AREC - AGRICULTURAL AND RESOURCE ECONOMICS

AREC200 The Chesapeake Bay Ecosystem: Intersection of Science, Economics, and Policy (3 Credits)
The Chesapeake Bay is one of the most studied and monitored ecosystems in the world. To develop effective policies to restore this system to a healthier status requires integrating what we know about the biological and physical properties of the system with our understanding of the human dimension. Issues such as achieving nutrient reduction goals, restoring healthy blue crab and oyster fisheries in the bay will be used to demonstrate how economics interacts with science to guide policies that can be effective in achieving Bay restoration goals.

AREC210 The Food Chain: What Happens As Your Food Goes From Farm to Table (3 Credits)
How can we feed a growing global population, reduce farming's environmental damage, and provide a healthier diet, all in the face of climate change? The course explores these global food system challenges in the context of the food supply chains that link farms, input providers, traders, food processors, retailers, consumers, and governments. We assess how supply chains are organized; how they use technologies; and how they can create organizations, develop new technologies, and adapt food production practices to meet these four major challenges facing the global food system.

AREC240 Introduction to Economics and the Environment (4 Credits)
Costs and social impacts of pollution and human crowding in the modern environment. The economic, legal and institutional causes of these problems. Public policy approaches to solutions and the costs and benefits of alternative solutions.
Credit Only Granted for: AREC240 or AREC250 .

AREC241 Environment, Economics and Policy (4 Credits)
How can economics help us understand modern environmental problems and design better policies to solve them? This course studies the relationship between the economy, environment and policy. The importance of production, consumption, externalities, property rights and public goods in environmental issues is examined. Technological and incentive-based solutions are considered. Students will apply these concepts to evaluate current controversial environmental problems.
Credit Only Granted for: AREC240 or AREC241.

AREC250 Elements of Agricultural and Resource Economics (3 Credits)
An introduction to economic principles of production, marketing, agricultural prices and incomes, farm labor, credit, agricultural policies, and government programs.
Credit Only Granted for: AREC240 or AREC250.

AREC254 Charting a Sustainable Future: Integrating Economics and Policy for Climate Action (3 Credits)
Explores climate change through an economic perspective, focusing on how economic principles can inform effective climate policies. Students will learn about the causes and impacts of a changing climate, evaluate various policy approaches, and develop critical thinking skills. By the end of the semester, they will understand economic tools for addressing climate change and the associated political, socioeconomic, and ethical complexities.

AREC260 The Science of Gender in Economics and Development (3 Credits)
Is science an objective enterprise that qualifies researchers to investigate gender free from the constraints and prejudice of their culture? We will investigate the process by which various scientific disciplines, including anthropology, evolutionary biology, psychology, and economics do research on the topic of gender. We will describe the current state of the literature on why different sexes exist and how sex translates into gender across different societies today. With a better understanding of the sources of sex and gender, we will examine how to research the reasons behind the highly divergent economic outcomes for men and women today. We will discuss these issues in the context of the labor market in developed countries like the US as well as a variety of contexts in developing countri es. A particular focus will be the techniques for learning more about the underlying reasons for these differences, how and whether they can be overcome, and if women play a specific role in improving economic outcomes in the poorest parts of the world.
Recommended: Completion of introductory statistics recommended but not required.

AREC280 Harvesting Big Data to Examine Agriculture and Climate Change (3 Credits)
Can agricultural production keep up with climate change? The digital revolution has changed the way we analyze and interpret the world. Big data offers both opportunities and challenges that require new tools and methods of analysis. This course applies sophisticated digital tools to an age-old concern: the impact of climate on agricultural productivity. In this hands-on introduction to data analysis and visualization with real-world data, students acquire the tools to understand the impacts of environmental change and more.
Credit Only Granted for: HNUH258A or AREC280.
Formerly: HNUH258A.

AREC306 Farm Management and Sustainable Food Production (3 Credits)
The organization and operation of farm businesses are explored through principles of management, financial analysis, production economics, marketing, and business planning. These farm management principles are presented in the context of a sustainable food production system.

AREC326 Intermediate Applied Microeconomics (3 Credits)
Deepens and broadens your ability to apply rigorous economic analysis skills to a broad range of problems.
Prerequisite: ECON200, AREC250, or AREC240; And MATH120, MATH136, or MATH140.
Credit Only Granted for: ECON306, ECON326, AREC489M, or AREC326.
Formerly: AREC489M.

AREC345 Global Poverty and Economic Development (3 Credits)
This interdisciplinary course explores social and economic development around the world. Topics include geography, democratization, political instability and conflict, health and education, agricultural development, micro-entrepreneurship, and an introduction to impact evaluation methods used to evaluate the efficacy of public policy aimed at alleviating poverty.

AREC360 Global Agriculture: Developing Extension Education & Agriculture Technologies in Africa (3 Credits)
Identifies challenges faced by farmers in Nimba County, Liberia, and works collaboratively across borders to discuss these challenges and develop extension education programming that will be implemented in the region in order to empower local farmers. The course is designed to create a paradigm shift for both cohorts of students who will educate and learn from each other in what is now becoming a critical context - the globalized workspace. UMD and LICC students will be grouped together to identify and develop particular thematic areas most needed by local farmers, and then as a cohort create a week-long extension program to be implemented on the ground.

AREC365 World Hunger, Population, and Food Supplies (3 Credits)
An introduction to the problem of world hunger and possible solutions to it. World demand, supply, and distribution of food. Alternatives for leveling off world food demand, increasing the supply of food, and improving its distribution. Environmental limitations to increasing world food production.

AREC370 From Poverty to Progress in The World's Largest Democracy: India's Political Economy in Transition (3 Credits)
India, the largest country in the world, is home to nearly 18% of the global population. As such, India's growth and progress have profound implications for humanity's trajectory in the 21st century. This course explores India's past, present, and future through the lens of political economy. We will explore the incentives of politicians and bureaucrats as well as issues related to local governance and social movements.
Prerequisite: ECON200, AREC250 or AREC240; and one of the following: STAT100, MATH107, BMGT230, ECON230 or STAT400.

AREC380 Data Science for Environmental and Resource Economics (3 Credits)
An introduction to principles of data science using modern, open source software tools with applications to important problems in environmental, energy and resource economics. Topics include data wrangling, exploratory data analysis and visualization, modeling, forecasting, practices for reproducible research, and communication of results.
Prerequisite: AREC240, AREC241, AREC250, or ECON200.

AREC388 Internship Experience (1-6 Credits)
Internship experience in agricultural, environmental or resource economics.
Prerequisite: Permission of the Department of Agricultural and Resource Economics. Must have an internship proposal approved by the Department of Agricultural and Resource Economics.
Restriction: Junior standing or higher.
Repeatable to: 6 credits if content differs.

AREC389 Special Problems (1-3 Credits)
Concentrated reading and study in some phase of a problem in agricultural and/or natural resource economics.
Restriction: Must have permission of the Department of Agricultural and Resource Economics.
Repeatable to: 6 credits if content differs.

AREC399 Undergraduate Research (3-6 Credits)
Research in agricultural, environmental or resource economics under the direction and close supervision of a member of the AREC faculty.
Restriction: Minimum cumulative GPA of 3.0; and must have permission of the Department of Agricultural and Resource Economics.
Repeatable to: 6 credits.
Additional Information: A maximum of 6 credits of any version of AREC399 may be applied to one or more, undergraduate degrees. Any research credits completed beyond the first 6 will be included, in the total earned credits and factored into the GPA but not applied to any undergraduate, degree.

AREC405 Economics of Production (3 Credits)
The use and application of production economics in analysis of firm and policy decisions. Production functions, cost functions, multiple product and joint production, and production processes through time.
Prerequisite: ECON326 or AREC326; or students who have taken courses with comparable content may contact the department.

AREC422 Econometric Analysis in Agricultural and Environmental Economics (3 Credits)
This course offers a hands-on introduction to econometrics. Students will explore the linear regression model from the ground up by analyzing real-world datasets and learning how to distinguish causation from correlation. They will gain practical experience using econometrics to address important questions in agricultural economics and environmental economics.
Prerequisite: 1 course from ECON230, ECON321, or BMGT230.
Credit Only Granted for: ECON422, ECON424, or AREC422.

AREC426 Economic Methods and Food Consumption Policy (3 Credits)
An overview of major econometric tools used by policy makers, economists and social scientists to analyze the effects of food consumption policy. Major food assistance programs in the United States such as SNAP, the School Lunch Program and the School Breakfast Program will be discussed.
Prerequisite: AREC326; or ECON326.
Credit Only Granted for: AREC489O or AREC426.
Formerly: AREC489O.

AREC427 Commodity Pricing and Markets (3 Credits)
Economic theory as applied to the marketing of agricultural commodities. How commodity prices vary with current demand and production, and how prices are linked over time, across space, and across grades.
The role played by contractual arrangements, cooperative marketing, vertical integration, and governmental policies in commodity marketing strategies.
Prerequisite: ECON326 or AREC326; or students who have taken courses with comparable content may contact the department.

AREC430 Introduction to Agricultural and Resource Law (3 Credits)
Survey of law with emphasis on problems and applications related to agricultural and natural resource economics. The course emphasizes strategies for managing legal risk arising from ownership, management, and use of agricultural resources. Students will get practical information to utilize in personal or professional settings. Contract law, constitutional law, tort law, property law, real estate transactions, business organization, estate planning, and debtor.
Prerequisite: ECON326 or AREC326.
Credit Only Granted for: AREC430 or AREC489K.
Formerly: AREC489K.

AREC433 Food and Agricultural Policy (3 Credits)
Economic and political context of governmental involvement in the farm and food sector. Historical programs and current policy issues. Analysis of economic effects of agricultural programs, their benefits and costs, and comparison of policy alternatives. Analyzes the interrelationship among international development, agricultural trade and general economic and domestic agricultural policies.
Prerequisite: ECON326 or AREC326; or students who have taken courses with comparable content may contact the department.

AREC435 Commodity Futures and Options (3 Credits)
The economics and institutional features of commodity futures and options markets. Students will develop a basic understanding of the underlying price relationships between cash and futures markets and will apply this information to business risk management decision making.
Prerequisite: AREC326; or ECON326; or students who have taken courses with comparable content may contact the department.

AREC445 Agricultural Development, Population Growth and the Environment (3 Credits)
Development theories, the role of agriculture in economic development, the agricultural policy environment, policies impacting on rural income and equity, environmental impacts of agricultural development.
Prerequisite: ECON326 or AREC326; or students who have taken courses with comparable content may contact the department.

AREC446 Sustainable Economic Development (3 Credits)
Examine why socially equitable and environmentally sustainable economic growth is difficult to achieve. It explores the interactive dynamics of environmental degradation, human capital, inequality and institutions. Emphasis is on the role of market imperfections and political failure in explaining the persistence of extractive economic institutions that hinder sustainable development.
Prerequisite: AREC326; or ECON326; or students who have taken courses with comparable content may contact the department.
Credit Only Granted for: AREC446 or AREC489G.
Formerly: AREC489G.

AREC447 The Economy of China (3 Credits)
An introductory survey course of economic development in China with emphasis on understanding the process of economic reform in mainland China since 1978.
Prerequisite: AREC326 or ECON326 or Permission of AGNR-Agricultural Resource Economics department.

AREC453 Natural Resources and Public Policy (3 Credits)
Rational use and reuse of natural resources. Theory, methodology, and policies concerned with the allocation of natural resources among alternative uses. Optimum state of conservation, market failure, safe minimum standard, and cost-benefit analysis.
Prerequisite: AREC326, ECON306, or ECON326; and (BMGT230 or ECON230).
Cross-listed with: ECON453.
Restriction: Must be in one of the following programs (Agricultural and Resource Economics; Agricultural and Resource Economics: Agribusiness; Agricultural and Resource Economics: Environmental and Resource Economics; Economics Bachelor of Arts; Environmental Science & Policy-Env Economics; Social Data Science-Economics; Economics minor).
Credit Only Granted for: AREC453 or ECON453.

AREC454 The Economics of Climate Change (3 Credits)
The role of economics in the formation of climate policy; basic concepts of environmental economics including efficiency, externalities, and policy instruments; economic models of intertemporal decisions and decision making in the face of uncertainty. Applied economic analysis of specific issues and current policy initiatives.
Prerequisite: 1 course with a minimum grade of C- from (AREC326, ECON306, ECON326); and 1 course with a minimum grade of C- from (ECON230, ECON321, BMGT230, STAT401).
Cross-listed with: ECON484.
Credit Only Granted for: AREC454 or ECON484.

AREC455 Economics of Land Use (3 Credits)
Fundamentals of location theory. Microeconomics of land use decisions, including determination of rent and hedonic pricing models. Impacts of government decisions on land use, including regulation (e.g., zoning), incentives (transferable development rights), provision of public services, and infrastructure investments. Impacts of land use on environmental quality, including issues relating to sprawl, agricultural land preservation, and other topics of special interest.
Prerequisite: 1 course with a minimum grade of C- from (AREC326, ECON306, ECON326); and 1 course with a minimum grade of C- from (ECON230, ECON321, BMGT230, STAT401).
Cross-listed with: ECON485.
Credit Only Granted for: AREC455 or ECON485.

AREC456 Energy and Environmental Economics (3 Credits)
Economic theory and empirical methods are used to study problems of energy, the environment, and the economy. It examines the extraction, production, and use of energy and market institutions and regulatory approaches used to correct market failures. Topics covered include: oil and natural gas markets, management and design of electricity markets, renewable energy, non-market valuation , climate change, and transportation policies.
Prerequisite: 1 course with a minimum grade of C- from (AREC326, ECON306, ECON326); and 1 course with a minimum grade of C- from (ECON230, ECON321, BMGT230, STAT401).
Cross-listed with: ECON486.
Credit Only Granted for: AREC456 or ECON486.

AREC466 Transportation Engineering, Economics, and Policy (3 Credits)
The transportation system moves people and goods around the world, but transportation has downsides: harming local air quality, contributing to climate change, causing traffic accidents, and wasting people's time on congested roads. Mitigating these downsides will require new policies, new technologies, and new decisions by households and businesses. Focusing on the US transportation system, students will apply an integrated economics, policy, and engineering perspective to analyze transportation's most pressing challenges. Students are expected to have some background in one of the three disciplines--economics, engineering, or policy--but not all three. The beginning of the semester will include tutorials for students without much economics or engineering background.
Prerequisite: BMGT230, ECON230, ECON321, ENCE302, or PLCY304; or permission of the instructors.
Recommended: AREC326, ECON306 or ECON326.
Credit Only Granted for: AREC466 or ENCE489T.

AREC481 Environmental Economics (3 Credits)
An exploration of the use of economic incentives for protection of the environment and the determination of appropriate (or efficient) level of environmental quality. Also covers the choice of policy instruments for the attainment of environmental standards.
Prerequisite: 1 course with a minimum grade of C- from (AREC326, ECON306, ECON326); and 1 course with a minimum grade of C- from (ECON230, ECON321, BMGT230, STAT401).
Cross-listed with: ECON481.
Restriction: Must be in one of the following programs (Agricultural and Resource Economics; Agricultural and Resource Economics: Agribusiness; Agricultural and Resource Economics: Environmental and Resource Economics; Economics Bachelor of Arts; Environmental Science & Policy-Env Economics; Social Data Science-Economics; Economics minor).
Credit Only Granted for: ECON481 or AREC481.

AREC489 Special Topics in Agricultural and Resources Economics (3 Credits)
Repeatable to: 9 credits.

AREC499 Honors Thesis Research (3-6 Credits)
Undergraduate honors thesis research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of AGNR Honors Program. The thesis will be defended to a faculty committee.
Restriction: Must be in the AGNR Honors program.
Repeatable to: 6 credits if content differs.