Courses

870. International Advertising
Spring, 4(4-0) ADV 826 or approval of department.
International advertising and promotion; formulation and implementation of international promotional strategies and policies; cases and problems from the viewpoint of advertisers and advertising agencies.

880. Special Problems
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 24 credits. Approval of department.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

931. Mass Media and the First Amendment
Fall, 4(4-0). Advanced graduate students. Interdepartmental with the School of Journalism and the Department of Telecommunication. Administered by the School of Journalism.
First amendment rights and the mass media. Analysis in depth of past and present public policy in areas of confrontation over guaranteed rights of freedom of expression.

965. Economics of the Mass Media
Spring, 4(4-0) Approval of department.
Economic theory and analysis relevant to mass media. Economic structure of the media and advertising. Conditions of competition among media and within related industries. Economic performance of media and advertising.

990. Independent Study
Fall, Winter, Spring, Summer. 3 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department.
Independent study of advanced theory, research and history of advertising thought.

AEROSPACE STUDIES

All University

041. Leadership Laboratory
Fall, Winter, Spring. 00-1) Approval of department. Open only to students who are not enrolled in any other Aerospace Studies course.
Basic concepts of leadership and the role of an Air Force officer; leadership development through practical experience.

110. Organization of the U.S. Air Force
Fall, 1(1-1)
The doctrine and mission of the U.S. Air Force; includes its history, organization, and how it is structured for mission accomplishment. Comparison of armed services mission relationships.

111. U.S. Strategic Offensive and Defensive Forces
Winter, 1(1-1)
Comparison of the missions and functions of specific Air Force commands, including employment of contemporary aerospace equipment and systems, as well as naval strategic offensive forces and army ABM systems.

112. U.S. General Purpose Forces
Spring, 1(1-1)
Tactical air forces. The mission, organization and function of the Air Force support commands and separate operating agencies as well as forces of other military branches.

210. The Development and Employment of Aerospace Forces
Fall, 1(1-1)
Development of flight from our first efforts to the present. Employment of aerospace forces in war and peace.

211. The Development and Employment of Aerospace Forces
Winter, 1(1-1)
Continuation of a S 210.

212. The Development and Employment of Aerospace Forces
Spring, 1(1-1)
Continuation of a S 211.

320. U.S. Air Force Communication and Management
Fall, 3(3-1)
Application of communication and management skills for Air Force officers.

Winter, 3(3-1)
Leadership theory, functions, and practices. Applications of leadership concepts by junior officers.

322. U.S. Air Force Management and Leadership
Spring, 3(3-1)
Traditional Air Force management functions and current practices. Emphasizes need for leadership and professionalism in modem officer corps.

420. The Military and American Society
Fall, 3(3-1)
Role of the professional officer in a democratic society; socialization process within the Armed Services; political economic and social constraints upon the national defense structure.

421. Strategy and the Management of Conflict
Winter, 3(3-1)
The formation and implementation of defense policy and strategy. The bureaucratic interplay and impact of nuclear technology. An investigation of limited and insurgency warfare.

422. National Defense Policy and Military Justice
Spring, 3(3-1)
Broad range of American civil-military relations and the environmental context in which defense policy is formulated. Military justice and the laws of war.

499. Independent Study
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Junior and approval of instructor.
Investigation of an aspect of aerospace activities of specific interest to the student and a faculty member.

AFRICAN LANGUAGES

See Linguistics and Germanic, Slavic, Asian and African Languages.

AGRICULTURAL ECONOMICS

College of Agriculture and Natural Resources

805. Agricultural Production Economics 1
Fall, 4(4-0) ECON 340 or EC 325.

809. Institutions; Behavior and Performance
Fall, 3(3-0) Approval of department.

810. Economics of Public Choice
Winter, 3(3-0) Approval of department. Interdepartmental with the departments of Economics and Resource Development.
Economics of alternative institutions for collective action. Emphasis on property rights and natural resources. Public goods, externalities, non-marginal change, commonwealth, income and power distribution, gains, welfare criteria and market failure.

811. Public Program Analysis
Spring, Summer of odd-numbered years. 3(3-0) EC 324 or approval of department. Interdepartmental with the departments of Economics and Resource Development.
Application of benefit-cost analysis to public programs of resource development. Issues and case studies in budgeting, investment criteria, pricing, externalities, and coordination.

831. Food Marketing Management
Fall, Spring, 4(4-0) May reenroll for a maximum of 8 credits. Interdepartmental with and administered by the Department of Marketing and Transportation Administration.
Interdepartmental with the departments of Economics and Resource Development.
Food industry adjustment to changing social, economic and internal company environment. Managerial principles and techniques applied to food processing and distribution. Student interaction with industry, labor and government representatives.

833. Mathematical Programming
Spring, 3(3-0) EC 900 or EC 811A, MTH 334. Interdepartmental with the departments of Economics, and Statistics and Probability.
Linear programming. Theory of linear economic models. Topics in nonlinear programming.
835. Introduction to Econometrics
Winter, Spring, Summer. 3(3-0) Approval of department. Interdepartmental with and administered by the Department of Economics.


837. Applied Operations Research I
Spring, 4(4-0) MTH 113 or MTH 229, Approval of department.

Use and interpretation of operations research techniques for problems encountered by agricultural economists. Emphasis on linear programming and its variations such as transportation models, network analysis, spatial equilibrium models.

838. Applied Operations Research II
Summer, 3(2-0) MTH 113 or MTH 229, STT 422. Approval of department.

Use and interpretation of operations research techniques for problems encountered by agricultural economists. Emphasis on techniques such as Markov processes, dynamic programming, and simulation. Monte-Carlo techniques, elementary simulation.

841. Industrial Organization of Agricultural Markets
Fall, 3(3-0) Approval of department.


843. Commodity Market Analysis
Winter, 3(3-0) STT 422, EC 325.


851. Advanced Farm Management
Summer, 3(2-0) FIM 430 or approval of department.

Emphasizes identification, analysis, and methods of solving problems of farm organization and management. New technology, specialization and scale. Farm case studies, role-playing, computer games and farm business simulation.

860. Rural Welfare and Development Policy
Spring, 3(3-0) Approval of department.


861. Agricultural Trade Policies
Fall of odd-numbered years; Summer of even-numbered years. 3(3-0) EC 429 or approval of department.

International trade in agricultural products, areas of competition, changes in comparative advantage, interrelationship of national and international policy regional groupings, trade and economic development, current policy proposals.

863. Agricultural Economics
Winter, 3(3-0) PAM 462 or approval of department.

Agricultural and industrial sector interactions in the development process. Theories and models of the agricultural development process. Transformation of agriculture in less-developed countries.

865. Rural Development Administration
Winter, 3(3-0) Approval of department.

Concepts and principles of development administration and their application in the analysis of the processes and structures through which rural development activities are formulated and implemented in less developed countries.

868. Data Collection in Developing Countries
Spring of even-numbered years, Summer of odd-numbered years, 3(3-0) AEC 830 or STT 825 or approval of department.

Principles for conducting household/village level studies of production and marketing in developing countries. Preparing research proposals, methodologies for data collection, processing and analysis. Field research administration.

876. Statistical Inference in Economics I
Fall, 3(3-0) EC 812a or EC 801; STT 442 or STT 863, Approval of department. Interdepartmental with the departments of Economics, and Statistics and Probability, Administered by the Department of Economics.


877. Statistical Inference in Economics II
Winter, 3(3-0) EC 876 or approval of department. Interdepartmental with the departments of Economics, and Statistics and Probability, Administered by the Department of Economics.


878. Statistical Inference in Economics III
Spring, 3(3-0) EC 877 or approval of department. Interdepartmental with the departments of Economics, and Statistics and Probability, Administered by the Department of Economics.

Validation and application of dynamic econometric models. Bayesian approach to estimation problems. Recent developments in econometric methods and in applied econometric research.

882. Independent and Supervised Study
Fall, Winter, Spring. Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department.

Arranged seminars initiated by faculty or students; supervised readings; individual study of special problems.

884. Selected Topics
Fall, Winter, Spring. Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits if different topics are taken. Approval of department.

899. Master's Thesis Research
Fall, Winter, Spring. Variable credit. Approval of department.

906. Agricultural Production Economics II
Winter, 4(4-0) AEC 805.

Resource allocation and efficiency in agriculture as related to management under conditions of both perfect and imperfect knowledge of price, institutional, technological and human change. Advanced topics.

910. Resource Economics Proseminar
Spring, 3(3-0) May reenroll for a maximum of 9 credits. Approval of department. Interdepartmental with the departments of Forestry, and Resource Development, Administered by the Department of Forestry.

A seminar wherein advanced graduate students in the fields of resource economics participate with faculty in the joint conduct of a major research project in resource economics and policy.

941. Seminar in Food Systems Organization and Policy
Spring of odd-numbered years, Summer of even-numbered years. 3(3-0) Approval of department.

Alternative methods of organization and control of food systems. Policy and program analysis. Development and presentation of position papers.

960. Agricultural Policy in Developed Economies
Winter, 3(3-0) FSM 421 and one year of graduate work in social science or approval of department.

Sectoral interrelationships and the impact of economic policies relating to agriculture in advanced economies. Public decision processes. Current issues in food and fiber policy.

962. Development Planning and Agricultural Sector Analysis
Spring, 3(3-0) AEC 862; one year of graduate study in agricultural economics or economics or approval of department.


972. Methodological Approaches to Research
Fall of even-numbered years, Summer of odd-numbered years. 3(3-0) Two terms of graduate study in social science or approval of department. Interdepartmental with the Department of Economics.

Selection, planning and conduct of research. Alternative research approaches. Role of theory, beliefs and values. Critical appraisal of research studies.

990C. Mathematical Economics and Econometrics Workshop
Fall, Winter, Spring. 3 to 16 credits. EC 812a, EC 832, or approval of department. Interdepartmental with and administered by the Department of Economics.

Critical evaluation of research reports by staff and other students. Students writing dissertations in the appropriate areas are encouraged to participate in workshop and may do so while registered for AEC 999.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.
Courses of Descriptions - Agricultural Economics

439. Advanced Food Processing and Distribution Management
Fall. 3(3-0). FSM 335. Interdepartmental with and administered by the Department of Marketing and Transportation Administration. Managerial principles and techniques applied to food processing and distribution. Emphasizes adjustment to changing social, economic and international company environment. Student interaction with industry, labor and government representatives. Field trips, special projects.

441. Commodity and Futures Marketing
Spring. 3(3-0). EC 201; FSM 370 or STT 317 recommended. Commodity pricing and use of marketing alternatives. Special emphasis on the futures markets and the institutional arrangements useful to farmers, elevator operators and commodity traders.

443. Cooperatives: Group Action in Marketing
Spring. 3(3-0) EC 200, Juniors, or approval of department. Organization and operation of cooperatives. Emphasis on economic and management principles, financial statements, and marketing.

461. Regional Economics Laboratory
Spring. 3(3-0) PAM 460 and approval of department. Interdepartmental with Public Affairs Management and the departments of Economics and Resource Development. Administered by the Department of Resource Development. Evaluation and use of analytical models designed to solve regional economic problems.

462. Agriculture and Rural Development in Developing Nations
Fall. 3(3-0) PAM 200 or EC 201; PAM 260 recommended. Interdepartmental with Public Affairs Management and Agriculture and Natural Resources. Traditional agricultural systems and the incentive environment for economic growth in rural areas. Adjustment to technological, institutional and human change. Strategies for rapid agricultural transformation.

473. Introduction to Systems Analysis
Fall. 3(3-0) MTH 111. Interdepartmental with and administered by Public Affairs Management. Principles of systems analysis applied to ecological, physical, economic and social phenomena. Case studies. Interpretation and design of systems models. Systems concepts in decision making.

480. Independent and Supervised Study
Fall, Winter, Spring, Summer. 1 to 9 credits. May reenroll for a maximum of 9 credits. Approval of department.

484. Selected Topics
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits if different topics are taken. Approval of department.

Public Affairs Management

201. Introduction to Community Economics
Fall. Spring. 3(3-0). Identification and analysis of problems faced by public decision makers in managing public revenues and services and governing private resource use. Impact of political and economic structures on resource use.

260. World Food, Population and Poverty
Winter. 4(4-0). Description, analysis and alternative solutions of food, technology transfer, population and poverty problems, emphasizing trade and aid programs and the role of multinational firms in low income nations.

303. Welfare, Health and Education Policy
Fall. 3(3-0) PAM 201 or EC 200. Evaluation of selected welfare health and education policies and alternatives. Role of public and private sectors. Impact of values, beliefs, costs, benefit distributions, political power and other factors on policy.

306. Government Programs for Workers
Winter. 4(4-0) EC 201. Interdepartmental with and administered by the Department of Economics. Economics of selected government institutions and programs for workers. Social security, worker's compensation, Unemployment Insurance, OSHA, employment and training programs, wages and hours legislation, anti-discrimination programs.

320. Economic Policy Processes I
Fall. 3(3-0) PAM 201 or EC 201. Analysis of processes by which public economic policy is established at various levels of government. Role of economic interests and pressures. Alternative processes for economic policy formulation. Case studies.

321. Economic Policy Processes II
Winter. 3(3-0) PAM 320 or approval of department. Analysis of socioeconomic forces as they affect the public decision processes for economic policy. Means of increasing effectiveness of staff persons in the decision process. Case studies.

340. Managerial Economics
Spring. 3(3-0) EC 201. Production, consumption decisions and their interrelation. Pricing of retail and non-retail goods. Effects of monetary and fiscal policies. Applications to problems in food system or community management.

363. Economic Development of Tropical Africa
Spring. 3(3-0) EC 200 and EC 201, or EC 210. Interdepartmental with and administered by the Department of Economics. African economic development in historical perspective. Analysis of contemporary economic development problems faced by tropical African countries. Alternative strategies for African economic development.
Agricultural Engineering — Descriptions of Courses

370. Applied Statistics
Winter. 3(3-0) Students may not receive credit in both FSM 370 and AEC 380. One course in statistics, one course in food systems economics and management or public affairs management. Interdepartmental with Food Systems Economics and Management. Interpretation and use of statistical results in decision making. Sampling index numbers, tabular analysis, trend estimation, regression models, decision theory.

404. Social Accounts and Community Choice
Winter. 3(3-0) PAM 303 or approval of department.
Social accounting as a framework for problem definition and measurement of policy effectiveness. Conceptualization of social accounts. Use of selected social indicators in policy formulation and decision making.

406. Public Expenditure: Theory and Policy
Fall, Spring. 4(4-0) EC 201 or EC 210. Interdepartmental with Food Systems Economics and Management and the departments of Resource Development and Economics. Administrated by the Department of Resource Development.
Expenditure theory; objectives and rationale of government activity in the market system; efficiency criteria in government decision making; planning-programming-budgeting systems and cost-benefit analysis.

417. Land Economics
Fall, Spring. 4(4-0) Interdepartmental with Food Systems Economics and Management and the departments of Resource Development and Economics. Administrated by the Department of Resource Development.
Factors affecting the economic use of land and space resources by people. Input-output relationships; development, investment, and enterprise location decisions. Land markets; property rights, area planning; zoning and land use controls.

431. Law and Social Change
Fall, Spring. 3(3-0) BOA 440 or approval of department. Interdepartmental with and administered by the Department of Resource Development.
Law as applied to urban and rural context of social change. A review of both formal and informal aspects of system accessibility, institutional formation, government, civil rights, and human service.

453. Women and Work: Issues and Policy Analysis
Winter. 3(3-0) PAM 201 or EC 200 or EC 201 or approval of department. Interdepartmental with the Department of Economics.
Quantity and quality of labor force participation by women, current status and past trends. Issues analyzed include differential earnings and occupations of men and women, employment discrimination and labor legislation.

461. Regional Economics Laboratory
Spring. 10(2-0) R D 460 and approval of Department. Interdepartmental with Food Systems Economics and Management and the departments of Economics and Resource Development. Administrated by the Department of Resource Development.
Evaluation and use of analytical models designed to solve regional economic problems.

462. Agricultural and Rural Development in Developing Nations
Fall. 3(3-0) PAM 201 or EC 201; PAM 290 recommended. Interdepartmental with Agricultural and Natural Resources, and Food Systems Economics and Management. Administrated by Food Systems Economics and Management.
Traditional agricultural systems and the incentive environment for economic growth in rural areas. Adjustment to technological, institutional and human change. Strategies for rapid agricultural transformation.

473. Introduction to Systems Analysis
Spring. 3(3-0) MTH 111. Interdepartmental with Food Systems Economics and Management.
Principles of systems analysis applied to ecological, physical, economic and social phenomena. Case studies. Interpretation and design of systems models. Systems concepts in decision making.

480. Independent and Supervised Study
Fall, Winter, Spring, Summer. 1 to 9 credits. May enroll for a maximum of 9 credits. Approval of department.

484. Selected Topics
Fall, Winter, Spring. Summer. 1 to 4 credits. May enroll for a maximum of 12 credits if different topics are taken. Approval of department.

490. Supervised Field Experience
Fall, Winter, Spring, Summer. 3 to 9 credits. May enroll for a maximum of 9 credits. PAM Juniors, approval of department.
Supervised field work in federal, state, or local government or organizations dealing with government.

493. Regional Economics
Winter. 4(4-0) R D 417 or EC 324. Interdepartmental with Food Systems Economics and Management and the departments of Economics and Resource Development. Administrated by the Department of Resource Development.
Forces affecting location decisions of firms, households and governments. Applications to agricultural, industrial, and regional developments.

495. Regional Economics Laboratory
Fall, Spring. 10(2-0) R D 460 and approval of Department. Interdepartmental with Food Systems Economics and Management and the departments of Economics and Resource Development. Administrated by the Department of Resource Development.
Evaluation and use of analytical models designed to solve regional economic problems.

512. Introduction to Agricultural Engineering
Fall, Spring. 3(3-0) Interdepartmental with Agricultural Engineering Technology.
An introduction to the agricultural engineering profession with an examination of existing problems.

515. Physical Principles of Biological Processes
Winter. 4(4-0) A E 335.
Basic scientific principles and engineering theory applied to biological systems and products.

535. Physical Principles of Plant Environment
Fall. 4(4-0) CPS 120, MTH 310, CEM 152 or CEM 132.
Physical processes and properties of the biosphere as related to engineering the plant environment.

534. Physical Principles of Animal Environment
Spring. 3(2-2) A E 352.
Interrelationship of environmental factors and physiological responses of animals for planning, design and control of optimum environmental systems.

536. Electric Power and Control
Winter. 4(3-2) PHY 288.
Alternating current calculations; sizing conductors of single- and three-phase loads, electric motors, their control and protection; switching logic; microprocessor applications. Examples drawn from agricultural applications.

576. Food Process Engineering
Spring. 3(2-2) A E 352, C E 321.
Analysis of unit processes involved in handling, processing, and distribution of liquid and solid biological materials. Flow of liquids, heating and cooling, freezing, concentration, dehydration, and separation.

594. Systems of Agricultural Machines
Fall. 3(3-0) MMM 306.
Functional requirements and operational characteristics of agricultural machines. Engineering principles of machines dealing with soil and plant materials. Aspects of agricultural machinery management and economics.

597. Professional Ethics and Responsibilities
Spring. 1(2-0) Senior majors.
Personal and professional ethics and social responsibilities will be addressed as related to the professions of engineering and engineering technology.

598. Design of Agricultural Structures
Fall. 4(4-0) MMM 211, MMM 215.
The analysis of structural systems and the design of components and connections. Examples selected from agricultural machinery and buildings.

599. Processing Biological Products
Spring. 3(3-0) A E 352, M E 311 or CEM 361.
Engineering principles of unsteady-state heat transfer, heat exchangers, drying, storage and refrigeration as applied to the processing of biological products.

590. Special Problems
Fall, Winter, Spring, Summer. 1 to 5 credits. May enroll for a maximum of 5 credits. Approval of department.
Individual student research and study in: agricultural machines and tractors, waste management, food processing, structures and environment, materials processing and handling, water management, meteorology and climatology, agricultural systems analysis.

591. Soil and Water Conservation Engineering
Winter. 4(5-0) C E 321, A E 333.
Engineering analysis, design and construction of drainage, irrigation and erosion control systems.