

Economics

1. Undergraduate Study

The department offers work for the degrees of bachelor of science with a major in agricultural business, bachelor of science with a major in business economics, and bachelor of science with a major in economics. The department also offers a minor in agricultural business and a minor in economics. In addition, the department participates in the interdepartmental programs in international agriculture and global resources systems offered by the College of Agriculture and Life Sciences, and the interdepartmental programs in international studies and women's studies offered by the College of Liberal Arts and Sciences. For further discussion of programs in agricultural business, see the statement below under College of Agriculture and Life Sciences. For programs in business economics, see the statement below under College of Business. For programs in economics, see the statement below under College of Liberal Arts and Sciences. Visit our web site at www.econ.iastate.edu.

Graduates of the Department of Economics have unique skills that distinguish them from other graduates. They have the ability to think and reason clearly, and can address complex issues using tools and decision making models of economics, mathematics, statistics, as well as concepts from the biological, physical, and social sciences. Graduates develop human relations skills that are essential in the work place and the community. They are able to communicate economic and business concepts to other professionals, collective organizations, governments, and the general public using a variety of means. Graduates understand the interaction of technology, human activity, and the environment. They are able to apply concepts associated with making "optimal" choices among economic alternatives. Graduates are prepared for graduate work in law, economics, and business, as well as the world of work, having learned tools of critical analysis and skills essential to getting and keeping meaningful employment.

1.1. College of Agriculture and Life Sciences

1.1.1. Major - Agricultural Business

The major in agricultural business prepares students for advanced studies and for careers in agricultural finance, management in agricultural supply and marketing industries, commodity merchandising and research, business research and management, farm and ranch operations, commercial farm management and appraisal, agricultural sales and marketing, agricultural reporting and public relations, agricultural extension, international activities, and government service. A major in agricultural business with a minor in economics is not permitted; however, a double major in agricultural business and economics is permitted.

Students majoring in Agricultural Business often choose elective coursework leading to minors in the College of Business or in the College of Agriculture and Life Sciences, or emphasizing specific areas within agricultural business such as finance, management, commodity analysis, research, agricultural sales and marketing, environmental economics, farm and ranch operations, international economics, agricultural extension, or government service.

The major in agricultural business requires a minimum of 120 credits and a 2.00 minimum GPA. Only 65 credits from a two-year institution may apply, which may include up to 16 technical credits. In addition, at most 9 P-NP credits of free electives can be applied toward the degree, and a minimum of 15 credits must be earned from courses taught by the Department of Economics at ISU.

The major in agricultural business requires:

International Perspective: 3 cr. from approved course list.

U.S. Diversity: 3 cr. from approved course list.

Communication/Library: 12.5 cr.

ENGL 150	Critical Thinking and Communication	3
ENGL 250	Written, Oral, Visual, and Electronic Composition	3
One of the following		3
ENGL 302	Business Communication	
ENGL 309	Report and Proposal Writing	
ENGL 314	Technical Communication	
One of the following		3
SP CM 212	Fundamentals of Public Speaking	

AGEDS 311	Presentation and Sales Strategies for Agricultural Audiences	
LIB 160	Information Literacy	1
A grade of C or better must be earned in two of the English composition courses (ENGL 150, ENGL 250, and (ENGL 302 or ENGL 309 or ENGL 314)) and the speech fundamentals course (SP CM 212 or AGEDS 311).		
Total Credits		13
Humanities and Social Sciences: 6 cr.		
ECON 102	Principles of Macroeconomics	3
Three credits from approved course list.		3
Ethics: 3 cr. from approved course list.		
Life Sciences: 6 cr.		
One of the following		3
BIOL 101	Introductory Biology	
BIOL 211	Principles of Biology I	
Three credits from approved course list.		3
Total Credits		6
Mathematics: 12-14 cr.		
One of the following		4
MATH 160	Survey of Calculus	
MATH 165	Calculus I	
One of the following		3-4
ECON 207	Applied Economic Optimization	
MATH 166	Calculus II	
STAT 226	Introduction to Business Statistics I	3
STAT 326	Introduction to Business Statistics II	3
Physical Sciences: 5 cr.		
CHEM 163 & 163L	College Chemistry and Laboratory in College Chemistry	5
Or		
PHYS 111	General Physics	5
Agricultural, Food, or Natural Resources Sciences: 6 cr. from approved course list.		
General Economics: 9-10 cr.		
ECON 101	Principles of Microeconomics	3
ECON 301	Intermediate Microeconomics	3-4
One of the following		3
ECON 302	Intermediate Macroeconomics	
ECON 353	Money, Banking, and Financial Institutions	
ECON 492	Graduating Senior Survey	R
Business and Agricultural Business: 28.5 cr.		
ACCT 284	Financial Accounting	3
FIN 301	Principles of Finance	3
Six credits from ACCT 285 or any 300-489 ACCT, FIN, MKT, MGMT, MIS, or SCM courses.		6
ECON 110	Orientation in Agricultural Business	0.5
ECON 235	Introduction to Agricultural Markets	3
ECON 292	Career Seminar	1
Nine credits of ECON courses from approved department list.		9
Three credits of 400-489 level ECON courses.		3
Electives: 32-35 cr.		
Agricultural business majors seeking a double major in economics must take a minimum of 42 credits in economics. These include all of the economics courses required for the economics major. To double major in economics, agricultural business majors must also earn an average grade of C or higher in ECON 101 Principles of Microeconomics, ECON 102 Principles of Macroeconomics, ECON 301 Intermediate Microeconomics, and ECON 302 Intermediate Macroeconomics, with no grade lower than a C#.		

1.1.2. Minor - Agricultural Business

The Department of Economics also offer a minor in Agricultural Business. Courses to be included in the minimum of 15 credits include the following:

ECON 101	Principles of Microeconomics	3
ECON 230	Farm Business Management	3
ECON 235	Introduction to Agricultural Markets	3
ECON 301	Intermediate Microeconomics	3-4
Three credits of ECON courses from approved department list.		3

1.2. College of Business

1.2.1. Major - Business Economics

The major in business economics provides a high-quality education with a balanced emphasis in both business and economics. Graduates from the business economics major possess a unique mix of analytical and applied business skills well-suited for employment in upper level management and public service positions. Graduates also have solid preparation for graduate studies in law, economics, and in Master of Business Administration (MBA) programs. A double major in business economics and agricultural business is not permitted; a double major in business economics and economics is not permitted, either. A major in business economics with a minor in economics is not permitted. For the undergraduate curriculum in business economics, see College of Business.

1.3. College of Liberal Arts and Sciences

1.3.1. Major - Economics

The major in economics prepares students for advanced studies, professional degrees such as law and business administration, and for careers in finance, business and economic research, management, insurance, brokerage, real estate, labor relations, international development, and government service. Candidates for the bachelor of science degree with a major in economics must fulfill requirements established by the College of Liberal Arts and Sciences. (For details of undergraduate curricula in liberal arts and sciences, see College of Liberal Arts and Sciences, Curriculum.)

Students majoring in economics are required to take following courses within the General Education Area of Natural Sciences and Mathematical Disciplines:

Choose one of the following:		8
MATH 165 & MATH 166	Calculus I and Calculus II	
MATH 165 & ECON 207	Calculus I and Applied Economic Optimization *	
MATH 160 & ECON 207	Survey of Calculus and Applied Economic Optimization *	
STAT 226	Introduction to Business Statistics I	3
STAT 326	Introduction to Business Statistics II	3

Students who plan to take postgraduate work in economics should take MATH 165 and MATH 166.

Students must complete the following courses in economics:

ECON 101	Principles of Microeconomics	3
ECON 102	Principles of Macroeconomics	3
ECON 301	Intermediate Microeconomics	3-4
ECON 302	Intermediate Macroeconomics	3
ECON 371	Introductory Econometrics	4
Three credits of ECON courses from approved department list.		3
Nine credits of 400-489 level ECON courses.		9

A minimum of 15 credits of economics coursework must be earned at Iowa State University. Economics majors must maintain a C average in ECON 101 Principles of Microeconomics, ECON 102 Principles of Macroeconomics, ECON 301 Intermediate Microeconomics, and ECON 302 Intermediate Macroeconomics, with no grade lower than a C#.

Communication Proficiency Requirement: The major in economics requires a grade of C or better in each of the following English courses:

ENGL 150	Critical Thinking and Communication	3
ENGL 250 or ENGL 250H	Written, Oral, Visual, and Electronic Composition	3
	Written, Oral, Visual, and Electronic Composition: Honors	

ENGL 302 or ENGL 314	Business Communication	3
	Technical Communication	

Optimal progress for an economics major would be to complete the principles sequence

ECON 101	Principles of Microeconomics	3
ECON 102	Principles of Macroeconomics	3

and one of the following sequences in the freshman year:

MATH 165 & MATH 166	Calculus I and Calculus II	4
MATH 165 & ECON 207	Calculus I and Applied Economic Optimization	
MATH 160 & ECON 207	Survey of Calculus and Applied Economic Optimization	

The freshman-year sequences should be followed in the sophomore year by the intermediate theory sequence.

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ECON 301 & ECON 302	Intermediate Microeconomics and Intermediate Macroeconomics	3-4
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STAT 226 Introduction to Business Statistics I and STAT 326 Introduction to Business Statistics II are recommended in the sophomore year.

1.3.2. Minor - Economics

Courses to be included in the minimum of 15 credits are:

ECON 101	Principles of Microeconomics	3
ECON 102	Principles of Macroeconomics	3
ECON 301	Intermediate Microeconomics	3-4
Six credits of ECON courses from approved department list.		6

1.4. Learner Outcome Goals

In general, our goal is that all Department of Economics graduates at Iowa State are able to use economic reasoning to think critically; to make decisions and to communicate effectively; to be ethical; to respect the environment, and to be multi-culturally and internationally aware.

Specifically, with respect to:

1. Critical Thinking, all graduates of the Department of Economics are able to:

- distinguish factual statements from opinions or value judgements
- use scientific methods to analyze and interpret data
- distinguish causal relationships from correlations
- determine the accuracy of statements
- understand the usefulness of abstractions and models
- distinguish simplifying and critical assumptions from unnecessary details
- objectively critique competing viewpoints to make reasoned judgements

2. Economic Reasoning:

- distinguish positive (what is) and normative (what should be) economics
- determine the opportunity cost of alternatives
- apply the concepts of comparative advantage, specialization, and exchange to analyze resource allocation issues
- identify the conditions under which markets allocate resources efficiently or markets fail
- apply marginal economic analysis to solve problems
- conduct comparative static analyses
- pose and test hypotheses

3. Decision Making/Problem Solving:

- work effectively alone and in teams to solve problems
- use scientific methods to identify optimal choices among economic alternatives
- identify decision-makers, objectives, choice variables, incentives, and constraints
- identify and apply the solution technique best suited for the specific problem

- e) understand how conclusions depend on assumptions
 - f) obtain information by accessing electronic or traditional media, listening, or by observation
 - g) use computer and statistical methods to organize and analyze data
4. Communications:
- a) communicate economic and business concepts to professionals, organizations, governments, and the general public
 - b) summarize research activities and analysis clearly and succinctly, and document sources and methods
 - c) write clearly and effectively
 - d) speak clearly and persuasively
 - e) prepare and present visual information effectively
5. Ethics:
- a) develop ethical perspectives and sense of moral responsibility and values
 - b) discuss contemporary ethical and moral issues in professional and private life
 - c) critically evaluate their own arguments and those of others
6. Environment Awareness:
- a) understand the physical and biological properties of the environment and ecological systems
 - b) understand how economic activity, such as business or agriculture, impacts the environment
7. International/Multi-Cultural Awareness:
- a) understand cultural diversity within our own nation and around the world
 - b) know the different economic or agricultural systems in other countries
 - c) have human relation skills essential in the work place and the community

2. Graduate Study

The department offers work toward the degrees master of science and doctor of philosophy with majors in economics and agricultural economics. The department also offers minors to students with majors in other departments. Visit our web site at www.econ.iastate.edu.

Students do not need to have an undergraduate major in economics or agricultural economics in order to qualify for graduate work in the department. However, students must have completed undergraduate coursework in macroeconomics, microeconomics, statistics, calculus, and matrix algebra. Some background in Math courses emphasizing logic and proofs is preferred, particularly for the Ph.D.

Candidates for the degree master of science (thesis option) are required to complete satisfactorily 30 credits of acceptable graduate work, including preparation of a thesis.

Candidates for the degree master of science (non-thesis option) may fulfill requirements by satisfactorily completing 32 credits of coursework, including preparation of a creative component.

Programs of study for the doctorate are organized by each student in consultation with the major professor and the individual's committee. Subject to staffing constraints, the department offers coursework to support the following fields of concentration: applied econometrics, agricultural economics, financial economics, industrial organization, international economics, human resources, macroeconomics, and environmental and resource economics. Each student must complete advanced courses in microeconomic and macroeconomic theory, quantitative methods and econometrics, and two fields from the list above. Students must demonstrate competence in theory by passing qualifying examinations. Students must also participate in workshops.

The department cooperates in the interdepartmental graduate majors in transportation and sustainable agriculture, and the interdepartmental minor in gerontology.

Courses primarily for undergraduates:

ECON 101. Principles of Microeconomics.

(3-0) Cr. 3.

Resource allocation, opportunity cost, comparative and absolute advantage. Supply and demand. Marginal analysis. Theories of production and consumption, pricing, and the market system. Perfect and imperfect competition and strategic behavior. Factor markets. Present discounted value.

ECON 101H. Principles of Microeconomics: Honors.

(3-0) Cr. 3. *Prereq: Honors program students only*

Resource allocation, opportunity cost, comparative and absolute advantage. Supply and demand. Marginal analysis. Theories of production and consumption, pricing, and the market system. Perfect and imperfect competition and strategic behavior. Factor markets. Present discounted value.

ECON 101L. Laboratory in Principles of Microeconomics.

(0-2) Cr. 1. *Prereq: Concurrent enrollment in the appropriate section of ECON 101*

Discussion of material typically covered in Econ 101. Application of economic principles to real world problems. Economic principles and basic business management concepts applied to decision-making in agribusiness operations.

ECON 102. Principles of Macroeconomics.

(3-0) Cr. 3. *Prereq: ECON 101 recommended*

Measurement of macro variables and general macro identities. Classical models of full employment. Production and growth. Savings and investment. Employment and unemployment. Money, inflation, and price levels. Operation of the U.S. banking system. Fiscal and monetary policy. Elements of international finance.

ECON 102H. Principles of Macroeconomics: Honors.

(3-0) Cr. 3. *Prereq: ECON 101 recommended; admission to the Honors program.*

Measurement of macro variables and general macro identities. Classical models of full employment. Production and growth. Savings and investment. Employment and unemployment. Money, inflation, and price levels. Operation of the U.S. banking system. Fiscal and monetary policy. Elements of international finance.

ECON 110. Orientation in Agricultural Business.

(1-0) Cr. 0.5.

Orientation course for freshman and new transfer students in agricultural business. Offered on a satisfactory-fail basis only.

ECON 207. Applied Economic Optimization.

(2-2) Cr. 3. *Prereq: MATH 151, MATH 160, MATH 165 or equivalent*

Application of linear algebra, calculus and unconstrained and constrained optimization techniques to economic problems. Learning outcomes include the ability to (i) identify the objective, decision variables and constraints in economic decision problems, (ii) represent elements of an economic problem in simple mathematical models, (iii) identify and apply mathematical tools that can be used to solve the problems, (iv) identify the strengths and limitations of the solution method, and (v) interpret the economic meaning and implications of the solution.

ECON 230. Farm Business Management.

(2-2) Cr. 3. *Prereq: ECON 101; ACCT 284*

Business and economic principles applied to decision making and problem solving in the management of a farm business. Cash flow, partial, enterprise, and whole farm budgeting. Information systems for farm accounting, analysis, and control. Obtaining and managing land, capital, and labor resources. Alternatives for farm business organization and risk management.

ECON 234. Small Business Management.

(3-0) Cr. 3. *Prereq: ECON 101*

An introduction to small business management, entrepreneurship, and economics utilizing a series of case studies. Exploration of issues related to starting or acquiring a new business and development of knowledge and skills for successful management of a small business, with an emphasis on agricultural business.

ECON 235. Introduction to Agricultural Markets.

(3-0) Cr. 3. *Prereq: ECON 101*

Basic concepts and economics principles related to markets for agricultural inputs and products. Overview of current marketing problems faced by farms and agribusinesses, farm and retail price behavior, structure of markets, food marketing channels, food quality and food safety, and the role of agriculture in the general economy. The implications of consumer preferences at the farm level. Introduction to hedging, futures, and other risk management tools.

ECON 292. Career Seminar.

(1-0) Cr. 1. *Prereq: Classification in economics or agricultural business*

Career opportunities in the various industries and government institutions. Required training and skills needed to perform successfully in different types of careers. Factors important in finding and obtaining employment either before or after graduation including personal resumes, interviewing, and letter writing.

ECON 297. Internship.

Cr. 2. Repeatable, maximum of 4 credits. *Prereq: Permission of instructor and classification in agricultural business or economics*

Students complete a research report, based on their internship or approved work experience, that examines chosen topics in management, marketing or finance. Offered on a satisfactory-fail basis only.

ECON 298. Cooperative Education.

Cr. R. Prereq: *Permission of the department cooperative education coordinator; sophomore classification*

Required of all cooperative education students. Students must register for this course prior to commencing each work period.

ECON 301. Intermediate Microeconomics.

(3-0) Cr. 3-4. Prereq: *ECON 101; ECON 207 or MATH 166*

Theory of consumer and business behavior; optimal consumption choices and demand; theory of firm behavior; costs, production, and supply; competitive and imperfectly competitive markets; theory of demand for and supply of factors of production; general equilibrium analysis. Recitation required for 4 credits. Nonmajor graduate credit.

ECON 301H. Intermediate Microeconomics: Honors.

(3-0) Cr. 3-4. Prereq: *ECON 101; ECON 207 or MATH 166*

Theory of consumer and business behavior; optimal consumption choices and demand; theory of firm behavior; costs, production, and supply; competitive and imperfectly competitive markets; theory of demand for and supply of factors of production; general equilibrium analysis. Recitation required for 4 credits. Nonmajor graduate credit.

ECON 302. Intermediate Macroeconomics.

(3-0) Cr. 3. Prereq: *ECON 101, ECON 102; MATH 160 or MATH 165*

Theory of income, employment, interest rates, and the price level; fiscal and monetary policy; budget and trade deficits; money and capital inflows, interest rates, and inflation. Nonmajor graduate credit.

ECON 302H. Intermediate Macroeconomics: Honors.

(3-0) Cr. 3. Prereq: *ECON 101, ECON 102; MATH 160 or MATH 165*

Theory of income, employment, interest rates, and the price level; fiscal and monetary policy; budget and trade deficits; money and capital inflows, interest rates, and inflation. Nonmajor graduate credit.

ECON 308. Agent-Based Computational Economics.

(3-0) Cr. 3. Prereq: *ECON 101*

Computational study of economies as evolving systems of autonomous interacting agents. Key ideas from game theory and complex adaptive systems theory for modeling the adaptation, learning, and co-evolution of economic agents in decentralized market economies. Evolution of behavioral norms and interaction networks. Building agent-based computational laboratories for the experimental study of market protocols and agent learning processes. Illustrative economic applications (e.g., financial markets, labor markets, agricultural markets, electricity markets, auction markets, automated Internet markets, collective usage of common-pool resources). Nonmajor graduate credit.

ECON 312. History of Economic Thought.

(3-0) Cr. 3. Prereq: *ECON 101*

The logic and explanatory value of received economic doctrines since the middle of the eighteenth century. The reflection of past economic doctrines in contemporary theory and policy. Discussion of major works by Smith, Ricardo, Mill, Marx, Marshall, Walras, Wicksell, and Keynes.

ECON 313. Economics of Sports.

(3-0) Cr. 3. Prereq: *ECON 101*

Application of economics to issues in sports, including franchising; rival leagues and barriers to entry; cooperative, competitive, and collusive behavior; player productivity and compensation; contracts, unions, and discrimination; antitrust, taxation, and subsidies. Economic concepts include supply and demand, labor economics, pricing, public finance, production, game theory, and industrial organization. Nonmajor graduate credit.

ECON 320. Labor Economics.

(3-0) Cr. 3. Prereq: *ECON 101*

Economic analysis of contemporary domestic and international labor market issues including labor supply and demand, unemployment, and employment in the U.S. and elsewhere; investments in and returns to education, training, health, immigration and migration; income inequality; labor productivity; out-sourcing and global competitiveness; work incentives; compensation including benefits; and labor policies such as minimum wages, over-time pay, discrimination, unions, and immigration. Examples drawn from the U.S. and other developed countries with reference to developing countries where relevant. Nonmajor graduate credit.

ECON 321. Economics of Discrimination.

(Cross-listed with W S). (3-0) Cr. 3. Prereq: *ECON 101*

Economic theories of discrimination. Analysis of the economic problems of women and minorities in such areas as earnings, occupations, and unemployment. Public policy concerning discrimination. Poverty measurement and antipoverty programs in the U.S. Nonmajor graduate credit. Meets U.S. Diversity Requirement

ECON 325. Biorenewable Systems.

(Cross-listed with A E, AGRON, AN S, BSE, BUSAD, TSM). (3-0) Cr. 3. F. Prereq: *ECON 101, CHEM 163 or higher, MATH 140 or higher*

Converting biorenewable resources into bioenergy and biobased products. Biorenewable concepts as they relate to drivers of change, feedstock production, processes, products, co-products, economics, and transportation/logistics.

ECON 332. Cooperatives.

(3-0) Cr. 3. Prereq: *ECON 101*

Survey of cooperative activities with emphasis on agricultural cooperatives, types of cooperatives, methods of organization and operation, principles, legal and tax aspects, cooperative finance, economic possibilities, and limitations of cooperation. Students will learn how to work together in teams to solve problems while role playing directors of cooperative boards. Nonmajor graduate credit.

ECON 333. Advanced Farm Business Management.

(3-2) Cr. 3-4. Prereq: *ECON 230*

Effective use of strategic planning, decision methods, and computer assistance for solving farm problems. Applications of economic and management theory to analyze farm business decisions using efficiency measures to assess current resource use and direct the farm business analysis, planning, and tax process. Computers as aids in the decision process. Three credits available only to students enrolled in AgPAQ. Laboratory required for 4 credits. Nonmajor graduate credit.

ECON 334. Entrepreneurship in Agriculture.

(3-0) Cr. 3. Prereq: *ECON 101*

Introduction to the process of entrepreneurship within the agricultural and food sectors. Emphasis on opportunity recognition and assessment, resource acquisition and feasibility analysis for both private and social enterprises. Students will develop a comprehensive feasibility study for a new business or non-profit organization.

ECON 336. Agricultural Selling.

(3-0) Cr. 3. Prereq: *ECON 101*

Principles of selling with application to agricultural and food related businesses. Attitudes, value systems, and behavioral patterns that relate to agricultural sales. Electronic marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Analysis of the buying or purchasing process. Evaluation of agri-selling as a possible career choice.

ECON 337. Agricultural Marketing.

(2-2) Cr. 3. Prereq: *ECON 101 required, ECON 235 recommended*

Understanding of agricultural commodity markets for grain, livestock and dairy with emphasis on marketing decisions and risk management for farmers and processors. Lab will provide hands-on applications of marketing and management tools via market simulations. Nonmajor graduate credit.

ECON 344. Public Finance.

(3-0) Cr. 3. Prereq: *ECON 101*

The economic role of governments in market economies. Public goods, externalities, income distribution, and income maintenance programs. The effect of taxes on economic behavior, descriptions of the structure of the principal U.S. taxes, and current reform proposals. Nonmajor graduate credit.

ECON 353. Money, Banking, and Financial Institutions.

(3-0) Cr. 3. Prereq: *ECON 101, ECON 102*

Theoretical and applied analysis of money, banking, and financial markets; interest rates and portfolio choice; the banking industry in transition; the money supply process; the Federal Reserve System and the conduct of monetary policy; macro implications of monetary policy; international finance.

ECON 355. International Trade and Finance.

(3-0) Cr. 3. Prereq: *ECON 101, ECON 102*

Explanations of causes of international trade and the impact of trade on welfare and employment patterns. Analysis of government policies towards trade, such as tariffs, quotas, and free trade areas. Theory of balance of payments and exchange rate determination, and the role of government policies. Examination of alternative international monetary arrangements. Nonmajor graduate credit. Meets International Perspectives Requirement.

ECON 362. Applied Ethics in Agriculture.

(Cross-listed with SOC). (3-0) Cr. 3. Prereq: *ECON 101 or SOC 130 or SOC 134, junior or senior status in the College of Agriculture*

Identify major ethical issues and dilemmas in the conduct of agricultural and agribusiness management and decision making. Discuss and debate proper ethical behavior in these issues and situations and the relationship between business and personal ethical behavior.

ECON 364. Rural Property Appraisal.(3-0) Cr. 3. *Prereq: ECON 101*

Use of income capitalization, sales comparison and cost appraisal concepts in appraising agricultural resources. Application of underlying economic/business/management principles, especially present value, as they relate to farmland appraisal. Determination and estimation of economic impacts of special consideration and property use factors. Evaluate feasibility and profitability of investment in rural property. Nonmajor graduate credit.

ECON 370. Comparative Capitalism and Economic Transitions.(3-0) Cr. 3. *Prereq: ECON 101, ECON 102*

Theories of capitalism and the economics of transition from a planned to a market economy; the role and the creation of economic institutions supporting different economic systems. An examination of recent experiences of Eastern European countries, the former Soviet Union, China, the European Union, and the United States.

Meets International Perspectives Requirement.

ECON 371. Introductory Econometrics.(4-0) Cr. 4. *Prereq: ECON 301, ECON 302 OR ECON 353, STAT 326*

Introduction to the models and methods used to estimate relationships and test hypotheses pertaining to economic variables. Among the topics covered in the course are: Single and multiple regression analysis; functional forms; omitted variable analysis; multicollinearity; heteroskedasticity; autocorrelation; simultaneous equations; and dynamic models. Nonmajor graduate credit.

ECON 376. Rural, Urban and Regional Economics.(Cross-listed with C R P). (3-0) Cr. 3. *Prereq: ECON 101*

Firm location with respect to regional resources, transport, scale economies, externalities, and policies. Measures of local comparative advantage and specialization. Spatial markets. Population location considering jobs, wages, commuting, and local amenities. Business, residential, and farm land use and value. Migration. Other topics may include market failure, regulation, the product cycle, theories of rural and urban development, developmental policy, firm recruiting, local public goods and public finance, schools, poverty, segregation, and crime. Nonmajor graduate credit.

ECON 378. Retirement Planning and Employee Benefits.(Cross-listed with HD FS, GERON). (3-0) Cr. 3. S. *Prereq: 3 credits in Principles of Economics and 3 credits in Human Development and Family Studies*

Economic well-being in the context of demographic change, the present and future of Social Security, family retirement needs analysis, investment strategies and characteristics of retirement plans, helping others to work towards financial security, family economic issues for retired persons. Overview of employee and retirement benefits.

Meets U.S. Diversity Requirement

ECON 380. Environmental and Resource Economics.(Cross-listed with ENV S). (3-0) Cr. 3. *Prereq: ECON 101*

Natural resource availability, use, conservation, and government policy, including energy issues. Environmental quality and pollution control policies.

ECON 385. Economic Development.(Cross-listed with GLOBE). (3-0) Cr. 3. *Prereq: ECON 101, ECON 102*

Current problems of developing countries, theories of economic development, agriculture, and economic development, measurement and prediction of economic performance of developing countries, alternative policies and reforms required for satisfying basic needs of Third World countries, interrelationships between industrialized countries and the developing countries, including foreign aid. Nonmajor graduate credit.

Meets International Perspectives Requirement.

ECON 387. Economies of China and India.(3-0) Cr. 3. *Prereq: ECON 101*

The economic development of China and India within the larger historical, political, and socioeconomic contexts. The characteristics of the development paths of major industries. The drivers of and impediments for future economic development. The two economies' connections with the world economy. Nonmajor graduate credit. Meets International Perspectives Requirement

Meets International Perspectives Requirement.

ECON 398. Cooperative Education.

Cr. R. *Prereq: Permission of the department cooperative education coordinator; junior classification*

Required of all cooperative education students. Students must register for this course prior to commencing each work period.

ECON 401. Topics in Microeconomics.(3-0) Cr. 3. *Prereq: ECON 301, STAT 226*

Advanced treatment of selected topics from one or more of the following areas: household production models, factor markets, game theory and imperfect competition, general equilibrium, intertemporal choice, asset markets, income distribution, externalities and public goods, etc. Nonmajor graduate credit.

ECON 402. Topics in Macroeconomics.(3-0) Cr. 3. *Prereq: ECON 301, ECON 302, STAT 226*

Advanced treatment of selected topics from one or more of the following areas: business cycle theory, growth theory, fiscal and monetary policy, coordination issues, open economy macroeconomics, and financial economics. Nonmajor graduate credit.

ECON 416. Industrial Organization.(3-0) Cr. 3. *Prereq: ECON 301*

Study of the structure of firms and markets and of their interaction, with emphasis on imperfectly competitive markets. Behavior of firms in strategic settings and insights of basic game-theoretic models. Welfare implications of alternative market organizations, consequences of market power, and scope for government regulation and antitrust/competition policies. Topics include monopoly and price discrimination, oligopoly models, product quality, product differentiation, vertical integration, information and advertising, patents, R&D and innovation, and regulation. Nonmajor graduate credit.

ECON 418. Introduction to Game Theory.(3-0) Cr. 3. *Prereq: ECON 301*

Systematic introduction to game theory and its uses in economics. Develops the basic framework, models and tools necessary to analyze games of strategy, including: Strategic and extensive-form representations of games; best response functions and Nash equilibrium, mixed strategies backward induction and subgame-perfect equilibrium, imperfect and incomplete information, Bayesian and sequential equilibria. Examples and applications taken from economics, business, political science, law and biology. Nonmajor graduate credit.

ECON 431. Managerial Economics.(3-0) Cr. 3. *Prereq: ECON 301*

Theory of the firm; organizational incentives and efficiency; moral hazard; role of information and decision making under uncertainty; ownership and control; business investment. Nonmajor graduate credit.

ECON 437. Commodity Marketing and Risk Management.(3-0) Cr. 3. *Prereq: ECON 235, ECON 301, STAT 326*

The purpose and performance of commodity markets. How commodity marketing institutions function. Merchandising arrangements. Distinguishing features of agricultural commodities. Hedging, arbitrage, and speculation in commodity spot, forward, futures, and options markets. Valuation theory. Nonmajor graduate credit.

ECON 455. International Trade.(3-0) Cr. 3. *Prereq: ECON 301*

Rigorous treatment of theories of international trade and international factor movements. Examination of the impact of trade and labor migration on domestic and world welfare and on the distribution of income. Theoretical analysis of government policies towards trade and factor movements, including quotas, tariffs, free trade areas and immigration restrictions. Discussion of contemporary issues and controversies concerning globalization, including multinational firms and labor migration. Nonmajor graduate credit.

Meets International Perspectives Requirement.

ECON 457. International Finance.(3-0) Cr. 3. *Prereq: ECON 302*

National income accounting and balance of payments; foreign exchange rates and exchange rate markets; money, interest rates, and exchange rate determination; prices, exchange rates, and output in the short run; international monetary arrangements; fixed versus flexible exchange rates; optimal currency areas; international capital flows; currency and financial crises in emerging markets. Nonmajor graduate credit.

Meets International Perspectives Requirement.

ECON 458. Economic Systems for Electric Power Planning.(Cross-listed with E E). (3-0) Cr. 3. *Prereq: E E 303 or ECON 301*

Evolution of electric power industry. Power system operation and planning and related information systems. Linear and integer optimization methods. Short-term electricity markets and locational marginal prices. Risk management and financial derivatives. Basics of public good economics. Cost recovery models including tax treatment for transmission investments. Nonmajor graduate credit.

ECON 460. Agricultural, Food, and Trade Policy.

(Dual-listed with ECON 560). (3-0) Cr. 3. *Prereq: ECON 301 or ECON 501*
Description and analysis of economic problems of U.S. agriculture. Explanation and economic analysis of government policies and programs to develop agriculture, conserve agricultural resources, address consumer food concerns, stabilize farm prices, and raise farm incomes. The influence of macropolicy, world economy, international trade, and bioenergy on U.S. agriculture. Nonmajor graduate credit.

ECON 466. Agricultural Finance.

(3-0) Cr. 3. *Prereq: ECON 301, STAT 226, FIN 301 and ECON 353 (recommended)*

Financial analysis of agricultural businesses; liquidity, capital structure, and growth and risk of agricultural firms; capital budgeting methods; analysis of land investments, leasing, and costs of credit; financial intermediation and major financial institutions for agriculture; borrower-lender relationships, and asset-liability management techniques by financial intermediaries; public policies affecting agricultural credit markets. Nonmajor graduate credit.

ECON 480. Intermediate Environmental and Resource Economics.

(Dual-listed with ECON 580). (3-0) Cr. 3. *Prereq: ECON 301 or ECON 501*
Theories of natural resource utilization and allocation. Externalities, public goods, and environmental quality. Renewable energy, biofuels, land use change and life cycle analysis of carbon, and sustainability and resource conservation. Methodologies for analyzing natural resource and environmental problems and evaluating resource policies. Nonmajor graduate credit.

ECON 490. Independent Study.

Cr. 1-5. Repeatable, maximum of 6 credits. *Prereq: Junior or senior classification, 14 credits in economics*
Offered on a satisfactory-fail basis only. No more than 9 credits of Econ 490 may be used toward graduation

ECON 490E. Independent Study: Entrepreneurship.

Cr. 1-5. Repeatable, maximum of 6 credits. *Prereq: Junior or senior classification, 14 credits in economics*
Offered on a satisfactory-fail basis only. No more than 9 credits of Econ 490 may be used toward graduation

ECON 490H. Independent Study: Honors.

Cr. 1-5. Repeatable, maximum of 6 credits. *Prereq: Junior or senior classification, 14 credits in economics*
Offered on a satisfactory-fail basis only. No more than 9 credits of Econ 490 may be used toward graduation

ECON 492. Graduating Senior Survey.

Cr. R. *Prereq: Graduating senior*
Final preparations for graduation. The final stages of job searching, interviewing, letter writing, and resume preparation. Outcomes assessment information from graduating seniors including opinion surveys, instructor/advisor/course evaluations, exit interviews, student accomplishment surveys, job placement surveys, and comprehensive skills examinations. Departmental recognition of graduating seniors. Life as an alumnus - expectations and obligations. Convocation and commencement information. Offered on a satisfactory-fail basis only.

ECON 496. Economics International Travel Course.

Cr. 1-3. Repeatable, maximum of 6 credits. *Prereq: Sophomore status; permission of instructor.*
Tour and study of international agricultural and/or nonagricultural economies, markets, and institutions. Locations and duration of tours will vary. Limited enrollment. Meets International Perspectives Requirement.
Meets International Perspectives Requirement.

ECON 498. Cooperative Education.

Cr. R. *Prereq: Permission of the department cooperative education coordinator; senior classification*
Required of all cooperative education students. Students must register for this course prior to commencing each work period.

Courses primarily for graduate students, open to qualified undergraduates:**ECON 500. Quantitative Methods in Economic Analysis I.**

(4-0) Cr. 4. *Prereq: ECON 301, 1 year of calculus, STAT 401, and permission of Director of Graduate Education*
Economic applications of selected mathematical and statistical concepts: linear models and matrix algebra; differential calculus and optimization; integral calculus and economic dynamics; probability distributions, estimation, and hypothesis testing in the analysis of economic data.

ECON 501. Microeconomics.

(4-0) Cr. 4. *Prereq: ECON 301, credit or enrollment in ECON 500 or equivalent background in calculus and statistics*
The theory of the consumer, theory of the firm, perfect and imperfect competition, welfare economics, and selected topics in general equilibrium and uncertainty.

ECON 502. Macroeconomics.

(4-0) Cr. 4. *Prereq: ECON 302, credit or enrollment in ECON 500 or equivalent background in calculus and statistics*
Models of aggregate supply and demand, theories of consumption and investment, money supply and demand, inflation, rational expectations, stabilization policy, financial markets, and international finance.

ECON 509. Applied Numerical Methods in Economics.

(2-2) Cr. 3. *Prereq: ECON 500, ECON 501; or ECON 600, ECON 601*
Use of numerical techniques to solve economic problems. Numerical differentiation and integration numeric solutions of systems of equations, static and dynamic optimization problems including unconstrained optimization, maximum likelihood methods, general nonlinear programming methods, dynamic programming and optimal control, numerical methods for solving functional equations.

ECON 510. Experimental Economics.

(3-0) Cr. 3. *Prereq: ECON 501 or ECON 601*
Introduction to experimental economics and major subject areas addressed by laboratory and field experiments. Exploration of experimental methods by concentrating on series of experiments. Applications include individual decision-making, behavioral game theory, markets, behavioral labor, public and development economics, social network, and neuroeconomics. Research project. Nonmajor graduate credit.

ECON 520. Labor Supply and Human Capital Formation.

(3-0) Cr. 3. *Prereq: ECON 501 or ECON 601*
Labor supply decisions and empirical analysis for agricultural operators and other self-employed and wage-earning households; multiple job holding; resource allocation in productive households; human capital formation by households, firms, and public institutions, which includes schooling, on-the-job training, migration, health, research, raising of children, and implications for household income and welfare; applications to problems in rural areas of developing and developed countries.

ECON 521. Labor Markets.

(3-0) Cr. 3. *Prereq: ECON 501 or ECON 601*
Analysis of labor demand and market determination of wages and employment; analysis of distortions in labor markets due to non-competitive forces, legislation, and discrimination; wage inequality, compensation and work incentives; compensating differentials; microeconomic analysis of unemployment and job search.

ECON 530. Advanced Farm Management.

(2-0) Cr. 2. *Prereq: 6 credits in economics*
Offered off campus as demand warrants. Risk management principles applied to agriculture. Sources of risk and uncertainty. Attitudes toward risk. Techniques for analyzing and controlling production, marketing, financial, legal and human risk. Designed for master of agriculture program only.

ECON 532. Managerial Economics for the Global Organization.

(3-0) Cr. 3. *Prereq: ECON 101 and enrollment in MBA or BAS program; not for economics majors*
Applications of microeconomic theory and decision analysis for firms operating in U.S. and internationally. Topics include demand & supply, consumer choice theory, production and cost theory, short run and long run business decisions, input cost and human capital differences across countries, empirical estimation of demand and supply, pricing, exchange rates, government and business, market structures and strategy.

ECON 533. Economic and Business Decision Tools.

(Cross-listed with BUSAD). (3-0) Cr. 3. *Prereq: ECON 501 or ECON 532*
Team taught by faculty in the Department of Economics and the College of Business, this course focuses on applied economic and business tools for decision making. The topics include: Monte Carlo analysis with applications to option pricing and insurance mechanism design, portfolio analysis using existing standard spreadsheet software and add-ons, dynamic programming tools for inventory management and sequential decisions, discrete choice modeling and statistical bootstrapping, and financial performance evaluation using commercially available software.

ECON 535. Applied Agricultural Marketing.(2-0) Cr. 2. *Prereq: 6 credits in economics*

Off campus. Offered as demand warrants. Market structure and performance in the food and agricultural sector. Vertical coordination systems and pricing systems in agriculture. Market information and price forecasting. Alternative marketing methods and strategies for major Iowa agricultural commodities including the use of futures and options markets. Designed for master of agriculture program only.

ECON 537. Commodity Markets: Analysis and Strategy.(3-0) Cr. 3. *Prereq: ECON 501 or ECON 532 or ECON 601, ECON 571 or STAT 326*

Analysis of exchange-traded and over-the-counter commodity markets, their functions and performance. Evaluation of hedging, speculation, and arbitrage strategies. Commodity transformation over space and time. Valuation of derivatives and comparison with derivatives on financial assets. Efficiency and the role of information in commodity markets. Market regulation.

ECON 545. Public Economics.(3-0) Cr. 3. *Prereq: ECON 501 or ECON 601*

Optimal taxation; excess burden; partial and general equilibrium analysis of tax incidence; social insurance; effects of taxation on labor supply and savings; economics of the health sector.

ECON 553. Applied Research in Monetary and Macroeconomics.(3-0) Cr. 3. *Prereq: ECON 502, ECON 571*

Application of economic theory to the analysis of contemporary issues in macroeconomics, monetary economics, and financial economics.

ECON 555. Issues in International Economics.(3-0) Cr. 3. *Prereq: ECON 501, ECON 502*

Theories of international trade and finance. Emphasis on current policy issues in international economics.

ECON 560. Agricultural, Food, and Trade Policy.(Dual-listed with ECON 460). (3-0) Cr. 3. *Prereq: ECON 301 or ECON 501*

Description and analysis of economic problems of U.S. agriculture. Explanation and economic analysis of government policies and programs to develop agriculture, conserve agricultural resources, address consumer food concerns, stabilize farm prices, and raise farm incomes. The influence of macroeconomic policy, world economy, international trade, and bioenergy on U.S. agriculture.

ECON 563. Issues in Government Policy Affecting Agriculture.(2-0) Cr. 2. *Prereq: ECON 101*

Off campus. Offered as demand warrants. Government policy and the policy-making process as it affects food, agriculture, and trade. Description and analysis of government policies and programs designed to address production agriculture problems and consumer food concerns. Evaluation of the interaction of agriculture and world trade as affected by U.S. and foreign government policies. Designed for master of agriculture program only.

ECON 571. Intermediate Econometrics.(3-0) Cr. 3. *Prereq: ECON 500*

Single and multiple equation regression models; dummy explanatory variables; serial correlation; heteroskedasticity; distributed lags; qualitative dependent variables; simultaneity. Use of econometric models for tests of economic theories and forecasting.

ECON 576. Spatial Economics.(3-0) Cr. 3. *Prereq: ECON 501 or ECON 601*

Analysis of location choice by firms, employees, and households emphasizing the role of spatial variations in agglomeration economies, economies of scale, distance, transport, endowments, amenities, and local government. Models of land use, urban form, spatial competition, central place theory, and migration. Techniques of discrete choice analysis, statistical analysis of categorical data, urban system modeling, and interregional computable general equilibrium.

ECON 580. Intermediate Environmental and Resource Economics.(Dual-listed with ECON 480). (3-0) Cr. 3. *Prereq: ECON 301 or ECON 501*

Theories of natural resource utilization and allocation. Externalities, public goods, and environmental quality. Renewable energy, biofuels, land use change and life cycle analysis of carbon, and sustainability and resource conservation. Methodologies for analyzing natural resource and environmental problems and evaluating resource policies.

ECON 581. Advanced Environmental Economics.(3-0) Cr. 3. *Prereq: ECON 501 or ECON 601*

Interrelationships of natural resource use and the environment. Applied welfare and benefit-cost analyses. Externalities and pollution abatement. Nonmarket valuation of resources. Property rights. Legal and social constraints. Policy approaches.

ECON 590. Special Topics.

Cr. 1-5. Repeatable.

Offered on a satisfactory-fail basis only.

ECON 599. Creative Component.

Cr. 1-5.

Offered on a satisfactory-fail basis only.

Courses for graduate students:**ECON 600. Quantitative Methods in Economic Analysis II.**(4-1) Cr. 4. *Prereq: ECON 500*

Unconstrained and equality- and inequality-constrained optimization; the Kuhn-Tucker formulation; abstract spaces; dynamic programming; dynamical systems.

ECON 601. Microeconomic Analysis I.(4-1) Cr. 4. *Prereq: ECON 301, previous or concurrent enrollment in 600 and permission of Director of Graduate Education*

Economic theory and methodology; theory of consumer behavior, theory of the competitive firm, supply and factor demand; duality relations in consumer and producer theory, welfare change measures; partial equilibrium analysis, perfect competition, monopoly; choice under uncertainty, the expected utility model, risk aversion; insurance, portfolio and production decisions under risk.

ECON 602. Macroeconomic Analysis.(4-1) Cr. 4. *Prereq: ECON 301, ECON 302, previous or concurrent enrollment in 600 and permission of Director of Graduate Education*

Neoclassical aggregate growth models; the overlapping generations model; endogenous growth models; equilibrium business cycle theories; equilibrium job search and matching; models of money; fiscal and monetary policy; income and wealth distribution.

ECON 603. Microeconomic Analysis II.(4-1) Cr. 4. *Prereq: ECON 601, ECON 602 and permission of Director of Graduate Education*

General equilibrium analysis, efficiency, and welfare; market failures, externalities, and the theory of the second best; introduction to game theory; adverse selection, signaling, screening and moral hazard.

ECON 604. Advanced Macroeconomic Analysis.(4-1) Cr. 4. *Prereq: ECON 601, ECON 602 and permission of Director of Graduate Education*

Topics will be selected from: new Keynesian approaches to business cycle theory; endogenously generated business cycles; models of credit and financial intermediation; mechanism design and time inconsistency issues; political economy models; heterogeneous-agent models with strategic interaction; path dependence, network effects, and lock-in; economies as evolving self-organizing systems.

ECON 605. Advanced Topics in Microeconomics.(3-0) Cr. 3. *Prereq: ECON 603*

Selected topics in microeconomic theory of current significance to the profession.

ECON 606. Advanced Topics in Macroeconomics.(3-0) Cr. 3. *Prereq: ECON 603, and credit or current enrollment in ECON 604*

Selected topics in macroeconomic theory of current significance to the profession.

ECON 615. Theoretical Industrial Organization.(3-0) Cr. 3. *Prereq: ECON 603*

Theoretical analysis of traditional topics in industrial organization. Review of game theory. Monopoly and oligopoly theory, price discrimination, product differentiation, research and development, diffusion of innovation, network externalities, and asymmetric information.

ECON 616. Empirical Methods in Industrial Organization.(3-0) Cr. 3. *Prereq: ECON 603, ECON 671*

Empirical methods in industrial organization. Measurement of market power. Discrete choice models of product differentiation. Empirical studies of price dynamics, entry, collusion, price discrimination, technology adoption, asymmetric information, and auctions.

ECON 618. Game Theory.(3-0) Cr. 3. *Prereq: ECON 603, or ECON 501 and permission of instructor*

Theoretical analysis and applications of strategic games, extensive form games, and cooperative games. Nash equilibrium, correlated equilibrium, Bayesian games, subgame perfect equilibrium, the core, evolutionary equilibrium, repeated games with finite automata, and common knowledge.

ECON 641. Agricultural Economics I.(3-0) Cr. 3. *Prereq: ECON 603*

Advanced treatment of topics in agricultural economics with emphasis on optimization models. Part 1: Applied duality in production and demand models. Flexible representation of production and demand systems. Production efficiency and nonparametric analysis. Production models with risk. Part 2: The role of contracts in the organization and coordination of agricultural production. Distribution of asset ownership, allocation of risk among parties, and the structure of incentive systems. Rationale for cooperative efforts and information sharing. The role of information, insurance, and credit.

ECON 642. Agricultural Economics II.(3-0) Cr. 3. *Prereq: ECON 603*

Advanced treatment of topics and models in agricultural economics with emphasis on equilibrium analysis. Part 1: Application of price theory to agricultural market analysis. Vertical market relations, product differentiation and quality in agri-food markets. Storage, futures markets and commodity prices. Part 2: Market failures and the scope for government intervention in agriculture. Applied welfare analysis of agricultural and environmental policies. Issues and models in international trade of agricultural products.

ECON 653. Financial Economics.(3-0) Cr. 3. *Prereq: ECON 603, ECON 672. Recommended: ECON 674, STAT 551*

Review of decision-making under uncertainty. Portfolio Theory. Theoretical foundations of asset valuation models: capital asset pricing model (CAPM), arbitrage pricing theory (APT), representative agent models, pricing of derivative securities. Complete and incomplete asset markets, credit markets, financial intermediaries, the role of government in the financial sector. Market frictions, crashes, bubbles. Applications of asset valuation models, with emphasis on their testable implications.

ECON 654. Advanced Topics in Financial Economics.(3-0) Cr. 3. Repeatable. *Prereq: ECON 603*

Selected topics in financial economics of current significance to the profession.

ECON 655. International Trade.(3-0) Cr. 3. *Prereq: ECON 603*

Theories of international trade; welfare and distributional aspects of trade and commercial policies. Optimal trade policies in the presence of domestic distortions; strategic trade policy; international trade and economic growth.

ECON 657. International Finance.(3-0) Cr. 3. *Prereq: ECON 602*

The intertemporal approach to current account determination; non-traded goods and the real exchange rate; fiscal policy in the open economy; monetary approach to balance of payments and exchange rate determination; sticky price models of the open economy; exchange-rate based stabilizations; capital inflows; financial and balance of payments crises; international business cycles.

ECON 671. Econometrics I.(4-1) Cr. 4. *Prereq: ECON 501 and STAT 447 or STAT 542*

Probability and distribution theory for univariate and multivariate normal random variables, introduction to the theory of estimators for linear models, hypothesis testing and inference, introduction to large sample properties of estimators; derivation of common estimators and their properties for the classical and general multiple regression models, hypothesis testing, forecasting, implications of specification errors - missing data, left-out regressors, measurement error, stochastic regressors.

ECON 672. Econometrics II.(4-1) Cr. 4. *Prereq: ECON 671*

Identification, estimation, and evaluation of systems of simultaneous equations; qualitative choice and limited dependent variable models; introduction to time series methods and applications, including alternative variance specifications.

ECON 673. Microeconometrics.(3-0) Cr. 3. *Prereq: ECON 672, ECON 601*

Econometric treatment of models arising in microeconomic applications. Methods are primarily concerned with the analysis of cross-section data. Topics may include: systems of demand equations in panel data settings, random utility models of discrete choices, production possibilities frontier estimation, and discrete/continuous models of participation and consumption.

ECON 674. Macroeconometrics.(3-0) Cr. 3. *Prereq: ECON 672, ECON 602*

Time-series econometric techniques and their application to macroeconomics and financial markets. Techniques may include GARCH and ARCH-M models, unit-root tests, nonlinear adjustment models, structural VARs, and cointegration tests.

ECON 675. Advanced Topics in Econometrics.(3-0) Cr. 3. Repeatable. *Prereq: ECON 672 or STAT 543*

Advanced treatment of issues important in econometrics. Topics chosen from asymptotic theory, nonlinear estimation, Bayesian and robust econometrics, econometric time series, limited dependent variables and censored regression models, nonparametric and semiparametric methods, bootstrapping and Monte Carlo techniques, etc.

ECON 680. Advanced Resource Economics.(3-0) Cr. 3. *Prereq: ECON 603*

Dynamic allocation of scarce, exhaustible, and renewable natural resources, including minerals and energy, soil, water, forests, and fish. Social versus private decisions. Market and nonmarket considerations. Technological change. Regulation. Dynamics and uncertainty.

ECON 690. Advanced Topics.

Cr. 1-5. Repeatable.

Offered on a satisfactory-fail basis only.

ECON 691. Third-Year Paper.

Cr. 3.

Under the direction of the major professor, Ph.D. students write a formal research paper as an introduction to the dissertation research process. Offered on a satisfactory-fail basis only.

ECON 693. Workshops.Cr. 1-3. Repeatable. *Prereq: 6 graduate credits in chosen field*

Offered on a satisfactory-fail basis only.

ECON 699. Research for Thesis or Dissertation.

Cr. arr. Repeatable.

Offered on a satisfactory-fail basis only.