

321. Concepts of U.S. Air Force Leadership
Winter. 3(3-1) Approval of department.

Leadership theory, functions, and practices. Applications of leadership concepts by junior officers. Leadership laboratory.

322. U.S. Air Force Management and Leadership
Spring. 3(3-1) Approval of department.

Traditional Air Force management functions and current practices. Emphasizes need for leadership and professionalism in modern officer corps. Leadership laboratory.

420. The Military and American Society
Fall. 3(3-1) Approval of department.

Role of the professional officer in a democratic society; socialization process with the Armed Services; political economic and social constraints upon the national defense structure. Leadership laboratory.

421. Strategy and the Management of Conflict
Winter. 3(3-1) Approval of department.

The formation and implementation of defense policy and strategy. The bureaucratic interplay and impact of nuclear technology. An investigation of limited and insurgency warfare. Leadership laboratory.

422. National Defense Policy and Military Justice
Spring. 3(3-1) Approval of department.

Broad range of American civil-military relations and the environmental context in which defense policy is formulated. Military justice and the laws of war. Leadership laboratory.

499. Independent Study
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Juniors 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 AND EXTENSION EDUCATION AEE

College of Agriculture and Natural Resources College of Engineering

203. American Agrarian Movements
Spring. 3(2-2)

Historical perspectives of America by pioneers, farmers, ranchers, and others who cultivated the land from 1700's to 1930. Film screenings of agricultural movements, trends, and development are reviewed and analyzed.

230. Agriculture and Natural Resources-Visual Communications
Winter. 3(2-2)

Basic principles governing the use, and design of visual communications in agriculture and natural resources. Posters, publications, presentations and computer graphics.

360. Developing Concurrent Work-Education Programs
Fall. 1(2-0) Approval of department.

Planning, organizing and implementing effective concurrent work-education programs for secondary vocational agribusiness and natural resources education students.

361. FFA in Agribusiness and Natural Resources Education
Winter. 1(2-0) Approval of department.

Planning and organizing an effective FFA program as an integral part of a secondary vocational agribusiness and natural resources education program.

362. Developing a Five-Year Plan
Spring. 1(2-0) Approval of department.

Developing and organizing a five-year plan for a comprehensive secondary vocational agribusiness and natural resources education program.

401. Agriculture and Natural Resources Communications
(ANR 401.) Fall, Winter, Spring. 3(2-2) JRN 201 or other writing course and approval of department.

Techniques, strategies and practices in development of agricultural and natural resources information programs. Including writing, public relations, TV and radio production for specialized and general audiences.

402. Agriculture and Natural Resources Communications Internship
(ANR 402.) Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 6 credits. AEE 401, approval of department.

Internship with professionals in communications field with emphasis on student's areas of interest—writing, radio, TV, publications, etc.

483. Readings and Independent Study
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 6 credits. Juniors; approval of department.

Study on an individual basis in the various areas of emphasis in agricultural and extension education.

802. Agricultural Education in Rural Development
Winter. 3(3-0) Approval of department.

Agricultural education at various levels and in different forms for rural development. Formal and non-formal education: planning, conducting and evaluating. Case studies from selected developing countries.

806. Education Through Cooperative Extension
Winter. 3(3-0) AEE 828 or EAD 860 or approval of department. Interdepartmental with the Department of Educational Administration.

Cooperative extension programs in the United States with emphasis on Michigan model: philosophy, history, scope, organizational structure, programs and methods.

810. Planning Programs
Spring of even-numbered years. 3(3-0) AEE 806 or approval of department.

Principles, theories and practices in developing state and local agricultural and extension education programs.

812A. Externship: Beginning Professionals in Agricultural and Extension Education
Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 3 credits. Approval of department.

Current assignments of beginning professionals used for identifying roles and program characteristics; inventory of school and community resources; establishing mentor networks.

812B. Externship: Experienced Professionals in Agricultural and Extension Education
Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 3 credits. AEE 810, AEE 812A.

Current assignments of experienced professionals for identifying problems and proposing possible solutions; review of trends in society and technology with application to local programs.

820. Developing Courses
Summer. 3(3-0) Approval of department.

Developing and utilizing survey instruments to identify community instructional needs in agricultural and extension education, and designing courses to assist in meeting those needs.

822. Principles and Practices in Directing Concurrent Work Education
Summer of odd-numbered years. 3(3-0) AEE 820 or approval of department.

Principles and practices involved in directing agricultural students in ownership, placement or school land laboratory programs.

824. Instructional Strategies
Spring. 3(3-0) AEE 820 or approval of department.

Strategies and methods for teaching agriculture and natural resources: objectives, mastery learning, demonstrations and others. Application of learning theory.

826. Methods of Teaching Agricultural Mechanics
Fall of odd-numbered years. 3(3-0) Approval of department.

Methods of instruction including program planning, scheduling, use of teaching aids, management of buildings, facilities and equipment; the selection, organization, and evaluation of activities in farm mechanics.

828. Teaching Farmer Classes in Agriculture
Fall of even-numbered years. 3(3-0) Approval of department.

Objectives of adult education in agriculture, organizing and promoting classes, course planning, instructional procedures, follow-up and evaluation.

830. Effective Communications in Agriculture
Fall, Winter. 3(3-0)

Scientific writing for professional lay agricultural and natural resources publications; grant writing; organizing, preparing and delivery of professional scientific presentations.

**Descriptions — Agricultural and Extension Education
of
Courses**

851. Program Administration and Supervision
Spring of odd-numbered years. 3(3-0)
ANR 806, EAD 851A.

Principles and practices for developing, supervising and administering agricultural and extension educational programs.

858. Leadership Development in Agricultural and Extension Education
Winter. 3(3-0) Approval of department.

Sociological and philosophical bases for leadership development for agricultural and extension education in a democratic society.

860. Program Evaluation
Summer of even-numbered years. 3(3-0) AEE 820 or approval of department.

Principles of evaluating agricultural and extension education programs.

881. Selected Topics
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 9 credits if different topics are taken. Approval of department.

Topics will be selected to meet needs of graduate students in agricultural and extension education.

883. Readings and Independent Study
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 6 credits. Approval of department.

Study on an individual and group basis in the various areas of agricultural and extension education.

885. Seminar
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 3 credits. Approval of department.

Studies and presentation of research in Agricultural and Extension Education.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

AGRICULTURAL ECONOMICS AEC

College of Agriculture and Natural Resources

805. Agricultural Production Economics I
Fall. 4(4-0) EC 324, PAM 370.

Economic principles of production. Analysis of inputs yielding services over several periods. Principles underlying present value models. Welfare economic concepts. Aggregation of firm results. Deriving production functions and process models.

809. Institutions; Behavior and Performance
Fall. 3(3-0) EC 324, EC 326; or approval of department.

Conceptual approaches to economic analyses of public policy issues and programs with emphasis on the relationships among institutions, behavior of participants and performance.

810. Economics of Public Choice
Winter. 3(3-0) Approval of department. Interdepartmental with the departments of Resource Development and Economics.

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, grants, welfare criteria and market failure.

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.

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.

835. Introduction to Econometrics
Spring, Summer. 3(3-0) EC 325, STT 422; not open to students with credit in EC 836. Interdepartmental with and administered by the Department of Economics.

Specification, estimation and interpretation of economic models. Applications to empirical problems.

837. Applied Operations Research
Spring. 4(4-0) EC 324, PAM 370. 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.

839. Topics in Dynamic Agricultural Economics
Winter of even-numbered years. 3(3-0) AEC 837, MTH 480; EC 812B or EC 805A, EC 805B.

Intertemporal analysis of production, resources and investment problems. Firm growth theory, calculus of variations. Pontryagin's maximum principle and dynamic programming. Emphasis on applications and economic interpretation.

841. Industrial Organization of Agricultural Markets
Spring. 3(3-0) EC 324, a junior-level course in agricultural marketing.

Conceptual and analytical approaches to identify and assess market performance. Institutions and market processes for coordinating agricultural systems. Issues of organization, control, and public policy.

843. Commodity Market Analysis
Fall. 3(3-0) EC 835 or approval of department.

Projecting short- and long-run demand, supply and prices of agricultural commodities. Data collection, model development and use of computers for understanding and measuring market dynamics. Futures and options markets.

850. Agricultural Production Management in Developing Countries
Winter. 3(3-0) EC 324 or approval of department. Not open to students with credit in FSM 430.

Farm management applications of comparative analysis, forward planning, budgeting, cash flow analysis and computer-aided decision making. Principles illustrated with developing country case studies.

851. Farm Management
Summer of even-numbered years. 3(3-0) FSM 430 or AEC 850 or approval of department.

Managerial processes for problem solving, planning and controlling. Review of decision literature in cognitive and information sciences. Budgeting, optimizing, scenario and stochastic simulation for predictive and prescriptive purposes.

853. Decision Support Systems for Agriculture
Fall of even-numbered years. 3(3-0) AEC 850; AEC 851 recommended.

Development and design of information systems. Database and modelbase systems with emphasis on decision maker/information systems interfaces. Analyses of systems using case studies.

860. Agricultural Policy in Developed Economies
Winter. 3(3-0) FSM 421, EC 324, EC 326; or approval of department.

Economic behavior of agricultural sector in advanced economies. Macroeconomic impacts. Evolution of sector problems and policy. Power structure and decision processes. Current issues in food and fiber policy.

861. Agricultural Trade Policies
Fall of odd-numbered years; Summer of even-numbered years. 3(3-0) EC 324, EC 326; 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.

862. Agriculture in Economic Development
Winter. 3(3-0) EC 324, EC 326, PAM 462; or approval of department.

Agricultural and industrial sector interactions in the development process, examined from both historical and theoretical perspectives. Theories and models of the agricultural development process. Policy issues in agricultural development.

863. Benefit Cost Analysis
Spring. 3(3-0) AEC 805 or AEC 850 or approval of department. Interdepartmental with the Department of Resource Development.

Benefit-cost analysis of agricultural and natural resource projects, including financial and economic analysis. Case studies in project design and appraisal in low and high income countries.

868. Data Collection and Analysis in Developing Countries
Spring of even-numbered years. Summer of odd-numbered years. 3(3-0) STT 422, one year of graduate study; or approval of department.

Conducting farm/household/firm level studies of production and marketing. Preparing research proposals. Methodologies for data collection, processing, and analysis. Microcomputer applications. Field research administration. Statistical systems in developing countries.

876. Statistical Inference in Economics I
Fall. 3(3-0) EC 812A or EC 805A; STT 443 or STT 863; or approval of department. Interdepartmental with the departments of Economics, and Statistics and Probability. Administered by the Department of Economics.

Review and extension of single-equation regression models. Properties of least-squares estimators under alternative specifications. Problems of analyzing nonexperimental data. Errors in variables, autoregressive and heteroscedastic models.