

AGRICULTURAL AND RESOURCE ECONOMICS MAJOR

Program Director: Lars Olson, Ph.D.

Agricultural and Resource Economics majors complete a set of foundational courses in economics, analytics, and business statistics; specialized classes in one of three specializations: Environmental and Resource Economics, Agribusiness, or Agricultural and Resource Economics; and one or more fields from Business Management, Environmental and Resource Policy, Advanced Degree Preparation, International Agriculture, Farm Management and Entrepreneurship, and others. The program allows students flexibility to choose fields to fit their career interests. The curriculum includes courses in economic analysis, environmental economics, energy economics, agribusiness management, data science, economic development, and agricultural policy. The major balances breadth and depth, and a strong foundation for careers in the public, private, and non-profit sectors in economics, management, environmental or natural resource policy, agribusiness, and international agriculture.

Program Learning Outcomes

Upon completion of the degree program, students should have acquired the following knowledge and skills:

1. **Disciplinary Foundation** – AREC majors will demonstrate knowledge of economic principles, terms and concepts and their application to analysis of economic problems in agricultural, environmental and resource economics, including the economics of consumers, producers and markets.
2. **Critical and Analytical Thinking** – AREC majors will demonstrate an ability to think critically about economic issues and to analyze and draw inferences from data.
3. **Understanding Economic Policy** – AREC majors will demonstrate knowledge of laws, policies and institutional arrangements in agricultural, environmental and resource economics, their role in determining resource allocation, and how economics can inform policy design.
4. **Diversity, Equity and Inclusion** – AREC majors will demonstrate an understanding of the causes and consequences of differences in the distribution of agricultural, environmental and natural resources across diverse socioeconomic, racial, and ethnic groups.

REQUIREMENTS

Course	Title	Credits
Foundational Courses		
ECON200	Principles of Microeconomics	3
ECON201	Principles of Macroeconomics	3
AREC326	Intermediate Applied Microeconomics	3
Statistics Requirement:		3-6
BMGT230	Business Statistics	
	or ECON230 Applied Economic Statistics	
and		
STAT100	Elementary Statistics and Probability	
	or MATH107 Introduction to Math Modeling and Probability	

or		
STAT400	Applied Probability and Statistics I	3
MATH120	Elementary Calculus I	
or MATH140 Calculus I		
Specialization (from list below)		24
Agribusiness		
Agricultural and Resource Economics		
Environmental and Resource Economics		
Total Credits		39-42

Specializations: Agribusiness

Course	Title	Credits
Select five of the following courses:		15
AREC306	Farm Management and Sustainable Food Production	
AREC382	Computer-Based Analysis in Agricultural and Resource Economics	
AREC405	Economics of Production	
AREC422	Econometric Analysis in Agricultural and Environmental Economics	
AREC426	Economic Methods and Food Consumption Policy	
AREC427	Commodity Pricing and Markets	
AREC430	Introduction to Agricultural and Resource Law	
AREC431	Agricultural Water Quality: Policy and Legal Issues	
AREC433	Food and Agricultural Policy	
AREC435	Commodity Futures and Options	
AREC445	Agricultural Development, Population Growth and the Environment	
AREC446	Sustainable Economic Development	
AREC453	Natural Resources and Public Policy	
AREC454	The Economics of Climate Change	
AREC455	Economics of Land Use	
AREC456	Energy and Environmental Economics	
AREC481	Environmental Economics	
AREC489	Special Topics in Agricultural and Resources Economics	
Other upper-level AREC courses with permission of advisor.		
Select three courses from one of the following fields:		9
Business Management		
Farm Management and Entrepreneurship		
Student Designed Field		
Total Credits		24

Agricultural and Resource Economics

Course	Title	Credits
Select five of the following courses:		15
AREC306	Farm Management and Sustainable Food Production	
AREC382	Computer-Based Analysis in Agricultural and Resource Economics	
AREC405	Economics of Production	

AREC422	Econometric Analysis in Agricultural and Environmental Economics
AREC426	Economic Methods and Food Consumption Policy
AREC427	Commodity Pricing and Markets
AREC430	Introduction to Agricultural and Resource Law
AREC431	Agricultural Water Quality: Policy and Legal Issues
AREC433	Food and Agricultural Policy
AREC435	Commodity Futures and Options
AREC445	Agricultural Development, Population Growth and the Environment
AREC446	Sustainable Economic Development
AREC453	Natural Resources and Public Policy
AREC454	The Economics of Climate Change
AREC455	Economics of Land Use
AREC456	Energy and Environmental Economics
AREC481	Environmental Economics
AREC489	Special Topics in Agricultural and Resources Economics
Other upper-level AREC courses with permission of advisor.	
Select three courses from one of the following fields:	9
Agriculture Science	
Advanced Degree Preparation	
Food Production	
Political Process	
Student Designed Field	
Total Credits	24

Environmental and Resource Economics

Course	Title	Credits
Select five of the following courses:		
AREC382	Computer-Based Analysis in Agricultural and Resource Economics	15
AREC405	Economics of Production	
AREC422	Econometric Analysis in Agricultural and Environmental Economics	
AREC431	Agricultural Water Quality: Policy and Legal Issues	
AREC445	Agricultural Development, Population Growth and the Environment	
AREC446	Sustainable Economic Development	
AREC453	Natural Resources and Public Policy	
AREC454	The Economics of Climate Change	
AREC455	Economics of Land Use	
AREC456	Energy and Environmental Economics	
AREC481	Environmental Economics	
Other upper-level AREC courses with permission of advisor.		
Select three courses from one of the following fields:		9
Advanced Degree Preparation		
Natural Science		
Social Science		
Total Credits		24

Fields: Advanced Degree Preparation

Course	Title	Credits
Choose three of the following courses:		
ECON407	Advanced Macroeconomics	
ECON414	Game Theory	
ECON415	Market Design	
ECON422	Econometrics	
ECON423	Advanced Topics in Econometrics	
ECON425	Mathematical Economics	
MATH141	Calculus II	
MATH240	Introduction to Linear Algebra	
MATH241	Calculus III	
STAT401	Applied Probability and Statistics II	
STAT410	Introduction to Probability Theory	
STAT420	Theory and Methods of Statistics	
STAT430	Introduction to Statistical Computing with SAS	
Any other upper-level ECON/MATH/STAT course chosen in consultation with advisor.		

Agricultural Science

Course	Title	Credits
Choose three of the following courses:		
ANSC101	Principles of Animal Science	
AGRI SCI	Other courses in agricultural science, chosen in consultation with an advisor ¹	

¹ Substitutions to the above listed courses may be made with the permission of advisor.

Business Management

Course	Title	Credits
Choose three of the following courses:		
BMGT340	Business Finance (BMGT340N) ¹	
BMGT350	Marketing Principles and Organization (BMGT350N)	
BMGT364	Managing People and Organizations (BMGT364N)	
BMGT380	Business Law I (BMGT380N)	

¹ Course has prerequisites that do not count toward major requirements.

Farm Management and Entrepreneurship

Course	Title	Credits
Choose three of the following courses:		
ENES140	Discovering New Ventures	
ENES461	Advanced Entrepreneurial Opportunity Analysis in Technology Ventures	
ENES471	Legal Aspects of Entrepreneurship	
INAG103	Agricultural Marketing	
INAG201	Agricultural Human Resources Management	
INAG204	Agricultural Business Management	

INAG205	Analyzing Alternative Enterprises	
BMGT289E	Entrepreneurial Thinking for Non-Business Majors: How Not to Miss Great Opportunities Your Life Throws at You	
or ENES210	Entrepreneurial Opportunity Analysis and Decision-Making in 21st Century Technology Ventures	
or INAG102	Agricultural Entrepreneurship	

GVPT273	Introduction to Environmental Politics	
GVPT306	Global Environmental Politics	
SOCY200	Human Societies	
SOCY405	Scarcity and Modern Society	
SOCY415	Environmental Sociology	
PLCY301	Sustainability	
or AGNR301	Sustainability	
Any higher-level social sciences course chose in consultation with advisor		

Food Production

Course	Title	Credits
Choose three of the following courses:		
PHYS121	Fundamentals of Physics I	
BSCI170 & BSCI171	Principles of Molecular & Cellular Biology and Principles of Molecular & Cellular Biology Laboratory	
BSCI223	General Microbiology	
NFSC100	Elements of Nutrition	
NFSC112	Food: Science and Technology	
NFSC430	Food Microbiology	
NFSC431	Food Quality Control	
Other courses related to food science can be substituted with permission of advisor		

Natural Science

Course	Title	Credits
Choose three of the following courses:		
AOSC200 & AOSC201	Weather and Climate and Weather and Climate Laboratory	
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab	
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory	
ENST200	Fundamentals of Soil Science	
ENST214	Introduction to Fish and Wildlife Sciences	
GEOG201 & GEOG211	Geography of Environmental Systems and Geography of Environmental Systems Laboratory	
PHYS121 & PHYS122	Fundamentals of Physics I and Fundamentals of Physics II	
Any higher-level lab science course		

Political Process

Course	Title	Credits
GVPT	Any three courses in government and politics, chosen with permission of the advisor.	

Social Sciences

Course	Title	Credits
Choose three of the following courses:		
ANTH222	Introduction to Ecological and Evolutionary Anthropology	
ANTH266	Changing Climate, Changing Cultures	
ANTH305	Archaeological Methods and Practice	
ANTH322	Method and Theory in Ecological Anthropology	

Student Designed Field

Course	Title	Credits
This field requires a written proposal listing at least three courses totaling at least 9 credits. ¹		9
Total Credits		9

¹ The proposal must be submitted to the Undergraduate Committee of the AREC department. Committee approval must be obtained 30 or more credit hours before graduation. A student designed field may be used to study a foreign language as part of the AREC curriculum.

Other Requirements for the Major

All courses must be passed with a grade of "C-" or better to count towards prerequisite courses, major core courses, or field requirements. "C- or better" means any grade for which the University awards 1.7 or more quality points in calculating GPA. Beginning with students matriculating Fall 2012, to be awarded a baccalaureate degree, students must have a minimum (2.00) cumulative grade point average across all courses used to satisfy major degree requirements.

FOUR-YEAR PLAN

Click here (<https://agnr.umd.edu/academics/advising/four-year-plans/>) for roadmaps for four-year plans in the College of Agricultural and Natural Resources.

Additional information on developing a four-year academic plan can be found on the following pages:

- <http://4yearplans.umd.edu>
- the Student Academic Success-Degree Completion Policy (<https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/#success>) section of this catalog