

Eastern Oregon University

Agricultural Sciences



Agricultural Sciences

Introduction

Oregon State University Agriculture at Eastern Oregon University

The Agriculture Program at Eastern is a cooperative effort between Oregon State University and Eastern Oregon University. Bachelor of Science Degrees are offered in Agricultural Business Management; Environment Economics, Policy & Management; Crop and Soil Science; and Rangeland Resources. All degrees are conferred by Oregon State University.

In order to graduate, students enrolled in the program must fulfill all graduation requirements of the College of Agricultural Sciences at Oregon State University, the department administering the degree program, and the minor if required or elected. Courses applied to any minor cannot count toward required courses within the major degree or the requirements for an additional minor.

Transfer students may apply most credits earned at an accredited institution toward a major or as electives. Community college students can transfer up to 108 lower division credits toward graduation. Lettered courses (WR 121, MATH 200, etc.) transfer directly and a limited number of vocational-technical courses transfer with restrictions. Specific information regarding curriculum requirements and transfer of credits should be obtained from the program advisers.

All freshmen and transfer students are admitted to Eastern and declare one of the Agricultural majors. At the end of the sophomore year with completion of 90 credits of course work with a satisfactory grade point average students are admitted to Oregon State University. Transfer students will be admitted to the program when their previous college work, plus additional course work at Eastern, fulfill the 90-credit and GPA requirements. All students must complete a minimum of 45 credits after admission to the program.

BACCALAUREATE CORE (48)* AS OF 2004

Skills (15) + WIC

Writing I (3)
Writing II (3)
Writing III (3)
Mathematics (3)
Fitness (3)
WIC (Writing Intensive Course)

Perspectives (24)

Physical Science (with lab) (4 or 8)
Biological Science (with lab) (4 or 8)
Western Culture (3)
Cultural Diversity (3)
Literature and Arts (3)
Social Processes and Institutions (3)
Difference, Power and Discrimination (3)
Synthesis (6)
Contemporary Global Issues (3)
Science Technology (3)
*A list of courses and specific departmental requirements of the Baccalaureate Core is available in the Agriculture Program Office.

GENERAL DEGREE REQUIREMENTS

Total Hours	180
Total Upper Division Hours	60
Total Agriculture Hours	36
Total Upper Division Agriculture Hours	24

ACADEMIC PROGRAMS IN AGRICULTURAL SCIENCES

AGRICULTURAL AND RESOURCE ECONOMICS

The Department of Agricultural and Resource Economics offers two baccalaureate (Bachelor of Science) degrees. They open doors to exciting careers in traditional areas of commercial agriculture, agricultural business management, agricultural policy, and in new career opportunities in natural resource and environmental management, international trade and development, rural growth and change, and environmental and resource law.

Agricultural Business Management (ABM)

The BS in Agricultural Business Management degree curriculum blends course work in agricultural economics, business, and agricultural sciences to prepare graduates for the broad and diverse employment opportunities in the field of production agriculture and agribusiness. Skills are developed in agribusiness marketing and trade, agribusiness

management, agribusiness finance, and agricultural economics. All ABM students must select an option area appropriate to their professional goals and interests. With the exception of those pursuing the Agricultural Economics option, ABM students must also complete a minor and an internship or project that will integrate their course work with a unique real-world experience. This combination of degree requirements allows graduate to be well equipped with the skills needed to work in a variety of situations in the agriculture and agribusiness industry.

BS Degree Requirements (180)

Baccalaureate Core (~48)

All courses marked with an asterisk (*) must be passed with a "C-" or better.

Agricultural and Resource Economics

AREC 101 Orientation to Agribusiness and Natural Resource Economics (2)
AREC 211 *Management in Agriculture (4)
AREC 221 *Marketing in Agriculture (3)
AREC 311 *Intermediate Microeconomic Theory (4)
AREC 406 Projects (6)
or **AREC 410** Internship (6)
AREC 461 Agricultural and Food Policy Issues (4)

Business Administration

BA 131 Business Data Processing (3)
BA 114 Spreadsheets (1)
BA 211 * Managerial Accounting (4)
BA 213 *Financial Accounting (4)
BA 254 Business Law (4)
BA 313 Principles of Finance (5)

Social Sciences

ECON 201 *Introduction to Microeconomics (5)
ECON 202 *Introduction to Macroeconomics (5)

Mathematics/Statistics

MATH 111 *College Algebra (4)
MATH 241 *Survey of Calculus (4)
STAT 315/316 *Principles of Statistics (5)
or **STAT 327** *Statistical and Exp. Design (5)

One additional writing course.

WR 210 *Science Writing (3)
or **WR 320** *Technical Writing (3)

Sciences

One Chemistry course w/lab (4)

Required Minor (additional 27 credit hours)

Approved by student's major adviser.

Students must select one of the following Options

Marketing and Trade (25 credit hours)
BA 312 Principles of Marketing (5)
AREC 370 Agricultural Marketing (3)
AREC 442 Ag. Business Mgmt. (4)

AREC 447 Ag. Price & Mkt. Analysis (4)
ECON 440 International Economics (5)
 Upper Division AREC, BA or ECON Electives in
 Option Area (4)

Management (25 credit hours)

AREC 370 Agricultural Markets & Trade (3)
AREC 441 Ag. Financial Management (4)
AREC 442 Ag. Business Mgmt. (4)
AREC 447 Ag. Price & Mkt. Analysis (4)
BA 321 Principles of Mgmt. (5)
 Upper Division AREC, BUS or ECON Electives in
 Option Area (5)

Agricultural Economics (~ 41 credit hours)

AREC 312
 Intermediate Microeconomic Theory (4)
AREC 351 Natural Resource
 Economics & Policy (3)
 or **AREC 353** Public Land Statutes & Policy (4)
AREC 370 Agricultural Markets & Trade (3)
AREC 447 Ag. Price & Mkt. Analysis (4)
Two of the following:
ANS 121 Introduction to Animal Sciences (4)
CSS 300 Introduction to Crop Production (4)
CSS 305 Principles of Soil Science (5)
RNG 341 Rangeland Resources (3)
 Upper Division AREC or ECON Electives in Option
 Area (15)
*Note: Students pursuing the Agricultural Economics
 option are not required to complete a minor, a
 project or internship (AREC406/410), Financial
 Accounting (BA213), Business Law (BA254), or
 Principles of Finance (BA313).*

Environmental Economics, Policy and Management (EPPM)

The B.S. in Environmental Economics, Policy and
 Management degree curriculum is designed to
 develop skills in agricultural economics, resource
 economics, economic development, and related
 fields. Along with the baccalaureate core of required
 courses in the sciences and humanities students
 may select courses from a broad range of approved
 electives. The program provides flexibility to meet a
 wide variety of educational and career goals.

BS Degree Requirements (180)

Baccalaureate Core (~48)

Agricultural and Resource Economics

AREC 101 Orientation to Agribusiness and Natural
 Resource Economics (2)
AREC 250 Introduction to Environmental
 Economics and Policy (3)
AREC 253 Evolution of U.S. Environmental and
 Natural Resource Law (4)
AREC 311 *Intermediate Microeconomic Theory (4)
AREC 312 Intermediate Microeconomic Theory II
 (4)

AREC 351 Natural Resource Economics and Policy
 (3)
AREC 434 Environmental and Resource
 Economics (4)
ECON 475 Environmental Economics (5)

Select one course from the following:

AREC 353 Public Land Statutes and Policy (4)
AREC 453 Public Land Law and Policy (3)

Select one course from the following:

AREC 454 Economics of Rural Develop. (3)
AREC 461 Agricultural & Food Policy Issues (4)
ECON 435 Public Finance (5)

Select one course from the following:

POLS 382 Constitutional Law (5)
POLS 314 State and Local Govt. (5)
POLS 351 Public Administration (5)
POLS 350 Public Policy (5)

Select two courses from the following:

CSS 305 Principles of Soil Science (4)
GEOL 103 Geological Oceanography (3)
GEOG 317 Land Use and Environment (3)
GEOL 102 Environmental Geology (3)
FOR 111 Introduction to Forestry (4)
RNG 341 Rangeland Resources (3)
FW 251 Introduction to Wildlife Conservation (3)

Social Sciences

ECON 201 *Introduction to Microeconomics (5)
ECON 202 *Introduction to Macroeconomics (5)
ECON 375 Macroeconomic Theory (5)
 or **ECON 318** Money and Banking (5)
POLS 101 American National Government (5)

Mathematics/Statistics

MATH 111 *College Algebra
MATH 241 *Survey of Calculus (4)
STAT 315/316 *Principles of Statistics (5)
 or **STAT 327** *Statistical and Exp. Design (5)

One additional writing course.

WR 210 *Science Writing (3)
 or **WR 320** *Technical Writing (3)

Sciences

One Chemistry course w/lab (4)
 One Biology course w/lab (4)

Information Management

BA 131 Business Data Processing (3)
BA 114 Spreadsheets (1)

16 Additional Upper Division Hours From The
 Approved List or By Completing An Approved
 Minor.

MINORS

**Agricultural Business Management Minor
 (additional 27 credits)**

ECON 201 Introduction to Microeconomics (5)

AREC 211 Management in Agriculture (4)
AREC 221 Marketing in Agriculture (3)
AREC 311
 Intermediate Microeconomic Theory (4)
BA 211 Managerial Accounting (4)

Select additional credits from approved list to make 27 credits.

AREC 461 Agricultural and Food Policy Issues (4)
AREC 370 Agricultural Marketing (3)
AREC 382 Farm and Ranch Appraisal (3)
AREC 442 Ag. Business Mgmt. (4)
BA 254 Business Law (4)
BA 313 Principles of Finance (5)

Agricultural Economics Minor (additional 27 credits)

ECON 201 Intro to Microeconomics (5)
ECON 202 Intro to Macroeconomics (5)
AREC 211 Management in Agriculture (4)
AREC 221 Marketing in Agriculture (3)
AREC 311
 Intermediate Microeconomic Theory (4)
AREC 461 Agricultural and Food Policy Issues (4)

Select additional upper division AREC credits to make 27 credits.

Natural Resources And Environmental Law And Policy Minor (additional 27 credits)

AREC 253 Evolution of U.S. Environmental and Natural Resource Law (4)
AREC 353 Public Land Statutes and Policy (4)
AREC 453 Public Land Law and Policy (3)
AREC 454
 Rural Development Economics and Policy (3)
AREC 461 Agricultural and Food Policy Issues (4)

Select additional credits from approved list to make 27 credits.

PHIL 420 Philosophy of Law (5)
POLS 350 Public Policy (5)
POLS 381 Law and Politics (5)
PHIL 490 Ethics and Public Affairs (5)
POLS 382 Constitutional Law (5)

Resource Economics Minor (additional 27 credits)

ECON 201 Introduction to Microeconomics (5)
AREC 311 Int. Microeconomic Theory I (4)

3 or more of the following:

AREC 351
 Natural Resource Economics and Policy (3)
ECON 475 Environmental Economics (5)
AREC 353 Public Land Statutes and Policy (4)
AREC 461 Agricultural and Food Policy Issues (4)

Select additional credits from approved list to make 27 credits.

AREC 250 Intro. to Environmental and Resource Economics (3)
AREC 253 Evolution of U.S. Environmental and Natural Resource Law (4)

AREC 434 Environmental and Resource Economics (4)
AREC 454
 Rural Development Economics and Policy (3)
ECON 202 Macroeconomics (5)
ECON 375 Intermediate Macroeconomics (5)
POLS 350 Public Policy (5)

CROP AND SOIL SCIENCE

Crop and Soil Science majors study the use and protection of plants and soils to provide the world's food, livestock feed, industrial raw materials, and seed for lawns, turf, watershed protection, and wildlife habitat. Courses integrate the scientific principles of soils, physics, chemistry, botany, and genetics as they deal with crop and natural resource management.

Undergraduate curricula are flexible enough to provide for the student's individual professional needs and interests and for a broad-based general education by allowing electives in other subject areas throughout the university. Positions are available in agricultural experiment stations and extension services, state departments of agriculture, food-processing companies, insurance agencies, and commercial firms dealing in the processing and sale of farm products, chemicals, and seed. Advisers and faculty provide curricular guidance and aid in professional extracurricular activities, career decision, and job placement. The Crop Management degree option is available at Eastern. Additional degree options are available at Oregon State University's Corvallis campus.

CROP MANAGEMENT OPTION REQUIREMENTS:

CROPS CORE

CSS 100 Orientation/Career Planning (1)
CSS 305 Principles of Soil Sci (4)
CSS 306 Problem Solving: Soil Sci Appl. (1)
CSS 315 (WIC) Nutrient Management & Cycling (4)
CSS 407 Senior Seminar (1)
CSS 300 Intro to Crop Production (4)
CSS 415 Soil Fertility Management (3)
CSS 430 Plant Genetics (3)
CSS 440 Weed Management (4)
CSS 475 Agricultural Management of Oregon Soil Resources (2)
CSS 480 Case Studies in Cropping Systems Mgmt (4)
CSS 310 Forage Production (4)
CSS 321 Prin. of Cereal Crop Production (1)
CSS 322 Prin. of Potato Production (1)
CSS 395 World Soil Resources (3)

Choose at least one of the following courses:

CSS 466 Soil Morph & Class (4)
CSS 460 Seed Production (3)

Choose at least one credit from the following:

- CSS 405** Reading and Conference (Career Plan/Job Search) (1)
CSS 410 Internship (1-6)

Biological Sciences

- BIOL 101** Introductory Biology (3)
BIOL 102 Introductory Biology (3)
BIOL 103/104 Introductory Biology (4)
BOT 202 Botany (5)
BOT 350 Introduction Plant Pathology (4)
ENT 311 Introduction Insect Pest Management (5)

Physical Sciences

- CHEM 101** Intro to Chemistry (4)
CHEM 102 Intro to Chemistry (4)
CHEM 103 Intro to Chemistry (4)

Business

- AREC 211** Management in Agriculture (4)
AREC 221 Marketing in Agriculture (3)
ECON 201 Intro to Microeconomics (4)
BA 131 Business Data Processing (3)

Choose a minimum of 8 credits from the following:

- BA 254** Business Law (4)
AREC 441 Ag Finance Mgmt (4)
BA 211 Financial Acct I (4)

Ethics or Conflict Management

- PHIL 102** Ethics, Politics and Law (5)

Ecology (choose one of the following)

- BIOL 357** General Ecology (4)
RNG 441 Rangeland Analysis (4)

Technology

- GEOG 201** Cartography I (3)
GEOG 202 Cartography II (3)

Mathematics

- MATH 111** College Algebra (4)
STAT 315 Principles of Statistics (4)

GRADUATION REQUIREMENTS

Crop Management Option (minimum)	127
Baccalaureate Core	
(51 credits required; 26 included in Crop Management Option)	25
Electives	28
Total	180

Crop Science Minor

- CSS 300** Intro to Crop Production (4)
CSS 305 Principles of Soil Sci (4)
CSS 306 Problem Solving: Soil Sci Appl. (1)
CSS 407 Senior Seminar (1)
 Select any CSS courses to bring total to a minimum of 27 credits.

RANGELAND RESOURCES

Rangeland Resources is one of the family of natural resource professions important to the social, economic, and political development of Oregon and the nation. It is concerned with the improvement, conservation, ecology, and use of the nation's rangelands. Since range management is practiced on lands producing domestic and wild animals, timber, water, and recreation, concepts of integrated land use are central to the curriculum. Range science, management, and business options are available at Eastern Oregon University.

The curriculum below includes Oregon State University and Departmental requirements for the B.S. degree and provides emphasis either in science, management, ecological, or allied disciplines. Facilities available for study and research include greenhouse, field plot, pasture and range, and two experiment stations in eastern Oregon. Field trips are taken in conjunction with specific courses.

Summer employment with private industry, federal and state agencies, and on range research projects makes possible earning while learning. Employment opportunities include resource management, research, extension, ranch management, college and university teaching, business, and industrial activities related to rangeland resources, and foreign agricultural and resource development assistance.

The Rangeland Resources Program is an extension of the Department of Rangeland Resources at Oregon State University. The Department of Rangeland Resources, Oregon State University, is accredited by the Society for Range Management.

RANGELAND RESOURCES CORE

- CHEM 101** Intro to Chemistry (4)
CHEM 102 Intro to Chemistry (4)
CHEM 103 Intro to Chemistry (4)
BIOL 101 Biology (3)
BOT 202 Botany (5)
BIOL 357 General Ecology (4)
BIOL 319 Vertebrate Natural History (3) **OR**
FW 251 Principles of Wildlife (3)
BIOL 433 Plant Physiology (5)
BIOL 334 Systematics (5)
BIOL 421 Agrostology (4)
CSS 305 Principles of Soil Science (4)
CSS 306 Problem Solving Soil Science (1)
CSS 466 Soil Morphology and Class (4)
ECON 201 Principles of Economics (5)
AREC 351 Natural Resource Economics and Policy (3)
MATH 241 Survey of Calculus (5)
STAT 315 Princ Statistics (4) **OR**
STAT 327 Statistic Methods (5)

- ANS 311** Animal Nutrition (3)
- ANS 443** Beef Production (3)
- GEOL 201** Physical Geology (5)
- WR 320** Technical Writing (3)* **OR**
- BA 225** Report Writing (4)*
- F 111** Introduction to Forestry (3)
- CSS 310** Forage Production (4)
- RNG 301** Career Orientation (1)
- RNG 341** Rangeland Resources (3)
- RNG 347** Arid Land Biomes (3)
- RNG 348** Arid Land Plants (2)
- RNG 350** Grassland Ecosystems (3)
- RNG 355** Desert Watershed Management (3)
- RNG 421** Wildland Restoration Ecology (4)
- RNG 441** Range Analysis (4)
- RNG 442** Rnglnd - Animal Relations (4)
- RNG 490** Rnglnd Management Planning (4)

Each student will take core coursework plus additional courses in one of the seven options (3 available at EOU).

Option course work must include a minimum of 15 upper division credits. Students must choose one option.

**Range Science Option
(27 credits)**

- CSS 430** Plant Genetics (3)
- PHYS 201** Physics (4)
- PHYS 202** Physics (4)
- Electives Science/Natural Resources (16)

Range Management Option (27 credits)

- GEOG 201** Cartography (3)
- CSS 430** Plant Genetics (3)
- CSS 440** Weed Management (4)
- AREC 211** Management in Agriculture (4)
- CSS 315** (WIC) Nutrient Management & Cycling (4)
- Electives Science/Natural Resources (9)

**General Rangeland Resources (Business)
Option (28 credits)**

- CSS 315** (WIC) Nutrient Management & Cycling (4)
- CSS 440** Weed Management (4)
- BA 211** Principles of Accounting (4)
- AREC 211** Management in Agriculture (4)
- AREC 311** Microeconomic Theory I (4)
- AREC 442** Agricultural Business Management (4)
- AREC 441** Agricultural Financial Management (4)

GRADUATION REQUIREMENTS

- Total (180)
- Baccalaureate Core (48)
- Rangeland Resources Core (105)
- Option (27)

Rangeland Resources Minor (27 credits)

NOTE: Completion of the Rangeland Resources

Minor alone does not qualify students for Rangeland Conservationist positions with the U.S. Office of Personnel Management (OPM).

Requirements:

- RNG 341** Rangeland Resources (3)
- RNG 347** Arid Land Biomes (3) **OR**
- RNG 350** Grassland Ecosystems (3)
- RNG 421** Wildland Restoration Ecology (4)
- RNG 442** Rangeland-Animal Relations (4)
- RNG 490** Rangeland Management & Plan (4)

Select 9 credits from:

- Any other **RNG** classes
- BIOL 357** General Ecology (4)
- ANS 443** Beef Prod (3)

**Animal Science Minor
(27 credits)**

Select 15 credits of upper division ANS from the following:

- ANS 311** Animal Nutrition(3)
- ANS 315** Cont. Sos Iss Animal Ag (3)
- ANS 316** Reproduction in Domestic Animals (4)
- ANS 317** Reproduction in Domestic Animals (1)
- ANS 443** Beef Production Systems (3)
- ANS 444** Beef Production Systems (3)
- ANS 410** Animal Science Internship (1-6)

Select a minimum of 12 credits from the following courses:

Any additional credit hours above the required course requirements from the list above plus the following courses:

- ANS 121** Intro to Animal Science (4)
- ANS 215** Beef/Horse Industries (3)
- AREC 211** Management in Agriculture (4)
- CSS 310** Forage Production (4)
- RNG 341** Range Resources (3)
- RNG 442** Rangelands-Animal Relations (4)

AGRICULTURAL AND RESOURCE ECONOMICS COURSE DESCRIPTIONS

AG 199 - Freshman Ag/Rsrce Sem I/II

Credits: 1.00

WINTER & SPRING Series of seminars designed to introduce students to faculty members of the OSU Agriculture program, provide perspectives on current issues in the fields of agriculture and natural resources, and insight into career possibilities in the fields of Crops, Range, Animal Science, Fish and Wildlife, Agriculture Business Management and Natural Resource Management. The seminars combine classroom activities, guest lectures, and field trips that will provide you with a broader understanding of what is going on in the agriculture and natural resource industry today. Emphasis will be placed on participation, attendance, and attitude. Students may take either one or both seminars. Prerequisite: Freshmen or consent of instructor.

Restrictions: Must be enrolled in one of the following Class(es): Freshman

AREC 101 - Orient Agribus/Nat Rsrce Econ Credits: 2.00

FALL Orientation to the land grant university system and to the fields of study in agricultural and resource economics; theory, methods, and applications; academic guidance and career planning. Prerequisite: Freshman or new major. Graded S/U

AREC 211 - Mgmt in Agriculture Credits: 4.00

WINTER Designed to familiarize students with tools and procedures for analysis and decision-making in farm and ranch business management. This includes learning principles for making farm management decisions, using modern decision making methods and tools, using enterprise as well as whole farm approaches to farm/ranch management planning and problem solving, and learning how to present a plan for a farm/ranch venture that you are planning to implement on your own or hypothetical farm. Prerequisite: MATH 111 or equivalent.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

AREC 221 - Marketing in Ag Credits: 3.00

WINTER An introduction into the agriculture marketing system. The course will cover concepts and ideas related to basic agriculture commodity markets, their functions, and their market channels. More specific and detailed discussion of marketing techniques and agribusiness marketing practices will be discussed in AREC 370. Prerequisite: ECON 201. Restrictions: May not be enrolled in one of the following Class(es): Freshman

**AREC 250 - Intro Environ Econ*CP Credits: 3.00
New Gen Ed-Crit Think/Prob Sol**

SPRING Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity.

AREC 253 - Hst Dev US Env/Ntrl Res Law*HB Credits: 4.00

New Gen Ed-Human Behavior

FALL, WEB/VIDEO Historical development, current structure, and organization of Anglo/Norman-American constitutional, statutory, and case law including related agency regulatory or administrative law. Relationships among legal processes, economic principles, social institutions, and natural resources issues are emphasized. Students also are exposed to the basic elements of legal research.

AREC 311 - Microecon Theory I Credits: 4.00

FALL An examination of the theories of consumer behavior and demand, production costs, the firm,

supply, and competitive and monopoly market structures. Prerequisites: ECON 201; MATH 241.

AREC 312 - Microecon Theory II Credits: 4.00

WINTER, ALT YRS Examination of the theories of imperfect competition, input markets, general equilibrium and welfare economics. Prerequisite: AREC 311.

AREC 351 - Natural Res Econ & Pol*CP Credits: 3.00

New Gen Ed-Crit Think/Prob Sol

FALL Application of principles of economics to identify the causes, consequences, and ways of dealing with natural resource problems, including problems associated with fisheries, forests, water resources, and land. Conceptual topics and policy applications. Emphasis is on developing students' skills in applying "economic way of thinking about natural resources management." Prerequisites: ECON 201; MATH 111

Restrictions: May not be enrolled in one of the following Class(es): Freshman

AREC 353 - Pub Land Statutes/Pol Credits: 4.00

WINTER, WEB/VIDEO Policies guiding the homesteading and economic development of the western states; laws and policies guiding the regulation and use of water, grazing, timber, and mineral resources. The significance of the Prior Appropriations Doctrine beyond its familiar role in water law and policy is emphasized. Prerequisite: ECON 201

AREC 370 - Agri Marketing Credits: 3.00

SPRING Discusses the economic nature of the activities involved in the value-added process of agriculture marketing. Information in the course covers traditional sales and marketing concepts as applied to agribusiness, marketing strategies of agribusinesses, and the role of agricultural input suppliers, processors, service and infrastructure providers play in the value chain. In addition, the course requires students to participate in the marketing tour field trip. This tour allows students to visit with industry leaders, observe production and marketing practices in a real-world setting, and learn of philosophies and strategies of those involved in agriculture today. Prerequisite: AREC 221 and 311.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 382 - Farm & Ranch Appraisal Credits: 3.00

SPRING, ALT YRS An introduction to appraisal of rural real estate, including methods of valuing property, different types of appraisals, and preparation and interpretation of an appraisal report. Restrictions: May not be enrolled in one of the following Class(es): Freshman

AREC 401 - Research Credits: 1.00 to 15.00

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 402 - Independent Study Credits: 1.00 to 15.00

Prerequisite: Faculty approval required.
Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 403 - Thesis Credits: 1.00 to 15.00

Prerequisite: Senior standing, faculty approval required.
Restrictions: May not be enrolled in one of the following Class(es): Freshman, Junior, Sophomore

AREC 405 - Reading and Conference Credits: 1.00 to 15.00

Prerequisite: Faculty approval required.
Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 406 - Projects Credits: 1.00 to 6.00

Prerequisite: Faculty approval required.
Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 407 - Seminar Credits: 1.00 to 15.00

Restrictions: May not be enrolled in one of the following Class(es): Freshman

AREC 408 - Workshop Credits: 1.00 to 15.00

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 410 - Internship Credits: 2.00 to 6.00

Practical on-the-job training in agricultural business, marketing, commercial agricultural production, or related private or public organizations. Prerequisite: Junior or senior standing. Submission of internship and consent of Internship Program Coordinator. Graded S/U

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 434 - Envir & Nat Rsrce Econ Credits: 3.00

SPRING/ALT YRS Examines economic perspectives on the allocation of natural resources and the management of environmental quality, emphasis on the use of economic concepts in the design and evaluation of public policies. Writing Intensive. Prerequisite: AREC 351; AREC 211.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 438 - Exploring World Ag I & II Credits: 2.00

SPRING/FALL Explores agricultural production, processing, and marketing in the global setting with an emphasis on a different region of the world each year. On campus study during the spring term will be combined with a two week travel experience immediately after Fall Quarter. This allows students to gain first hand familiarity with agriculture, natural resources, food systems, and culture in other regions of the world. Enrollment in the spring term course does not require that you complete the travel component of the course. You may also complete the travel component without the spring term

component.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 441 - Agri Fin Mgmt Credits: 4.00

FALL Provides students with an understanding of the tools of financial analysis as applied to various agricultural businesses. The course covers: the role of credit in agriculture, evolution of financial markets in agriculture, sources of agriculture credit, financial analysis, and capital investment analysis. Prerequisite: AREC 211, 311, and BA 213 (or concurrent enrollment).

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 442 - Ag Bus Mgmt Credits: 4.00

SPRING Application of economic, business, and management principles to the analysis, planning and organization of agricultural firms; use of analytical tools; marketing, pricing, and competitive strategies; management information systems; decision making in the global economy. Prerequisite: AREC 211, 221, 370, Senior Standing or consent of instructor.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Junior, Sophomore

AREC 447 - Ag Price & Market Analy Credits: 4.00

WINTER Price determination for agricultural commodities and factors; quantitative analysis of prices, factors and markets; agricultural market structures, performance and roles of institutions. Prerequisites: AREC 311; STAT 315/16 or STAT 327. Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

AREC 453 - Public Land/Rsrce Law Credits: 4.00

WEB/VIDEO Constitutional, administrative, and historical foundations of federal natural resources law and related public policy. Applicable case law emphasizing water, range, mineral, wildlife, and recreational resources. Prerequisites: AREC 353.

AREC 454 - Rural Dev Econ & Policy Credits: 3.00

SPRING, ALT YRS Theories of economic change in developed and less-developed economies; natural resource sectors and the development of rural regions, with emphasis on growth, diversification, and instability; resource mobility and the spatial aspects of development; poverty and inequality; rural development policy. Prerequisite: AREC 311.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

AREC 461 - Ag & Food Policy Issues Credits: 4.00

SPRING Principles of agricultural and food policy formulation; agricultural adjustment processes; agricultural price and income policies in relation to land use, water, and rural development policies; interrelationships among U.S. and foreign agriculture and trade policies. Writing intensive. Prerequisite: AREC 311.

ANIMAL SCIENCE

ANS 121 - Intro To Animal SciNW* Credits: 4.00 New Gen Ed-Natural World**

WINTER Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production.

ANS 215 - Beef/Horse Industries Credits: 3.00

FALL, ODD YEARS Introduction to beef and horse industries; history, current industry status, and demonstration and practice of basic husbandry skills. Prerequisite: ANS 121

ANS 215L - Beef/Horse Ind Lab Credits: .00

FALL, ODD YEARS

ANS 311 - Animal Nutrition Credits: 3.00

FALL Comparative nutrient metabolism and digestive physiology; consequences of nutritional deficiencies, ration formulation and balancing. Prerequisite: CHEM 103.

ANS 315 - Cont Soc Iss Animal AgHB* Credits: 3.00 New Gen Ed-Human Behavior**

WINTER, EVEN YEARS Discussion of contentious issues including role of animal products and human health; use of hormones and antibodies; new animal biotechnologies; animal rights/welfare; livestock grazing public lands.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

ANS 316 - Reprod Domestic Animals Credits: 4.00

SPRING Anatomy and physiology of mammalian reproductive systems; fertilization, embryonic and fetal development. Principles, techniques and recent development in semen collection, artificial insemination, estrus detection/synchronization, and embryo transfer. Prerequisite: ANS 121, Chem 103

ANS 317 - Reproduction Dmstc Anmls Lab Credits: 1.00

SPRING Semen collection and microscopic evaluation of semen, artificial insemination, estrus detection/synchronization, and embryo transfer. Prerequisite: ANS 121, CHEM 103

ANS 405 - Reading & Conference Credits: 1.00 to 16.00

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

ANS 406 - Projects Credits: 1.00 to 6.00

Prerequisite: Faculty approval required.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

ANS 410 - Animal Sci Internship Credits: 1.00 to 12.00

ANS 438 - Exploring World Ag I & II Credits: 2.00

SPRING/FALL Explores agricultural production, processing, and marketing in the global setting with

an emphasis on a different region of the world each year. On campus study during the spring term will be combined with a two week travel experience immediately after Fall Quarter. This allows students to gain first hand familiarity with agriculture, natural resources, food systems, and culture in other regions of the world. Enrollment in the spring term course does not require that you complete the travel component of the course. You may also complete the travel component without the spring term component.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

ANS 443 - Beef Production Systems Credits: 3.00

WINTER, ODD YEARS Fundamentals of nutrition, reproductive physiology and health programs and their applications in the care and management of beef cattle. Prerequisite: ANS 311. Junior or Senior standing.

ANS 444 - Beef Production Systems Credits: 3.00

SPRING, ODD YEARS Continuation of the study of beef cattle management. Students will practice decision making processes using beef cattle operations as case studies. Overnight field trip with extra fee charged. Prerequisite: ANS 311, ANS 443. Junior or Senior standing.

BOTANY COURSE DESCRIPTIONS

BOT 350 - Intro Plant Path Credits: 4.00

WINTER, EVEN YEARS. This is an OSU class. Infectious and noninfectious plant diseases; nature of pathogens and pathogenesis; influence of environment, and principles of control. Prerequisite: Introductory botany or biology.

BOT 350L - Intro Plant Path Lab Credits: .00

WINTER. EVEN YEARS. This is an OSU class.

CROP SCIENCE

CSS 100 - Orient/Career Plan Credits: 1.00

FALL Introduction to departmental, college and university programs. Individual and group counseling and baccalaureate program planning. Exposure to career opportunities in crop science. Graded P/N. Prerequisite: CSS Major.

CSS 300 - Intro Crop Production Credits: 4.00

FALL Fundamental principles, concepts, and illustrative examples relative to the selection, planting, management, quality, rotation, and improvement of agronomic crops. Prerequisite: General biology or botany sequence. co-requisite: CSS 300L.

CSS 300L - Crop Science Lab Credits: .00

co-requisite: CSS 300.

CSS 305 - Prin of Soil Science Credits: 4.00
 SPRING Origin, formation, classification; physical, chemical, and biological characteristics; effects of soil management on agricultural and forest crop production. Prerequisite: Introductory chemistry. Lec/lab.

CSS 305L - Soil Sci Lab Credits: .00

CSS 306 - Prob Solving Soil Sci Credits: 1.00
 SPRING Problem solving for, and in-depth exploration of, Principles of Soil Science (CSS 305). Real-world problems requiring knowledge of soil physical, chemical, and biological properties. Prerequisite: CSS 305 or concurrent enrollment; MATH 111.

CSS 310 - Forage Production Credits: 4.00
 Uses and production practices of forage crops. Prerequisite: CSS 300; CSS 305. co-requisite: CSS 310L.

CSS 310L - Forage Prod Lab Credits: .00
 co-requisite: CSS 310 Forage Production.

CSS 315 - Nutrient Management & Cycling Credits: 4.00
 SPRING Nutrient forms, transformations, and plant availability in soils; soil pH and management of acid and alkaline soils; characteristics and use of fertilizers, soil amendments and organic wastes; soil fertility evaluations and interpretations. Standard lab analysis procedures, nutrient deficiencies, field trips. Designated "writing intensive course". Prerequisite: CSS 305. Lab/Lec.

CSS 315L - Nutrient Mgt Lab Credits: .00

CSS 320 - Prin Oil/Fiber Crp Prod Credits: 1.00
 SPRING Characteristics of oil seed, essential oil, and fiber crops. Prerequisite: CSS 305, CSS 300.

CSS 321 - Prin Cereal Crop Prod Credits: 1.00
 SPRING Production practices of cereal grains. Prerequisites: CSS 300 or equivalent; CSS 305.

CSS 322 - Prin Potato Prod Credits: 1.00
 SPRING Principles and practices governing all aspects of potato production, storage and use. Prerequisites: CSS 300 or equivalent; CSS 305.

CSS 381 - Ag/Pwr/Discrim/Survival Credits: 3.00

CSS 395 - World Soil Resources Credits: 3.00
 WINTER, ALT YRS The world soils order and their use by humans as rangelands, forestlands, and croplands.

CSS 401 - Research Credits: 1.00 to 16.00
 Terms and credits arranged. Junior or senior standing required.

CSS 405 - Reading & Conference Credits: 1.00 to 15.00

Various topics. Terms and credits to be arranged. Junior or Senior standing required.

CSS 407 - Senior Seminar Credits: 1.00
 SPRING Senior seminar is intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and to submit written documentation supporting that seminar. Graded P/N. Prerequisite: SPCH 112; Senior standing in sciences.

CSS 408 - Workshop Credits: 1.00 to 16.00
 Various Topics. Terms and credits arranged.

CSS 410 - Internship Credits: 1.00 to 15.00
 Professional work experience previously approved and supervised by the department. Written report required. Prerequisite: Junior standing, major students only; instructor consent.

CSS 430 - Plant Genetics Credits: 3.00
 WINTER The biology of plant genes and their manipulation in crop plants. Prerequisite: CSS 300, one year of biology or botany. Junior or Senior standing required.

CSS 440 - Weed Management Credits: 4.00
 FALL Principles of weed control by cultural biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use. Prerequisite: Introductory botany or biology. Lec/Lab Junior or Senior standing required.

CSS 440L - Weed Management Lab Credits: .00

CSS 460 - Seed Production Credits: 3.00
 FALL Cultivation, processing, testing, certification and legal aspects of crops grown for seed. Prerequisite: CSS 300.

CSS 466 - Soil Morph & Classifica Credits: 4.00
 FALL Soil profile descriptions; soil landscape patterns; morphology and nomenclature of major soil groups; soil survey techniques and uses. Prerequisite: CSS 305 Lec/lab. Junior or Senior standing required.

CSS 475 - Agri Mgt Oregon Soil Res Credits: 2.00
 SPRING Field trips to study soil and crop management for agriculture and forestry. Prerequisite: CSS 300, 305, Junior or Senior standing.

CSS 480 - Case Std Crop Syst Mgmt Credits: 4.00
 The decision-making process; group and individual problem-solving activities related to field crop production, management, and marketing. Prerequisite: Junior or Senior standing.

CSS 499 - Special Topics Credits: 1.00 to 16.00
 Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ. Prerequisite: Instructor approval required.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

ENTOMOLOGY COURSE DESCRIPTIONS

ENT 311 - Insect Pest Mgmt Credits: 5.00
 FALL. This is an OSU class. Recognition, biology, and management of injurious and beneficial insects; insects and human welfare. Concurrent laboratory is designed to illustrate principles of insect pest management in agricultural cropping systems. Prerequisite: One year college biology.

ENT 311L - Insect Pest Mgmt Lab Credits: .00
 This is an OSU class.

FISH & WILDLIFE COURSE DESCRIPTIONS

FW 251 - Prin Fish/Wildlife Conserv Credits: 3.00
 History of conservation and natural resource use; ecological principles, and social and economic limitations of conservation; principles and practices of wildlife and fisheries management; role of research in management. Prerequisite: MATH 111 or equivalent.

FW 481 - Wildlife Ecology Credits: 3.00
 Interrelationships of wildlife, environment and humans. Evaluation of properties and habitats of wildlife populations. Prerequisite: FW 251, BIOL 357 and either STAT 315, STAT 327 or equivalent. Restrictions: May not be enrolled in one of the following Class(es): Freshman

FORESTRY COURSE DESCRIPTIONS

F 111 - Intro Forestry*NW Credits: 3.00
New Gen Ed-Natural World
 FALL Forest and forest ecosystems; management alternatives; forester's role in managing trees, water, wildlife, recreation, forage, aesthetics and wilderness; site visits to acquire skills and observe forest management. Required: Field trips.

RANGELAND RESOURCES COURSE DESCRIPTIONS

RNG 301 - Career Orientation Credits: 1.00
 FALL Opportunity to explore rangeland careers in an informal, seminar-like setting.

RNG 341 - Range Resources*NW Credits: 3.00
New Gen Ed-Natural World
 FALL Nature and management of rangelands. Integrated land use with emphasis on plant-animal-soil interactions. Required: Field Trips.

RNG 347 - Arid Land Biomes Credits: 3.00
 FALL, EVEN YEARS Designed to acquaint students with the physical, climactic, and vegetational characteristics of arid rangelands in the U.S. and their world counterparts. An emphasis will be placed upon community level descriptions of arid biomes.

RNG 348 - Arid Land Plants Credits: 2.00
 SPRING Emphasis is placed on identification of important plant species occurring in arid land biomes of the U.S. Students are required to learn both scientific and common names, ecological requirement and tolerances, reaction to grazing and their value as forage and cover.

RNG 350 - Grassland Ecosystem Credits: 3.00
 FALL, ODD YEARS. Designed to acquaint students with grassland systems with emphasis on North American grasslands and comparison with grasslands of other continents. Emphasis of the course will be on system structure, process and function. Major consideration will be placed on phytoedaphic relationships.

RNG 355 - Desert Watershed Mgmt Credits: 3.00
 WINTER Principles and methods in managing rangeland for optimum production and regulation of water yields as well as maintaining soil stability and on-site productivity. Effects of grazing herbivores and their potential as a land management tool. Concepts of arid land hydrology, with emphasis on the resultant effects on runoff quantity and quality.

RNG 403 - Senior Thesis Credits: 1.00 to 16.00
 BY ARRANGEMENT Designated "writing intensive course".

RNG 405 - Reading & Conference Credits: 1.00 to 16.00

RNG 406 - Projects Credits: 1.00 to 16.00

RNG 407 - RNG 407 Credits: 1.00
 Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

RNG 421 - Wildland Restoration Ecology Credits: 4.00
 SPRING, ODD YEARS. Practices for rehabilitating degraded rangelands are studied. This involves knowledge of manipulating plants, animals, and micro-environments of rangelands for optimal sustained yield of rangeland resources, for maintenance and improvement of ecosystem functions. Prerequisites: RNG 341. Required: Field trips.

RNG 441 - Range Analysis Credits: 4.00

WINTER, ODD YEARS. Techniques used to describe vegetation in shrublands, grasslands, and forests. Use of measurements in resource management. Course is field-orientated, emphasizing both theory and practice of wildland inventory methods. Prerequisite: Introductory Statistics course is helpful, RNG 341. Junior or Senior standing.

RNG 442 - Rangeland Animal Relationships Credits: 4.00

WINTER, EVEN YEARS. Domestic and wild animal use of rangelands as related to environmental factors; palatability, food habits, nutrition, and their effects on management of rangeland animal resources. Prerequisite: RNG 341.

RNG 490 - Range Mgt Planning Credits: 4.00

SPRING, EVEN YEARS. Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution and other steps necessary for decision making. Use of data collected from field problems to support the execution of class plans. Required: Field trips and lab fee. Prerequisites: RNG 341.