Economics and Business

2017-18

Program Description

The economy is becoming increasingly global and dependent on advanced technology. In such a world, private companies and public organizations need leaders and managers who understand economics and business, as well as science and technology.

Programs in the Division of Economics and Business are designed to bridge the gap that often exists between economists and managers, on the one hand, and engineers and scientists, on the other. All Mines undergraduate students are introduced to economic principles in a required course, and many pursue additional course work in minor programs or elective courses. The courses introduce undergraduate students to economic and business principles so that they will understand the economic and business environments, both national and global, in which they will work and live.

In keeping with the mission of the Colorado School of Mines, the Division of Economics and Business offers a Bachelor of Science in Economics. Most economics degrees at other universities are awarded as a Bachelor of Arts, with a strong liberal arts component. Our degree is grounded in mathematics, engineering, and the sciences. We graduate technologically literate economists with quantitative economics and business skills that give them a competitive advantage in today’s economy.

Economics majors have a range of career options following their undergraduate studies. Some pursue graduate degrees in economics, business, or law. Others begin careers as managers, economic advisors, and financial officers in business or government, often in organizations that deal with engineering, applied science, and advanced technology.

Program Educational Objectives (Bachelor of Science in Economics)

In addition to contributing toward achieving the educational objectives described in the Mines Graduate Profile and the ABET Accreditation Criteria, the educational objectives of the undergraduate program in economics and business are:

1. To provide students with a strong foundation in economic theory and analytical techniques, taking advantage of the mathematical and quantitative abilities of Mines undergraduate students; and
2. To prepare students for the work force, especially in organizations in Mines areas of traditional strength (engineering, applied science, mathematics, and computer science), and for graduate school, especially in economics, business, and law.

Curriculum

All economics majors take forty-five percent of their courses in math, science, and engineering, including the same core required of all Mines undergraduates. Students take another forty percent of their courses in economics and business. The remaining fifteen percent of the course work can come from any field. Many students complete minor programs in a technical field, such as computer science, engineering, geology or environmental science. A number of students pursue double majors.

To complete the economics major, students must take 45 hours of 300 and 400 level economics and business courses. Of these, 18 hours must be at the 400 level. At least 30 of the required 45 hours must be taken in residence in the home department. For students participating in an approved foreign study program, up to 19 hours of the 30 hours in residence requirement may be taken abroad.

Degree Requirements in Economics

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<th>Freshman</th>
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<td>MATH201</td>
<td>PROBABILITY AND STATISTICS FOR ENGINEERS</td>
<td>3.0</td>
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<td>MATH225</td>
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The following list details the courses that are included in the GPA for this degree:

- EBGN100 through EBGN599 inclusive

General Mines Minor/ASI requirements can be found here (bulletin.mines.edu/undergraduate/undergraduateinformation/minorasi).

**Minor Program in Economics**

The minor in Economics requires that students complete 6 economics courses, for a total of 18.0 credit hours. Minors are required to take Principles of Economics (EBGN201) and either Intermediate Microeconomics (EBGN301) or Intermediate Macroeconomics (EBGN302). Students must complete 4 additional courses from the lists below. Students may choose courses from either the economics focus or the business focus list (or both). Regardless of their course selection, the minor remains “Economics.” Economics courses taken as part of the Humanities and Social Sciences electives can be counted toward the minor.

**Area of Special Interest in Economics**

The area of special interest in Economics requires that students complete Principles of Economics (EBGN201) and 3 other courses in economics and business chosen from the lists below, for a total of 12 credit hours. Except for Principles of Economics (EBGN201), economics courses taken to complete any other graduation requirement may not be counted toward the area of special interest.

**Area of Special Interest in Entrepreneurship**

The objective of the Area of Special Interest in Entrepreneurship is to supplement an engineering or applied science education with tools and processes to recognize and evaluate entrepreneurial opportunities. These tools include financial forecasting, business models and the interrelationships of business functions including accounting, marketing, finance, human resources and operations. The processes include developing feasibility studies and business plans. The area of Special Interest in Entrepreneurship requires that students complete Principles of Economics (EBGN201), Business Principles for Entrepreneurs (EBGN361), Introduction to Entrepreneurship (EBGN360) and Business Plan Development (EBGN460), for a total of 12 credit hours.

**Economics Focus**

- EBGN301 INTERMEDIATE MICROECONOMICS 3.0
- EBGN302 INTERMEDIATE MACROECONOMICS 3.0
- EBGN303 ECONOMETRICS 3.0
- EBGN310 ENVIRONMENTAL AND RESOURCE ECONOMICS 3.0
- EBGN315 BUSINESS STRATEGY 3.0
- EBGN320 ECONOMICS AND TECHNOLOGY 3.0
- EBGN330 ENERGY ECONOMICS 3.0
- EBGN340 ENERGY AND ENVIRONMENTAL POLICY 3.0
- EBGN342 ECONOMIC DEVELOPMENT 3.0
- EBGN401 ADVANCED TOPICS IN ECONOMICS 3.0
- EBGN409 MATHEMATICAL ECONOMICS 3.0
- EBGN437 REGIONAL ECONOMICS 3.0
- EBGN441 INTERNATIONAL ECONOMICS 3.0
- EBGN443 PUBLIC ECONOMICS 3.0
- EBGN470 ENVIRONMENTAL ECONOMICS 3.0
- EBGN495 ECONOMIC FORECASTING 3.0
Business Focus
EBGN304 PERSONAL FINANCE 3.0
EBGN305 FINANCIAL ACCOUNTING 3.0
EBGN306 MANAGERIAL ACCOUNTING 3.0
EBGN314 PRINCIPLES OF MANAGEMENT 3.0
EBGN321 ENGINEERING ECONOMICS 3.0
EBGN325 OPERATIONS RESEARCH 3.0
EBGN345 PRINCIPLES OF CORPORATE FINANCE 3.0
EBGN360 INTRODUCTION TO ENTREPRENEURSHIP 3.0
EBGN361 BUSINESS PRINCIPLES FOR ENTREPRENEURS 3.0
EBGN455 LINEAR PROGRAMMING 3.0
EBGN459 SUPPLY CHAIN MANAGEMENT 3.0
EBGN460 BUSINESS PLAN DEVELOPMENT 3.0
EBGN461 STOCHASTIC MODELS IN MANAGEMENT SCIENCE 3.0
EBGN474 INVENTING, PATENTING AND LICENSING 3.0

Professor
Roderick G. Eggert, Interim Division Director, Viola Vestal Coulter Professor

Associate Professors
Edward J. Balistreri
Jared C. Carbone
Michael B. Heeley

Assistant professors
Tulay Flamand
Richard A. Hunt
Ian Lange
Peter Maniloff
Steven M. Smith

Teaching Associate Professors
Scott Houser
Becky Lafrancois
Mark Mondry
Andrew Pederson
John Stermole

Professors Emeriti
Carol A. Dahl
John E. Tilton
Graham Davis
Franklin J. Stermole

Michael R. Walls

Courses
EBGN198. SPECIAL TOPICS IN ECONOMICS AND BUSINESS. 1-6 Semester Hr.
(I, II) Pilot course or special topics course. Topics chosen from special interests of instructor(s) and student(s). Usually the course is offered only once. Prerequisite: none. Variable credit; 1 to 6 credit hours. Repeatable for credit under different titles.

EBGN199. INDEPENDENT STUDY. 0.5-6 Semester Hr.
(I, II) Individual research or special problem projects supervised by a faculty member, also, when a student and instructor agree on a subject matter, content, and credit hours. Prerequisite: Independent Study form must be completed and submitted to the Registrar. Variable credit; 1 to 6 credit hours. Repeatable for credit.

EBGN201. PRINCIPLES OF ECONOMICS. 3.0 Semester Hrs.
(I, II) This course introduces the theoretical and analytical foundations of microeconomics and macroeconomics. This course focuses on applying the economic way of thinking and basic tools of economic analysis. Economic effects of public policies. Analysis of markets for goods, services and resources. Tools of cost-benefit analysis. Measures of overall economic activity. Determinants of economic growth. Monetary and fiscal policy. Prerequisites: None. 3 hours lecture; 3 semester hours.

EBGN298. SPECIAL TOPICS IN ECONOMICS AND BUSINESS. 1-6 Semester Hr.
(I, II) Pilot course or special topics course. Topics chosen from special interests of instructor(s) and student(s). Usually the course is offered only once. Prerequisite: none. Variable credit; 1 to 6 credit hours. Repeatable for credit under different titles.

EBGN299. INDEPENDENT STUDY. 1-6 Semester Hr.
(I, II) Individual research or special problem projects supervised by a faculty member, also, when a student and instructor agree on a subject matter, content, and credit hours. Prerequisite: Independent Study form must be completed and submitted to the Registrar. Variable credit; 1 to 6 credit hours. Repeatable for credit.

EBGN301. INTERMEDIATE MICROECONOMICS. 3.0 Semester Hrs.
Equivalent with EBGN411,
(I,II) This course introduces the theoretical and analytical foundations of microeconomics and applies these models to the decisions and interactions of consumers, producers and governments. Develops and applies models of consumer choice and production with a focus on general equilibrium results for competitive markets. Examines the effects of market power and market failures on prices, allocation of resources and social welfare. Prerequisites: EBGN201 and MATH213. 3 hours lecture; 3 semester hours.

EBGN302. INTERMEDIATE MACROECONOMICS. 3.0 Semester Hrs.
Equivalent with EBGN412,
(I,II) Intermediate macroeconomics provides a foundation for analyzing both short-run and long-run economic performance across countries and over time. The course discusses macroeconomic data analysis (including national income and balance of payments accounting), economic fluctuations and the potentially stabilizing roles of monetary, fiscal and exchange rates policies, the role of expectations and intertemporal considerations, and the determinants of long-run growth. The effects of external and internal shocks (such as oil price shocks, resource booms and busts) are analyzed. Prerequisites: EBGN201 and MATH213. 3 hours lecture; 3 semester hours.
EBGN303. ECONOMETRICS. 3.0 Semester Hrs.
Equivalent with EBGN390.
(I, II) (WI) Introduction to econometrics, including ordinary least-squares and single-equation models; two-stage least-squares and multiple-equation models; specification error, serial correlation, heteroskedasticity, and other problems; distributive-lag models and other extensions, hypothesis testing and forecasting applications. Prerequisites: EBGN201 and MATH201. 3 hours lecture; 3 semester hours.

EBGN304. PERSONAL FINANCE. 3.0 Semester Hrs.
(S) The management of household and personal finances. Overview of financial concepts with special emphasis on their application to issues faced by individuals and households: budget management, taxes, savings, housing and other major acquisitions, borrowing, insurance, investments, meeting retirement goals, and estate planning. Survey of principles and techniques for the management of a household's assets and liabilities. Study of financial institutions and their relationship to households, along with a discussion of financial instruments commonly held by individuals and families. 3 hours lecture; 3 semester hours.

EBGN305. FINANCIAL ACCOUNTING. 3.0 Semester Hrs.
(I, II) Survey and evaluation of balance sheets and income and expense statements, origin and purpose. Evaluation of depreciation, depletion, and reserve methods for tax and internal management purposes. Cash flow analysis in relation to planning and decision making. Inventory methods and cost controls related to dynamics of production and processing. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN306. MANAGERIAL ACCOUNTING. 3.0 Semester Hrs.
(I) Introduction to cost concepts and principles of management accounting including cost accounting. The course focuses on activities that create value for customers and owners of a company and demonstrates how to generate cost-accounting information to be used in management decision making. Prerequisite: EBGN201, EBGN305. 3 hours lecture; 3 semester hours.

EBGN310. ENVIRONMENTAL AND RESOURCE ECONOMICS. 3.0 Semester Hrs.
(I) (WI) Application of microeconomic theory to topics in environmental and resource economics. Topics include analysis of pollution control, benefit/cost analysis in decision-making and the associated problems of measuring benefits and costs, non-renewable resource extraction, measures of resource scarcity, renewable resource management, environmental justice, sustainability, and the analysis of environmental regulations and resource policies. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN314. PRINCIPLES OF MANAGEMENT. 3.0 Semester Hrs.
(II) Introduction of underlying principles, fundamentals, and knowledge required of the manager in a complex, modern organization. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN315. BUSINESS STRATEGY. 3.0 Semester Hrs.
(II) An introduction to game theory and industrial organization (IO) principles at a practical and applied level. Topics include economies of scale and scope, the economics of the make-versus-buy decision, market structure and entry, dynamic pricing rivalry, strategic positioning, and the economics of organizational design. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN320. ECONOMICS AND TECHNOLOGY. 3.0 Semester Hrs.
(II) The theoretical, empirical and policy aspects of the economics of technology and technological change. Topics include the economics of research and development, inventions and patenting, the Internet, e-commerce, and incentives for efficient implementation of technology. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN321. ENGINEERING ECONOMICS. 3.0 Semester Hrs.
Equivalent with CHEN421.
(II) Time value of money concepts of present worth, future worth, annual worth, rate of return and break-even analysis applied to after-tax economic analysis of mineral, petroleum and general investments. Related topics on proper handling of (1) inflation and escalation, (2) leverage (borrowed money), (3) risk adjustment of analysis using expected value concepts, (4) mutually exclusive alternative analysis and service producing alternatives. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN325. OPERATIONS RESEARCH. 3.0 Semester Hrs.
(I) This survey course introduces fundamental operations research techniques in the optimization areas of linear programming, network models (i.e., maximum flow, shortest path, and minimum cost flow), integer programming, and nonlinear programming. Stochastic (probabilistic) topics include queuing theory and simulation. Inventory models are discussed as time permits. The emphasis in this applications course is on problem formulation and obtaining solutions using Excel Software. Prerequisite: Junior Standing, EBGN201, MATH112. 3 hours lecture; 3 semester hours.

EBGN330. ENERGY ECONOMICS. 3.0 Semester Hrs.
Equivalent with ENGY330.
(I) Study of economic theories of optimal resource extraction, market power, market failure, regulation, deregulation, technological change and resource scarcity. Economic tools used to analyze OPEC, energy mergers, natural gas price controls and deregulation, electric utility restructuring, energy taxes, environmental impacts of energy use, government R&D programs, and other energy topics. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN340. ENERGY AND ENVIRONMENTAL POLICY. 3.0 Semester Hrs.
This course considers the intersection of energy and environmental policy from an economic perspective. Policy issues addressed include climate change, renewable resources, externalities of energy use, transportation, and economic development and sustainability. Prerequisites: EBGN201. 3 hours lecture; 3 semester hours.

EBGN342. ECONOMIC DEVELOPMENT. 3.0 Semester Hrs.
(II) (WI) Theories of development and underdevelopment. Sectoral development policies and industrialization. The special problems and opportunities created by an extensive mineral endowment, including the Dutch disease and the resource-curse argument. The effect of value-added processing and export diversification on development. Prerequisite: EBGN201. 3 lecture hours; 3 semester hours. Offered alternate years.

EBGN345. PRINCIPLES OF CORPORATE FINANCE. 3.0 Semester Hrs.
(II) Introduction to corporate finance, financial management, and financial markets. Time value of money and discounted cash flow valuation, risk and returns, interest rates, bond and stock valuation, capital budgeting and financing decisions. Introduction to financial engineering and financial risk management, derivatives, and hedging with derivatives. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.
EBGN360. INTRODUCTION TO ENTREPRENEURSHIP. 3.0 Semester Hrs.
(I) This course introduces students to the entrepreneurial process, focusing on the concepts, practices, and tools of the entrepreneurial world. This will be accomplished through a combination of readings, cases, speakers, and projects designed to convey the unique environment of entrepreneurship and new ventures. The mastery of concepts covered in this course will lead to an initial evaluation of new venture ideas. In this course students will interact with entrepreneurs, participate in class discussion, and be active participants in the teaching/learning process. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN361. BUSINESS PRINCIPLES FOR ENTREPRENEURS. 3.0 Semester Hrs.
(I) Students will be introduced to each of the functional areas of an entrepreneurial business, including marketing, accounting, finance, operations, human resources management, and business operations. The course is designed to help students appreciate the interrelationship of these business functions and, understand how they operate in an entrepreneurial start-up business. In this course students are expected to participate in class discussion, and be active participants in the teaching/learning process. The class will be highly interactive and your engaged participation and presence will be required. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

EBGN398. SPECIAL TOPICS IN ECONOMICS AND BUSINESS. 1-6 Semester Hr.
(I, II) Pilot course or special topics course. Topics chosen from special interests of instructor(s) and student(s). Usually the course is offered only once. Prerequisite: none. Variable credit; 1 to 6 credit hours. Repeatable for credit under different titles.

EBGN399. INDEPENDENT STUDY. 1-6 Semester Hr.
(I, II) Individual research or special problem projects supervised by a faculty member, also, when a student and instructor agree on a subject matter, content, and credit hours. Prerequisite: ?Independent Study? (I, II) form must be completed and submitted to the Registrar. Variable credit; 1 to 6 credit hours. Repeatable for credit.

EBGN401. ADVANCED TOPICS IN ECONOMICS. 3.0 Semester Hrs.
(I) Application of economic theory to microeconomic and macroeconomic problems. This course will involve both theoretical and empirical modeling. Specific topics will vary by semester depending on faculty and student interest. Topics may include general equilibrium modeling, computational economics, game theory, the economics of information, intertemporal allocations, economic growth, microfoundations of macroeconomic models and policy simulation. Prerequisites: EBGN301, EBGN302 and EBGN303. 3 hours lecture; 3 semester hours.

EBGN403. FIELD SESSION. 3.0 Semester Hrs.
Equivalent with EBGN402.
(S) (WI) An applied course for students majoring in economics. The field session may consist of either participation in a computer simulation or an independent research project under the supervision of a faculty member. In the computer simulation, students work as part of the senior executive team of a company and are responsible for developing and executing a strategy for their company with on-going decisions on everything from new product development, to marketing, to finance and accounting. Prerequisites: EBGN301, EBGN302, EBGN303. 3 semester hours.

EBGN404. ADVANCED TOPICS IN MICROECONOMICS. 3.0 Semester Hrs.
(I) Application of economic theory to microeconomic problems. This course will involve both theoretical and empirical modeling of consumers, producers and markets. Topics may include game theory, risk and uncertainty, the economics of information, intertemporal allocations and general equilibrium modeling. Prerequisites: EBGN301, EBGN302 and EBGN303. 3 hours lecture; 3 semester hours.

EBGN405. ADVANCED TOPICS IN MACROECONOMICS. 3.0 Semester Hrs.
(I) This course is a sequel to Intermediate Macroeconomics. The course will cover (i) modern economic growth theory and empirics; (ii) microfoundations and econometric estimation of macroeconomic relationships, such as consumption, gross fixed investment, inventory behavior and the sustainability of fiscal deficits; and (iii) multi-sectoral models of international trade and finance. Other topics may include real business cycle models, macroeconomic policy simulation, macroeconomic policy efficacy in globally integrated economies, foreign repercussions effects, empirical relationships between interest rates and exchange rates, and interactions between resource industries and the rest of the economy. Prerequisites: EBGN301, ENG302, EBGN303. 3 hours lecture; 3 semester hours.

EBGN409. MATHEMATICAL ECONOMICS. 3.0 Semester Hrs.
(II) Application of mathematical tools to economic problems. Coverage of mathematics needed to read published economic literature and to do graduate study in economics. Topics from differential and integral calculus, matrix algebra, differential equations, and dynamic programming. Applications are taken from mineral, energy, and environmental issues, requiring both analytical and computer solutions using programs such as GAMS and MATHEMATICA. Prerequisites: MATH213, EBGN301, EBGN302. 3 hours lecture; 3 semester hours.

EBGN430. ADVANCED ENERGY ECONOMICS. 3.0 Semester Hrs.
(II) (WI) Application of economic models to understand markets for oil, gas, coal, electricity, and renewable energy resources. Models, modeling techniques and applications include market structure, energy efficiency, demand-side management, energy policy and regulation. The emphasis in the course is on the development of appropriate models and their application to current issues in energy markets. Prerequisites: EBGN301, EBGN302, EBGN303. 3 hours lecture; 3 semester hours.

EBGN437. REGIONAL ECONOMICS. 3.0 Semester Hrs.
(II) (WI) Analysis of the spatial dimension of economies and economic decisions. Interregional capital and labor mobility. Location decisions of firms and households. Agglomeration economies. Models of regional economic growth. Measuring and forecasting economic impact and regional growth. Local and regional economic development policy. Urban and regional spatial structure. Emphasis on application of tools and techniques of regional analysis. Prerequisite: EBGN301 or EBGN302. 3 hours lecture; 3 semester hours.

EBGN441. INTERNATIONAL ECONOMICS. 3.0 Semester Hrs.
(II) (WI) Theories and determinants of international trade, including static and dynamic comparative advantage and the gains from trade. The history of arguments for and against free trade. The political economy of trade policy in both developing and developed countries. Prerequisite: EBGN301. 3 hours lecture; 3 semester hours.
EBGN443. PUBLIC ECONOMICS. 3.0 Semester Hrs.
(I) (WI) This course covers public-sector economics, including the fundamental institutions and relationships between the government and private decision makers. It covers the fundamental general equilibrium welfare theorems and their interaction with government policy instruments that affect efficiency and distribution. Normative topics include an intensive study of the causes and consequences of, and policy prescriptions for, market failure due to public goods, or other problems associated with externalities and income distribution. Positive analysis focuses on policy formation in the context of political- economy and public choice theories. Prerequisite: EBGN301. 3 hours lecture; 3 semester hours.

EBGN455. LINEAR PROGRAMMING. 3.0 Semester Hrs.
(I) This course addresses the formulation of linear programming models, examines linear programs in two dimensions, covers standard form and other basics essential to understanding the Simplex method, the Simplex method itself, duality theory, complementary slackness conditions, and sensitivity analysis. As time permits, multi-objective programming, an introduction to linear integer programming, and the interior point method are introduced. Applications of linear programming models discussed in this course include, but are not limited to, the areas of manufacturing, finance, energy, mining, transportation and logistics, and the military. Prerequisites: MATH332 or MATH348 or EBGN409. 3 hours lecture; 3 semester hours.

EBGN459. SUPPLY CHAIN MANAGEMENT. 3.0 Semester Hrs.
(II) As a quantitative managerial course, the course will explore how firms can better organize their operations so that they more effectively align their supply with the demand for their products and services. Supply Chain Management (SCM) is concerned with the efficient integration of suppliers, factories, warehouses and retail-stores (or other forms of distribution channels) so that products are provided to customers in the right quantity and at the right time. Topics include managing economies of scale for functional products, managing market- mediation costs for innovative products, make-to order versus make-to-stock systems, quick response strategies, risk pooling strategies, supply-chain contracts and revenue management. Additional "special topics" will also be introduced, such as reverse logistics issues in the supply-chain or contemporary operational and financial hedging strategies. Prerequisite: None. 3 hours lecture; 3 semester hours.

EBGN460. BUSINESS PLAN DEVELOPMENT. 3.0 Semester Hrs.
(II) This course leads students through the process of developing a detailed business plan for a start-up company. The creation of a business plan can be challenging, frustrating, fascinating and will lead to a more in-depth understand of how businesses start and operate. Most new ventures are started by teams, with complementary skills and experience sets. In this class, therefore, students will work in teams to develop and write a business plan. This class is also about identifying a new product or service with a viable market and potential to develop into a profitable enterprise by expanding the feasibility study work from EBGN360. This course is the hands-on work of developing a business plan, and as such is intense and demanding. Additionally, this course will integrate previous entrepreneurship, business and economics classes. In this course students are expected to participate in class discussion, and be active participants in the teaching/learning process. The class will be highly interactive and engaged participation and presence will be required. Prerequisites: EBGN360, EBGN361; 3 hours lecture; 3 semester hours.

EBGN461. STOCHASTIC MODELS IN MANAGEMENT SCIENCE. 3.0 Semester Hrs.
(II) As a quantitative managerial course, the course is an introduction to the use of probability models for analyzing risks and economic decisions and doing performance analysis for dynamic systems. The difficulties of making decisions under uncertainty are familiar to everyone. We will learn models that help us quantitatively analyze uncertainty and how to use related software packages for managerial decision-making and to do optimization under uncertainty. Illustrative examples will be drawn from many fields including marketing, finance, production, logistics and distribution, energy and mining. The main focus of the course is to see methodologies that help to quantify the dynamic relationships of sequences of "random" events that evolve over time. Prerequisite: None. 3 hours lecture; 3 semester hours.

EBGN470. ENVIRONMENTAL ECONOMICS. 3.0 Semester Hrs.
(II) (WI) This course considers the role of markets as they relate to the environment. Topics discussed include environmental policy and economic incentives, market and non-market approaches to pollution regulation, property rights and the environment, the use of benefit/cost analysis in environmental policy decisions, and methods for measuring environmental and nonmarket values. Prerequisite: EBGN301. 3 hours lecture; 3 semester hours.

EBGN474. INVENTING, PATENTING AND LICENSING. 3.0 Semester Hrs.
(S) (WI) This course provides an introduction to the legal framework of inventing and patenting and addresses practical issues facing inventors. The course examines patent law, inventing and patenting in the corporate environment, patent infringement and litigation, licensing, and the economic impact of patents. Methods and resources for market evaluation, searching prior art, documentation and disclosure of invention, and preparing patent applications are presented. Prerequisite: None. 3 hours lecture; 3 semester hours.

EBGN495. ECONOMIC FORECASTING. 3.0 Semester Hrs.
(II) An introduction to the methods employed in business and econometric forecasting. Topics include time series modeling, Box-Jenkins models, vector autoregression, cointegration, exponential smoothing and seasonal adjustments. Covers data collection methods, graphing, model building, model interpretation, and presentation of results. Topics include demand and sales forecasting, the use of anticipations data, leading indicators and scenario analysis, business cycle forecasting, GNP, stock market prices and commodity market prices. Includes discussion of links between economic forecasting and government policy. Prerequisites: EBGN301, EBGN302, EBGN303. 3 hours lecture; 3 semester hours.

EBGN497. SUMMER PROGRAMS. 6.0 Semester Hrs.
EBGN498. SPECIAL TOPICS IN ECONOMICS AND BUSINESS. 1-6 Semester Hr.
(I, II) Pilot course or special topics course. Topics chosen from special interests of instructor(s) and student(s). Usually the course is offered only once. Prerequisite: none. Variable credit; 1 to 6 credit hours. Repeatable for credit under different titles.

EBGN499. INDEPENDENT STUDY. 1-6 Semester Hr.
(I, II) Individual research or special problem projects supervised by a faculty member, also, when a student and instructor agree on a subject matter, content, and credit hours. Prerequisite: ?Independent Study? form must be completed and submitted to the Registrar. Variable credit; 1 to 6 credit hours. Repeatable for credit.