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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON200</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON201</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>AREC326</td>
<td>Intermediate Applied Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>BMGT230</td>
<td>Business Statistics</td>
<td></td>
</tr>
<tr>
<td>or ECON230</td>
<td>Applied Economic Statistics</td>
<td></td>
</tr>
<tr>
<td>and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT100</td>
<td>Elementary Statistics and Probability</td>
<td></td>
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<tr>
<td>or MATH107</td>
<td>Introduction to Math Modeling and Probability</td>
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Statistics Requirement:

| STAT400  | Applied Probability and Statistics I                      |         |
| MATH120  | Elementary Calculus I                                      | 3       |
| or MATH140 | Calculus I                                              |         |

Specialization (from list below) 24

- Agribusiness
- Agricultural and Resource Economics
- Environmental and Resource Economics

Total Credits 39-42

Specializations:

Agribusiness

Select five of the following courses:

- 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

Select five of the following courses:

- 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.
### Agricultural and Resource Economics Major

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<tr>
<td>AREC422</td>
<td>Econometric Analysis in Agricultural and Environmental Economics</td>
</tr>
<tr>
<td>AREC426</td>
<td>Economic Methods and Food Consumption Policy</td>
</tr>
<tr>
<td>AREC427</td>
<td>Commodity Pricing and Markets</td>
</tr>
<tr>
<td>AREC430</td>
<td>Introduction to Agricultural and Resource Law</td>
</tr>
<tr>
<td>AREC431</td>
<td>Agricultural Water Quality: Policy and Legal Issues</td>
</tr>
<tr>
<td>AREC433</td>
<td>Food and Agricultural Policy</td>
</tr>
<tr>
<td>AREC435</td>
<td>Commodity Futures and Options</td>
</tr>
<tr>
<td>AREC445</td>
<td>Agricultural Development, Population Growth and the Environment</td>
</tr>
<tr>
<td>AREC446</td>
<td>Sustainable Economic Development</td>
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<tr>
<td>AREC453</td>
<td>Natural Resources and Public Policy</td>
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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

Select five of the following courses: 15
- AREC382 Computer-Based Analysis in Agricultural and Resource Economics
- 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

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

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

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

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
### Food Production

**Course**  | **Title**  | **Credits**
--- | --- | ---
Choose three of the following courses:

- PHYS121: Fundamentals of Physics I
- BSCI170: Principles of Molecular & Cellular Biology
  & BSCI171: 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
- 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.  

<table>
<thead>
<tr>
<th><strong>Total Credits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

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