Courses are subject to revision and final approval.

AGRICULTURAL AND EXTENSION EDUCATION

497*. Selected Topics
Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 4 credits.
P: AEE 101 or AEE 401. R: Open only to Agribusiness and Natural Resource Education and Agricultural and Natural Resources Communications majors.
Topics selected to meet students needs in agriculture and natural resources communications or agriscience and natural resources education.
Q: AEE 401 OR AEE 360

501*. Global Development Through Agricultural and Extension Education
Fall. 3(3-0)
P: AEE 806 R: None
Application of education theories, principles and practices in planning, conducting and evaluation (formal and non-formal) education programs that focus on international development through agricultural and extension education.
Q: AEE 802

503*. Instructional Strategies in Agricultural and Extension Education
Spring. 3(3-0)
Strategies and methods for effectively assessing learning needs, developing or selecting appropriate teaching strategies, using teaching strategies and evaluating their effectiveness with groups of learners.
Q: AEE 824

504*. Communication Strategies in Agricultural and Extension Education
Fall. 3(3-0)
R: Senior and above Agriculture and Natural Resources
Strategy for effective communication for diverse audiences. Emphasis on new information delivery systems such as satellites & computers. Writing and preparing oral presentations for varied agricultural and Extension audiences is required.
Q: AEE 830

505*. Leadership Development in Agricultural and Extension Education
Spring. 3(3-0)
Assessing leader values, style, behavior and principles, philosophical and sociological bases for leadership development with applications in the Agricultural and Extension Education.
Q: AEE 888

506*. Program Planning and Evaluation in Agricultural and Extension Education
Spring of odd-numbered years, Summer of even-numbered years. 3(3-0)
P: Graduate Student R: Graduate Student
Principles of planning and evaluating programs in agricultural and extension education.
Q: AEE 810 AEE 860

507*. The Research Process in Agricultural and Extension Education
Fall. 3(3-0)
Principles and practices of planning, designing, conducting, and reporting research in agricultural and extension education.
Q: AEE 881 AEE 881

508*. Education Through Extension
Fall. 3(3-0)
Examination and analysis of the function, organization and operation of extension education programs.
Q: AEE 806

509*. Principles and Philosophy of Agriscience Education
Summer. 3(3-0)
Principles and philosophy that provide bases for analyzing and developing Agriscience Education courses, curricula, and programs.
Q: AEE 820

510*. Teaching Supervised Agricultural Experience (SAE)
Summer of odd-numbered years. 3(3-0)
R: Graduate
The principles and practices involved in teaching high school youth in school sponsored agriscience laboratory learning.
Q: AEE 826 AEE 822

511*. Readings and Independent Study in Agricultural and Extension Education
Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 4 credits.
P: Approval by Agricultural and Extension Education Instructor. R: Graduate Students
Study by an individual and/or group basis in the various areas of Agricultural and Extension Education.
Q: AEE 883

512*. Selected Topics in Agricultural and Extension Education (MTC)
Fall, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 6 credits.
R: Graduate
Topics selected to focus on contemporary issues and problems in Agricultural & Extension Education.
Q: AEE 889

513*. Seminar in Agricultural and Extension Education (MTC)
Fall, Spring, Summer. 3(3-0) May reenroll for a maximum of 6 credits.
Seminar on selected issues in Agricultural and Extension Education. Students expected to contribute through individual reports/contributions and through active discussion.
Q: AEE 885

514*. Professional Field Experience in Agricultural and Extension Education (MTC)
Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 4 credits.
R: Graduate Students
The practice, observation and analysis of and through field based experiences in Agricultural and Extension Education.
Q: AEE 881

515*. Masters Plan B Research(W)
Fall, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 3 credits.
R: Masters Students/Agricultural and Extension Education/Plan B Agriculture and Natural Resources Agricultural and Extension Education Masters Students Plan B Research
Q: AEE 889

516*. Masters Thesis Research(W)
Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 4 credits.
R: Masters Agriculture and Natural Resources Agricultural and Extension Education Masters Thesis Research
Q: AEE 889

517*. World Wide Agricultural and Extension Education Systems
Spring. 3(3-0)
P: AEE 801 or AEE 811 or AEE 811 R: Graduate
A comparative course on selected systems of Agricultural and Extension Education in different countries with attention to philosophical and structural differences and similarities of organization, programs, staffing, staff development and delivery.
Q: AEE 883 AEE 881

518*. Research Project Design and Implementation
Spring. 3(3-0)
P: AEE 807
Principles and practices of selecting, developing and analyzing research instruments. Analyzing and interpreting both quantitative and qualitative data in Agricultural and Extension Education.
Q: AEE 881 AEE 881

519*. Nonformal Learning
Fall of even-numbered years. Summer of odd-numbered years. 3(3-0)
P: AEE 811 or equivalent
Examination of theories and philosophies that define learning in out-of-school settings. Alternative strategies for facilitating nonformal learning.
Q: AEE 883

520*. Advanced Extension Administration
Spring. 3(3-0)
P: AEE 862 AEE 811
Advanced practices and applications necessary for effective management/administration within Extension Education.
Q: AEE 851

521*. Doctoral Dissertation Research(W)
Fall, Spring, Summer. 1 to 36 credits. May reenroll for a maximum of 30 credits.
R: PAD ANR AEE
Doctoral dissertation research. Credits used to complete this Ph.D. thesis.
Q: AEE 899

AGRICULTURAL ECONOMICS

511*. Institutional and Behavioral Economics
Fall. 3(3-0) Interdepartmental with the Department(s) of Economics, Resource Development.
P: EC 324, EC 526
Q: AEE 810 AEC 809

Courses with an asterisk (*) have not been approved by the University Committee on Curriculum.
Agricultural Economics

815*. Applied Welfare Economics
Fall of odd-numbered years. 3(3-0)
P: EC 480, EC 805A or EC 812A, EC 805B or EC 813A
Concepts and issues in Welfare Economics with application to problems in development, agricultural policy and trade, marketing and finance, environmental policy, and technological change.

817*. Political Economy of Agricultural and Trade Policy
P: EC 428 or EC 802A, EC 805A or EC 812A, EC 805B or EC 813A

821*. The Economics of Environmental Resources
Fall, 3(3-0) Interdepartmental with the Department(s) of Economics, Resource Development, Forestry, Park and Recreation Resources.
P: EC 325 or equivalent R: None
Economic principles used to understand environmental conflicts and to evaluate public policy alternatives. Applications to water quality, land use, conservation, development, and global environmental issues.

835*. Introductory Econometrics
P: STT 450 R: Graduate
Estimation and interpretation of regression models and their modifications when usual assumptions are not valid. Applications focus on problems faced by agricultural economists.

841*. Organization and Performance of Agricultural Markets
Spring, 3(3-0)
P: EC 324 or equivalent R: Graduate
Analytical approaches to the study of organization and performance of agricultural markets. Institutions and processes for coordinating food and agricultural systems. Issues of organization, control and public policy.

851*. Agricultural Firm Management
Summer, 3(3-0)
P: FSC 330 or FSC 351 or EC 325 R: Graduate
Managerial processes for planning and controlling agricultural production and marketing. Emphasis on structures, strategies, principles, budgets, simulations, cognitive and information systems to developed and developing countries. Predictive and prescriptive analysis.

853*. Agricultural Production Economics
Spring, 3(3-0)
P: FSC 480 and 805A R: Graduate
Principles and applications of static production economics including study of capital inputs that yield continuous benefits over several time periods. Investment/disinvestment models. Intro. to methods for incorporating risk and technological change into models.

861*. Agriculture in Economic Development (MTC)
Fall, 3(3-0)
P: EC 226; FSC 342 or instructor's approval R: Graduate
Role of Agriculture in Economic development of low- and middle-income countries. Theories of agricultural growth, Agricultural policy issues in developing countries. Case studies.

865*. Benefit-Cost Analysis
Spring, 3(3-0)
P: EC 322; EC 327 or EC 428 or instructor's approval R: Graduate
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.

869*. Agriculture Business Management
Fall of odd-numbered years. 3(3-0)
P: FSC 429
Identify and analyze common managerial problems faced by agro-business firms. Examine strategies used to interpret and respond to change trends and other forces affecting the industry.

892B*. Applied Operations Research
Spring of odd-numbered years. 3(3-0)
P: EC 480
Use and interpretation of operations research techniques for problems encountered by agro-economicists. Emphasis on linear programming and its variations, quadratic programming, spatial equilibrium, models and risk programming.

892C*. Field Data Collection and Analysis in Developing Countries
Summer of odd-numbered years. 3(3-0)
P: STT 430; FSC 462 or AEC 662 R: Graduate
Principle for conducting agricultural production and marketing studies/surveys in developing countries; preparing research proposals; data processing and analysis.

892D*. Decision Support Systems for Agriculture
Fall of odd-numbered years. 2(2-0)
P: FSC 330
Support of decision making through development and design of agricultural information systems stressing the role of databases and modules. Concepts illustrated through the use of case studies.

893E*. Seminar in Agricultural and Trade Policy
Spring of even-numbered years. 1 to 3 credits
P: EC 805A and EC 805B or EC 812A and EC 813A
Explorations of agricultural and trade policy subject matter not covered in regular course offerings. Domestic agricultural policy issues. Trade and international policy issues.

899F*. Rural Development Policy
Summer of even-numbered years. 1 to 3 credits
P: FSC 804A and EC 805B or EC 812A
Explorations of agricultural and trade policy subject matter not covered in regular course offerings. Domestic agricultural policy issues. Trade and international policy issues.

899G*. Independent and Supervised Study
Fall, Spring, Summer. 1 to 6 credits.
R: Graduate
Arranged seminars initiated by faculty or student supervised readings, individual study of selected problems.

899H*. Master's Research
Fall, Spring, Summer. 1 to 4 credits.
R: X

899I*. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits.
R: X

921*. Theory of Resource and Environmental Economics
Spring of even-numbered years. 3(3-0) Interdepartmental with the Department(s) of Economics, Resource Development, Forestry, Park and Recreation Resources.
P: AEC 821, EC 805A

944*. Analysis of Food Systems Organization
Summer, 3(3-0)
P: AEC 841, AEC 811(new), AEC 845, EC 897, EC 809 or approval of Dept. R: Graduate
Professional practice as an agricultural economist dealing with public and private policy issues related to the organization and performance of food systems. Professional presentations. Implications of current professional literature.

991A*. Advanced Price Analysis (MTC)
Fall of even-numbered years. 1 to 2 credits.
P: AEC 845, AEC 891C or departmental approval R: Graduate
Advanced topics in price analysis and commodity markets. Emphasis on current research on risk in agriculture; the economic analysis of time series and topics in agricultural finance.

991B*. International Agricultural Development
Spring of even-numbered years. 2(2-0)
P: AEC 861, EC 805A and 805B or EC 812A and 813A R: Ph.D, students AEC Economics or Economics
Advanced topics and analytical methods in international agricultural development research. New theory and its application to specific problems in development.

991C*. Risk Analysis
Fall of odd-numbered years. 3(3-0)
P: AEC 845 R: Graduate
Examination of individual and firm response to alternative sources of risk.

991D*. Frontiers in Agricultural and Trade Policy
Fall of even-numbered years. 1 to 3 credits.

P: AEC 895
# AGRICULTURAL ECONOMICS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>991E*</td>
<td>Dynamic Models in Agricultural Economics</td>
<td>F: EC 459, EC 812A</td>
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<tr>
<td>991F*</td>
<td>Methodological Approaches to Research</td>
<td>R: None</td>
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<tr>
<td>991G*</td>
<td>Agricultural Finance</td>
<td>P: AEC 855 and 991G</td>
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<td>991H*</td>
<td>Environmental Economics Research Topic</td>
<td>P: AEC 821, EC 805A</td>
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<tr>
<td>999*</td>
<td>Doctoral Dissertation Research</td>
<td>R: X</td>
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## AGRICULTURAL ENGINEERING

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Notes</th>
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<tbody>
<tr>
<td>152W*</td>
<td>Food and Agricultural Engineering</td>
<td>R: Freshman, Sophomore</td>
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<tr>
<td>333R</td>
<td>Principles of Agricultural Machines</td>
<td>P: MMM 211, CE 321 or CHE 311 or ME 332</td>
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<tr>
<td>333R</td>
<td>Principles of Food Processing Equipment</td>
<td>P: MMM 211, CHE 311 or CE 321 or ME 332</td>
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<tr>
<td>335E</td>
<td>Engineering Principles of the Plant Environment</td>
<td>P: CEM 316 or ES 110; CEM 141; MTH 225, ME 201</td>
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<tr>
<td>335E</td>
<td>Electric Power and Control Hydraulics</td>
<td>P: FS 345 or EE 200</td>
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<tr>
<td>335E</td>
<td>Power and Control Hydraulics</td>
<td>P: CE 321 or ME 332</td>
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<tr>
<td>335E</td>
<td>Agricultural and Small Watershed Hydrology</td>
<td>P: CPS 130 or CPS 131; CE 321 or CHE 311 or ME 332</td>
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<tr>
<td>486W*</td>
<td>Agricultural Engineering Design Fundamentals</td>
<td>P: AE 356 or AE 336</td>
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<tr>
<td>486W*</td>
<td>Agricultural Engineering Design Project</td>
<td>P: AE 356 or AE 336</td>
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<td>490*</td>
<td>Independent Study</td>
<td>R: Fall, Spring, Summer</td>
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<tr>
<td>490*</td>
<td>Special Problems</td>
<td>R: Spring, Summer, 1 to 4 credits. May enroll for a maximum of 9 credits.</td>
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</table>

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