

## Fall 2020 Course Descriptions as of 04/05/2020 08:10 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: [http://rcs.registrar.arizona.edu/course\\_descriptions\\_key](http://rcs.registrar.arizona.edu/course_descriptions_key).

### Agric & Resource Economics (AREC)

#### **AREC 101: Ethics, Economy & Entrepreneurship** (3 units)

**Description:** CENTRAL QUESTIONS: Why do some societies grow rich while other societies remain poor? What must a person do to succeed in market society? What must a person do to deserve to succeed? (What does it mean to truly be of service?) How do entrepreneurs think and act? How do they start a business? How do they sustain a business? How do they learn to acknowledge and correct flaws in their business model?

**Grading basis:** Student Option ABCDE/PF

**Career:** Undergraduate

<b>Course Components:</b>	Discussion	May Be Offered
	Lecture	Required

**Also offered as:** ENTR 101, PPEL 101

**Course typically offered:**

Main Campus: Fall, Spring

Community Campus: Fall, Spring, Summer

**Recommendations and additional information:** This class does not fulfill any requirements toward the PPEL major. This is not a change to enrollment requirements, but clarifies requirements for PPEL majors.

**Home department:** Political Economy & Moral Science

#### **AREC 150C1: The Role of Markets and Incentives** (3 units)

**Description:** This course focuses on a few first principles of economics with the aim of understanding 1) how markets work, 2) the normative significance of markets as a non-coercive and cooperative form of social interaction, 3) circumstances under which the normative significance and efficacy of market outcomes might be questioned (so-called "market failure"), and 4) problems associated with government intervention to remedy "market failure" and other perceived ills (so-called "government failure"). Math proficiency at the basic university level is assumed.

**Grading basis:** Regular Grades

**Career:** Undergraduate

<b>Course Components:</b>	Discussion	May Be Offered
	Lecture	Required

**Enrollment requirement:** Enrollment not allowed if you have previously taken INDV 103 "The Role of Markets and Incentives" (Topic 9).

**General Education:** INDV 103

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 150C2: World Food Issues** (3 units)

**Description:** This course will describe the prominent characteristics of the world food system in terms of the utilization of land, water and energy resources, the role of different technologies in world agricultural production, and the nutritional requirements of consumers. The primary focus of the course is on developing countries, however, important interactions between wealthy and poor countries will be emphasized. The course will include foundational knowledge about individuals and societies.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Discussion                      May Be Offered  
Lecture                      Required

**Enrollment requirement:** Enrollment not allowed if you have previously taken INDV 103 "World Food Issues" (Topic 12).

**General Education:** INDV 103

**AREC 150C3: Sustaining Life: The Global Economy of Food** (3 units)

**Description:** This course describes the operational fundamentals of the global food system ranging from smaller-scale subsistence or organic production to the larger-scale commercial food trade. Consumer food behavior, both local and international, represents a core analytical issue in this class. A consistent thread throughout the course is the evaluation of the role of markets to efficiently and effectively allocate food resources for individuals and societies.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture                      Required

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 193: Internship** (1 - 8 units)

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study                      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 195B: Global Poverty and Hunger** (1 unit)

**Description:** Students are introduced to current issues and analysis surrounding the challenges of global hunger and poverty. Special emphasis is given to the role of economic principles and models for helping us understand and mitigate these difficult human conditions. Classroom discussions, videos, guest speakers, and short writing assignments facilitate student interaction with these important issues.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Colloquium Required

**Freshman Colloquia:** Freshman Colloquia

**AREC 197A: Strategy and Planning for Academic Success** (1 unit)

**Description:** This course is designed to expose the student to departmental and university expectations for a successful academic career and beyond, and the resources available to students that will enable them to achieve their life goals.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Workshop Required

**Success Course:** Success Course

**AREC 199: Independent Study** (1 - 3 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 201: Introduction to Statistics** (3 units)

**Description:** An introduction to the foundation of statistical reasoning and probability coupled with applied data analysis including frequencies, descriptive statistics, and hypothesis testing.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Also offered as:** FCSC 201

**Course typically offered:**

Main Campus: Fall, Spring, Summer

**Home department:** Family and Consumer Sciences

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 210: Understanding the World of Commerce (3 units)**

**Description:** This course provides students with 1) a survey of business organizations as major institutions and the role of individuals as consumers, future entrepreneurs, and employees; 2) knowledge of the formal business and market structures that makes economies work; and 3) informed opinions about socio-cultural issues based on knowledge about economic theory. It offers an overview of entrepreneurial thinking and problem solving in the context of relations among the world of commerce and life sciences.

**Grading basis:** Regular Grades

**Career:** Undergraduate

<b>Course Components:</b>	Lecture	Required
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**Also offered as: PPEL 210**

**Course typically offered:**

Main Campus: Fall, Spring

**Recommendations and additional information:** Two courses from Tier One, Individuals and Societies.

### General Education: Tier 2 Individuals & Societies

**AREC 217: Resources and Environmental Economics (3 units)**

**Description:** Relationship between man and use of natural resources and environmental systems, with emphasis on the economic implications of alternative environmental, energy and land-use policies.

**Grading basis:** Student Option ABCDE/PF

**Career:** Undergraduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 217, ECON 217

**Recommendations and additional information:** ECON 200 or ECON 201A.

**AREC 239: Introduction to Statistics and Data Analysis (4 units)**

**Description:** This is an introductory course in statistics and probability. This course deals with applied data analysis, probability concepts, and statistical inference including confidence intervals and hypothesis testing. Applications and examples will be drawn from life and social sciences.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Discussion Required

Lecture	Required
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**Course typically offered:**

### Main Campus: Spring

**Enrollment requirement:** PPL 60+ or MCLG 88+ or SAT I MSS 640+ or ACT MATH 26+ or one recent course from MATH 112, 113, 116, 122B, or 125. Some students may need to take Math 100, then Math 112 first. Test scores expire after 2 years.

## Mathematics Foundations: Moderate Math Strand

**-SA** represents a Student Abroad & Student Exchange offering

**-CC** represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 293: Internship** (1 - 8 units)

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 297: Excel Applications for Economic Analysis** (1 unit)

**Description:** Data can help us discover the facts and Excel is an effective means to explore data. In general, agricultural economics and management increasingly rely on quantitative analyses to understand the economy and make decisions. The main objective of this course is to help students develop basic skills in quantitative and statistical analysis with Excel to (1) present an agricultural issue with data, graphs, and charts; and (2) confidently interpret and use descriptive statistics encountered everyday as well as in upper-level classes.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Workshop      Required

**Course typically offered:**

Main Campus: Spring

**Enrollment requirement:** ECON 200 or (ECON 201A and ECON 201B).

**AREC 299: Independent Study** (1 - 3 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 299H: Honors Independent Study** (1 - 3 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**AREC 304: Intermediate Production & Consumption Analysis** (3 units)

**Description:** Production and consumption theory and techniques for the analysis of agricultural and resource economics issues.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture      Required

**Course typically offered:**

Main Campus: Fall

**Enrollment requirement:** Major or minor: ABEMBS, EWREBS. Junior or Senior status. (ECON 200 or ECON 201A) and (MATH 113 or MATH 116 or MATH 122B or MATH 124 or MATH 125).

**AREC 313: Economics of Futures Markets** (3 units)

**Description:** Commodity and financial futures market participants, evolution, functions, performance, price determination, and regulation with hedging and speculative applications of futures and futures-options contracts.

**Grading basis:** Student Option ABCDE/PF

**Career:** Undergraduate

**Course Components:** Lecture      Required

**Equivalent to:** AEC 313, ECON 313, FIN 313

**Also offered as:** ECON 313, FIN 313

**Course typically offered:**

Main Campus: Fall

**Enrollment requirement:** ECON 200 or ECON 201A. Junior or Senior status only.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 315: Agribusiness Economics and Management** (3 units)

**Description:** Essential economic concepts and analytical tools for agribusiness managers are developed and applied to current business challenges and opportunities. Emphasis placed on decision tools, budgeting, entrepreneurship, strategy, organization and relationship management.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Course typically offered:**

Main Campus: Fall

**Enrollment requirement:** Major or minor: ABEMBS or EWREBS. Junior or Senior status. ECON 200 or ECON 201A.

**AREC 339: Economic Statistics** (3 units)

**Description:** Application and interpretation of statistical measures to problems in economics.

**Grading basis:** Student Option ABCDE/PF

**Career:** Undergraduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 339, ECON 339

**Also offered as:** ECON 339

**Course typically offered:**

Main Campus: Fall, Summer

**Recommendations and additional information:** Credit allowed for only one of these courses: AREC 339, ECON 376, MAP 376, MKTG 376.

**Enrollment requirement:** Junior or Senior status. (ECON 200 or ECON 201A) and (MATH 113 or MATH 116 or MATH 122B or MATH 124 or MATH 125).

**AREC 360: The Poverty and Development of Nations** (3 units)

**Description:** Exploration and analysis of the multi-dimensionality of hunger, poverty, and economic growth, with special emphasis on the cases of lower-income nations. Both microeconomic (e.g. technology, education) and macroeconomic (e.g. foreign aid, trade) factors are examined.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Course typically offered:**

Main Campus: Spring

**Enrollment requirement:** ECON 200 or ECON 201A. Junior or Senior status only.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**Description:** This course familiarizes students with the food economy and its efficiencies while identifying where gaps occur as food flows from producers to consumers. These gaps frequently lead to food insecurity with a less healthy populous, as well as food waste, an issue in more developed societies. By examining 1) the food supply chain and markets, 2) food insecurity, 3) food loss and waste along the food supply chain and 4) food policies, students will gain insights into the economic forces that shape the food system. This course stimulates critical thinking and problem solving through economic and policy perspectives, which may lead to potential resolutions for those who struggle to afford and consume healthy, wholesome foods.

Main Campus: Fall, Spring

**General Education:** Tier 2 Individuals & Societies

Main Campus: Fall, Winter, Spring, Summer

**Enrollment requirement:** Major or minor: ECON or BNEC. ECON 200 or (ECON 201A and 201B).

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.



**AREC 391: Preceptorship (1 - 3 units)**

**Description:** Specialized work on an individual basis, consisting of instruction and practice in actual service in a department, program, or discipline. Teaching formats may include seminars, in-depth studies, laboratory work and patient study.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated for a maximum of 15 units.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 393: Internship (1 - 8 units)**

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 397: Preparing for Career and Life Success (1 unit)**

**Description:** This course is designed to assist juniors and seniors as they prepare to enter the workplace on a full-time, professional basis. Using University and College career resources, guest speakers from the public and private sectors, classroom discussions, and a major out-of-class reading assignment and report, students are provided the opportunity to equip themselves with job search and critical thinking skills as well as reflect on the important character traits needed to be a valuable contributor to society. This course is designed so students, upon completion of the class, will be able to prepare a professional resume and cover letter customized to a particular opportunity, research career opportunities and understand the job market in their fields of interest, professionally interview for a job position, effectively communicate, both in writing and verbally, and, listening in a variety of settings, and reflect on the leadership and character qualities of a productive employee and citizen.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Workshop      Required

**Course typically offered:**

Main Campus: Fall

**Field trip:** No field trips off campus, but students will be required to attend on campus events such as Career Services or CALS Career Center Career Fair and Mock Interviews.

**Enrollment requirement:** ABEM and EWRE majors and minors only. Junior or Senior status.

**Student Engagement Activity:** Professional Development

**Student Engagement Competency:** Professionalism

**Success Course:** Success Course

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 399: Independent Study** (1 - 3 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 399H: Honors Independent Study** (1 - 3 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**AREC 403: Analysis of Economic Data** (3 units)

**Description:** Market functions, costs, price indices, seasonality, marketing margins, commodity market models, price determination and price forecasting.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture      Required

**Equivalent to:** AEC 403

**Course typically offered:**

Main Campus: Spring

**Enrollment requirement:** Major or minor: ABEM or EWRE. Junior or senior status. (AREC304 or ECON301 or ECON300 or ECON361) and AREC339.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 450: Financial Management for Agribusiness** (3 units)

**Description:** Application of financial management principals and tools to challenges and opportunities facing agribusiness firms. Emphasis is placed on the acquisition, allocation, control and transfer of capital resources.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 450, RCSC 450

**Co-convened with:** AREC 550

**Course typically offered:**

Main Campus: Spring

**Enrollment requirement:** Major or minor: ABEM or EWRE. Junior or Senior status. ACCT 210 and (AREC 304 or ECON 301 or ECON 300 or ECON 361) and (MATH 113 or MATH 116 or MATH 122B or MATH 124 or MATH 125).

**AREC 464: Economics of Policy Analysis** (3 units)

**Description:** Applied economic theory and method of policy analysis and public choice. Emphasis is on policies impacting agriculture and rural America-especially historical and continuing government intervention in agricultural markets.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 464

**Course typically offered:**

Main Campus: Fall

**Enrollment requirement:** Major or minor: ABEMBS, EWREBS. Junior or Senior status. (AREC 304 or ECON 300 or ECON 301 or ECON 361 or AREC 315) and (MATH 113 or MATH 116 or MATH 122B or MATH 124 or MATH 125).

**Writing Emphasis:** Writing Emphasis Course

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 471: Problems in Regional Development (3 units)**

**Description:** Topical issues in regional development, with emphasis on policy in diverse contexts and case study analysis.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 471, AISD 471, AREC 471, PLAN 471, PLG 471, PLN 471, PLNG 471

**Also offered as:** GEOG 471, PLG 471

**Co-convened with: AREC 571**

**Course typically offered:**

Main Campus: Spring

**Home department:** School of Geography and Development

### Student Engagement Activity: Professional Development

### Student Engagement Competency: Professionalism

### Writing Emphasis: Writing Emphasis Course

**AREC 476: Environmental Law and Economics (3 units)**

**Description:** A complex set of laws has developed to control the environmental risks posed by potentially polluting activities. In this course, a survey and an economic evaluation are presented of major environmental legislation designed to protect air, land and water resource quality.

**Grading basis:** Regular Grades

**Career:** Undergraduate

<b>Course Components:</b>	Lecture	Required
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**Equivalent to:** AEC 476, ECON 476, HWRS 476, RNR 476, WRA 476, WSM 476

**Also offered as:** HWRS 476, RNR 476

**Course typically offered:**

Main Campus: Spring

**Enrollment requirement:** Major or minor: ABEM, EWRE. Junior or Senior status. (AREC 304 or ECON 300 or ECON 301 or ECON 361) and (MATH 113 or MATH 116 or MATH 122B or MATH 124 or MATH 125).

**-SA** represents a Student Abroad & Student Exchange offering

**-CC** represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 478: Economics of the Natural Environment** (3 units)

**Description:** Economics is used to study the allocation, management, and ownership of such natural resources as air, fisheries, forests, global resources, minerals, natural areas, oil & gas, water, and wildlife. The course is comprised of theoretical models and detailed applications - including the relationship between economic development and environment, the economics of climate change, and the economics of public land management. Emphasis is placed on the causes and effects of alternative institutions governing the use of the natural environment with a focus on property rights, legal rules, regulations, and administrative agencies.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:**      Lecture                                      Required

**Equivalent to:** ECON 478

**Also offered as:** ECON 478

**Enrollment requirement:** Major or minor: ABEMBS, EWREBS. Junior or Senior status. (AREC 304 or ECON 300 or ECON 361) and AREC 339.

**AREC 479: Economic Analysis of Water, Food & Environmental Policies** (3 units)

**Description:** This course focuses on economic methods for designing and evaluating water, food and environmental policies. Topics include optimizing water as an input in producing food, energy, recreation, and other ecosystem services; water & environmental issues in food production; pricing and conservation incentives; managing shortage risks; and economic tools for addressing conflicts over water, food and the environment. Interactive seminar style course. Calculus proficiency is required.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:**      Lecture                                      Required

**Equivalent to:** GEOG 479, HWRS 479, RNR 479, SWES 479

**Also offered as:** ENVS 479, HWRS 479, RNR 479

**Co-convened with:**

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** One semester of college calculus. One of the following courses: MATH 113, MATH 116, MATH 122B, MATH 125

**Enrollment requirement:** Major in College of Engineering or major/minor in ABEM, ENVS, EWRE, HWRS, NTRS, or WSM. Junior or Senior status. MATH 113, MATH 116, MATH 122B, or MATH 125 (or AP credit for Calculus AB or BC).

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 493: Internship** (1 - 6 units)

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 493H: Honors Internship** (1 - 3 units)

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment. This is an honors section and will have additional report writing required with the internship. Structure to be determined by coordinating faculty member.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 2 times.

**Course typically offered:**

Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**AREC 493L: Legislative Internship** (1 - 12 units)

**Description:** Working experience at the Arizona State Legislature; responsibilities draw upon student's area of major expertise and include preparing written and oral reports, summarizing legislative proposals, and providing information to legislators and legislative committees.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Equivalent to:** AEC 493L

**Course typically offered:**

Main Campus: Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 494R: Research** (3 units)

**Description:** The practical application, on an individual basis, of previously studied theory and the collection of data for future theoretical interpretation.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 2 times.

**Course typically offered:**

Main Campus: Fall, Spring

**Recommendations and additional information:** ENGL 101 and ABE 120 or consent of instructor.

**AREC 496A: Structure, Management, and Performance of American Agriculture** (3 units)

**Description:** In a seminar setting, students will study and discuss the current economic and management issues surrounding America's modern agricultural sector. Special attention will be given to topics of competitiveness, structure, organization, and strategy using an economics analytical framework.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Flat Fee:** \$100

**Course Components:** Seminar Required

**Recommendations and additional information:** ECON 200 or ECON 201A.

**AREC 497: Developing Economic Leadership Skills for Success** (1 - 3 units)

**Description:** Economic Leadership is the application of economics into decision-making to successfully lead organizations. Economic leaders utilize economic theory informed by data analysis to create, manage, and execute dynamic plans. Therefore, this course is designed to teach students leadership skills so they can become leaders in the field of applied economics. Students will inspire to participate in clubs and activities where they can develop and practice their skills as they prepare to enter the workplace.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Workshop Required

**Repeatable:** Course can be repeated a maximum of 12 times.

**Co-convened with:** AREC 597

**Course typically offered:**

Main Campus: Fall, Winter, Spring, Summer

**Recommendations and additional information:** Student must have a junior or higher class standing AND Student must be an AREC minor/major to enroll in this class AND Student must have been accepted into the LEAD program to enroll in this course.

**Field trip:** Students may have the opportunity to travel to local, regional and national conferences.

**Student Engagement Activity:** Leadership

**Student Engagement Competency:** Professionalism

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 498: Senior Capstone** (1 - 3 units)

**Description:** A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing required.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 498H: Honors Thesis** (3 units)

**Description:** An honors thesis is required of all the students graduating with honors. Students ordinarily sign up for this course as a two-semester sequence. The first semester the student performs research under the supervision of a faculty member; the second semester the student writes an honors thesis.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated for a maximum of 9 units.

**Equivalent to:** AEC 498H

**Course typically offered:**

Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**Writing Emphasis:** Writing Emphasis Course

**AREC 499: Independent Study** (1 - 5 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Equivalent to:** AEC 499

**Course typically offered:**

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.



**AREC 499H: Honors Independent Study (1 - 3 units)**

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Equivalent to:** AEC 499H

**Course typically offered:**

Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**AREC 504: Production Economics (3 units)**

**Description:** Theory of the firm and industry; single and multiple products; risk and uncertainty.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Repeatable:** Course can be repeated for a maximum of 6 units.

**Equivalent to:** ECON 504

**Also offered as:** ECON 504

**Course typically offered:**

Main Campus: Spring

**AREC 512: Development Economics (3 units)**

**Description:** This course provides a graduate-level overview of development economics from a policy-oriented perspective. The goal of this course is to allow students to analyze policy debates surrounding economic growth and development from a broad and rigorous analytical base. Topics covered include theories of economic growth, poverty, inequality, education, health, gender inequality, development programs, and psychological and social foundations of economic development.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Equivalent to:** ARL 512, ARL 512, ECON 512

**Also offered as:** ARL 512, ECON 512

**Course typically offered:**

Main Campus: Fall

**Recommendations and additional information:** ECON 361, MATH 113.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 513: Consumption Economics and Price Analysis (3 units)**

**Description:** Theory of the consumer, demand, and market equilibrium, and welfare analysis.

**Grading basis:** Regular Grades

**Career:** Graduate

<b>Course Components:</b>	Lecture	Required
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**Repeatable:** Course can be repeated for a maximum of 6 units.

**Equivalent to:** AEC 513, ECON 513

**Also offered as: ECON 513**

**Course typically offered:**

Main Campus: Fall

**Recommendations and additional information:** ECON 361, MATH 113.

## AREC 514: Cost-Benefit Analysis (3 units)

**Description:** Theoretical bases and empirical techniques. Consumer-producer surplus; social and private costs; macroeconomic distortions; non-market goods; uses in policy analysis.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 514, ECON 514, MAP 514, RNR 514

**Also offered as: ECON 514, RNR 514**

**Recommendations and additional information:** ECON 361, MATH 113.

**AREC 516: Microeconomics of Agricultural Development (3 units)**

**Description:** Economics of farm- and household-level decision making. Study input and output markets, technology adoption and social economics in lower-income countries.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:**    Lecture                  Required

**Equivalent to: ECON 516**

**Also offered as: ECON 516**

**Course typically offered:**

Main Campus: Spring

**AREC 548: Introduction to Statistical Methods in Economics (4 units)**

**Description:** The objective of the course is to provide a sound understanding of fundamental statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics, business, and finance, public health and other social sciences.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:**    Lecture                      Required

**Course typically offered:**

Main Campus: Fall

**-SA** represents a Student Abroad & Student Exchange offering

**-CC** represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 549: Applied Econometric Analysis (3 units)**

**Description:** Econometric model-building, estimation, forecasting and simulation for problems in agricultural and resource economics. Applications with actual data and models emphasized.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Equivalent to:** AEC 549, AREC 549

**Also offered as:** ECON 549

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** ECON 518.

**Home department:** Economics

**AREC 550: Financial Management for Agribusiness (3 units)**

**Description:** Application of financial management principals and tools to challenges and opportunities facing agribusiness firms. Emphasis is placed on the acquisition, allocation, control and transfer of capital resources. Graduate-level requirements include a research paper of publishable quality which analyzes a current financial issue or problem in the agricultural sector and selected readings in professional journals.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Equivalent to:** RCSC 550

**Co-convened with:** AREC 450

**Course typically offered:**

Main Campus: Spring

**AREC 559: Advanced Applied Econometrics (4 units)**

**Description:** Emphasis in the course is on econometric model specification, estimation, inference, forecasting, and simulation. Applications with actual data and modeling techniques are emphasized.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Discussion May Be Offered  
Lecture Required

**Course typically offered:**

Main Campus: Fall

**Recommendations and additional information:** AREC 517, ECON 518, ECON 549.

**Field trip:** field trip

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**Description:** Structure, conduct, and performance of American industry; governmental institutions and policies affecting business. Graduate-level requirements include an applied research project that examines the impact of public policy on industry performance.

**Career:** Graduate

**Equivalent to: AREC 560**

**Also offered as: ECON 560**

**Course typically offered:**

Main Campus: Fall, Spring

**Home department:** Economics

**Description:** Economic incentives, tradable permits and markets for ecosystem services are pivotal in contemporary water and environmental policy. This class covers theory and application of economic concepts needed to evaluate water and environmental laws and policies; including ecosystem service provision, tradable use permits, benefit cost analysis, externalities, public goods and valuation methodologies. Case studies include federal, state, tribal and international water and environmental policies.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Equivalent to:** ARL 575, ECON 575, GEOG 575, HWRS 575, RNR 575

**Also offered as:** ARL 575, ECON 575, GEOG 575, HWRS 575, RNR 575

**Course typically offered:**

Main Campus: Fall

**Recommendations and additional information:** One full semester of natural resource economics or microeconomics (AREC 304, AREC 373, ECON 201A, ECON 300, ECON 301, ECON 361, ECON 373 or equivalent).

**-CC** represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 576: Natural Resource Law and Economics** (3 units)

**Description:** Advanced economic and legal analysis of environmental and natural resource policies.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:**      Lecture                              Required

**Equivalent to:** ECON 576, HWRS 576, RNR 576

**Also offered as:** ECON 576, ENVS 576, HWRS 576, LAW 576, RNR 576

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** ECON 361 recommended but not required. Must have graduate standing to enroll.

**AREC 577: Advanced Topics in Water Resource Economics and Policy** (3 units)

**Description:** Advanced economic approaches applied to water management and policy. Topics include economic modeling, pricing, incentive-based policies, regulation of pollution, alternative regulatory instruments and managing risk. Interactive seminar style course. Calculus proficiency and regular attendance essential.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:**      Lecture                              Required

**Equivalent to:** ECON 577, HWRS 577, WSM 577

**Also offered as:** ECON 577, HWRS 577, PA 577, WSM 577

**Recommendations and additional information:** Calculus proficiency required.

**AREC 579: Economic Analysis of Water, Food & Environmental Policies** (3 units)

**Description:** This course focuses on economic methods for designing and evaluating water, food and environmental policies. Topics include optimizing water as an input in producing food, energy, recreation, and other ecosystem services; water & environmental issues in food production; pricing and conservation incentives; managing shortage risks; and economic tools for addressing conflicts over water, food and the environment. Interactive seminar style course. In addition to the requirements for AREC 479, graduate students must complete a class project, including a paper and presentation. Interactive seminar style course; regular attendance essential. Calculus proficiency required.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:**      Discussion                              Required  
   Lecture                              Required

**Co-convened with:** AREC 479

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** Calculus proficiency required.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 580: Mathematics for Economists** (2 units)

**Description:** Intensive course in essential mathematics for entering graduate students in the M. S. and Ph.D. programs in Economics and Agricultural and Resource Economics. Topics covered include matrix algebra, functions, limits, differentiation, comparative statistics, and constrained and unconstrained optimization.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Lecture Required

**Equivalent to:** ECON 580

**Also offered as:** ECON 580

**Course typically offered:**

Main Campus: Fall

**AREC 593: Internship** (1 - 6 units)

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 593L: Legislative Internship** (1 - 12 units)

**Description:** Working experience at the Arizona State Legislature; responsibilities draw upon student's area of major expertise and include preparing written and oral reports, summarizing legislative proposals, and providing information to legislators and legislative committees.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 596A: Agricultural and Resource Economics (1 unit)**

**Description:** The development and exchange of scholarly information, usually in a small group setting. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Seminar Required

**Repeatable:** Course can be repeated for a maximum of 6 units.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 597: Developing Economic Leadership Skills for Success (1 - 3 units)**

**Description:** Economic Leadership is the application of economics into decision-making to successfully lead organizations. Economic leaders utilize economic theory informed by data analysis to create, manage, and execute dynamic plans. Therefore, this course is designed to teach students leadership skills so they can become leaders in the field of applied economics. Students will inspire to participate in clubs and activities where they can develop and practice their skills as they prepare to enter the workplace.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Workshop Required

**Repeatable:** Course can be repeated a maximum of 12 times.

**Co-convened with:** AREC 497

**Course typically offered:**

Main Campus: Fall, Winter, Spring, Summer

**Recommendations and additional information:** ARECMS graduate students.

**Field trip:** Students may have the opportunity to travel to local, regional and national conferences.

**AREC 599: Independent Study (1 - 6 units)**

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**AREC 693: Internship** (1 - 8 units)

**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 697: Topics in Advanced Applied Econometrics and Data Analytics** (1 - 6 units)

**Description:** This is an advanced workshop course in applied econometrics covering casual inference, sample selection, qualitative dependent variables, panel data analysis, time series analysis, quantile regression, and nonparametrics. Emphasis will be on empirical applications with real world data. The course will be offered in three distinct modules that are taught consecutively. Each module is self-contained and students can take one, two or all three modules in a semester. Each module will be for one credit hour and covers specific topics listed at the end of the syllabus. Students are advised to check with the instructor before they register for further clarification on list of topics in each module.

**Grading basis:** Regular Grades

**Career:** Graduate

**Course Components:** Workshop Required

**Repeatable:** Course can be repeated a maximum of 6 times.

**Course typically offered:**

Main Campus: Fall, Spring

**Field trip:** None

**Enrollment requirement:** AREC/ECON 549 or equivalent.

**AREC 697S: Economics, Law and Environment** (1 unit)

**Description:** The Economics, Law and Environment workshop (ELE Workshop) is intended to expose students and participating faculty members to a broad range of original research in the area of overlap between law, economics and environmental issues. The workshop will consist of six meetings during which leading scholars in the field will present their research for discussion and critique by the enrolled students and participating faculty. The workshop is part of the broader Program on Economics, Law and the Environment, a research and educational collaboration between the College of Law and the College of Agriculture and Life Sciences.

**Grading basis:** Pass/Fail

**Career:** Graduate

**Course Components:** Workshop Required

**Equivalent to:** AREC 697S

**Also offered as:** ENVS 697S, LAW 697S

**Home department:** Law

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.



**AREC 699: Independent Study** (1 - 3 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 900: Research** (1 - 8 units)

**Description:** Individual research, not related to thesis or dissertation preparation, by graduate students.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 909: Master's Report** (1 - 8 units)

**Description:** Individual study or special project or formal report thereof submitted in lieu of thesis for certain master's degrees.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Course typically offered:**

Main Campus: Fall, Spring

**AREC 910: Thesis** (1 - 8 units)

**Description:** Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Graduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.