ECONOMICS

Economics has been called the "science of scarcity." It is the study of how individuals allocate scarce resources for production in order to satisfy their human needs and wants. This focus on the human condition places economics firmly into the social sciences area. However the application of economic principles to problems of choice in markets and in financial decision-making also gives economics a central role in the theory of business administration and management.

The Missouri S&T economics department offers a relevant business-oriented educational experience while maintaining the social science flavor of the traditional economics degree. The curriculum is based on a broad foundational core, business and information and technology. Students majoring in economics also take up to 33 hours of economics, finance, and management courses.

The economics courses are taught rigorously and are technically-oriented. They also provide a solid social science education with studies of the social problems of market failure, monopoly, inflation, and the effectiveness of government economic and social policy. Graduated students have an excellent education with job opportunities across the spectrum including business, finance, study of the law, government and public policy.

The economics program allows for the flexibility of selecting either the bachelor of arts or bachelor of science programs, depending on which best fits your goals and skills. Either degree will provide you with the necessary skills to compete effectively in the job market or succeed in graduate school.

Students wishing to minor in economics may select from a variety of courses tailored to their own needs. Specific tracks are available in energy/technology and international economics.

Students majoring in an academic area at Missouri S&T other than economics can pursue a secondary B.A. or B.S. in economics to accompany their primary major. See the department chair of economics for more details on this academic option.

The Missouri S&T economics department has in place a cooperative bachelor of science/master of science in accounting with the College of Business and Public Administration at the University of Missouri-Columbia. A student can take at Missouri S&T up to 90 hours of the 150 required courses tailored to their own needs. Specific tracks are available in energy/technology and international economics.

Bachelor of Arts
Economics (Secondary Education Emphasis Area)

You may earn a B.A. degree in economics from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with the emphasis area program. This program can be completed in four academic years and student teaching is arranged with public schools within 30 miles of the Rolla campus.

Students interested in this emphasis area should consult with the minor advisor in the economics department.

In order to successfully complete this emphasis area, students must maintain a cumulative GPA of at least 2.75, and attain at least a 3.0 GPA in content courses and Professional EDUC courses. Current Missouri S&T or transfer students who wish to pursue this emphasis area must meet both these GPA requirements to be accepted into the program. Students must also meet all requirements listed under the teacher education section of this catalog. Students who do not meet all the teacher certification requirements will not be eligible for the secondary education emphasis area, even if they have completed all course work.

A degree in this emphasis area requires 136-138 credit hours. The required courses are provided below. A minimum grade of "C" is required by the department in all mathematics and statistics courses counted toward this degree.

<table>
<thead>
<tr>
<th>Communications Skills: 9 semester hours</th>
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</thead>
<tbody>
<tr>
<td>ENGLISH 1120 Exposition And Argumentation</td>
</tr>
<tr>
<td>ENGLISH 1160 Writing And Research</td>
</tr>
<tr>
<td>or ENGLISH 3560 Technical Writing</td>
</tr>
<tr>
<td>SP&amp;M S 1185 Principles Of Speech</td>
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<table>
<thead>
<tr>
<th>Humanities: 9 semester hours</th>
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</thead>
<tbody>
<tr>
<td>Must include 9 hours from each of the following 3 areas: Art, Music or Theatre, Philosophy, Literature</td>
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<table>
<thead>
<tr>
<th>Social Sciences: 18 semester hours</th>
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</thead>
<tbody>
<tr>
<td>HISTORY 1300 American History To 1877</td>
</tr>
<tr>
<td>HISTORY 1310 American History Since 1877</td>
</tr>
<tr>
<td>HISTORY 2110 World Regional Geography</td>
</tr>
<tr>
<td>HISTORY 4435 History of the American West</td>
</tr>
<tr>
<td>POL SCI 1200 American Government</td>
</tr>
<tr>
<td>PSYCH 1101 General Psychology</td>
</tr>
<tr>
<td>PSYCH 4600 Social Psychology</td>
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<table>
<thead>
<tr>
<th>Natural Sciences: 7 semester hours (including 1 lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics or Geology w/Lab</td>
</tr>
<tr>
<td>BIO SCI 1113 General Biology</td>
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</table>

<table>
<thead>
<tr>
<th>Mathematics: 3 semester hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1120 College Algebra</td>
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<tr>
<td>or MATH 1140 College Algebra</td>
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</table>

<table>
<thead>
<tr>
<th>Professional Requirements: 26 semester hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 1040 Perspectives In Education</td>
</tr>
<tr>
<td>EDUC 1174 School Organization &amp; Adm For Elementary &amp; Secondary Teachers</td>
</tr>
<tr>
<td>EDUC 3216 Teaching Reading in Content Area</td>
</tr>
<tr>
<td>EDUC 3280 Teaching Methods And Skills In The Content Areas</td>
</tr>
<tr>
<td>EDUC 4298 Student Teaching Seminar</td>
</tr>
<tr>
<td>ENGLISH 3170 Teaching And Supervising Reading and Writing</td>
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</table>
Areas of Concentration

Students are encouraged to use their electives, both in economics and in general, to develop areas of concentration beyond the core requirements. Among the possibilities are business, finance, and international affairs. Faculty advisors will assist students in establishing these curricular tracks.

Bachelor of Science Economics

In Economics, the Bachelor of Science degrees consist of 120 credit hours. First, all undergraduate students in Economics are required to complete a prescribed General Education Requirements Core that corresponds to the recommendations of the Missouri State Coordinating Board for Higher Education and consists of 42 credit hours in the areas of Individual Expression, Natural Systems, and Human Institutions. In addition, all undergraduate students are required to complete a 39 credit hour core consisting of courses in Information Technology, Management, Quantitative Skills, and Communication Skills. A minimum grade of "C" is required for courses in both the Information Technology and the Management areas. Finally, each degree includes 19 credit hours of free electives.

The remaining 27 credit hours of the required 120 credit hours for the Economics degree are divided into a prescribed 18 credit hour degree core and 9 credit hours of specific degree electives. A minimum grade of "C" is required in these courses. The Economics degree requires courses in advanced Micro, Macro and Statistics. The electives for this degree consist of courses from areas such as Law and Economics, Money and Banking, Energy Economics and E-Commerce.

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGLISH 1120(^1)</td>
<td>3</td>
<td>PSYCH 1101</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1140</td>
<td>3</td>
<td>MATH 1212</td>
<td>4</td>
</tr>
<tr>
<td>Free Electives</td>
<td>3</td>
<td>History</td>
<td>3</td>
</tr>
<tr>
<td>BIO SCI 1113, or 2223, or 2233, or 2263</td>
<td>3</td>
<td>IS&amp;T 1750</td>
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Lab w/Living or Physical Science Course

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<tr>
<th>Credits</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>1</td>
<td>ECON 1100 or 1200(^4)</td>
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Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>BUS 1110</td>
<td>3</td>
<td>BUS 1210</td>
<td>3</td>
</tr>
<tr>
<td>SP&amp;M S 1185</td>
<td>3</td>
<td>ECON 1100 or 1200(^5)</td>
<td>3</td>
</tr>
<tr>
<td>STAT 3111</td>
<td>3</td>
<td>Chemistry, Geol, Ge Eng, or Physics</td>
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<tr>
<td>IS&amp;T 1551</td>
<td>3</td>
<td>ART 1180, or 1185, or MUSIC 1150, or THEATRE 1190</td>
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</tr>
<tr>
<td>ENGLISH 1211, or 1212, or 1231, or 1221, or 2223, or 1223</td>
<td>3</td>
<td>Free Electives</td>
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<tr>
<th>Credits</th>
<th>Second Semester</th>
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<tr>
<td>16</td>
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Junior Year

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<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>ENGLISH 1600</td>
<td>3</td>
<td>SP&amp;M S 2181</td>
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<tr>
<td>FINANCE 2150</td>
<td>3</td>
<td>ECON 2200(^4)</td>
<td>3</td>
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<tr>
<td>ECON 2100(^4)</td>
<td>3</td>
<td>Emphasis Area Electives(^2)</td>
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<tr>
<td>POL SCI 1200</td>
<td>3</td>
<td></td>
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<tr>
<td>ECON 2300</td>
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<tr>
<th>Credits</th>
<th>Second Semester</th>
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<tr>
<td>15</td>
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<td>15</td>
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</table>

Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGLISH 2560</td>
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<td>Free Electives</td>
<td>13</td>
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<tr>
<td>Culture, Sociology, Religion(^3)</td>
<td>3</td>
<td>ECON 4860</td>
<td>3</td>
</tr>
<tr>
<td>Emphasis Area Electives(^2)</td>
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<table>
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<tr>
<th>Credits</th>
<th>Second Semester</th>
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<tr>
<td>16</td>
<td></td>
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</table>

Total Credits: 120

1. In-Major Writing Intensive
2. Economics Emphasis Electives 18 hours of which 12 hours must be Economics to be selected from ECON 2114, ECON 3810,ECON 3880 or at or above 3000 level Econ Lecture course and accumulate 6 hours from the following PSYCH 4700, PSYCH 4601, PSYCH 4602 or any 3000 or 4000 level Business Lecture courses.
4. A Grade of "C" or better is required for ECON 1100, ECON 1200, ECON 2100, ECON 2200, and ECON 2300.

Economics Minor

Students majoring in other disciplines are encouraged to develop a minor in economics. The formal minor in economics is designed to provide students with a solid understanding of economic principles and concepts and the ability to apply this knowledge to a host of economic, public policy and business problems. This program will be of particular benefit to those students whose major field of study may lead them to pursue a management position or later graduate studies in business.

The minor in economics requires the completion of a minimum of 15 hours of economics course work with a grade of "C" or better. Required courses in the minor program include both ECON 1100 and ECON 1200 and at least one of the intermediate theory courses, ECON 2100 and/or ECON 2200. The choice of which intermediate theory course depends on
which 300 level economic electives the student, in consultation with the department's minor advisor, selects for their program.

**Energy/Technology Minor**

*(15 hours)*

**Required courses:**
- ECON 1100 Principles Of Microeconomics
- ECON 1200 Principles Of Macroeconomics
- ECON 2100 Intermediate Microeconomic Theory
- And 6 hours from:
  - ECON 4330 Cost-Benefit Analysis
  - ECON 4430 Cost-Benefit Analysis

**Global Sustainable Economics Minor**

*(15 hours)*

**Required courses:**
- ECON 1100 Principles Of Microeconomics and Intermediate Microeconomic Theory
- ECON 1200 Principles Of Macroeconomics and Intermediate Macroeconomic Theory
- ECON 4641 Foundations of Sustainability
- And 6 hours from:
  - ECON 3512/ MIN ENG 3512 Mining Industry Economics
  - ECON 4440 Environmental And Natural Resource Economics
  - ECON 4642 Introduction to Global Eco- and Social-preneurship and Innovation
  - ECON 4643 Ethical Problems in a Global Environment
  - ECON 4730 Economic Development
  - ECON 4540 Energy Economics
  - ENV ENG 5640 Environmental Law And Regulations
  - PSYCH 4730 Environmental Psychology
  - HISTORY 4470 American Environmental History

**International Economics Minor**

*(15 hours)*

**Required courses:**
- ECON 1100 Principles Of Microeconomics
- ECON 1200 Principles Of Macroeconomics
- ECON 2200 Intermediate Macroeconomic Theory
- And 6 hours from:
  - ECON 4710 International Trade
  - ECON 4730 Economic Development
  - ECON 4350 Statistical Models in Actuarial Science

**Bonnie J Bachman**, Professor  
PHD Rutgers University

**Michael C Davis**, Associate Professor  
PHD University of California-San Diego

**Mahelet Fikru**, Assistant Professor  
PHD Southern Illinois University-Carbondale

**Gregory Gelles**, Professor  
PHD West Virginia University

**Ana-Maria Ichim**, Assistant Professor  
PHD Louisiana State University

**Eun Soo Park**, Associate Professor  
PHD Northwestern University

**Sarah Steelman**, Assistant Teaching Professor  
MA University of Missouri-Columbia

**Yishu Zhou**, Assistant Professor  
PHD University of Connecticut

**ECON 1000 Special Problems** *(IND 1.0-6.0)*  
Problems or readings on specific subjects or projects in the department. Prerequisite: Consent of instructor required.

**ECON 1001 Special Topics** *(IND 0.0-6.0)*  
This course is designed to give the department an opportunity to test a new course. Variable title.

**ECON 1100 Principles Of Microeconomics** *(LEC 3.0)*  
An examination of how resources and products are priced and how income is distributed within various types of market structures. ECON 1100 - MOTR ECON 102: Introduction to Microeconomics

**ECON 1200 Principles Of Macroeconomics** *(LEC 3.0)*  
A study of alternative strategies for managing the U.S. economy within a global environment, to attain the goals of full employment, stability and growth. ECON 1200 - MOTR ECON 101: Introduction to Macroeconomics

**ECON 1300 Business And Economic Statistics I** *(LEC 3.0)*  
This is an introductory course in business and economic statistics. Our main objective is to familiarize the student with elementary statistical concepts within the context of numerous applications in Business and Economics. We will highlight the primary use of statistics, that is, to glean information from an available sample regarding the underlying population. Prerequisite: Math 1120 or Math 1140 with a grade of "C" or better. (Co-listed with Stat 1111).

**ECON 2000 Special Problems** *(IND 1.0-6.0)*  
Problems or readings on specific subjects or projects in the department. Prerequisite: Consent of instructor required.

**ECON 2001 Special Topics** *(LEC 0.0-6.0)*  
This course is designed to give the department an opportunity to test a new course. Variable title.

**ECON 2100 Intermediate Microeconomic Theory** *(LEC 3.0)*  
Analysis of demand and supply in various market environments using the theories of production, resource pricing, and distribution of income. Emphasis on efficiency attainment and the rationale for market intervention. Prerequisites: Econ 1100 and 1200.
ECON 2114 Managerial Economics (LEC 3.0)
Focuses on micro- and macroeconomic contributions to managerial decision-making, business analysis and strategy. The roles of information, economic incentives, efficient markets, profits and decision-making under risk and uncertainty will be explored in both domestic and global settings. Prerequisites: Econ 1100 & 1200.

ECON 2200 Intermediate Macroeconomic Theory (LEC 3.0)
Examines the theoretical framework of national income and product generation, and the use of this theory to construct approaches such as, monetary and fiscal policy to attain economic, political and social goals. Prerequisites: Econ 1100 and 1200.

ECON 3000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

ECON 3001 Special Topics (LEC 0.0 and LAB 0.0)
This course is designed to give the department an opportunity to test a new course. Variable title.

ECON 3512 Mining Industry Economics (LEC 3.0)
Importance of the mineral industry to national economy, uses, distribution, and trade of economic minerals, time value of money, mineral taxation, economic evaluation utilizing depreciation, depletion, and discounted cashflow concepts, social and economical significance of mineral resources. Prerequisite: Econ 1100 or 1200. (Co-listed with Min Eng 3512).

ECON 3810 Law And Economics (LEC 3.0)
Study of application of economics analysis to legal concepts, issues and reasoning. Emphasizes the use of microeconomic theory to examine questions of efficacy and efficiency of decisions emanating from three major areas of common law - property rights, contracts and torts. Prerequisite: Econ 1100 or equivalent.

ECON 3830 History Of Economic Thought (LEC 3.0)
Contributions of the classical and modern economists to the development of economic thought. Course aims at establishing a synthesis of evolving doctrines which have become the basis of currently accepted economic theory. Prerequisites: Econ 1100 and 1200.

ECON 3880 Introduction to Sports Economics (LEC 3.0)
The course uses economics to analyze the business of sports. The course is designed for students with both an introductory or broader economics background, but who have not studied the economics of sports. Topics include labor relations, stadium financing, league structure, competitive balance, amateurism, sports gambling and in-game strategy. Prerequisite: Econ 1100 or Econ 1200.

ECON 4000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

ECON 4001 Special Topics (LEC 0.0 and LAB 0.0)
This course is designed to give the department an opportunity to test a new course. Variable title.

ECON 4010 Seminar (RSD 0.0-6.0)
Discussion of current topics.

ECON 4085 Internship (IND 0.0-6.0)
Internship will involve students applying critical thinking skills and discipline-specific knowledge in a work setting based on a project designed by the advisor and employee. Activities will vary depending on the student’s background and the setting. Prerequisite: Senior status; must have completed 24 hours in major.

ECON 4120 Micro and Macro Economics Essentials (LEC 1.5)
This course is an introduction to the essentials of micro and macro economics for running a business. It is designed for students planning to enter the MBA program who need this area and for non-business students who want some business background. Credit in this course cannot be applied to any major or minor in Business, IS&T, or Economics. Prerequisite: Senior or Junior standing and 3.0 GPA required.

ECON 4130 Network Economy (LEC 3.0)
Emerging Network/Internet economy, using traditional economic tools. Topics: production and reproduction cost of information, information as an "experience good," versions of products, switching cost, lock-in effects, market adoption dynamics, first-mover advantage, intellectual property rights. Prerequisite: Econ 1100 or Econ 1200. (Co-listed with IS&T 4257).

ECON 4230 Money And Banking (LEC 3.0)
Study of the origin, principles, and functions of money, emphasizing the role of banks in the effectuation of monetary policies geared to achieve various economic and political goals. Prerequisite: Econ 2200.

ECON 4300 Research Methods and Applications in Economics and Business (LEC 2.0 and LAB 1.0)
Introduction of basic econometric and statistical techniques with empirical illustrations that reference real economic and business issues. Students will be introduced to modern statistical software packages (STATA, R), but also work with productivity software (Excel, PowerPoint) to perform quantitative analysis and present their results. Prerequisites: Econ 1100 or Econ 1200; Math 1140 or higher; Stat 1115 or Stat 3111 or Stat 3113 or Stat 3115 or Stat 3117 or Stat 5643.

ECON 4310 Mathematical Economics (LEC 3.0)
Marginal analysis, calculus, and linear algebraic systems are applied in selected advanced topics in economics such as price theory, general equilibrium theory, input-output analysis, activity analysis, and game theory. Prerequisite: Econ 2100, 2200, and Math 1208.

ECON 4350 Statistical Models in Actuarial Science (LEC 3.0)
This course covers the statistical foundation of actuarial models and their applications. Topics include survival and severity models, Kaplan-Meier and Nelson-Aalen estimators, aggregate and credibility models for insurance losses, discrete time Markov chains, ruin theory, and simulation. Prerequisite: Stat 5643 and either Stat 5644 or a 3000-level Stat course. (Co-listed with Stat 5755).
**ECON 4410 Public Finance** (LEC 3.0)
Study of government expenditures and sources of revenue. Particular emphasis is given to governmental decision making--how these decisions affect the economy and the behavior of individuals, firms, and families within the economy; and how these decisions may be evaluated. Prerequisite: Econ 2100.

**ECON 4430 Cost-Benefit Analysis** (LEC 3.0)
Investigates the rationale for cost-benefit analysis within a free enterprise setting. Discussion of market efficiency and failure; determination of social costs and benefits; applications of cost-benefit analysis; and, problems remaining in theory and practice. Prerequisite: Econ 2100.

**ECON 4440 Environmental And Natural Resource Economics** (LEC 3.0)
Optimum use of replenishable and non-replenishable resources, public goods and common resources, externalities, private vs. public costs, and quality of the environment; emphasis on public policy related to environmental and natural resource economics. Prerequisite: Econ 2100. (Co-listed with Min Eng 4523).

**ECON 4512 Mine Management** (LEC 3.0)
Theory and practice of mine management, including basic managerial functions, management theories, communication skills, motivation, leadership, organization, maintenance management, managerial decision making, cost control, labor relations, government relations, ethics and risks management with emphasis in presentation skills. Prerequisite: Completion of 50 credits toward Mining Engineering degree. (Co-listed with Min Eng 4512).

**ECON 4540 Energy Economics** (LEC 3.0)
Course is currently co-taught with Economics department. This course will provide an additional elective for senior chemical engineering students wishing to gain more experience in energy with a focus on the economic and policy surrounding energy technology. This course will help better inform engineering students regarding various energy technologies that they will encounter in the workplace after graduation and help them understand the relation between energy and economics and the associated trade-offs to consider when choosing between technologies. Prerequisite: Econ 2100. (Co-listed with Eng Mgt 4540).

**ECON 4611 Foundations of Sustainability** (LEC 3.0)
This interdisciplinary course is designed as an introduction to sustainability in commerce. It examines the concept of environmental, social, and economic issues in an organizational context. Principles, processes, and practices of sustainability will be explored.

**ECON 4612 Introduction to Global Eco- and Social-preneurship and Innovation** (LEC 3.0)
This interdisciplinary course applies an entrepreneurial mindset to the environmental and social opportunities and challenges facing the global community. Topics are examined from multiple perspectives: nonprofit, hybrid, and for-profit organizations.

**ECON 4643 Ethical Problems in a Global Environment** (LEC 3.0)
Focuses on the international dimension of ethics including corporate responsibility from economic, social, and environmental perspectives. It addresses the ethical challenges of decision making, stakeholder engagement, and governance at micro- (personal), meso- (org), and macro- (system) levels.

**ECON 4710 International Trade** (LEC 3.0)
Analysis of gains from trade; the effects of factor mobility; effects of trade restrictions on trade flow and income distribution; arguments for restricting trade; and effects of trade on economic development, employment and human capital development. Prerequisite: Econ 2100.

**ECON 4720 International Finance** (LEC 3.0)
Examination of the international monetary system, the Balance of Payments, the foreign exchange market, futures and options markets; foreign exchange and other risk management for firms, financing from a global perspective and direct foreign investment. Prerequisite: Econ 2200.

**ECON 4730 Economic Development** (LEC 3.0)
Theoretical analysis of the problem of economic development of the "poor" countries, where two-thirds of the world's population lives. Treatment of basic problem areas leading to a synthesis of theoretical approaches for the achievement of development. Prerequisite: Econ 2100 or 2200.

**ECON 4820 Labor Economics** (LEC 3.0)
Labor as a factor of production, collective bargaining, trade unionism, labor legislation, from the viewpoint of public policy. Prerequisite: Econ 2100 or Econ 2200.

**ECON 4860 Problems In Economic Policy** (LEC 3.0)
Advanced course designed for students majoring within the department. Appraisal and analysis of major problems of economic policy. Research and reports. Topics covered vary from year to year. Offered jointly by members of the department. Prerequisite: Seniors with 24 or more hours in Econ.

**ECON 5000 Special Problems** (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

**ECON 5001 Special Topics** (LEC 0.0 and LAB 0.0)
This course is designed to give the department an opportunity to test a new course.

**ECON 5010 Seminar** (RSD 0.0-6.0)
Discussion of current topics.

**ECON 5120 Advanced Micro and Macro Economics Essentials** (LEC 1.5)
An introduction to the essentials of micro and macro economics for running a business. It is designed for students planning to enter the MBA program who need this area and for non-business students who want some business background. Credit in this course cannot be applied to any major or minor in Business, IS&T, or Economics. Additional case or report required. Prerequisite: Bachelor Degree.
**ECON 5310 Advanced Mathematical Economics** (LEC 3.0)
Marginal analysis, calculus, and linear algebraic systems are applied in selected advanced topics in economics such as price theory, general equilibrium theory, input-output analysis, activity analysis, and game theory. This course is an advanced version of Econ 4310, and will include additional research and project assignments. Credit cannot be obtained for both Econ 4310 and Econ 5310. Prerequisites: Econ 2100, 2200 and Math 1208, Math 3103.

**ECON 5330 Econometric Methods** (LEC 2.0 and LAB 1.0)
A survey of econometric topics and methods illustrated through real world applications. Includes least squares estimation, generalized least squares, two-stage least squares, simultaneous equations models, panel data and qualitative choice models. Students will use modern statistical software packages (STATA, R) to perform hands-on quantitative analysis. Prerequisites: Econ 2100 and Econ 2200, Stat 3111 or Stat 3113 or Stat 3115 or Stat 3117 or Stat 5643.

**ECON 5337 Financial Mathematics** (LEC 3.0)
The course objective is to provide an understanding of the fundamental concepts of financial mathematics. Topics include pricing, assets-liability management, capital budgeting, valuing cash flow, bonds, futures, swaps, options. Preparation for the financial mathematics actuarial exam will be provided. Prerequisites: Math 1215 or Math 1221, Econ 2100 or Econ 2200 or Finance 2150 or Econ 5160, Stat 3111 or Stat 3113 or Stat 3115 or Stat 3117 or Stat 5643. (Co-listed with Math 5737).

**ECON 5342 Advanced Finance** (LEC 3.0)
This course provides a rigorous and consistent presentation of the theory of financial decisions. Capital markets are analyzed under assumptions of risk aversion and uncertainty. Models of modern portfolio theory are discussed including the CAPM and the Modigliani-Miller analysis. This course is an advanced version of Econ 321, and will include additional research and project assignments. Credit cannot be obtained for both Econ 5160 and Econ 5342. Prerequisite: Econ 2100 or Econ 2200.

**ECON 5430 Advanced Cost-Benefit Analysis** (LEC 3.0)
Investigates the rationale for cost-benefit analysis within a free enterprise setting. Discussion of market efficiency and failure; determination of social costs and benefits; applications of cost-benefit analysis; and, problems remaining in theory and practice. This course is an advanced version of Econ 4430, and will include additional research and project assignments. Credit cannot be obtained for both Econ 4430 and Econ 5430. Prerequisite: Econ 2100.

**ECON 5532 Advanced Mining Economics** (LEC 3.0)

**ECON 5644 Creativity, Innovation, and Sustainability** (LEC 3.0)
This interdisciplinary course examines the use of innovation as a competitive technological strategy with a sustainability perspective. It explores ways in which individuals, groups, and organizations can become more creative and how leadership and a culture of change can be implemented.

**ECON 5710 Advanced International Trade** (LEC 3.0)
Analysis of gains from trade; the effects of factor mobility; effects of trade restrictions on trade flow and income distribution; arguments for restricting trade; and effects of trade on economic development, employment and human capital development. This course is an advanced version of Econ 4710+D1194, and will include additional research and project assignments. Credit cannot be obtained for both Econ 4710 and Econ 5710. Prerequisite: Econ 2100.

**ECON 5720 Advanced International Finance** (LEC 3.0)
Examination of the international monetary system, the Balance of Payments, the foreign exchange market, futures and options markets; foreign exchange and other risk management for firms, financing from a global perspective and direct foreign investment. This course is an advanced version of Econ 4720, and will include additional research and project assignments. Credit cannot be obtained for both Econ 4720 and Econ 5720. Prerequisite: Econ 2200.

**ECON 5820 Advanced Labor Economics** (LEC 3.0)
Labor as a factor of production, collective bargaining, trade unionism, labor legislation, from the viewpoint of public policy. This course is an advanced version of Econ 4820, and will include additional research and project assignments. Credit cannot be obtained for both Econ 4820 and Econ 5820. Prerequisite: Econ 2100 or Econ 2200.