in Omicron Delta Epsilon will be permanently noted on the student’s transcript. Invitees will be contacted by the Academic Coordinator. The activities of the Washington University chapter are the responsibility of the students with the assistance of a faculty advisor.
V. THE ECONOMICS MINOR

A. Declaring an Economics Minor

Students may select Economics as a minor via the “Academics/Major Programs” link on the student’s WebStac home page. Students will automatically be assigned to the Academic Coordinator as a minor advisee, and the student normally retains the Academic Coordinator as an advisor in subsequent years. If a student wishes to switch advisors after the minor declaration request has been approved, s/he should email the Academic Coordinator with that request, and the Department will try to meet the request.

Changing the designation of Economics between a major and a minor is also accomplished via the “Academics/Major Programs” link. Please see the Academic Coordinator for assistance, as needed.

B. Minor Requirements

At least five economics courses, along with the mathematics courses, as described below, are required for the minor, and there are two minor “tracks”:

- **The Minor in General Economics**: Econ 1011, 1021, 4011, 4021 and one additional elective having at least Econ 1011 and/or 1021 as a prerequisite.
- **The Minor in Applied Microeconomics**: Econ 1011, 1021, 4011, one elective having Econ 4011 as a prerequisite, and one elective having at least Econ 1011 and/or 1021 as a prerequisite.

In addition to the courses listed above, both tracks of the minor requires the completion of Math 132 (or an equivalent calculus course) and the Econ 493 prerequisite, as described above in the major requirements.

Notes (Please read carefully):

(i) Minors must take all required economics courses, including calculus, for a letter grade, not Credit / No Credit. To count toward the minor, students must receive a grade of C- or better in all courses required for the minor. Students who have taken Econ 1011 or 1021 with the Credit / No Credit option prior to deciding to declare an economics minor should consult with the department’s Academic Coordinator.

(ii) Minors need to be mindful of the maximum allowable transfer credits. See the discussion of transfer credit in Section VII for more information.

(iii) Arts & Sciences policy on double counting for the Class of 2018 and earlier:

- For the Class of 2018 and earlier: If a student has a major and a minor, the major must have at least 18 upper-level units independent of the minor. The minor must have at least 12 units independent of the major. If a student has two minors, each minor must have 12 units independent of the other minor.
- For the Class of 2019 and later: If a student has a major and a minor, the upper-level credits for the major must be independent of the upper-level units counted toward the minor. If a student has two minors, the upper-level units for each minor must be independent of the other. Prerequisite courses at the 100- and 200-level may count for both minors.
- For additional information on the College of Arts & Sciences’ policy on double-counting, please click here.

(iv) With the prior approval of the Academic Coordinator, Economics courses from University College *may* be used to satisfy minor requirements. The exception to this is that University College’s Econ 1011 or Econ 1021 will transfer for Arts & Sciences’ Econ 1011 or Econ 1021, respectively, with no prior approval required. See the Academic Coordinator and here for further clarification, as necessary.

(v) Note that 200-level economics courses, 490, 493, 494, 496, 497, 498 and 499 may *not* be used to satisfy minor requirements.

(vi) Econ 4011, Econ 4021, and/or the required Econ 4011/4021 prerequisite elective must be taken through the Washington University Economics department during the regular academic year (i.e., Fall and Spring semesters).
University College and Washington University Summer School courses may not be used to fulfill the requirements for 4011, 4021 or the course with 4011/4021 prerequisites. Note: Econ 4011 is a prerequisite to Econ 4021.

(vii) Transfer courses from other schools (and AP/IB/British A-Level credit) that qualify for Arts and Sciences credit may be used to replace Econ 1011, 1021, and Math 131/132; but minors need to be mindful of the maximum allowable transfer credits. See the discussion in Section VII and Section VIII for more information. The Study Abroad section (Section VI) may also be relevant.

(viii) Students from the John M. Olin School of Business who are completing a minor in Economics may substitute either MECO 290 for Econ 1011 or MECO 292 for Econ 1021, but the maximum allowable transfer credit toward the minor is one economics course.

VI. STUDY ABROAD

The Economics Department views study abroad (and study away in the WU program at American University in Washington, D.C.) as highly desirable and strongly encourages Economics majors to consider it. There are two programs of special note: Carlos III in Madrid, Spain, and Bocconi in Milan, Italy.

- Carlos III, in Madrid, Spain, is a demanding study abroad program. Students taking economics courses should plan carefully, with the Academic Coordinator as needed.
- The WU Economics Department has an exchange program with Bocconi in Milan, Italy. Although classes at Bocconi are taught in English, students interested in the program must take one year of Italian prior to studying abroad.

Additionally, students interested in Study Abroad should keep in mind the following.

- For many overseas programs, all or nearly all economics electives effectively have Econ 4011 or 4021 prerequisites. For such programs, therefore, students should take Econ 4011 and 4021 before going abroad. A few programs are more flexible. Consult with the Academic Coordinator for details.
- Grades in courses taken abroad do not factor into your WU GPA. Courses taken abroad are noted on your WU transcript, and academic credit toward graduation is earned, but the grades earned at the foreign institution are not reported on your WU transcript. Two comments:
  o Students must earn a C or better in classes taken abroad in order to earn transfer credit.
  o Students continuing to post-graduate education may have to submit their transcript from abroad, in conjunction with their WU transcript.
- Students can both study abroad and participate in the Honors Program provided they start early, plan carefully, and get the necessary prerequisites out of the way. Consult with your advisor and the Academic Coordinator immediately.
- Similarly, students can study abroad and prepare for application to economics Ph.D. programs, but again this requires an early start and careful planning.
- Students considering the London School of Economics (LSE) should note that the options are to be in residence at LSE for the entire academic year or for the summer (3-week sessions). Students studying for the academic year must sit for exams in the third trimester to receive academic transfer credit at WU. (Similar rules apply to any other year-long programs abroad where there is an option to take exams at the end of the year.)
- Students studying abroad for a full academic year may be able to use study abroad coursework to fulfill either the Econ 4011 or Econ 4021 requirement (but not both). The Economics department allows Econ 4011 or 4021 transfers only from a select group of study abroad programs, so students must consult with the Academic Coordinator. Students who take Econ 4011 or 4021 abroad must take an additional 400-level class at WU. All majors must take four 400 level courses from the WU Economics department during the fall or spring semesters. (“400 level” means Econ 4011, 4021, or any class with an Econ 4011 and/or 4021 prerequisite.)
- Students should verify foreign language prerequisites of all study abroad destinations, as these occasionally change.
In making the decision as to which semester to study abroad, bear in mind the following:
- There are typically fewer WU students who study abroad in the fall semester.
- One component of the opportunity cost of spring study abroad is a shorter summer between junior and senior year, which may be important for those seeking a summer internship.

Procedures
- For information on available programs and application procedures, visit the Overseas Programs website http://overseas.wustl.edu/ Talk to your advisor and the Academic Coordinator for additional information about specific programs.
- The exact manner in which abroad economics elective credit will transfer to WU and major (or minor) requirements will be confirmed when the student consults with the Economics Department Study Abroad advisor. A meeting is required as part of the application process: the Academic Coordinator must sign the study abroad applicant’s “Study Plan” form, which is part of the application paperwork. All approved economics electives successfully completed abroad will transfer back to WU as 300-level economics elective credit. An abroad elective generally will not be approved for transfer credit unless it has at least a principles (e.g., Econ 1011 and/or Econ 1021) prerequisite and it is taught in an Economics department.
- Majors who study abroad for one semester may receive transfer credit for Econ 413 and up to two other economics classes (transferring as the 300-level electives). Minors may apply one elective course from abroad toward their Economics minor. However, majors/minors who study abroad must be mindful of the rules regarding transfer credit. (See the next section for further details.)
- The transfer credit process is finalized via an “exit interview” with the department’s Study Abroad advisor in the semester following the student’s semester abroad. The student should be prepared to present the course syllabus, documenting the course prerequisites, as well course materials (homework, exams).

VII. TRANSFER CREDIT FOR COURSEWORK TAKEN OUTSIDE THE WASHINGTON UNIVERSITY ECONOMICS DEPARTMENT

Note that all Economics majors, including transfer students, must take at least four 400-level courses from the WU Economics department during the regular school year. All Economics minors must take both 400-level courses from the WU Economics department during the regular school year. “400-level” means Econ 4011, 4021, or any class with an Econ 4011 and/or 4021 prerequisite. Most of the following discussion pertains to Economics coursework. There are no restrictions on Mathematics courses: if the Math Department indicates (e.g., on your transcript) that you have completed a Math class (e.g., Math 131 via “proficiency” or Math 2200 via AP Statistics in high school), that is satisfactory, from the perspective of the Economics department.

A. Students entering WU as freshmen
For Economics majors entering Washington University as freshmen and spending 8 semesters on the Washington University campus (i.e., not studying abroad), the Economics Department will accept at most 2 economics courses (6 units) as transfer credit from outside the Economics Department, subject to the stipulations below. One of these courses may be transferred at the 300-level, but prior approval by the Academic Coordinator is required. In this case, students should have an official course description and, if possible, a syllabus for the proposed transfer course.

For Economics minors entering Washington University as freshmen and spending 8 semesters on the Washington University campus (i.e., not studying abroad), the Economics Department will accept at most 1 economics course (3 units) as transfer credit from outside the Economics Department, subject to the stipulations below. This course may be transferred at the 300-level, but prior approval by the Academic Coordinator is required. In this case, students should have an official course description and, if possible, a syllabus for the proposed transfer course.

The following courses are pre-approved for transfer credit:
- MEC 290 (Olin) or Econ 103/1011 (University College) for Econ 1011
- MEC 292 (Olin) or Econ 104/1021 (University College) for Econ 1021

All other transfer credit requests (for Economics coursework) require the written approval of the Academic Coordinator of the Economics Department.

“Outside the Economics Department” includes, but is not limited to, study abroad credit, and courses from the Olin School of Business, University College, etc.

**STIPULATIONS (Please read carefully):**

1) **Study Abroad:** Majors who study abroad for one semester may have transfer credit for up to three economics courses (Econ 413 and up to two electives, each counting as elective credit at the 300-level). Students will consult with the Academic Coordinator to formalize transfer credit approvals, as described in the Section VI (Study Abroad).

2) **Four “advanced” courses are required of all majors:** In general, the Department will not accept transfer or summer school courses to satisfy major or minor requirements for Econ 4011, Econ 4021, or Econ 4011 and/or 4021 prerequisite courses. In rare cases, exceptions can be made only for students studying abroad for a full academic year, as described here, or in extreme academic situations such as in a limited number of “medical leave of absence” situations. Contact the Academic Coordinator, as needed.

3) **Transfer credit for statistics (Math 2200):** Transfer credit for Math 2200 does not count against the 6-unit maximum for transfer units for majors (or 3-unit maximum for minors). A major/minor may satisfy the mathematics/statistics requirements via pre-matriculation and/or transfer credit: majors (and minors) are not required to complete a minimum number of mathematics courses while in residence at Washington University.
   - Students may use an appropriate transfer course (e.g., over the summer) to satisfy the statistics requirement, Math 2200; however note that many introductory statistics courses offered at other institutions are not adequate to satisfy this requirement. Acceptable courses must have a prerequisite of one semester of calculus. Students must have a detailed course description for any statistics course that will be approved to replace Math 2200, and **prior approval from the Math department is required**, according to the process described here.
   - The Economics Department will accept Math 3200, ESE 326 and the Olin School of Business’ QBA 120 and 121 as substitutes for Math 2200. Written approval for this substitution is **not** required.
   - The Economics Department will accept PSYCH 300 as a substitute for Math 2200 for Economics and Psychology double majors ONLY. Written approval for this substitution is **not** required.
   - Students completing a double major in Philosophy-Neuroscience-Psychology (PNP) and Economics must take Math 2200.
   - The Economics Department will accept PolSci 363 as a substitute for Math 2200 for Economics and Political Science double majors **or** for Economics and Environmental Policy double majors ONLY. Written approval for this substitution is **not** required.
     - Students with majors or minors other than Political Science or Environmental Policy must consult with the **Academic Coordinator** prior to taking PolSci 363 in lieu of Math 2200.

4) **Transfer credit for calculus (Math 131 and Math 132):** Transfer credit for Math 131 and/or 132 does not count against the 6-unit maximum for transfer units for majors (or 3-unit maximum for minors). A major/minor may satisfy the mathematics/statistics requirements via pre-matriculation and/or transfer credit: majors (and minors) are not required to complete a minimum number of mathematics courses while in residence at Washington University. Students seeking transfer credit for Math 131 and/or Math 132 must receive prior approval from the Math department, according to the process described here (scroll to “Credit for Non-WashU Courses”).
B. Transfer Students

- Students who transfer to Washington University from another institution and who have sophomore standing are governed by the transfer rules stipulated above.
- Students who transfer to Washington University from another institution but have junior standing will be dealt with on a case-by-case basis by the Academic Coordinator. Note that all Economics majors, including transfer students, must take at least four 400 level courses from the WU Economics department during the regular term. (“400 level” means Econ 4011, 4021, or any class with an Econ 4011 and/or 4021 prerequisite.)

VIII. PRE-MATRICULATION CREDIT: AP, IB, BRITISH A-LEVEL

The College of Arts & Sciences’ policies on pre-matriculation credit can be found by clicking here. Note that Arts & Sciences limits pre-matriculation credit to a maximum of 15 units. The Economics Department’s policies follow below.

1) **Advanced Placement (AP):** The Economics department does not award credit toward the major or the minor for AP Economics coursework. If a student receives a 5 on the Microeconomics or the Macroeconomics AP exam, s/he may elect to by-pass the corresponding principles course (Econ 1011 or Econ 1021, respectively), but the credits will have to be made up with Economics elective coursework. Whether it’s appropriate to by-pass principles is a decision that should be made after consultation with the Director of Undergraduate Studies or the Academic Coordinator. Students receiving a 4 on either AP exam are advised to complete the corresponding principles class.

   - Students who have received a 5 on the Microeconomics AP exam will receive 3 units of undergraduate general degree credit, contingent upon completion of Econ 4011 with a grade of B or better. No credit is awarded for AP exam scores of 4 or lower.
   - Students who have received a 5 on the Macroeconomics AP exam will receive 3 units of undergraduate general degree credit, contingent upon completion of Econ 4021 with a grade of B or better. No credit is awarded for AP exam scores of 4 or lower.

2) **International Baccalaureate (IB) & British A-level exams:** The Economics department does not award credit toward the major or minor for IB coursework or British A-level exams. If a student receives a 7 or 6 on the IB exam, or if the student receives an “A” on the British A-level exams (Cambridge exams) in Economics, then s/he may elect to by-pass one or both principles courses (Econ 1011 or Econ 1021), but the by-passed credits will have to be made up with elective coursework. Whether it’s appropriate to by-pass principles is a decision that should be made after consultation with the Director of Undergraduate Studies or the Academic Coordinator.

   - Students earning a 6 on the IB exam are encouraged to complete at least Econ 1011; students with IB exam grades lower than 6 should complete both Econ 1011 and 1021.
   - Students who have received a 7 on the IB exam or an “A” on the British A-level exam in Economics will receive 3 units of undergraduate general degree credit, contingent upon completion of Econ 4011 with a grade of B or better. (No credit is awarded for IB exam scores of 6 or lower.)

3) **AP credit for statistics (Math 2200):** Students earning a score of 5 on the AP Statistics exam will receive 3 units of pre-matriculation credit for Math 2200. This satisfies the major requirement of Math 2200.

4) **AP credit for calculus (Math 131 and Math 132):**

   - The Mathematics Department’s policy on pre-matriculation credit and the awarding of back credit can be found here: [http://artsci.wustl.edu/resources/policies-procedures#anchor-group-2874](http://artsci.wustl.edu/resources/policies-procedures#anchor-group-2874)

   - If the Math Department indicates (i.e., on your transcript) that you have completed a Math class (e.g., Math 131 via AB Calculus), that is satisfactory, from the perspective of the Economics department. Majors (and minors) are not required to complete a minimum number of mathematics courses at Washington University – it is fully satisfactory for the major/minor mathematics requirements to be met via pre-matriculation credit.
IX. THE ACCELERATED A.B. / A.M. PROGRAM IN ECONOMICS

Washington University allows qualified undergraduates to complete a Master of Arts (A.M.) degree in a one-year accelerated program after completing the A.B. degree. The undergraduate and graduate degrees are awarded sequentially, with admission to the master’s degree, if approved, for the fall semester following the completion of the undergraduate degree in the preceding December, May or August. In Economics, in order to participate in the math/statistics “boot camps” that occur in August, undergraduates interested in the A.M. degree must apply by May 15 of the senior year. GRE tests are not required. The program is available only to students currently in their senior year and only for continuous enrollment in the next year. There is no option for deferred admissions.

Economics requires the completion of at least 30 units for the A.M., and the graduate school will permit a maximum of 3 courses at the 400-level or above (with a maximum of 12 units) to be counted toward both the A.B. and the A.M. degrees. These 3 courses must be pre-approved by the Economics department, and each must be completed with a final grade of B or higher. All admissions to the Accelerated A.M. program are provisional until the successful completion of the A.B. degree. The actual awarding of each degree is contingent on successful completion of all requirements for that degree.

Students considering this option should consult with the Academic Coordinator, ideally no later than the beginning of the junior year in the undergraduate program. The application for admission must be made to the department, which forwards the application and the department’s recommendation for admission to the Graduate School. Further (administrative) information can be obtained from the Graduate School website: https://graduateschool.wustl.edu/accelerated-abam-program.

The requirements for the A.M. portion of the degree are as follows:

1. At least 30 units (10 classes) from the available 400- and 500-level classes in Economics, where up to 3 advanced Economics electives can be “double counted” across the A.B. and A.M. degrees. These 10 classes must include:
   a. Econ 501 and Econ 503
   b. at least two other 500-level economics courses
   c. an Econometrics course from among Econ 4151, Econ 513 or Econ 5161.
2. All courses offered toward the graduate degree must be passed with a grade of B or better.
3. The department must certify the student’s achievement of a level of competence normally expected of candidates for the A.M. degree in Economics. That involves one of the following:
   a. Successful completion (“M.A. Pass”) of the Ph.D. general examinations
      i. The Ph.D. general examinations (the “prelims”) consist of three, 5-hour exams in microeconomics, macroeconomics, and econometrics. Students planning to take the prelims must take Econ 502 and Econ 504 as part of their “10 additional classes.” Candidates for the A.M. degree in Economics must take, and pass, the microeconomic and macroeconomic exams; the econometrics prelim exam is not required for the A.M. degree.
      ii. The exams are given in August each year, on dates to be specified by the Economics department. Students are notified of the exam dates in the late spring; typically there are 4 days between exams, with the microeconomics prelim taken first.
      iii. Any student not earning an “M.A. Pass” on the microeconomics (or, macroeconomics) portion of the August exam has the opportunity to retake the microeconomics (or, macroeconomics) portion of the prelim in the following January, at a date to be specified by the Economics department.
      iv. Because Accelerated A.M. students are taking exams in August (or January), the A.M. degree cannot be awarded until the semester after the exam.
   b. Or, successful completion of an A.M. essay/thesis.
      i. A senior Honors Thesis may not be used as the A.M. essay. The A.M. essay can be related to the senior Honors Thesis; but it must be a distinctly different paper. See the Academic Coordinator and/or the Graduate School for Graduate School thesis guidelines.
      ii. Students writing an A.M. essay must work with a faculty advisor. Finding an advisor and beginning research should begin during the senior year of the undergraduate degree.
      iii. A.M. students must defend their essay before a group of selected faculty. The defense date and the selected faculty will be arranged between the student and that student’s advisor.
X. OPPORTUNITIES FOR INDEPENDENT STUDY AND RESEARCH

Occasionally there is an opportunity to participate in a faculty research program or to work as a research assistant for an individual faculty member. Students typically find these opportunities via discussion with the professors of their elective classes. The Academic Coordinator maintains a database of students interested in working with faculty; but networking is generally more effective. Students working for a faculty member may register for Econ 497 to obtain academic credit for the research opportunity.

Students interested in doing individual research under the supervision of a faculty member can, with junior or senior standing and the permission of the supervising faculty member, register for Econ 490, for up to 3 units per semester, which can be repeated up to a maximum of 6 units in total.

Econ 490 and 497 cannot be used to fulfill major (or minor) requirements.

XI. INTERNSHIP OPPORTUNITIES

Internships are an effective means of learning about potential careers, developing work-related skills that complement your academic background, and building a network that may serve as a point of departure when you begin to search for a full-time job. An internship can be from 7-20 hours per week during the academic year, and up to 40 hours per week during the summer. Washington University encourages every student to complete at least one internship as part of his or her undergraduate education.

To match majors with interesting internships, the Economics Department cooperates with The Career Center. Students should visit The Career Center website at https://careercenter.wustl.edu/ or stop by the office: Suite 110, Danforth University Center (DUC) for a calendar of events, including workshops and special programs. From time-to-time, alumni and other recruiters contact the department separately with internship opportunities. This information is posted on the department website, in the “Undergraduate Opportunities & News” section.

Students interested in an internship should follow the steps described on the Career Center website (https://careercenter.wustl.edu/students/resources/). Students are strongly encouraged to meet regularly with a Career Development Specialist in the Career Center, beginning in the sophomore year, if not earlier.

**Important:** The job and internship data base is shared between the Career Center and the Weston Career Center (the career center dedicated to students in the Olin School of Business), so all available postings are visible on CareerLink (http://careercenter.wustl.edu/tools/careerlink/Pages/default.aspx). However, students pursuing a second major or a minor in business, while majoring or minorin in economics in Arts & Sciences, can obtain advising from the Weston Career Center, by referral. The referral form is available upon request from the Weston Career Center (in person, at the desk), and must be returned to the Weston Career Center.

**Credit for Unpaid Internships:**

The Department offers a course, Econ 299, for economics majors who participate in an unpaid internship. (The policies of the College of Arts and Sciences prohibit the awarding of credit for any work undertaken for pay.) You may receive up to three units of academic credit. Sixty (60) hours worked is equal to one unit of academic credit. In addition to completing the hour requirement, you must work a minimum of eight weeks to earn three units, or a minimum of six weeks to earn one or two units. To receive credit you must do the following, before your internship begins (academic credit cannot be awarded retroactively):

1) Identify a faculty sponsor. Usually, this person is your major advisor.

2) Complete the “Internship Learning Agreement” found at http://careercenter.wustl.edu/tools/careerdevelopment/Pages/InternshipLearningAgreement.aspx Consult with your faculty sponsor before completing the “educational objectives” section of the form. For the “evaluation requirements”
section of the form, the typical response is to write that you will complete an economics paper on a topic related to your internship. In general, interns, with the help of their faculty sponsors, identify suitable paper topics about halfway through their internship. The exact parameters of the paper or project will clearly depend on the number of units earned as a result of the internship. A project completed as part of the internship cannot be substituted for the Econ 299 paper/project, but the project may serve as a starting point for the paper. Your faculty sponsor may also impose additional requirements.

3) Bring a copy of your signed Learning Agreement to the Career Center within two weeks of starting your internship.

4) Register for Econ 299 by the semester Drop/Add date. If you intern during the summer, you may register for the credit to appear on your transcript in the following fall. Note that Econ 299 cannot be used for major/minor credit, and it must be taken with the Credit / No Credit grade option.

Additional considerations:

1. CPT/OPT – F-1 (and J-1) Visa students face significant constraints on working in the U.S. The department’s general recommendation is to consult with an advisor in the Office of International Students and Scholars (OISS). It is possible for a student to use CPT authorization for a summer internship, but that internship must be approved by both the department and OISS. After that approval, paperwork is filed per the instructions on the OISS website. For further information on CPT (and the associated OPT), please refer to the OISS site: https://oiss.wustl.edu/students/employment-training/f-1/

2. Internships and study abroad are two excellent experiences to plan for during your four years at WU. If you decide to study abroad, plan ahead to be sure you can also do at least one internship. For ideas and support, contact Overseas Programs (at WU) or call The Career Center at 935-5930 to make an advising appointment.

3. Research experience is helpful for students who are planning to apply to graduate school. This experience may take place at Washington University or another university. For details on research opportunities available at Washington University, visit the Undergraduate Research web site (http://ur.wustl.edu), or contact one of the advisors there (Dean Kiefer or Dr. Sobotka). The Office of Undergraduate Research is located in Cupples II.
   a. Research Experiences for Undergraduates (REU) are sponsored by the National Science Foundation (http://www.nsf.gov and http://www.nsf.gov/crssprgm/reu/reu_search.cfm). These research opportunities typically require a formal application process.
   b. For underrepresented minorities, there is a summer research experience sponsored by the American Economic Association: https://www.aeaweb.org/about-aea/committees/aeasp

4. Public policy internships may be available via the Weidenbaum Center (http://wc.wustl.edu/), and/or the Gephardt Institute of Public Service (http://www.gephardtinstitute.wustl.edu/). Additional opportunities may be available through the Skandalaris Center (https://skandalaris.wustl.edu/). Finally, a general “Google” search on “undergraduate internships in economics” might reveal something of interest.

XII. CAREER PLANNING ASSISTANCE

A. Beginning a Career with an A.B. Degree

Most Economics majors start their careers after graduation in a wide range of professions. Students who want to pursue a business career after graduation are encouraged to consider courses from the John M. Olin School of Business, such as Accounting 2610, Finance 340 and other courses as interested.

The Career Center can help you match your interests, skills, and values with career opportunities, connect you to employers and Washington University alumni for information about various careers, and assist you in developing a job search strategy. By registering with the Career Center’s online database, CareerLink, you will have access to their full-time job listings. You might also consider the websites “Experience, Inc.” and “Monster.com”. You should also establish a LinkedIn profile and investigate networking opportunities with Washington University students and alumni via the LinkedIn platform.
Additional considerations:

1. Referral to the Olin School of Business’ Weston Career Center is an option for students who are pursuing a second major or a minor in business, while majoring or minoring in economics in Arts & Sciences. You must request, in person, a referral form from the main Career Center (Suite 110, Danforth University Center) and return the completed form to the Weston Career Center. Note that all job and internship information is posted on CareerLink – the job and internship data bases are shared, university-wide. In particular, job and internship postings for general “Business” majors should be positions to which Economics majors (and, possibly minors) can apply. If you encounter situations in which you’re prevented – by software – from applying to positions for which you feel you’re qualified, please bring this to the attention of the Academic Coordinator, who will follow up with contacts in Weston and the main Career Center.

2. Many recruiters of interest to Economics students come to campus in early September, and the job market is in full swing from mid-September until at least November. Economics majors (and minors) should make sure that resumes, cover letters and references are complete and ready to go in the summer between the junior and senior years.

3. The Academic Coordinator occasionally receives requests by employers to meet with Economics majors. This information is passed along to majors, occasionally via email, and, increasingly via, social media. Check your Washington University email, and follow the Academic Coordinator via social media by clicking HERE and following the links. This information will also be published on the department website in the “Opportunities & News” area.

B. Professional Degree Programs Linked to Economics

Economics provides an excellent foundation for students who want a Master in Business Administration degree or who want to go to law school. What follows is a brief description of coursework in Economics that might be most appropriate for these career paths.

1) Pre-Business

The standard pre-business economics concentrations are Industrial Organization and Finance. Courses in other areas (e.g. Labor, International) may also be relevant, depending on your interests. Obviously, Econ 413 (Introduction to Econometrics) is also particularly relevant.

You should take Accounting 2610, and we encourage you to take other courses from the business school. Note that many business courses have prerequisites, so you need to plan your program carefully.

Business school admissions committees look for evidence of analytical ability and writing ability. Merely being an economics major helps demonstrate analytical ability. To develop your writing ability, we recommend taking a writing intensive economics course (these are indicated by a W in the course number; e.g., Econ 448W) as well as composition courses from the English department.

Finally, note that most M.B.A. programs recommend that students work for at least a few years prior to applying for business school admission.

2) Pre-Law

A basic pre-law recommendation, for all undergraduates, is to take microeconomics, Econ 1011 at a minimum. But, of course, all economics majors and minors complete this course automatically. Some economics courses, notably Econ 445 (Public Finance) and Econ 452 (Industrial Organization) complement parts of the law school curriculum. Alumni uniformly report on the value of econometrics (Econ 413) in their legal work.

As with business school admissions, law school admissions committees also look for evidence of analytical ability and writing ability. As stated above, the Economics Department recommends taking a writing intensive economics course, as well as composition courses from the English department.
C. Economics and Economics-related Ph.D. programs (e.g. Finance)

The American Economic Association website has an extensive set of information about preparing for graduate school admissions, particularly at this link: https://www.aeaweb.org/resources/students/grad-prep. The website also lists Undergraduate Research Opportunities (https://www.aeaweb.org/resources/students/undergrad-research). In prior years, WUSTL undergraduates have participated in Georgetown’s Carroll Round (https://carrollround.georgetown.edu/, and also on the AEA site). Additional research and conference information is posted, as received, on the department’s website: http://economics.wustl.edu/undergraduate/undergraduate-news.

The AEA is actively working to promote diversity in the profession. Under-represented minority majors – particularly those interested in a future research career – may wish to apply to the American Economic Association’s Summer Program and Minority Scholarship Program (https://www.aeaweb.org/about-aea/committees/aeaesp). Mackenzie Alston, now a Ph.D. candidate at Texas A&M is the most recent WUSTL participant, and the department is eager to support other interested participants.

The major at Washington University provides a solid foundation for graduate work toward the Ph.D. in economics and economics-related fields (e.g. finance). You can see the department’s recent placements in graduate programs on the website. What follows is a description of how to best prepare for admission to a Ph.D. programs.

Graduate admissions is highly competitive and depends heavily on grades in economics and economics-related (e.g., math) courses. The general advice is: take as many courses in economics and mathematics as you can and do well in them. On mathematics courses, a minimum (typically not adequate to gain admission to a top department) is a third semester of calculus (Math 233) and a course in matrix algebra (Math 309). You will be much better prepared for your first year graduate classes if you take Math 318, which is a more advanced version of Math 233. The Mathematics department allows strong students to take Math 318 in place of Math 233 provided the student has already taken Math 309; students should consult with their Economics advisor and with the Mathematics department. Some admissions committees also want to see differential equations (Math 217) and/or Linear Algebra (Math 429). See below for additional comments on mathematics preparation.

Graduate admissions committees look closely at advanced economics courses (generally speaking, 400-level and above). You should take more of these than the major requires. You should, in particular, take Econ 4111, Econ 467 and Econ 4151. For guidance on other courses, use the list of Economics Concentrations (in the next section) and talk to your advisor.

Graduate admissions committees in top programs pay close attention to grades in first-year graduate core courses (Econ 501 and 503). These courses are extremely demanding: they move fast; they are taught at a high level; and grading is tough. You should consider taking these courses only if your academic performance has been outstanding and you have very good math skills. In addition, although taking one graduate course, and doing well, will help your application to top Economics Ph.D. programs, there are sharply diminishing returns, in terms of admission prospects, from taking two or more.

To prepare you for first year graduate micro (Econ 503), we offer Econ 4111 (Optimization) and Econ 467 (Game Theory). Students considering enrollment in Econ 503 in their senior year should take Econ 4111 in the spring semester of their junior year. Note that Econ 4111 has a Math 309 prerequisite, so you should take that in the fall semester of your junior year or earlier. Although Econ 4111 provides very good preparation, even someone who has done well in Econ 4111 will find Econ 503 challenging.

If you aspire to a top program, then you should double major in mathematics and economics. You should, in particular, take Math 310, Math 4111 and Math 4121. These courses are demanding, which is one of the reasons admissions committees are interested in your performance in them. Note that, if you take these courses and the advanced probability and statistics sequence (Math 493 and 494), which the economics department also recommends, then you will be very close to having already fulfilled the requirements for Tracks A, B, or E of the mathematics major. The department is beginning to hear that Linear Algebra (Math 429) is sought by some Ph.D. programs’ admission committees. For more specific guidelines, you should consult with the Mathematics Department and the Economics Department’s Director of Undergraduate Studies or Academic Coordinator.
Strong students who are comfortable with proof-oriented courses can sometimes bypass intermediate courses such as Math 309, 310, 308 or 318 and instead take the more advanced sequences Math 4111-4121 or Math 429-430. Students should consult with the Director of Undergraduate Studies in the Mathematics Department and/or their mathematics major advisor when bypassing courses required for the major (and/or making substitutions).

All students should take Math 493 (Probability) and Math 494 (Mathematical Statistics). An option for students with adequate preparation is Math 5061-5062. Students interested in empirical research should also consider Econ 4151 and Math 475 (Statistical Computation). Students should consult with the Math department and their advisors for additional guidance.

All students interested in economic or econometric theory should take Math 310, Math 4111 and Math 4121, preferably prior to their senior year. As already noted, all students aspiring to top Ph.D. programs should take these courses as well. The very strongest (math) students could consider taking Math 5051/5052 sequence if the Ph.D. interest is microeconomic theory, in particular.

Students planning to apply to a Ph.D. program in finance should take Math 493, 494, and 495. Students aspiring to a top finance program could consider Math 5061-5062 or ESE 520 in place of Math 493, 494, and 495. The Math department also periodically offers Math 456, “Topics in Financial Economics,” which may be of interest. Please refer to the Math department website for the schedule of course offerings: [http://wumath.wustl.edu/courses](http://wumath.wustl.edu/courses)

NOTE TO MATH MAJORS: The math major is divided into five “tracks.” Of these, the three that are relevant for economics are A (Traditional); B (Probability and Statistics); and E (Mathematics: Economics Emphasis). Refer to the Math department’s web site: [http://wumath.wustl.edu/undergraduate](http://wumath.wustl.edu/undergraduate) and [http://wumath.wustl.edu/fall15classfive-major-tracks](http://wumath.wustl.edu/fall15classfive-major-tracks)

---

**XIII. THE ECONOMICS CURRICULUM: CONCENTRATIONS & COURSE DESCRIPTIONS**

In addition to the descriptions, below, students should also pay careful attention to each semester’s *Course Listings* to be aware of special opportunities that may be available.

**A. Economics Concentrations**

This sub-section presents a categorization of courses into their respective economic “fields.” The listings here are suggestions, meant to help organize your course selection. For instance, a student particularly interested in macroeconomics might wish to select many of the electives described in that section, below. Students do **not** declare a concentration for their economics major (or minor).

For a list of coursework that is most appropriate for post-graduate education (i.e., M.B.A., J.D., Ph.D.), please refer to the discussion in Sections XII.B. and XILC, above.

**Econometrics**

Econ 413 (Introduction to Econometrics), Econ 4151 (Applied Econometrics), Econ 407 (Market Design), Econ 428 (Capital Market Imperfections and Entrepreneurial Finance), Econ 452 (Industrial Organization), Econ 483 (Economics of Education).

We also recommend Math 309 (Matrix Algebra), Math 475 (Statistical Computation), Math 493 (Probability), and Math 494 (Mathematical Statistics). Additional possibilities in math include: Math 408 (Nonparametric Statistics), Math 420 (Experimental Design), Math 439 (Linear Statistical Models), Math 4392 (Advanced Linear Statistical Models), Math 460 (Multivariate Statistical Analysis), Math 461 (Time Series Analysis), and Math 495 (Stochastic Processes). Students should check for semester-specific advanced electives in the mathematics department. Occasionally, there is coursework in computer science, electrical and systems engineering and/or political science with an econometrics focus. Students can consult with their major advisor as needed. Ambitious students with the necessary background may consider Math 5061 and 5062 (Theory of Statistics I and II).
Finance  (see also:  Certificate in Financial Economics)
Econ 3311 (Financial Markets & Analysis), Econ 335 (Money and Banking), Econ 428 (Capital Market Imperfections and Entrepreneurial Finance), Econ 429 (Decision Under Risk and Time), Econ 4301 (Understanding Financial Crises), Econ 435 (Open Economy Macroeconomics), Econ 437 (The Economics of Financial Intermediation), Econ 477 (Topics in Financial Economics), and Econ 413 (Introduction to Econometrics).

Math 456 (Topics in Financial Economics) may also be of interest. We especially encourage you to take classes in the finance sequence at the business school, in particular Fin 340 (Capital Markets and Financial Management), Fin 448 (Advanced Financial Management) and Fin 451 (Options, Futures and Derivative Securities). NOTE: Fin 340 is the prerequisite to all other Finance courses, but some finance courses in the business school have multiple prerequisites; you need to plan your program carefully.

History
Econ 326 (American Economic History), Econ 348 (Economic Realities of the American Dream), Econ 410 (Macroeconomics of Inequality), Econ 4301 (Understanding Financial Crises), Econ 469 (The Great Transformation), Econ 474 (Poverty of Nations), Econ 488 (Seminar in Political Economy).

Industrial Organization
Econ 452 (Industrial Organization), Econ 428 (Capital Market Imperfections and Entrepreneurial Finance), Econ 444 (Innovation and Intellectual Property: Theory & Practice), Econ 467 (Game Theory), Econ 413 (Introduction to Econometrics).

You may also be interested in courses in the business school’s Managerial Economics and Strategy curriculum, particularly MGT 380 (Business Strategy), MEC 370 (Game Theory for Business), MEC 380 (Competitive Industry Analysis), MEC 470 (Market Competition and Value Appropriation), and MEC 471 (Empirical Techniques for Industry Analysis).

International
Econ 3761 (International Economics), Econ 410 (Macroeconomics of Inequality), Econ 435 (Open Economy Macroeconomics), Econ 469 (The Great Transformation), Econ 474 (Poverty of Nations), and Econ 413 (Introduction to Econometrics).

We also encourage you to take classes from Political Science and International and Area Studies.

Labor
Econ 348 (Economic Realities of the American Dream), Econ 380 (Labor and the Economy), Econ 413 (Introduction to Econometrics), Econ 4151 (Applied Econometrics), Econ 480 (Labor Economics).

Macroeconomics
Econ 3311 (Financial Markets & Analysis), Econ 335 (Money and Banking), Econ 410 (Macroeconomics of Inequality), Econ 435 (Open Economy Macroeconomics), Econ 437 (The Economics of Financial Intermediation), Econ 469 (The Great Transformation), Econ 472 (Topics in Growth & Development), Econ 4721 (Advanced Topics in Modern Economic Growth), Econ 474 (Poverty of Nations), and Econ 413 (Introduction to Econometrics).

Public Policy
Econ 348 (Economic Realities of the American Dream), Econ 352 (Health Economics), Econ 380 (Labor and the Economy), Econ 407 (Market Design), Econ 410 (Macroeconomics of Inequality), Econ 4301 (Understanding Financial Crises), Econ 445 (Public Finance), Econ 451 (Environmental Policy), Econ 460 (Urban Economics), Econ 480 (Labor Economics), Econ 483 (Economics of Education), and Econ 413 (Introduction to Econometrics).

Theory
Econ 4111 (Optimization and Economic Theory), Econ 407 (Market Design), Econ 429 (Decision Under Risk and Time), Econ 435 (Open Economy Macroeconomics), Econ 445 (Public Finance), Econ 452 (Industrial Organization), Econ 460 (Urban Economics), Econ 467 (Game Theory), Econ 472 (Topics in Growth & Development), Econ 4721 (Advanced
Topics in Modern Economic Growth.

We also encourage you to take theory courses from Political Science, including graduate-level courses in mathematical modeling and collective choice. Consult with the Political Science Department regarding course offerings and prerequisites. Additionally, if you are interested in decision theory and learning, we encourage you to take Psych 100B (Introduction to Psychology) and Psych 361 (Psychology of Learning). You should contact the Psychology department for information on the availability of other coursework in this vein.

B. Undergraduate Course Descriptions

Notes to what follows:
1. This list includes courses that are not offered every year.
2. Econ 451, marked with an “*” does not have Econ 4011 and/or 4021 as a prerequisite, and cannot be used as an advanced (Econ 4011/4021 prerequisite) economics elective.
3. The following courses cannot satisfy Economics elective credit for the major or minor: 200-level electives, Econ 490, Econ 493, Econ 494, Econ 497, Econ 498, Econ 499.
4. Courses numbered as xxxW indicate a “writing intensive” course. All students in the College of Arts and Sciences must take at least one writing intensive course as part of their degree requirements. Students majoring in Economics are not required to take their writing intensive class in economics.

1011 Introduction to Microeconomics.
Determination of prices; distribution of national income; theory of production. For a thorough introduction to economics, Econ 1021 should also be taken. 3 units.

1021 Introduction to Macroeconomics.
Business fluctuations, inflation, recession; monetary and fiscal policy; long-term economic growth; international trade and exchange rates. For a thorough introduction to economics, Econ 1011 should also be taken. 3 units.

208 Economics and Society.
Economics and Society is a freshman seminar, open to interested students, and is without prerequisites of any kind. Two to four topics will be chosen for in-depth discussion during the semester. Possible topics include, but are not limited to: inequality (domestic and international); globalization (pros/cons); “big banks” and their role in financial crises; wars and national security; health and disease; capitalism and socialism. The seminar seeks to spread economic literacy among tomorrow's opinion leaders, improve their ability to analyze social issues, help them explain their viewpoint to others, and understand different opinions. (The course cannot be used for Economics major/minor credit.) 3 units.

202 The Great Economists.
Examination of the great economic thinkers, the problems they sought to solve, the historically conditioned assumptions that they bring to their work, and the moral issues they raise. The class reads from the works of Adam Smith, Ricardo, Malthus, Marx, Veblen, Keynes, Schumpeter, Galbraith and others as well as commentary from Heilbronner. These readings are paired with selected texts on the social and moral issues of their times. Same as IPH 201B. Credit 3 units.

2391 Economics as Cultural Systems.
Many contemporary approaches to economics downplay or bracket the importance of culture in the workings of economic systems. In this class we will focus on approaches to distribution and exchange in which culture and social institutions figure prominently, if not pre-eminently. We will sample a diverse array of economies, from gift exchange to the ceremonial destruction of wealth, from Melanesia to Wall Street, in order to evaluate some of the assumptions that undergird market capitalism. What are market institutions and what forms do they take? What is the relationship between economy and society? How does culture shape distribution and consumption? 3 units.

296 Undergraduate TA.
Opportunity for undergraduates to assist in course instruction, tutoring, and preparation of problems sets, solutions, readings and/or exam materials under the supervision of faculty. Credit variable; typically 2 P/F units per semester, with a maximum of 3 units. This course is repeatable, but may not be used to satisfy major or minor requirements. Prerequisite: instructor permission.

299 Internship in Economics.
Students can receive up to 3 units of credit for an approved and faculty-sponsored internship. The internship must be approved by the
Career Center and be supervised by a faculty member. Prerequisites: Econ 1011 and 1021. 3 units possible.

326 **American Economic History.**
This course will apply basic theoretical concepts to analyze the changing structure and performance of the American economy from Colonial times to the present. Prerequisites: Econ 1011 and 1021. Credit 3 units.

3311 **Financial Markets and Analysis.**
This course is a rigorous introduction to financial markets and financial institutions, and their purpose and functions in the economy. In financial markets trade is, essentially, "money now" for "money in the future." As such, financial decisions must often take into account future events, whether those be related to individual stocks, portfolios or the market as a whole. This class explores the topics related to the level and structure of interest rates and of stock prices, portfolio choice, basic investment theory, and arbitrage pricing theory, among others. Prerequisite: Econ 1011 & 1021. 3 units.

335 **Money and Banking.**
Money and the monetary system; money creation by the banking system; central bank functions; monetary theory and economic policy. Prerequisites: Econ 1011 and 1021. 3 units.

348 **Economic Realities of the American Dream.**
Exploration of the realities of economic life in the United States and how they correspond to the American Dream. Interdisciplinary perspectives from economics, sociology and other areas of social inquiry. Emphasis on the consistency between empirical data and different concepts of the American Dream. Specific topics to include sources of economic growth and changing living standards, unemployment, impact of globalization on U.S. citizens, economic mobility, poverty and inequality, and social justice. Prerequisites: Econ 1011 and Econ 1021, or consent of the instructors. 3 units.

3501 **Political Economy.**
The course introduces students to the field of political economy. The approach is to apply the economic theory and concepts to political actors and behavior. Students are expected to learn: how economic and political forces may shape the incentives and constraint of political actors (e.g. voters and policy makers); the role of institutions in shaping both political behavior and policy outcomes. Prerequisite: Econ 1011. 3 units.

352 **Health Economics.**
Choices made by consumers and providers of medical services and their relation to constraints will be examined. Major emphasis will be on the determination of the quality of outcomes of medical intervention and of the difficulties of attaining accurate information concerning those outcomes. Prerequisite: Econ 1011. 3 units.

3761 **International Economics.**
This course provides an analysis of the international economy, the economic theories that help explain it, and analysis of important current issues of international economic policy. The course covers both trade and monetary issues. Prerequisites: Econ 1011 and Econ 1021. 3 units.

380 **Labor & the Economy.**
Economic analysis of labor markets. Theory and policy applications of labor supply and labor demand; explanations of wage and income differentials; migration and immigration; discrimination; labor unions; unemployment. Prerequisite: Econ 1011. 3 units.

4011 **Intermediate Microeconomic Theory.**
Analytic theory of consumer and producer behavior under perfect and imperfect competition. Coverage of demand theory; indifference curves, utility functions and preferences under uncertainty; expected utility and risk aversion. Development of general equilibrium under pure exchange, including the concepts of competitive equilibrium and Pareto efficiency. Discussion of the role of time as it pertains to interest rates, discounting and net present value. Analysis of standard monopoly and simple oligopoly problems. Development of non-cooperative game theory, including strategic and extensive-form equilibria and Nash and sub-game perfect equilibria. Thorough training in intermediate theory would require both Econ 4011 and Econ 4021. Prerequisites: Econ 1011, Math 131, Math 132 and concurrent enrollment in, or prior completion of, Econ 493 (or Math 233). 3 units.

4021 **Intermediate Macroeconomic Theory.**
National income and labor market measurement. Business cycle fact and consideration of alternative explanations for business cycle phenomena. Development of the Solow growth model, along with theories of endogenous growth and an examination of reasons for differences in growth rates across counties. General equilibrium description of firms and consumers in labor and product markets. Implementation of monetary and fiscal policy, and exploration of the impact of policy changes on the macroeconomy. Prerequisites: Econ 1021 and Econ 4011. 3 units.
404 Behavioral Economics and Experimental Economics.
Behavioral economics is an effort to incorporate ideas from psychology into economic models of behavior. We focus on popular experimental anomalies, including the Allais and Rabin paradoxes, ultimatum bargaining, the centipede and public goods contribution games. We examine the extent to which these are consistent with standard economic theory and how they may contradict it. The primary focus is a critical examination of psychological theories of nonstandard preferences including loss aversion, probability weighting, reciprocity, fairness and present bias. Theories of incorrect beliefs and systematic biases such as money illusion and procrastination are covered. Applications to the current economic crisis also are discussed. The class includes an introduction to experimental methods in economics, including hands-on experience in the MISSEL laboratory. A sound grounding in economic theory is essential to the course. Prerequisites: you must have successfully completed Econ 4011, and should be acquainted with basic optimization theory, expected utility theory, risk aversion, discounting and basic game theory including dominance, Nash equilibrium and subgame perfection. Prerequisite: Econ 4011. 3 units.

407 Market Design.
The objective of this course is to study how to design mechanisms to allocate scarce resources and how to create successful marketplaces. We will primarily consider two topics: (1) two-sided matching markets, such as the National Resident Matching Program and the Kidney Exchange for transplants, and (2) auctions used by Google, Facebook, etc. Time permitting, a third topic will be the problem of designing and regulating market "platforms," such as the e-commerce markets run by eBay, Amazon, and Craigslist, and applications marketplaces run by Apple, Google, etc., as well as the electronic financial trading platforms run by the NYSE. Prerequisite: Econ 4011. 3 units.

410 Macroeconomics of Inequality.
In this course, we study the driving forces of inequality across countries; across time; and across individuals within a country. We will define and measure inequality using standard measures of economic well-being, such as income, wealth, and consumption of market goods, as well as with broader measures such as health outcomes. Historical cross-country data, microdata, and specific case studies will be used to evaluate theories of the sources of inequality. Key variables to be evaluated include: physical capital investment; education and human capital investment; technological progress; robotization; international trade; and financial markets, among others. Prerequisites: Econ 4011 and Econ 4021. 3 units.

4111 Optimization and Economic Theory.
An introduction to mathematical optimization and its applications within economics. The course is designed for, and should be taken by, all undergraduates considering graduate study in economics, but all interested students are welcome. Prerequisites: Econ 4011, Math 233, and Math 309 or permission of the instructor. 3 units.

413 Introduction to Econometrics.
Course provides a basic working knowledge of econometrics. Topics will include: Translation of economic theory into statistical models, statistical foundations of econometrics, regression analysis, bivariate and multiple regression techniques, hypothesis testing, multicollinearity, specification error, autocorrelation, errors in variables, identification and simultaneous estimation. Prerequisites: Econ 1011, Econ 1021, and Math 2200 or equivalent. 3 units.

413W Introduction to Econometrics with Writing.
Econometrics is the development and application of statistical techniques for the measurement of economic phenomena. Topics include: translation of economic theory into statistical models, statistical foundations of econometrics, pre-regression analysis, bivariate and multiple regression techniques, hypothesis testing, multicollinearity, specification error, autocorrelation, errors in variables, identification, and simultaneous estimation. The 3 writing assignments and the final paper will provide you an opportunity to formulate an economic model, estimate the model with appropriate data, and interpret the results. This experience will help you understand how econometrics relates to other upper-level economics courses which focus on theoretical models for how the world operates. Econometrics provides a method of testing the validity of these economic models, and the term paper will improve your writing skills, giving you a chance to write clearly and concisely about technical material. Prerequisites: Econ 4011 and Math 2200 or equivalent. 3 units.

4151 Applied Econometrics
Introduction to econometrics as it is applied in microeconomics and macroeconomics (modular). Emphasis is on hands-on implementation of the models covered in the course. Topics related to the analysis of microeconomic data include cross-section and panel data linear models and robust inference; instrumental variables estimation; simultaneous equation models; models for discrete choice; and truncation, censoring and sample selection models. Topics related to the analysis of macroeconomic data include linear time series models; practical issues with likelihood-based inference; forecasting; structural identification based on timing restrictions; and computational methods for hypothesis testing. Prerequisites: Econ 4011, Econ 413. 3 units.
428 Capital Market Imperfections and Entrepreneurial Finance.
Capital market imperfections arise for many reasons, including asymmetric information between firms and potential investors. Information asymmetries can lead to adverse selection and moral hazard problems, which can drive up the cost of external financing, reducing the number of startups and constraining the investment and growth of existing firms. In addition to examining theoretical aspects of capital market imperfections, the course also explores empirical tests of the presence of financing constraints, particularly as they pertain to R&D investment. Approximately forty percent of the course explores the role played by venture capital in dealing with capital market imperfections in high-tech industries. Venture capital financing is an important reason for the U.S.’s success in commercializing new science. The last portion of the course deals with microfinance, a possible solution to addressing capital market imperfections encountered in lending to the poor in developing countries. Prerequisite: Econ 4011. Econ 413 is strongly recommended. 3 units.

429 Decision Under Risk and Time.
This course covers topics on individual decision making, subject to risk and to inter-temporal considerations. The emphasis is on economic modeling, which combines both theory and reality. The course begins by establishing a framework for analyzing preferences about risky outcomes. This framework is applied to practical problems such as portfolio choice, asset pricing and insurance. The remainder of the course considers decision-making in the long run, with focuses on the lifecycle consumption-versus-saving decision, the problem of time inconsistency and other real-world implications. Prerequisites: Econ 4011, Math 2200. 3 units.

4301 Understanding the Financial Crisis.
The global financial crisis of 2007-2009 was the most severe since the Great Depression. The goal of the course is to provide tools to analyze key elements of this crisis. We move from a corporate finance perspective — to understand the behavior of firms and financial institutions — to a macroeconomic perspective — to make this behavior in aggregate outcomes and policy responses. Topics covered include: The U.S. crisis in historical and international perspective; corporate finance of firms and banks in closed and open economy; monetary and fiscal policy intervention; the open economy dimension of the financial crisis; the European Sovereign Debt crisis. 3 units.

435 Open Economy Macroeconomics.
The course will begin with a review of international trade theory, of the balance of payment accounts and their relationship to international borrowing and lending. We will then study the asset approach to exchange rates determination, exchange rate behavior in the short and in the long run, and the relationship of exchange rates with prices and output. The course will also explore monetary and fiscal policy under both fixed and floating exchange rates, macroeconomic policy coordination and optimum currency areas, international debt problems of developing countries and their relation to stabilization programs. Prerequisite: Econ 4021. 3 units.

437 The Economics of Financial Intermediation.
The structure and the role of banks have changed tremendously. The historically-traditional activity of granting loans and collecting deposits has evolved into a much richer and more complex set of financial contracts. The separation between financial asset trading activity and traditional commercial bank activity that was typical of the financial system in the period after the World War II also disappeared. Coincident with the evolution of financial institutions was the development of the asymmetric information model. The role of banks in the economy can be explained with the tools developed in these models of the economics of information, as a microeconomic theory of banking does not exist when information is symmetric and markets are complete. The economics of information literature is also used to explain the evolution of financial institutions and markets, and to understand the consequences of that evolution for economic outcomes (such as economic development and financial crises) and for monetary policy choices (such as central bank interventions, regulations and changes in the payments system). Prerequisite: Econ 4021. 3 units.

444 Innovation and Intellectual Property: Theory & Practice.
Innovation - that is: figuring out better and cheaper ways of satisfying human desires - is the key to improving our well-being. It is not patient saving and accumulation that makes us so much better off than we used to be: capital accumulation is only the conduit through which the innovation juices flow. The question is what drives it? How come some societies are apparently much more innovative than others? How come we have the impression that most useful inventions took place in the last three centuries? Are there policies that help fostering innovation and others that hurt? The course tries to address these questions. Economists have many theories of innovation, and some better than others. We will look at the theories, we will examine the facts (past and present), then we will go back to the theories and reconsider their explanatory power. With this background we approach the debate about Intellectual Property, what it is and what it is not good for, whose interests it serves and whose well-being it thwarts. Prerequisite: Econ 4011. 3 units.

445 Public Finance.
The study of fundamental forms of market failure that provide a rationale for government action. The first third of the class analyzes the allocation of resources and the natural and social phenomena that determine the feasibility and efficiency of allocations and
whether they occur as equilibria. Topics include the characterization of efficiency when an economy contains externalities and public goods and the efficiency enhancing role of policy. The second third examines whether particular public policies achieve their goals and are cost effective and whether they produce unintended consequences. The final third addresses taxation. Topics include the measurement and evaluation of tax burdens, the structure of the federal personal income tax and corporate profits tax, tax evasion, and proposals for fundamental tax reform. There is significant use of price theory and calculus throughout the course. Prerequisite: Econ 4011.

451 Environmental Policy/Business and the Environment.
This course will examine the relationship between environmental economics and environmental policy and raise more general questions about the political economy of regulation. The course will focus on air pollution, water pollution, and hazardous wastes, although some attention will be given to biodiversity and global climate change. The course will examine critically two prescriptions that economists usually endorse: (1) the "balancing" of benefits against costs (e.g., benefit-cost analysis) and the use of risk analysis in evaluating policy alternatives. (2) The use of market incentives (e.g., prices, taxes, or charges) or "property rights" instead of traditional command-and-control regulations to implement environmental policy. Prerequisite: Econ 1011. 3 units.

452 Industrial Organization.
Theoretical and empirical analysis of the presence and value of competitive forces in the United States economy. Theories of industrial organization and development of criteria for performance of noncompetitive industries. Prerequisite: Econ 4011. 3 units.

460 Urban Economics.
This course is a survey of modern urban economics. We shall examine the microeconomics of the structure of cities and housing markets, economic theories addressing how, why and where cities form; they history and dynamics of the urban economy; and the role of government policy in correcting for market failures in the urban economy. Prerequisite: Econ 4011. 3 units.

467 Game Theory.
Introduction to the analytical theory of non-cooperative games, with applications to Economics. Course will cover game theoretic aspects of decision theory, Nash equilibrium and its refinements, and topics in strategic and extensive form games, and in games of incomplete information. Prerequisites: Econ 4011, Math 233, and Math 2200. 3 units.

469 Great Transformation.
This course asks the question, "What brought about the Industrial Revolution and the emergence of the contemporary `capitalist, market society`?" In particular, is there a fundamental difference between the values, norms and cultures in "pre-capitalist" societies compared to post-Industrial Revolution societies? The answer to these questions depends on whether the Industrial Revolution represents an historical discontinuity - a "Great Transformation" turning-point - or whether, instead, there is more continuity in human history than the "Great Transformation" theory would have us believe. These questions are important as we try to determine whether the current market society is sustainable or whether (and when) we should expect a "Great Transformation" to emerge. The course will address these questions via readings from the best lessons of psychology, economics, anthropology and history, with a particular focus on data and empirical results. Classes will consist of a combination of lectures and class discussions, supplemented by individual- and group-based writing assignments. Prerequisites: Econ 4011 and Econ 4021 or permission of instructor. 3 units.

472 Topics in Growth and Development.
This course highlights important empirical facts concerning growth and development in various countries at different development stages. Fundamental growth theory is then provided for explaining these facts systematically and for evaluating the consequences of commonly adopted development policies. Topics vary, but may include population; human capital and labor market development; R&D and innovation; finance and growth; modernization and industrial transformation; world income disparities and poverty problems; institutions and political economy issues; environmental and social factors; and international trade and economic integration. Prerequisites: Econ 4011 and 4021. 3 units.

4721 Advanced Topics in Modern Economic Growth.
This course studies economic theories that explain the observed patterns of economic development across time and space. What explains the growth of the world economy since the Industrial Revolution? Why are the level and the growth rate of per-capita income so different across countries? What are the determinants of inequality and risk faced by individuals in different countries? Theories featuring the role of investment, human capital, technology, coordination, financial markets and environmental variables are presented. Theories are evaluated using historical data and detailed case studies. This course is designed to complement Econ 472. Prerequisite: Econ 4011. 3 units.
474 Poverty of Nations.
This course focuses on the failures of economic development and the extreme and persistent poverty we find in South Asia, sub-Saharan Africa and other parts of the developing world, including major urban centers. What exactly is poverty? Who are the poor? How many of them are there? Why are they poor? What individual or collective actions can they (or we) take to improve their lot?
Prerequisites: Econ 4011 and 4021 or permission of instructor. 3 units.

477 Topics in Financial Economics: Asset Pricing.
The objective of the course is to develop the basic economic models that can be used to study the valuation of different financial assets and to discuss how to confront the theory with the evidence from financial markets. The course will develop the basic model of investment under uncertainty and discuss portfolio choices in static and dynamic settings as well as market equilibria and the impact of news on the forecast-ability of excess returns. The course will describe valuation in incomplete asset markets (e.g. arbitrage pricing theory) and the extension to the valuation of firms and real estate assets. Prerequisites: Econ 4011, Econ 4021 and Econ 413. 3 units.

477 Topics in Financial Economics: Investments.
This course surveys recent developments in investments and portfolio management. The course aims to provide students with a structure for thinking about investment decisions from the perspective of a portfolio manager. We start by understanding fundamental concepts for investment theory: modern asset valuation and portfolio selection under uncertainty. We will proceed to investigate various sources of risk which financial institutions are exposed to, such as interest rate risk, credit risk and liquidity risk, and study how financial institutions manage these risks. The course will also introduce student to investment evaluation techniques. We will explore recent innovations in financial markets, as well as various frictions that arise in markets. Students will have the opportunity to apply concepts learned in class on a virtual investment and trading platform, StockTrak. Prerequisites: Econ 4011, Math 2200 (or approved substitute). 3 units.

480 Labor Economics.
Economic analysis of labor markets. Theory and evidence on supply of and demand for labor, explanation of wage and income differentials; impact of education on human skills and productivity. Prerequisite: Econ 4011 and 413. 3 units.

483 Economics of Education
The "economics of education" involves analysis of the economic and social determinants and consequences of education. Because each person`s education is an investment in human capital which allows the individual to contribute to society in a productive way, education becomes a crucial determinant of an economy`s ability to achieve high growth with high wages, low unemployment and strong social cohesion. This course will address three essential topics from the wide-ranging field of the economics of education. The first is demand-side oriented and includes: (i) the measurement of the returns to education in the labor market (human capital theory; the central idea of education as human capital investment); and (ii) a characterization of the education production function, which relates the various inputs affecting a student`s learning (schools, families, peers, neighborhoods, etc.) to measure outputs including labor market success, graduation rates and standardized test scores. The second important topic involves political economy and the supply side: the financing and provision of education. The third part of the course is devoted to the links between education and economic development, including cross-country differences in schooling, returns to schooling and per-capita income. Prerequisites: Econ 4011, Econ 4021, and Econ 413. 3 units.

490 Independent Work.
Prerequisite, junior or senior standing and permission of the Academic Coordinator. Credit variable; maximum 6 units. This course may not be used to satisfy major or minor requirements.

493 Mathematical Economics.
The objective of this course is to develop the mathematical tools necessary for the study of intermediate micro- and macro-economics theory and the advanced electives in economics. The principal focus is the calculus of multivariate functions, including total and partial differentiation, unconstrained and constrained optimization of multivariate functions, and implicit and inverse function rules. Time permitting, the application of prior to utility theory and production and cost are developed. Additional topics include difference equations and an introduction to matrices. Economics majors and minors must take either this course or Math 233. Either this course or Math 233 must be taken prior to Econ 4011. Students who have taken, or are taking, Math 233 are encouraged to take this course as well. Prerequisites: Econ 1011 and 1021, and Math 132. 1 unit.

494 Introduction to Stata.
This short course introduces students to the data analysis and statistical software tools used in upper-level econometrics and applied economics courses. The course is designed to serve as a bridge between introductory econometrics and practical work with real-world databases. The course will be held in the computer classroom so that students can obtain hands-on experience with data preparation, workflow, and modeling using the Stata statistical software package. Emphasis throughout the course is placed on examples of
applications in economics. No final; the final course project will be due on the last day of class per the course syllabus. Prerequisite: prior completion of, or concurrent enrollment in, Econ 413. 1 unit.

497 Research in Economics.
Opportunity to work on a research project under faculty supervision. Credit variable, maximum 3 units. May be repeated for credit. This course may not be used to satisfy major or minor requirements.

498 Honors Seminar.
Advanced application of economic theory to policy problems. This is the first part of the two-course sequence for seniors writing an honors thesis, and it is taken in the fall semester of the senior year. This course may not be used to satisfy major requirements. Prerequisite: invitation into the “Honors in Economics with Thesis” track of the department’s Honors Program. 3 units.

499 Study for Honors.
Independent reading and research under faculty direction leading to a Senior Honors Thesis. This is the second part of a two-course sequence for seniors writing an honors thesis, and it is taken in the spring semester of the senior year. This course may not be used to satisfy major requirements. Prerequisites: invitation into the “Honors in Economics with Thesis” track of the department’s Honors Program. 3 units.
XIII. ECONOMICS FACULTY

Research and undergraduate teaching interests are indicated for each faculty member.

Professors

Gaetano Antinolfi (macroeconomics, monetary and international macroeconomics; 4021, 437)
Costas Azariadis (labor contracts, macroeconomic dynamics and economic development; 208, 4021, 474)
Marcus C. Berliant (public finance, mathematical economics, urban economics; 445, 460)
Ana Babus (Microeconomic theory, finance; 3311, 477)
Michele Boldrin (economic theory, economic growth and macroeconomics; 444, 469)
Francisco (Paco) Buera (macroeconomics, macroeconomic development; 4721, 410)
Steven M. Fazzari (macroeconomics, monetary economics, post-Keynesian economics, econometrics; 1021, 348, 448W)
Ian Fillmore (labor economics, industrial organization, applied microeconomics, economics of education; 452)
Sanghmitra Gautam (development economics, applied microeconometrics, public economics; 471)
George-Levi Gayle (econometric theory, contract theory, labor economics, personnel economics, corporate governance; 452)
Limor Golan (labor economics, applied microeconomics, applied econometrics; 4151, 480)
Sukkoo Kim (economic history, urban & regional economics, international trade; 326, 3761)
SangMok Lee (microeconomics; operations research; 407)
Anqi Li (microeconomic theory; 429)
Rudolfo Manuelli (macroeconomics, growth; 4021, 477)
John H. Nachbar (microeconomics, game theory; 4111)
Paulo Natenzon (behavioral economics, decision theory, economic theory, financial economics; 467)
Robert P. Parks (econometrics, public finance; 1021, 413)
Bruce Petersen (microeconomics, industrial organization, finance, environmental economics; 1011, 452, 428)
Werner Ploberger (statistics, econometric methodology, time series econometrics)
Robert A. Pollak (environmental economics, economics of the family, consumer economics; 451)
Brian Rogers (applied microeconomics; 1011, 404)
Carl Sanders (labor economics, applied econometrics; 4011, 4151)
Norman Schofield (political economy, game theory)
Yongseok Shin (macroeconomics, growth; 4721)
Ping Wang (macroeconomics, growth, urban economics; 472)
Jonathan Weinstein (microeconomics; 4011)

Post-Doctoral Fellows

Valerio Dotti (political economy; 3501)
Lecturers

Sudeshna Bandyopadhyay (microeconomics, labor; 1011, 1021, 380)
Maria Canon (microeconomics, labor, econometrics; 1011, 380, 413, 4151)
Dorothy Petersen (macroeconomics, monetary economics, international; 1021)

Adjunct Faculty

Grace Johnson (microeconomics, econometrics, health economics; 1011, 352)
Fernando Martin (macroeconomics; 4301)
Alexander Monge-Naranjo (macroeconomics, international; 435)
B. Ravikumar (financial economics, macroeconomics, education, business cycle theory)
Juan Sanchez (monetary and macroeconomics; 335)
Guillaume Vandenbroucke (microeconomics, public policy; 483)

Affiliated Faculty

Mariagiovanna Baccara (microeconomics)
Scott Baker (law and economics)
James Bullard (macroeconomics, monetary economics)
John Drobak (law and economics, regulatory economics)
Philip Dybvig (economic theory and finance)
Leonard Green (psychology, behavioral economics)
Barton Hamilton (entrepreneurship, health economics, labor economics, econometrics)
Glen MacDonald (industry evolution, strategy & value appropriation, microeconomics & industrial organization, investor protection, compensation)
Camillo Padoa-Schioppa (psychology, neurobiology)

Emeritus Faculty

Lee Benham (industrial organization, medical economics)
David Levine (game theory, general equilibrium theory, microeconomic theory, political economy)
Wilhelm Neuefeind, (microeconomics, economic theory)
Frederic Q. Raines (statistics, econometrics, labor, macroeconomics)