

AGRICULTURAL AND RESOURCE ECONOMICS MAJOR

Program Director: Maria E. Soppelsa, Ph.D.

Agricultural and Resource Economics majors complete a set of foundational courses in economics, analytics, and business statistics; specialize in one of three tracks: Environmental and Resource Economics, Agribusiness, or Agricultural and Resource Economics; and take a complementary field from Business Management, Environmental Data Science, Agricultural Management and Entrepreneurship, Ag Food and Natural Resources Systems, Environmental and Resource Management and Policy, Sustainable Development or Advanced Degree Preparation. The curriculum includes courses in economic analysis, energy economics, agribusiness management, data science, environmental economics, economic development, and natural resource policy. The major provides a strong foundation for careers in the private, public and non-profit sectors in business, economics, agriculture, management, environmental or natural resource policy, and sustainable development. Well qualified students may also choose to pursue an advanced degree in applied economics, business, statistics or law.

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 or AREC240 or AREC250 | Principles of Microeconomics Introduction to Economics and the Environment Elements of Agricultural and Resource Economics | 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 | |
| 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

| Course | Title | Credits |
|---|--|-----------|
| Select five of the following courses: | | 15 |
| AREC306 | Farm Management and Sustainable Food Production | |
| AREC380 | Data Science for Environmental 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 | | |
| AREC433 | Food and Agricultural Policy | |
| AREC435 | Commodity Futures and Options | |
| AREC447 | The Economy of China | |
| AREC455 | Economics of Land Use | |
| 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 | | |
| Agricultural 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 | |
| AREC380 | Data Science for Environmental 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 | |
| AREC433 | Food and Agricultural Policy |
| AREC435 | Commodity Futures and Options |
| AREC445 | Agricultural Development, Population Growth and the Environment |
| AREC446 | Sustainable Economic Development |
| AREC447 | The Economy of China |
| AREC453 | Natural Resources and Public Policy |
| AREC454 | The Economics of Climate Change |
| AREC455 | Economics of Land Use |
| AREC456 | Energy and Environmental Economics |
| AREC466 | Transportation Engineering, Economics, and Policy |
| 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 |
| Advanced Degree Preparation | |
| Agricultural, Food and Natural Resource Systems | |
| Global Hunger, Poverty and Sustainable Development | |
| Student Designed Field | |
| Total Credits | 24 |

Environmental and Resource Economics

| Course | Title | Credits |
|---|--|-----------|
| Select five of the following courses: | | |
| AREC380 | Data Science for Environmental and Resource Economics | 15 |
| AREC405 | Economics of Production | |
| AREC422 | Econometric Analysis in Agricultural and Environmental Economics | |
| AREC431 | | |
| 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 | |
| AREC466 | Transportation Engineering, Economics, and Policy | |
| 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 | | |
| Environmental Data Science | | |
| Environmental and Resource Management and Policy | | |
| Student Designed Field | | |
| Total Credits | 24 | |

Fields: Advanced Degree Preparation

| Course | Title | Credits |
|--|--|---------|
| Choose three of the following courses: | | |
| ECON406 | Advanced Microeconomics | |
| ECON414 | Game Theory | |
| ECON415 | Market Design | |
| ECON422 | Econometrics | |
| ECON423 | Advanced Topics in Econometrics | |
| MATH141 | Calculus II | |
| MATH240 | Introduction to Linear Algebra | |
| MATH241 | Calculus III | |
| STAT401 | Applied Probability and Statistics II | |
| 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, Food and Natural Resource Systems

| Course | Title | Credits |
|---|---|---------|
| Choose three of the following courses: | | |
| AREC210 | The Food Chain: What Happens As Your Food Goes From Farm to Table | |
| ANSC101 | Principles of Animal Science | |
| ANSC227 | Eating with Eyes Wide Open | |
| ANTH242 | Fire, Farming and Climate Change: An Archaeology Take on the History of Human Impacts on our Planet | |
| ANTH421 | Nutritional Anthropology | |
| ENST441 | Sustainable Agriculture | |
| GEOG431 | Culture and Natural Resource Management | |
| GVPT206 | Appetite for Change: Politics and the Globalization of Food | |
| NFSC100 | Elements of Nutrition | |
| PLSC112 | Introductory Crop Science | |
| PLSC125 | Feeding Ten Billion by 2050: Food Security and Crop Protection | |

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.

Agricultural 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 | |

Global Hunger, Poverty and Sustainable Development

| Course | Title | Credits |
|---|---|---------|
| Choose three of the following courses: | | |
| AREC260 | The Science of Gender in Economics and Development | |
| AREC345 | Global Poverty and Economic Development | |
| AREC365 | World Hunger, Population, and Food Supplies | |
| AREC445 | Agricultural Development, Population Growth and the Environment <small>Course may not double count toward upper level specialization requirements</small> | |
| AASP320 | | |
| AGNR/PLCY301 | Sustainability | |
| ANTH407 | Anthropology and Development | |
| HLTH325 | Poor in America: Health and Wellbeing | |
| SOCY340 | Globalization's Winners and Losers | |

Environmental Data Science

| Course | Title | Credits |
|---|--|---------|
| Choose three of the following courses: | | |
| AREC280 | Harvesting Big Data to Examine Agriculture and Climate Change | |
| AREC380 | Data Science for Environmental and Resource Economics <small>Course may not double count toward upper level specialization requirements</small> | |
| AREC422 | Econometric Analysis in Agricultural and Environmental Economics <small>Course may not double count toward upper level specialization requirements</small> | |
| FIRE298 | FIRE Semester 3 | |
| AOSC247 | Scientific Programming: Python | |

or GEOG276 Principles of Python Programming and Geocomputing

GEOG272 Introduction to Earth Observation Science

GEOG373 Geographic Information Systems

AOSC447 Machine Learning in Earth Science

Environmental and Resource Management and Policy

| Course | Title | Credits |
|--------------|---|---------|
| AREC200 | The Chesapeake Bay Ecosystem: Intersection of Science, Economics, and Policy | |
| AGNR/PLCY301 | Sustainability | |
| ANTH242 | Fire, Farming and Climate Change: An Archaeology Take on the History of Human Impacts on our Planet | |
| or ANTH266 | Changing Climate, Changing Cultures | |
| AOSC375 | Introduction to the Blue Ocean | |
| ENST403 | Invasive Species Ecology | |
| ENST485 | Water Management in Urban Environment | |
| FGSM340 | Energy and Environmental Policy | |
| GEOG332 | Economic Geography | |

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.

GRADUATION PLANS

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

Additional information on developing a graduation 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