

# COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES

## College Administration

Thomas G. Coon, PhD—Vice President, Dean and Director  
 Cynda R. Clary, PhD—Associate Dean for Academic Programs  
 Karen Hickman, PhD—Assistant Dean for Academic Programs  
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 Kassi Jo Winn-Huizar, MS—Coordinator, Prospective Student Services  
 Amy Gazaway, MS—Coordinator, Student Success  
 Katie Smithson, MS—Coordinator, Student Success  
 José Uscanga, MS – Director, CASNR Multicultural Programs

## Campus Address and Phone

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The College of Agricultural Sciences and Natural Resources (CASNR) is the academic unit of the Division of Agricultural Sciences and Natural Resources, and offers outstanding undergraduate and graduate programs that are recognized at the state, regional, national and international levels. In collaboration with the Oklahoma Cooperative Extension Service (OCES) and the Oklahoma Agricultural Experiment Station (OAES), CASNR faculty provide great breadth and exceptional quality in teaching, advising, research, extension and service.

A CASNR education values hands-on instruction and the importance of a well-rounded student experience. The college's award-winning faculty members are dedicated to developing students and passionate about adding value to the total educational experience. CASNR's academic programs prepare students to analyze information, communicate effectively, think critically, solve problems, and assume leadership roles in their respective fields of study. Students also receive a solid general education in communications, humanities and social sciences. In agriculture or natural resources, the graduate will have an opportunity for a rewarding career that will last as long as food is consumed, fiber is grown, and soil, water and wildlife resources are valued.

CASNR students come from both traditional agricultural roots and urban settings. This diversity adds strength to the college experience for all CASNR students. Career opportunities in Agricultural Sciences and Natural Resources are also diverse. The college's majors include traditional agricultural and natural resource disciplines such as animal science, agricultural business, soil science, range science, horticulture, entomology and agricultural education, in addition to distinctive areas such as plant and animal biotechnology, food safety, natural resource management and agricultural communications. CASNR's programs also include many fields not commonly associated with agriculture such as landscape architecture, turf management, biochemistry and molecular biology, environmental science, leadership, pre-law and pre-medical sciences. Active international programs, including study abroad opportunities, are available to students in every CASNR major and add a unique dimension to the college experience.

## Accreditation

Agricultural Sciences and Natural Resources include broad and diverse professions and do not have a single accrediting society as do some other professions. Programs in agricultural education, agricultural engineering, biochemistry and molecular biology, forestry, landscape architecture and landscape management are accredited by their professional organizations.

## Academic Programs

### Undergraduate Programs

The Bachelor of Science in Agricultural Sciences and Natural Resources degree is offered in the following major fields of study: agribusiness, agricultural communications, agricultural economics, agricultural education, agricultural leadership, animal science, biochemistry and molecular biology, entomology, environmental science, food science, horticulture, landscape management, natural resource ecology and management, and plant and soil sciences. The Bachelor of Landscape Architecture is also offered in the College of Agricultural Sciences and Natural Resources. The biosystems engineering degree program is jointly administered by the College of Agricultural Sciences and Natural Resources and the College of Engineering, Architecture and Technology (Bachelor of Science in Biosystems Engineering). In addition to undergraduate majors, most CASNR departments offer one or more minors. The requirements for the minors are available from the department offering the specified minor.

### Graduate Programs

Graduate study is available in all CASNR academic departments and in the multidisciplinary international agriculture program. In addition to the Master of Agriculture and Master of Science degrees that may be obtained through several departments, the Doctor of Philosophy degree (PhD) may be earned in the following areas: agricultural economics, agricultural education, biosystems engineering, animal science, biochemistry and molecular biology, crop science, entomology, food science, plant pathology, soil science, natural resource ecology and management and in horticulture through interdisciplinary programs in crop science, environmental science, and plant science.

## High School Preparation and Admission Requirements

The high school preparation and admission requirements for the College are the same as the general University requirements. The undergraduate biosystems engineering degree includes additional enrollment requirements which are described in the College of Engineering, Architecture and Technology section of this catalog.

## Transfer Students

Students who transfer from an accredited college or two-year college must meet the general University admission requirements. All transferred courses are recorded on the OSU transcript; however, a minimum of 60 credit hours must be earned at a senior college (baccalaureate degree-granting institution) to meet the College's degree requirements. Credits will be accepted by transfer from a community college to meet lower-division (i.e., 1000- and 2000-level courses) requirements only. Specific departmental requirements needed for graduation are determined by the department in which the student plans to earn his or her degree.

## Scholarships

Students enrolled and entering the College of Agricultural Sciences and Natural Resources are annually awarded over 1.4 million dollars in scholarships by the College and its departments. The following areas are considered in the awarding of scholarships: scholastic standing in high school or college; leadership activities; financial need and sincere interest in the various CASNR disciplines.

Additional information may be obtained from the office of the associate dean, College of Agricultural Sciences and Natural Resources, Oklahoma State University, 136 Agricultural Hall, Stillwater, OK 74078 (casnr.okstate.edu (<http://casnr.okstate.edu>)).

## Student Success Center

The College of Agricultural Sciences and Natural Resources Student Success Center (SSC) helps students with educational, career and personal goals. The SSC provides important services, programs and student support including Student Academic Mentors, Ambassadors, Career Liaisons, Freshmen in Transition, Success Coaches for Outstanding Transfer Students, Career Services, Prospective Student Services, assistance with tutoring or other services, and liaison to the OSU Writing Center, Mathematics Learning Resource Center and the Learning and Student Success Opportunity Center.

## Academic Advising

All students in the College have the advantage of being advised by a faculty member working in the individual student's academic discipline. Academic advisers are readily available to students and work closely with the students throughout their academic careers.

## Special Academic Programs

### Honors Program

The Honors Program through the College of Agricultural Sciences and Natural Resources is designed to provide outstanding students with opportunities to pursue new challenges and academic excellence. Honors courses, seminars, and special honors contracts provide for discussions and independent study by students who have the desire and ability to explore academic subjects beyond the normal class work material. The OSU Honors College oversees the following Honors Award Recognitions:

1. General Honors.
2. College or Department Honors.
3. The Honor's College Degree.

Award descriptions and Honors College eligibility requirements can be found in the Honors College section of the catalog. Online information is available at <http://honors.okstate.edu>.

### Pre-Veterinary Medicine Curriculum

Specific pre-veterinary science majors in agribusiness, animal science, biochemistry and molecular biology, entomology, and natural resources and ecology management as offered in the College of Agricultural Sciences and Natural Resources, include all courses required for admission to the Center for Veterinary Health Sciences.

## Graduation Requirements

General University requirements for graduation are stated elsewhere in the Catalog. In addition, specific requirements must be met for the Bachelor of Science in Agricultural Sciences and Natural Resources

and Bachelor of Landscape Architecture degrees. For the BS degree, the required total semester credit hours vary by department, major and option. A minimum of 40 semester credit hours and 100 grade-points must be earned in courses numbered 3000 or above. The Bachelor of Landscape Architecture is a five-year program requiring 150 credit hours.

## College and Departmental Organizations, Competitive Teams and Honor Societies

AECL Graduate Student Association  
 Aggie-X Club  
 Agricultural Communicators of Tomorrow  
 Agricultural Economics Graduate Student Association  
 Agricultural Economics Quiz Bowl Team  
 Agronomy Club  
 Alpha Epsilon  
 Alpha Tau Alpha (Agricultural Education Honor Society)  
 Alpha Zeta (College Honor Society)  
 American Fisheries Society  
 American Society of Agricultural & Biological Engineers  
 American Society of Landscape Architects  
 Animal Science Academic Quadrathlon Team  
 Animal Science Graduate Student Association  
 Animal Science Leadership Alliance  
 Biochemistry Club  
 Biochemistry & Molecular Biology Graduate Student Association  
 Block and Bridle Club  
 CASNR Ambassadors  
 CASNR Career Liaisons  
 CASNR Student Council  
 Collegiate 4-H  
 Collegiate FFA/ATA  
 Cowboy Motorsports  
 Cowboy Waterworks  
 Crops Judging Team  
 Dairy Cattle Judging Team  
 Dairy Science Club  
 ENPP Graduate Student Association  
 Environmental Science Club  
 Equine Judging Team  
 Food Industry Club  
 Freshmen in Transition  
 Horseman's Association  
 Horticulture Club  
 Landscape Management Club  
 Linnaean Games Team  
 Livestock Judging Team  
 Meat Animal Evaluation Team  
 Meat Judging Team  
 Meat Science Association  
 Minorities in Agriculture, Natural Resources and Related Sciences  
 NREM Graduate Student Association  
 Oklahoma Collegiate Cattlemen  
 Oklahoma Collegiate Cattlewomen  
 Pi Alpha Xi  
 Plant and Soil Sciences Graduate Student Organization  
 Pre-Veterinary Science Club  
 Rodeo Association  
 Sanborn Entomology Club  
 Sigma Lambda Alpha (Landscape Architecture Honor Society)  
 Society of American Foresters/Forestry Club  
 Society for Range Management

Soil and Water Conservation Society  
 Soil Judging Team  
 Student Organization for International Agriculture  
 Swine Club  
 The FARM Theory  
 Turf Club  
 Weed Science Team  
 Wildlife Society  
 Xi Sigma Pi (Forestry Honor Society)

## Academic Areas

- Agricultural Communications (p. 798)
- Agricultural Economics (p. 805)
- Agricultural Education (p. 829)
- Agricultural Leadership (p. 842)
- Agriculture (p. 850)
- Animal Science (p. 852)
- Biochemistry and Molecular Biology (p. 880)
- Biosystems and Agricultural Engineering (p. 888)
- Entomology and Plant Pathology (p. 890)
- Environmental Sciences (p. 900)
- Horticulture and Landscape Architecture (p. 908)
- International Agriculture (p. 923)
- Natural Resource Ecology and Management (p. 924)
- Plant and Soil Sciences (p. 941)

## Undergraduate Programs

The Bachelor of Science in Agricultural Sciences and Natural Resources degree is offered in the following major fields of study: agribusiness, agricultural communications, agricultural economics, agricultural education, agricultural leadership, animal science, biochemistry and molecular biology, entomology, environmental science, food science, horticulture, landscape management, natural resource ecology and management, and plant and soil sciences. The Bachelor of Landscape Architecture is also offered in the College of Agricultural Sciences and Natural Resources. Most departments offer one or more minors. The requirements for the minors are available from the department offering the specified minor.

- Agribusiness, BSAG (p. 807)
- Agribusiness: Agricultural Communications Double Major, BSAG (p. 809)
- Agribusiness: Crop and Soil Sciences, BSAG (p. 811)
- Agribusiness: Farm and Ranch Management, BSAG (p. 813)
- Agribusiness: International, BSAG (p. 815)
- Agribusiness: Pre-Law, BSAG (p. 817)
- Agribusiness: Pre-Veterinary Business Management, BSAG (p. 819)
- Agricultural Communications, BSAG (p. 799)
- Agricultural Communications: Agribusiness Double Major, BSAG (p. 801)
- Agricultural Communications: Animal Science Double Major, BSAG (p. 803)
- Agricultural Economics, BSAG (p. 822)
- Agricultural Economics: Accounting Double Major, BSAG (p. 825)
- Agricultural Education: Agricultural Business and Economics, BSAG (p. 830)
- Agricultural Education: Agricultural Communications, BSAG (p. 832)
- Agricultural Education: Animal Agriculture, BSAG (p. 834)
- Agricultural Education: Horticultural Sciences, BSAG (p. 836)
- Agricultural Education: Multidisciplinary, BSAG (p. 838)
- Agricultural Education: Natural Resources, BSAG (p. 840)
- Agricultural Leadership, BSAG (p. 843)
- Agricultural Leadership: Extension Education, BSAG (p. 845)
- Agricultural Leadership: International Studies, BSAG (p. 847)
- Animal Science: Agricultural Communications Double Major, BSAG (p. 855)
- Animal Science: Agricultural Education Double Major, BSAG (p. 857)
- Animal Science: Animal Biotechnology, BSAG (p. 859)
- Animal Science: Business, BSAG (p. 861)
- Animal Science: Livestock Merchandising, BSAG (p. 863)
- Animal Science: Pre-Veterinary Animal Science, BSAG (p. 865)
- Animal Science: Production, BSAG (p. 867)
- Animal Science: Ranch Operations, BSAG (p. 869)
- Biochemistry and Molecular Biology, BSAG (p. 883)
- Biochemistry and Molecular Biology: Pre-Medical or Pre-Veterinary Science, BSAG (p. 885)
- Entomology: Bio-Forensics, BSAG (p. 893)
- Entomology: Insect Biology and Ecology, BSAG (p. 895)
- Entomology: Pre-Veterinary and Pre-Medical, BSAG (p. 897)
- Environmental Science: Environmental Policy, BSAG (p. 902)
- Environmental Science: Natural Resources, BSAG (p. 904)
- Environmental Science: Water Resources, BSAG (p. 906)
- Food Science: Food Industry, BSAG (p. 872)
- Food Science: Food Safety, BSAG (p. 874)
- Food Science: Meat Science, BSAG (p. 876)
- Food Science: Science, BSAG (p. 878)
- Horticulture: Horticultural Business, BSAG (p. 910)
- Horticulture: Horticultural Science, BSAG (p. 912)
- Horticulture: Public Horticulture, BSAG (p. 914)
- Horticulture: Turf Management, BSAG (p. 916)
- Landscape Architecture, BLA (p. 918)
- Landscape Management, BSAG (p. 921)
- Natural Resource Ecology & Management: Fisheries & Aquatic Ecology, BSAG (p. 928)
- Natural Resource Ecology & Management: Forest Ecology & Management, BSAG (p. 930)
- Natural Resource Ecology & Management: Rangeland Ecology & Management, BSAG (p. 932)
- Natural Resource Ecology & Management: Wildlife Biology & Pre-veterinary Science, BSAG (p. 934)
- Natural Resource Ecology & Management: Wildlife Ecology & Management, BSAG (p. 936)
- Plant and Soil Sciences: Agronomic Business, BSAG (p. 945)
- Plant and Soil Sciences: Crop Production and Management, BSAG (p. 947)
- Plant and Soil Sciences: Plant Biotechnology and Improvement, BSAG (p. 949)
- Plant and Soil Sciences: Soil and Water Resources, BSAG (p. 951)

## Minors

- Agricultural Economics and Agribusiness (AEAB), Minor (p. 821)
- Agricultural Real Estate Appraisal (AREA), Minor (p. 827)
- Agronomy (AGRN), Minor (p. 943)
- Animal Science (ANSI), Minor (p. 854)
- Biochemistry (BIOC), Minor (p. 882)
- Entomology (ENTO), Minor (p. 892)
- Environmental Economics, Politics and Policy (EEPP), Minor (p. 828)
- Environmental Science (ENVR), Minor (p. 901)
- Fisheries and Aquatic Ecology (FAEC), Minor (p. 926)
- Food Science (FDSC), Minor (p. 871)
- Forestry (FOR), Minor (p. 927)
- Horticulture (HORT), Minor (p. 944)
- Leadership Education (LDED), Minor (p. 849)
- Natural Resource Ecology and Management (NREM), Minor (p. 938)
- Pest Management (PEST), Minor (p. 899)
- Rangeland Ecology and Management (REM), Minor (p. 939)
- Soil Science (SOIL), Minor (p. 953)
- Wildlife Ecology (WLEC), Minor (p. 940)

## Graduate Programs

Graduate study is available in all CASNR academic departments and in the multidisciplinary international agriculture program. In addition to the Master of Agriculture and Master of Science degrees that may be obtained through several departments, the Doctor of Philosophy degree (PhD) may be earned in the following areas: agricultural economics, agricultural education, biosystems engineering, animal science, biochemistry and molecular biology, crop science, entomology, food science, plant pathology, soil science, natural resource ecology and management and in horticulture through interdisciplinary programs in crop science, environmental science, and plant science.

- Agricultural Communication, MS (p. 798)
- Agricultural Economics, MS/PhD (p. 805)
- Agricultural Education, MS/PhD (p. 829)
- Animal Science, MS/PhD (p. 853)
- Biochemistry and Molecular Biology, MS/PhD (p. 880)
- Crop Science, PhD (p. 941)
- Entomology, MS/PhD (p. 890)
- Plant Pathology, MS/PhD (p. 890)
- Food Science, MS/PhD (p. 853)
- Agribusiness, MAG (p. 805)
- Agricultural Leadership, MAG (p. 842)
- Horticulture, MS (p. 908)
- International Agriculture, MAG/MS (p. )
- Fisheries and Aquatic Ecology, MS/PhD (p. 924)
- Forest Resources, MS/PhD (p. 924)
- Rangeland Ecology and Management, MS/PhD (p. 924)
- Wildlife Ecology and Management, MS/PhD (p. 924)
- Plant and Soil Sciences, MS (p. 941)
- Soil Science, PhD (p. 941)

## Agricultural Communications

Modern agriculture, with its diversity and specialization, requires accurate communication between industry leaders and the public. Education in agricultural communications prepares students to provide the necessary communications link mixing the most current media platforms with traditional principles.

By majoring in agricultural communications, students gain communications education with industry specific classes in advertising and public relations, Web design, magazine writing and production, radio and television broadcasting, photography, reporting and newswriting, or research report writing. Opportunities also are available for the student to develop a double-major program with other departments in the College of Agricultural Sciences and Natural Resources.

For the graduate with a bachelor's degree in agricultural communications, career opportunities are abundant in the agricultural production industry and in service organizations as well as with publishing firms, broadcast stations, trade publications or related media.

## Undergraduate Programs

- Agricultural Communications, BSAG (p. 799)
- Agricultural Communications: Agribusiness Double Major, BS (p. 801)
- Agricultural Communications: Animal Science Double Major, BSAG (p. 803)

## Graduate Programs

The Master of Science degree in agricultural communications is designed to build mastery of knowledge in key areas such as communication theory, history, philosophy, technology, advanced communication skills and research and data analysis. The Master of Science degree in agricultural communications reflects the distinctive body of knowledge, research base, professional delivery and program focus of the discipline. In addition, the program introduces and requires students to apply research tools and methods.

The Master of Science program serves two primary purposes:

- a. encouraging mastery of discipline-specific knowledge with an introduction to research and data analysis and
- b. offering discipline-specific knowledge with professional application to the work setting.

The Master of Science program offers students two options for completion of the degree: thesis option and formal report option. The thesis option requires 30 approved credit hours of course work, which includes a six credit hour formal thesis following the graduate college format. The formal report option requires 32 approved semester credit hours of course work, including a two credit hour formal report.

Students applying for the Master of Science program without a background in the appropriate option will be expected to complete course work to bring their preparation to an acceptable level.

## Admission Requirements

All students accepted into the agricultural communications Master of Science degree program will be expected to meet all University and Graduate College requirements and to have earned a degree in agricultural communications or related field from an accredited

university. Applicants from outside agricultural communications will be required to complete prerequisite courses equivalent to the knowledge and competencies expected in the agricultural communications undergraduate program.

An undergraduate grade point average of 2.80 overall on a 4.00 scale or 3.00 in the last 30 hours is required. The applicant must complete the Graduate Record Examination, submit a statement of goals for pursuing the master's degree, and submit letters of reference from at least three people knowledgeable of the applicant's professional qualifications. These references should include statements relating to:

- a. the applicant's success in professional settings or commitment to professions allied with the disciplines in the College of Agricultural Sciences and Natural Resources,
- b. the applicant's prior academic record as a reflection of ability to succeed in a Master of Science program, and
- c. the applicant's potential for success in research, writing and course work at the Master of Science level.

If such references are not available, the applicant should submit references from one or more faculty members familiar with the applicant's academic career. Other references should be from individuals capable of addressing the applicant's ability to successfully complete a Master of Science program.

## Review Process for Admission

The Office of the Associate Dean of Graduate Studies manages all procedures and records pertinent to admission. The admission process is ongoing with admission recommendations rendered by the graduate faculty in the department. To be eligible for committee review, each applicant must submit an application for admission to the Graduate College, transcripts of all academic records, reference letters, goal statement and GRE scores.

## Faculty

Robert Terry, Jr., PhD—Professor and Head

**Professors:** D. Dwayne Cartmell, PhD; M. Craig Edwards, PhD; James P. Key, EdD (emeritus); J. Shane Robinson, PhD; Shelly R. Sitton, PhD; Penny L. Weeks, PhD; William G. Weeks, PhD

**Associate Professors:** Jon W. Ramsey, PhD; Jeff Sallee, PhD

**Assistant Professors:** Marshall Baker, PhD; Angel Riggs, PhD



## Agricultural Communications, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 1483	Mathematical Functions and Their Uses (A)	
MATH 1493	Applications of Modern Mathematics (A)	
MATH 1513	College Algebra (A)	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>1</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>1</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>1</sup>	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		

### College/Departmental Requirements

#### Agricultural Sciences and Natural Resources

AG 1011	First Year Seminar	1
ANSI 1124 & PLNT 1213	Introduction to the Animal Sciences and Introduction to Plant and Soil Systems	7
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2103	Regional Diversity in Food Production, Selection and Consumption (D)	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
ANSI 2233	The Meat We Eat	
ANSI 2253	Meat Animal and Carcass Evaluation	
NSCI 2114	Principles of Human Nutrition (N)	
NSCI 3543	Food and the Human Environment (IS)	
Select one of the following:		3
ENTO 2003	Insects and Society (N)	
ENTO 2143	Global Issues in Agricultural Biosecurity and Forensics	
ENTO 2223	Insects in Global Public Health (N)	
ENTO 2993	Introduction to Entomology (LN)	
ENVR 1113	Elements of Environmental Science	
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
SOIL 1113	Land, Life and the Environment (N)	
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGEC 2303	Food Marketing to a Diverse Population (D)	
AGEC 3403	Agricultural Small Business Management	
AGLE 2303	Agricultural Leaders in Society (S)	
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	
<i>Written &amp; Oral Communications</i>		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
<b>Hours Subtotal</b>		23
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGCM 3123	New Media in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Web Design for Agricultural Organizations	3
AGCM 3233	Basic Photography and Photo Editing for Agriculture	3
or AGCM 4233	Agricultural Photography Tour	
AGCM 3503	Issues Management and Crisis Communications in Agriculture and Natural Resources	3
AGCM 4113	Features Writing and Editing for Agricultural Publications	3

AGCM 4203	Professional Development in Agricultural Communications	3
AGCM 4300	Internships in Agricultural Communications	2
AGCM 4403	Planning Campaigns for Agriculture and Natural Resources	3
AGCM 4413	Agricultural Communications Capstone	3
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3703	Issues in Agricultural Policy	3
AGEC 3713	Agricultural Law	3
FIN 2123	Personal Finance	3
or ACCT 2103	Financial Accounting	
<i>Related Courses</i>		
To be selected from courses in agriculture, communications, or discipline-related areas		16
<b>Hours Subtotal</b>		<b>57</b>
<i>Electives</i>		
0 or hours to complete required total for degree		
Total Hours		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- The student must earn a minimum grade of "C" in all AGCM courses.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Communications: Agribusiness Double Major, BS

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 128**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		

AG 1011	First Year Seminar	1
ANSI 1124 & PLNT 1213	Introduction to the Animal Sciences and Introduction to Plant and Soil Systems	7
<i>Written &amp; Oral Communications</i>		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Select one of the following: <sup>2</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>17</b>
<b>Major Requirements</b>		
<i>Agricultural Communications Core Courses</i>		
AGCM 3123	New Media in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Web Design for Agricultural Organizations	3
AGCM 3233	Basic Photography and Photo Editing for Agriculture	3
or AGCM 4233	Agricultural Photography Tour	
AGCM 3503	Issues Management and Crisis Communications in Agriculture and Natural Resources	3
AGCM 4113	Features Writing and Editing for Agricultural Publications	3
AGCM 4203	Professional Development in Agricultural Communications	3
AGCM 4300	Internships in Agricultural Communications	2
AGCM 4403	Planning Campaigns for Agriculture and Natural Resources	3
AGCM 4413	Agricultural Communications Capstone	3
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2103	Regional Diversity in Food Production, Selection and Consumption (D)	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
ANSI 2233	The Meat We Eat	
or ANSI 2253	Meat Animal and Carcass Evaluation	
NSCI 2114	Principles of Human Nutrition (N)	
NSCI 3543	Food and the Human Environment (IS)	
<i>Agribusiness Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3



AGEC 4343	International Agricultural Markets and Trade (I) <sup>3</sup>	3
AGEC 4503	Environmental Economics and Resource Development <sup>3</sup>	3
AGEC 4703	American Agricultural Policy <sup>3</sup>	3
ECON 2203	Introduction to Macroeconomics	3
ECON 3113 or ECON 3023	Intermediate Microeconomics Managerial Economics	3
<b>Hours Subtotal</b>		<b>71</b>
<i>Electives</i>		
0 or hours to complete required total for degree		
<b>Total Hours</b>		<b>128</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>3</sup> AGECE 4503 Environmental Economics and Resource Development satisfies environmental science requirement and AGECE 4703 American Agricultural Policy satisfies policy requirement for the Agricultural Communications major. AGECE 4343 International Agricultural Markets and Trade (I) satisfies international dimension requirements. If another course is taken for these requirements, a different 4000-level AGECE course except AGECE 4990 Problems of Agricultural Economics may be taken. At least nine hours of 4000-level AGECE besides 4990 required for AGBU major.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- The student must earn a minimum grade of "C" in all AGCM courses.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Communications: Animal Science Double Major, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 130**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1483	Mathematical Functions and Their Uses (A) <sup>1</sup>	3
or MATH 1513	College Algebra (A)	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
or MATH 1613	Trigonometry (A)	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
Select one of the following:		3
ENTO 3003	Livestock Entomology	

ENVR 1113	Elements of Environmental Science	
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N)	
Select two of the following:		5
ANSI 2112	Live Animal Evaluation	
ANSI 2233	The Meat We Eat	
or FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
FDSC 1133	Fundamentals of Food Science	
FDSC 2103	Regional Diversity in Food Production, Selection and Consumption (D)	
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Written &amp; Oral Communications</i>		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>3</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>3</sup>	
<b>Hours Subtotal</b>		<b>26</b>
<b>Major Requirements</b>		
<i>Agricultural Communications Core Courses</i>		
AGCM 3123	New Media in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Web Design for Agricultural Organizations	3
AGCM 3233	Basic Photography and Photo Editing for Agriculture	3
or AGCM 4233	Agricultural Photography Tour	
AGCM 4113	Features Writing and Editing for Agricultural Publications	3
AGCM 4203	Professional Development in Agricultural Communications	3
AGCM 4300	Internships in Agricultural Communications	2
AGCM 4403	Planning Campaigns for Agriculture and Natural Resources	3
AGCM 4413	Agricultural Communications Capstone	3
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3703	Issues in Agricultural Policy	3
AGEC 3713	Agricultural Law	3
FIN 2123	Personal Finance	3
or ACCT 2103	Financial Accounting	
<i>Animal Science Core Courses</i>		
ANSI 1111	Animal and Food Science Experience	1
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3

ANSI 3543	Principles of Animal Nutrition	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
Select two of the following:		6
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4713	Beef Seedstock Management and Sales	
<i>Related Courses</i>		
To be selected from courses in agriculture, communications, or discipline-related areas to meet total		1
<b>Hours Subtotal</b>		<b>64</b>
<i>Electives</i>		<i>0</i>
0 or hours to complete required total for degree		
<b>Total Hours</b>		<b>130</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements

<sup>2</sup> If used as (N) course above, hours in this block reduced by 4

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- The student must earn a minimum grade of "C" in all AGCM courses

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Economics

The Department of Agricultural Economics at Oklahoma State University offers programs of study leading to the BS, MS, MAg and PhD degrees in Agricultural Economics and the BS and MAg degree in Agribusiness. Agricultural economics and agribusiness curricula study the economic relationships among individuals, firms and service agencies in agriculture and between the agricultural sector and other sectors of the economy. The department's courses emphasize the economic issues and concepts associated with producing, processing, marketing, and consuming agricultural goods and services and those used in the industry.

Undergraduate programs in Agricultural Economics and Agribusiness combine instruction in technical agricultural sciences with education in the application of economic and business management principles and tools. The agricultural economist or agribusiness person draws upon the physical and social sciences to outline, understand, and solve economic problems created by agriculture's dynamic operating environment. Curricula in the Department of Agricultural Economics emphasize the decision-making and problem-solving skills used in the management of agricultural production and marketing firms.

Study in agricultural economics or agribusiness prepares students to excel in many challenging careers. Many graduates work to improve food production and processing throughout the world. Other graduates work with government policies that affect the food and fiber sector. Others assist rural communities to adjust and thrive in the rapidly changing world. Graduates also help protect and maintain natural resources and the environment for the greatest benefit of society. Many graduates choose career paths that lead them far from the farm; and others choose to return to family businesses.

## Agricultural Economics

The Agricultural Economics BS degree trains students to analyze problems and make decisions using a solid framework of economic and business principles. Students may tailor study to a wide variety of career interests. The base Agricultural Economics degree plan offers specializations in Quantitative Studies, Environmental and Natural Resources, and Community and Regional Analysis. The Agricultural Economics BS degree student can also choose a double major with Accounting. Each of the study plans in Agricultural Economics equips students for a variety of employment opportunities at competitive salaries in private industry and government agencies.

## Agribusiness

Like the Agricultural Economics degree, the Agribusiness BS degree trains students to analyze problems and make decisions using a solid framework of economic and business principles. In addition, the agribusiness degree targets the skills needed for careers in agribusiness firms, including all areas of food and fiber production, processing, and marketing. Students may choose from six degree options: Farm and Ranch Management, Crop and Soil Science, International, Pre-Law, Pre-Veterinary Business Management or a double major with Agricultural Communications. Agribusiness students also may develop a minor area of study or a double major by selecting various course electives. Employment opportunities for agribusiness graduates are widely diverse, including jobs with farms, agricultural advisers, processing firms, wholesalers and retailers of food and fiber products, farm input supply firms, banks and other financial services firms, utilities and educational institutions.

## Minor in Agricultural Economics and Agribusiness

The minor helps students understand the basics of economics and business within the context of Agricultural Sciences and Natural Resources. Requirements of the minor include an introduction to Agricultural Economics or Microeconomics and Financial Accounting or Agribusiness Accounting and Taxation plus 15 hours controlled electives of upper division Agricultural Economics courses.

## Minor in Environmental Economics, Politics and Policy

This minor offered in cooperation with Political Science helps students understand economic, politics and policy issues related to environmental issues. Requirements of the minor include an introduction to Agricultural Economics or Microeconomics, a 3000 level environmental economics course, Environmental Economics and Resource Development and 12 hours controlled electives from related upper division courses.

## Minor in Agricultural Real Estate Appraisal

This minor helps students understand the basis of agricultural real estate appraisal. Requirements of the minor include financial and managerial accounting, statistics, quantitative methods in agricultural economics, farm and agribusiness management, agricultural finance, and farm appraisal.

## Undergraduate Programs

- Agribusiness, BSAG (p. 807)
- Agribusiness: Agricultural Communications Double Major, BSAG (p. 809)
- Agribusiness: Crop and Soil Sciences, BSAG (p. 811)
- Agribusiness: Farm and Ranch Management, BSAG (p. 813)
- Agribusiness: International, BSAG (p. 815)
- Agribusiness: Pre-Law, BSAG (p. 817)
- Agribusiness: Pre-Veterinary Business Management, BSAG (p. 819)
- Agricultural Economics and Agribusiness (AEAB), Minor (p. 821)
- Agricultural Economics, BSAG (p. 822)
- Agricultural Economics: Accounting Double Major, BSAG (p. 825)
- Agricultural Real Estate Appraisal (AREA), Minor (p. 827)
- Environmental Economics, Politics and Policy (EEPP), Minor (p. 828)

## Graduate Programs

The department offers graduate work leading to the Master of Science, the Master of Agriculture and the Doctor of Philosophy degrees. Both thesis and non-thesis options are available at the MS level. PhD students complete a teaching practicum in addition to the research thesis as a part of the degree requirements.

The graduate program stresses development of superior professional competence, suited to the demands of the modern business, academic, government and research environments. Advanced courses concentrate on economic analysis applied to problems of production, distribution and consumption of agricultural products. Courses in economic theory, econometrics, mathematical programming, and statistics are an integral part of the program. Primary data analysis, natural resource use,

international trade, planning, policy, and development are also important topics included in graduate courses.

The faculty provide direction and individual guidance to student research in marketing, production, management of agricultural enterprises, demand and price analysis, land and water use and development, non-market valuation, rural development and planning, agricultural finance, international trade, farm appraisal, agricultural policy, econometrics, and experimental economics. Students specialize through course electives and research topics. In addition, an advisory committee guides each student in preparing the program of study to ensure that the student's background, graduate course work, and research program together lead to the desired depth and breadth of proficiency.

## Admission Requirements.

Prerequisites to advanced training in agricultural economics are

1. the desire to understand and solve the complex and changing economic problems faced by agriculture and rural society, and
2. the desire and ability to learn methods of rigorous logical analysis.

In addition, differential calculus, statistics, and intermediate macro- and microeconomic theory constitute a minimum background for advanced study in agricultural economics. In certain cases, a student can take part of this work after admission but the work will not count towards a graduate degree.

Acceptance by an adviser in the department is not required prior to admission to the departmental graduate program. GRE test scores are required for admission to the program.

## Faculty

Mike Woods, PhD— Professor and Head

**Regents Professors:** B. Wade Brorsen, PhD; Damona G. Doye, PhD; Shida R. Henneberry, PhD; Phil Kenkel, PhD

**Professors:** Brian Adam, PhD; Chanjin Chung, PhD; Cynda R. Clary, PhD; Cheryl S. DeVuyst, PhD; Eric DeVuyst, PhD; David Henneberry, PhD; Rodney Holcomb, PhD; Notie H. Lansford, PhD; Ross O. Love, PhD; F. Bailey Norwood, PhD; Derrell S. Peel, PhD; Larry D. Sanders, PhD; Raymond J. Schatzer, PhD; James N. Trapp, PhD; Brian Whitacre, PhD; Michael D. Woods, PhD

**Associate Professors:** Tracy Boyer, PhD; Shannon Ferrell, JD; Rodney Jones, PhD; Kellie Raper, PhD; David Shideler, PhD; Arthur Stoecker, PhD; Jeff Vitale, PhD

**Assistant Professor:** John Michael Riley, PhD



# Agribusiness, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average:** 2.00

**Total Hours:** 120

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1

From two of the following groups, select one course:		6
<i>Group 1</i>		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
<i>Group 2</i>		
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
<i>Group 3</i>		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
<i>Group 4</i>		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written &amp; Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following: <sup>3</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
Select 9 hours from AGEC 4000 level excluding AGEC 4990		9
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	

ECON 3123	Intermediate Macroeconomics	3
or ECON 3313	Money and Banking	
Select 6 hours of the following:		6
AGEC 3323	Agricultural Product Marketing and Sales	
BCOM, MC, SPCH, foreign language courses, or written communication courses not used elsewhere		
<b>Related Courses</b>		
Check with your Advisor about using these hours and electives to minor in an area in CASNR or Spears School of Business (SSB)		
15 hours from CASNR or SSB courses not used elsewhere with at least 9 of the 15 hours upper division		15
<b>Hours Subtotal</b>		62
<b>Electives</b>		
Select 5 hours or hours to complete required total for degree <sup>4</sup>		5
<b>Hours Subtotal</b>		5
Total Hours		120

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>3</sup> If used as (S) course above, hours in this block reduced by 3.
- <sup>4</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agribusiness: Agricultural Communications Double Major, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average:** 2.00

**Total Hours:** 128

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		

Course cannot be used here and as an (N)

AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Written &amp; Oral Communications</i>		
Select one of the following: <sup>2</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>11</b>
<b>Major Requirements</b>		
<i>Agribusiness Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
AGEC 4343	International Agricultural Markets and Trade (I) <sup>3</sup>	3
AGEC 4503	Environmental Economics and Resource Development <sup>3</sup>	3
AGEC 4703	American Agricultural Policy <sup>3</sup>	3
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
<i>Agricultural Communications Core Courses</i>		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
AGCM 3123	New Media in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Web Design for Agricultural Organizations	3
AGCM 3233	Basic Photography and Photo Editing for Agriculture	3
or AGCM 4233	Agricultural Photography Tour	
AGCM 4113	Features Writing and Editing for Agricultural Publications	3
AGCM 4203	Professional Development in Agricultural Communications	3
AGCM 4300	Internships in Agricultural Communications (2 hours)	2
AGCM 4403	Planning Campaigns for Agriculture and Natural Resources	3
AGCM 4413	Agricultural Communications Capstone	3

Select 3 hours from the following:	3
FDSC 1133	Fundamentals of Food Science
FDSC 2103	Regional Diversity in Food Production, Selection and Consumption (D)
FDSC 2233	The Meat We Eat
FDSC 2253	Meat Animal and Carcass Evaluation
ANSI 2233	The Meat We Eat
ANSI 2253	Meat Animal and Carcass Evaluation
NSCI 2114	Principles of Human Nutrition (N)
NSCI 3543	Food and the Human Environment (IS)
<b>Hours Subtotal</b>	<b>76</b>
<i>Electives</i>	
1 hour or hours to complete required total for degree <sup>4</sup>	1
<b>Hours Subtotal</b>	<b>1</b>
<b>Total Hours</b>	<b>128</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>3</sup> AGECE 4503 Environmental Economics and Resource Development satisfies environmental science requirement and AGECE 4703 American Agricultural Policy satisfies policy requirement for the Agricultural Communications major. AGECE 4343 International Agricultural Markets and Trade (I) satisfies international dimension requirements. If another course is taken for these requirements, a different 4000-level AGECE course except AGECE 4990 Problems of Agricultural Economics may be taken. At least nine hours of 4000-level AGECE besides 4990 required for AGBU major.

<sup>4</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- The student must earn a minimum grade of "C" in all AGCM courses.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agribusiness: Crop and Soil Sciences, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		

AG 1011	First Year Seminar	1
SOIL 2124	Fundamentals of Soil Science (N) <sup>2</sup>	4
Select one of the following:		3
PLNT 1213	Introduction to Plant and Soil Systems <sup>2</sup>	
HORT 1013	Principles of Horticultural Science (LN) <sup>2</sup>	
NREM 1113	Elements of Forestry <sup>2</sup>	
<i>Written &amp; Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>14</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3503	Natural Resource Economics	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
AGEC 4403	Advanced Farm and Ranch Management	3
Select 6 hours from AGEC 4000 level excluding AGEC 4990		6
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
ECON 3123	Intermediate Macroeconomics	3
or ECON 3313	Money and Banking	
<i>Minor Areas</i>		
Select at least one of the following minors:		19
Agronomy		
Entomology		
Forestry		
Horticulture		
Natural Resource Ecology and Management		
Pest Management		
Rangeland Ecology & Management		
Soil Science		



Take additional hours from courses in any other minor areas or MATH 1483 or MATH 1513 to complete the required total of 20 hours

**Hours Subtotal** 66

*Electives*

0 hours to complete required total for degree <sup>5</sup>

**Total Hours** 120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> Depending upon minor chosen.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>5</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agribusiness: Farm and Ranch Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average:** 2.00

**Total Hours:** 120

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		

AG 1011	First Year Seminar	1
From two of the following groups, select one course:		6
<i>Group 1</i>		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
<i>Group 2</i>		
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
<i>Group 3</i>		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
<i>Group 4</i>		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written &amp; Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following: <sup>3</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
AGEC 4403	Advanced Farm and Ranch Management	3
6 additional hours from AGECE 4000 excluding AGECE 4990		6
ECON 2203	Introduction to Macroeconomics	3

ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
ECON 3123	Intermediate Macroeconomics	3
or ECON 3313	Money and Banking	
Select 6 hours of the following:		6
AGEC 3323	Agricultural Product Marketing and Sales	
BCOM, MC, SPCH, foreign language courses, or written communication courses not used elsewhere		
<i>Related Courses</i>		
15 hours from the following course prefixes that are not used elsewhere with at least 9 of the 15 hours upper division:		15
<b>Hours Subtotal</b>		<b>62</b>
ANSI, ENTO, HORT, NREM, MCAG, PLNT, PLP, SOIL		
<i>Electives</i>		
5 hours or hours to complete required total for degree <sup>4</sup>		5
<b>Hours Subtotal</b>		<b>5</b>
Total Hours		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>4</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agribusiness: International, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average:** 2.00

**Total Hours:** 120

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1

From two of the following groups, select one course:		6
<i>Group 1</i>		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
<i>Group 2</i>		
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
<i>Group 3</i>		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
<i>Group 4</i>		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written &amp; Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following: <sup>3</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
AGEC 4343	International Agricultural Markets and Trade (I)	3
AGEC 4803	International Agricultural Economics Tour (I) <sup>4</sup>	3
Select 6 hours from AGEC 4000 level excluding AGEC 4990		6

ECON 2203	Introduction to Macroeconomics	3
ECON 3113 or ECON 3023	Intermediate Microeconomics Managerial Economics	3
ECON 3123 or ECON 3313	Intermediate Macroeconomics Money and Banking	3
<i>International Related Courses</i>		
Select 15 hours from courses in same foreign language <sup>5</sup>		15
Select 6 additional hours from courses in above foreign language or upper-division courses designated (I)		6
<b>Hours Subtotal</b>		<b>65</b>
<i>Electives</i>		
2 hours or hours to complete required total for degree <sup>6</sup>		2
<b>Hours Subtotal</b>		<b>2</b>
Total Hours		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>4</sup> An international student may substitute 3 hours of AGECE 3810 Domestic Agricultural Economics Tour for AGECE 4803 International Agricultural Economics Tour (I).

<sup>5</sup> A native speaker of a foreign language may substitute 15 hours towards one or more minors for the 15 hours in the same foreign language.

<sup>6</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.



## Agribusiness: Pre-Law, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1

From two of the following groups, select one course:		6
Group 1:		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
Group 2:		
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Group 3:		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
Group 4:		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written &amp; Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>3</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>3</sup>	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
Select 6 hours of AGEC 4000 level excluding AGEC 4990		6
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3

or ECON 3023	Managerial Economics	
ECON 3123	Intermediate Macroeconomics	3
or ECON 3313	Money and Banking	
Select 3 hours of the following:		3
AGEC 3323	Agricultural Product Marketing and Sales	
BCOM, MC, SPCH, foreign language courses, or written communication courses not used elsewhere		
<i>Related Courses</i>		
Select Alternative A, B or C (p. 818)		21
<b>Hours Subtotal</b>		62
<b>Electives</b>		
5 hours or hours to complete required total for degree <sup>4</sup>		5
<b>Hours Subtotal</b>		5
<b>Total Hours</b>		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>4</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course. PHIL 1313 Logic and Critical Thinking (A) is recommended.

## Alternatives

### Alternative A

Select 3 additional hours from AGECE 3323 Agricultural Product Marketing and Sales, BCOM, MC, SPCH, foreign language courses, or written communication courses not used elsewhere.

Select 3 additional hours from AGECE 4000 level excluding AGECE 4990 Problems of Agricultural Economics

Select 15 additional hours with 12 hours upper-division from: ACCT, AGECE, ECON, FIN, LSB, MGMT, MKTG, MSIS, POLS or a minor

### Alternative B

Select 3 additional hours from: AGECE 3323 Agricultural Product Marketing and Sales, BCOM, MC, SPCH, foreign language courses, or written communication courses not used elsewhere.

Select 3 additional hours from AGECE 4000 level excluding AGECE 4990 Problems of Agricultural Economics

Select 15 hours to complete Legal Studies Minor.

Code	Title	Hours
POLS 2023	The Individual And The Law	3
or HONR 2013	Honors Law and Legal Institutions (S)	
POLS 3983	Courts and Judicial Process (S)	3
POLS 3993	Legal Research And Analysis	3
Select 6 hours of the following:		6
ENGR 4103	Impact of Law on Engineering Practice	
ENGR 4133	Environmental Regulation for Technical Professionals (S)	
PHIL 3843	Philosophy Of Law(H)	

POLS 4363	Environmental Law And Policy
POLS 4963	U.S. Constitution: Civil Rights and Liberties
POLS 4973	U.S. Constitution: Civil Liberties
POLS 4980	Advanced Topics in Public Law
PSYC 4143	Psychology and Law
SOC 4443	Course SOC 4443 Not Found

### Alternative C

With approval of Advisor and Department Head a maximum of 21 hours from an accredited doctoral law program may be used as related courses and electives.

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agribusiness: Pre-Veterinary Business Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		13
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN)	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1515	General Chemistry (LN)	
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		0
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
From two of the following groups, select one course: <sup>2</sup>		6

Group 1:	
PLNT 1213	Introduction to Plant and Soil Systems
HORT 1013	Principles of Horticultural Science (LN)
NREM 1113	Elements of Forestry
Group 2:	
SOIL 1113	Land, Life and the Environment (N)
SOIL 2124	Fundamentals of Soil Science (N)
Group 3:	
ANSI 1124	Introduction to the Animal Sciences
FDSC 1133	Fundamentals of Food Science
ENTO 2993	Introduction to Entomology (LN)
ENTO 3003	Livestock Entomology
Group 4:	
NREM 1014	Introduction to Natural History (LN)
NREM 2013	Ecology of Natural Resources
ENVR 1113	Elements of Environmental Science
BIOC 2344	Chemistry and Applications of Biomolecules
BIOC 3713	Biochemistry I
LA 1013	Introduction to Landscape Architecture and Landscape Management
<i>Written &amp; Oral Communications</i>	
Select one of the following:	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources
BCOM 3113	Written Communication
BCOM 3443	Business Communication for International Students
ENGL 3323	Technical Writing <sup>3</sup>
Select one of the following:	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)
SPCH 2713	Introduction to Speech Communication (S)
SPCH 3733	Elements of Persuasion (S)
<b>Hours Subtotal</b>	
<b>13</b>	
<b>Major Requirements</b>	
<i>Core Courses</i>	
ACCT 2103	Financial Accounting
AGEC 1101	Agricultural Economics and Agribusiness Experience
AGEC 3101	Professional Career Development
AGEC 3213	Quantitative Methods in Agricultural Economics
AGEC 3333	Agricultural Marketing and Price Analysis
AGEC 3423	Farm and Agribusiness Management
AGEC 3603	Agricultural Finance
AGEC 3713	Agricultural Law
Select one of the following:	
ANSI 3423	Animal Genetics
BIOL 3023	General Genetics
PLNT 3554	Plant Genetics and Biotechnology
ANSI 3543	Principles of Animal Nutrition
BIOC 3653	Survey of Biochemistry

Select one of the following:	5
CHEM 3015 The Chemistry of Organic Compounds (or)	
CHEM 3053 Organic Chemistry (and)	
CHEM 3153 Organic Chemistry (and)	
CHEM 3112 Organic Chemistry Lab	
MICR 2123 Introduction to Microbiology	3
MICR 2132 Introduction to Microbiology Laboratory	2
PHYS 1114 General Physics (LN)	4
PHYS 1214 General Physics (LN)	4
Select one of the following:	4
BIOL 1604 Animal Biology	
BIOL 3204 Physiology	
ANSI 3414 Form and Function of Livestock and Poultry	
<i>Alternatives</i>	
Choose one of two alternatives (p. 820)	16
<b>Hours Subtotal</b>	<b>67</b>
<i>Electives</i>	
0 hours or hours to complete required total for degree <sup>4</sup>	
<b>Total Hours</b>	<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> Course cannot be used here and as an (N).

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>4</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Alternatives

### I. First Year of Professional Program

With the approval of the adviser, department head, and dean the student may use hours from an accredited dental, medical, optometry, osteopathic, pharmacy, podiatry, or veterinary medical school to complete degree

### II. Without First Year of Professional Program

Code	Title	Hours
AGEC 4403	Advanced Farm and Ranch Management	3
or AGEC 4423	Advanced Agribusiness Management	
ECON 2203	Introduction to Macroeconomics	3
Select one of the following:		3
ECON 3113	Intermediate Microeconomics	
ECON 3023	Managerial Economics	
ECON 3123	Intermediate Macroeconomics	
ECON 3313	Money and Banking	
6 additional hours from AGEC 4000 level excluding AGEC 4990		6
1 additional hour		1

Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Economics and Agribusiness (AEAB), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 21 hours

Code	Title	Hours
<b>Minor Requirements</b>		
AGEC 1113	Introduction to Agricultural Economics (S)	3
or ECON 2103	Introduction to Microeconomics (S)	
ACCT 2103	Financial Accounting <sup>1</sup>	3
Select 15 hours in five upper division (3 hour) AGEC courses <sup>2</sup>		15

<sup>1</sup> ACCT 3183 Agribusiness Accounting and Taxation or AGEC 3183 Agribusiness Accounting and Taxation may be substituted for ACCT 2103 Financial Accounting

<sup>2</sup> excluding AGEC 3010 Internship in Agricultural Economics, AGEC 3101 Professional Career Development, AGEC 3183 Agribusiness Accounting and Taxation, AGEC 3990 Special Problems in Agricultural Economics, AGEC 4101 Agricultural Economics Seminar, AGEC 4990 Problems of Agricultural Economics

### Other Requirements

- At least nine hours of upper division AGEC courses must be taken at OSU.

### Additional OSU Requirements

#### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).



## Agricultural Economics, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1

From two of the following groups, select one course:		6
Group 1:		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
Group 2:		
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Group 3:		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
Group 4:		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written &amp; Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following: <sup>3</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3333	Agricultural Marketing and Price Analysis	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
ECON 3123	Intermediate Macroeconomics	3

or ECON 3313	Money and Banking	
Select 6 hours of the following:		6
AGEC 3323	Agricultural Product Marketing and Sales	
BCOM, MC, SPCH, foreign language courses, or written communication courses not used elsewhere		
<b>Related Courses</b>		
Select one of four alternatives (p. 823)		24
MATH 2144 and STAT 4013 recommended in General Education		
<b>Hours Subtotal</b>		62
<i>Electives</i>		
Select 5 hours or hours to complete required total for degree <sup>4</sup>		5
<b>Hours Subtotal</b>		5
<b>Total Hours</b>		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

<sup>4</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Alternatives

### I. General

Code	Title	Hours
Select 9 hours from AGEC 4000 level not including AGEC 4990		9
Select 9 additional upper-division hours in AGEC courses		9
Select 6 additional upper-division hours in any courses		6

### II. Community and Regional Analysis

Code	Title	Hours
AGEC 4723	Rural Economics Development	3
ECON 3423	Public Finance	3
Select 6 hours from AGEC 4000 level excluding AGEC 4990		6
Select 6 hours of the following:		6
ECON 4643	International Economic Development (IS)	
ECON 4913	Urban and Regional Economics	
GEOG 3123	Urban Geography (S)	
GEOG 3333	Spatial Analysis (A)	
GEOG 4123	Geographical Aspects of Urban Planning	
GEOG 4143	Geography of Travel and Tourism	
GEOG 4153	Geography of Outdoor Recreation	
POLS 2033	Introduction to Public Administration	
POLS 3493	Public Policy	
POLS 3613	State and Local Government	
POLS 4413	Government Budgeting	
SOC 3423	Urban Sociology	
SOC 4533	World Population Problems	
Select 6 additional upper-division hours in AGEC courses		6

### III. Natural Resources

Code	Title	Hours
AGEC 3503	Natural Resource Economics	3
AGEC 4503	Environmental Economics and Resource Development	3
GEOG 2344	Digital Tools for Environmental Exploration (LN)	4
or GEOG 4323	Computer Cartography	
Select 6 hours from AGEC 4000 level excluding AGEC 4990		6
Select 9 hours of the following:		9
ECON 3903	Economics of the Environment	
ECON 4113	Energy Economics: Traditional and Renewable Energy Markets	
ENVR 4112	Land Measurement and Site Analysis	
ENVR 4363	Environmental Soil Science	
GEOG 3023	Climatology (N)	
GEOG 3033	Meteorology (N)	
GEOG 3063	Economic Meteorology	
GEOG 3153	Conservation of Natural Resources (S)	
GEOG 4063	Geoarchaeology and Environmental History	
GEOG 4073	Climate Change: Past, Present, and Future	
GEOG 4083	Geography of Grass-Dominated Ecosystems	
GEOG 4153	Geography of Outdoor Recreation	
GEOG 4163	Resource Management in the National Parks	
GEOG 4333	Remote Sensing	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
GEOG 4353	Geographic Information Systems: Socioeconomic Applications	
GEOL 3043	Geology of the National Parks (N)	
GEOL 3503	Environmental Geology	
MCAG 4112	Land Measurement and Site Analysis	
Any upper-division NREM		
POLS 4363	Environmental Law And Policy	
POLS 4593	Natural Resources and Environmental Policy	
SOC 4433	Environmental Sociology (S)	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	

### IV. Quantitative Studies

Code	Title	Hours
AGEC 4213	Advanced Quantitative Methods in Agricultural Economics	3
MATH 2153	Calculus II (A)	3
MATH 3013	Linear Algebra	3
Select 6 hours of the following:		6
AGEC 4333	Commodity Futures Markets	
AGEC 4403	Advanced Farm and Ranch Management	
AGEC 4423	Advanced Agribusiness Management	
AGEC 4503	Environmental Economics and Resource Development	

AGEC 4703	American Agricultural Policy	
Select 6 hours of the following:		6
ECON 4213	Econometric Methods	
ECON 4223	Business and Economic Forecasting	
MSIS 3223	Operation Analytics	
MSIS 3233	Management Science - Prescriptive Analytics	
STAT 3013	Intermediate Statistical Analysis	
STAT 4023	Statistical Methods II (A)	
STAT 4043	Applied Regression Analysis	
Select 3 additional upper-division hours in AGECE courses		3

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Economics: Accounting Double Major, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 123**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 2103	Business Calculus (A) <sup>1</sup>	
MATH 2123	Calculus for Technology Programs I (A) <sup>1</sup>	
MATH 2144	Calculus I (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated (A)) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>1</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<i>Agricultural Course Designated General Education</i>		
Select one of the following:		3
SOIL 1113	Land, Life and the Environment (N) <sup>1</sup>	
SOIL 2124	Fundamentals of Soil Science (N)	
ENTO 2993	Introduction to Entomology (LN)	
HORT 1013	Principles of Horticultural Science (LN)	

NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
Select one course from a group below not used for agricultural general education requirement:		3
Group 1:		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
Group 2:		
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Group 3:		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
Group 4:		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written &amp; Oral Communications</i>		
BCOM 3113	Written Communication	3
<b>Hours Subtotal</b>		7
<b>Major Requirements</b>		
<i>Agricultural Economics Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1101	Agricultural Economics and Agribusiness Experience	1
AGEC 3101	Professional Career Development	1
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3333	Agricultural Marketing and Price Analysis <sup>2</sup>	3
AGEC 3423	Farm and Agribusiness Management <sup>2</sup>	3
AGEC 3603	Agricultural Finance <sup>2</sup>	3
Select 9 hours from AGEC 4000 level excluding AGEC 4990		9
ECON 2203	Introduction to Macroeconomics	3
Select one of the following:		3
ECON 3113	Intermediate Microeconomics	
ECON 3023	Managerial Economics	

ECON 3313	Money and Banking	
LSB 3213	Legal and Regulatory Environment of Business	3
<i>Accounting Required Courses</i>		
ACCT 3013	Federal Income Taxation	3
ACCT 3103	Intermediate Accounting I	3
ACCT 3113	Intermediate Accounting II	3
ACCT 3203	Cost Accounting	3
ACCT 3603	Accounting Information Systems	3
ACCT 4133	Advanced Accounting	3
ACCT 4503	Auditing and Assurance Services	3
MGMT 3013	Fundamentals of Management (S)	3
MGMT 4513	Strategic Management	3
MSIS 2103	Business Computer Concepts and Applications	3
MSIS 3223	Operation Analytics	3
MSIS 4123	Information Assurance Management	3
<b>Hours Subtotal</b>		<b>74</b>
<i>Electives</i>		
Select 2 hours or hours to complete required total for degree <sup>3</sup>		2
<b>Hours Subtotal</b>		<b>2</b>
<b>Total Hours</b>		<b>123</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> These AGEC courses replace courses required for the Accounting Major.

<sup>3</sup> MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1513 College Algebra (A) may need to be taken as prerequisite to required Calculus course.

## Other Requirements

- Exit interview with Head of Department of Agricultural Economics.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- A grade of "C" or better must be earned in all accounting courses.
- A 2.20 GPA is required in the following courses:

Code	Title	Hours
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 1113	Introduction to Agricultural Economics (S)	3
ECON 2203	Introduction to Macroeconomics	3
MSIS 2103	Business Computer Concepts and Applications	3
STAT 2023	Elementary Statistics for Business and Economics (A)	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
MGMT 3013	Fundamentals of Management (S)	3
AGEC 3333	Agricultural Marketing and Price Analysis	3

LSB 3213	Legal and Regulatory Environment of Business	3
MGMT 4513	Strategic Management	3

- A 2.20 GPA and a grade of C or better is required in the following courses:

Code	Title	Hours
ACCT 3013	Federal Income Taxation	3
ACCT 3103	Intermediate Accounting I	3
ACCT 3113	Intermediate Accounting II	3
ACCT 3203	Cost Accounting	3
ACCT 3603	Accounting Information Systems	3
ACCT 4133	Advanced Accounting	3
ACCT 4503	Auditing and Assurance Services	3

One of the following: 3

ECON 3113	Intermediate Microeconomics	
ECON 3023	Managerial Economics	
ECON 3123	Intermediate Macroeconomics	

6 hours 4000 AGEC 6

One of the following: 3

BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	

In addition 18 of these 36 hours, including 15 of 21 required 3000 and 4000 level accounting hours must be taken in residence at OSU.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Real Estate Appraisal (AREA), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 24 hours

Code	Title	Hours
<b>Minor Requirements</b>		
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3
AGEC 4513	Farm Appraisal	3
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
STAT 2023	Elementary Statistics for Business and Economics (A)	3

### Other Requirements

- At least nine hours of the AGECE courses must be taken at OSU.

### Additional OSU Requirements

#### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).



## Environmental Economics, Politics and Policy (EPPP), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 21 hours

Code	Title	Hours
<b>Minor Requirements</b>		
AGEC 1113 or ECON 2103	Introduction to Agricultural Economics (S) Introduction to Microeconomics (S)	3
AGEC 3503 or ECON 3903	Natural Resource Economics Economics of the Environment	3
AGEC 4503	Environmental Economics and Resource Development	3
Select at least 12 hours of the following:		12
AGEC 3703	Issues in Agricultural Policy	
AGEC 3713	Agricultural Law	
ECON 3113	Intermediate Microeconomics	
ENVR 4512	Environmental Impact Analysis	
ENVR 4573	Ethical Issues in Agriculture and the Environment	
GEOG 3153	Conservation of Natural Resources (S)	
GEOG 4233	Human Dimensions of Global Environmental Change	
HIST 4523	American Environmental History (H)	
NREM 4093	Natural Resources, People and Sustainable Development (I)	
NREM 4053	Natural Resource Recreation	
POLS 4363	Environmental Law And Policy	
POLS 4593	Natural Resources and Environmental Policy	
SOC 4433	Environmental Sociology (S)	
SOC 4473	Oklahoma Environmental Sociology	
SOC 4533	World Population Problems	

### Other Requirements

- No grade below "C." At least nine upper-division hours must be taken at OSU.

### Additional OSU Requirements

#### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for

example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).

- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Agricultural Education

The programs of study offered in Agricultural Education are designed to provide both comprehensive and specialized training to prepare graduates for careers in a wide range of fields of agriculture. In addition to being prepared for licensure as teachers, graduates are professionally prepared for work in cooperative extension and other federal and state programs and services, as well as international education endeavors. Graduates also may find employment as educational directors and consultants with agribusiness firms and organizations. Studies may culminate in the BS, MAg, MS or PhD degrees. The Agricultural Education program is accredited by the Council for the Accreditation of Educator Preparation (CAEP).

The undergraduate teaching option is designed to qualify the bachelor's degree recipient for the Oklahoma Agricultural Education Teaching License. This license is recognized as meeting requirements for initial employment as a teacher in most states. Graduates look forward to careers ranging from Agricultural Education teacher and Cooperative Extension Educator to agricultural sales, marketing and production positions. The undergraduate Agricultural Education major is structured to provide educational experiences in general education, agriculture and professional education. However, additional degree options are offered to allow students the opportunity to specialize in a particular area of agriculture or natural resources such as Animal Agriculture or Horticultural Sciences.

## Undergraduate Programs

- Agricultural Education: Agricultural Business and Economics, BSAG (p. 830)
- Agricultural Education: Agricultural Communications, BSAG (p. 832)
- Agricultural Education: Animal Agriculture, BSAG (p. 834)
- Agricultural Education: Horticultural Sciences, BSAG (p. 836)
- Agricultural Education: Multidisciplinary, BSAG (p. 838)
- Agricultural Education: Natural Resources, BSAG (p. 840)

## Graduate Programs

Graduate programs in Agricultural Education are designed to

1. prepare students for entry into or advancement in teaching careers and
2. provide for further development of professional leadership skills for other educational careers in agriculture, agribusiness, government service, extension, or adult education.

To meet the needs of both international and domestic students, plans of study are developed for academic excellence specific to students' career goals. The selection and organization of courses are made in consultation with the adviser and the student's advisory committee.

The Master of Science program offers students three options for completion of the degree: thesis option, formal report option, and creative component option. The thesis option requires 30 approved credit hours of course work, which includes a six credit hour formal thesis following the graduate college format. The formal report and creative component options require 32 approved semester credit hours of course work, including a two credit hour formal report or creative component.

The Doctor of Philosophy program is designed to prepare graduates for careers in professional education, supervision, administration, curriculum development and other areas of professional leadership in Agriculture,

Agricultural Extension, Career and Technology, and Agricultural Communications. Within the minimum 60 credit hour requirement, 15 credit hours must be completed in Agricultural Education. In addition, 15 credit hours must be completed in an area of specialization such as Agricultural Extension, Technical Agriculture, Educational Administration, or other similar areas. The additional hours include 15 hours of research design and statistics and 15 hours for the dissertation.

## Admission Requirements

Students seeking admission to the master's degree program must have earned a bachelor's degree in Agricultural Education, Agriculture or Education. A student with background deficiencies must compensate for such deficiencies before completing the masters degree. Evidence of academic ability (2.80 GPA or above) in undergraduate course work is required. Three letters of reference and a statement of purpose are also required. Graduate Record Exam (GRE) scores are required for students seeking admission to the Master of Science degree program.

Admission to the doctoral degree program is based upon evidence that the applicant meets the general requirements of the Graduate College, has demonstrated superior achievement, and can successfully complete a doctoral program as evidenced by three letters of recommendation, GRE scores, a minimum of 2.80 undergraduate grade-point average and 3.00 graduate grade-point average, three years of successful professional experience, and a philosophy statement and goals. Alternative criteria may be considered by the graduate committee for those who submit ample supportive evidence of other exemplary qualifications.

## Faculty

Robert Terry, Jr., PhD—Professor and Head

**Professors:** D. Dwayne Cartmell, PhD; M. Craig Edwards, PhD; James P. Key, EdD (emeritus); J. Shane Robinson, PhD; Shelly R. Sitton, PhD; Penny L. Weeks, PhD; William G. Weeks, PhD

**Associate Professors:** Jon W. Ramsey, PhD; Jeff Sallee, PhD

**Assistant Professors:** Marshall Baker, PhD; Angel Riggs, PhD

## Agricultural Education: Agricultural Business and Economics, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 125**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH or STAT (A)		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
SPCH 2713	Introduction to Speech Communication (S) <sup>1</sup>	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course <sup>2</sup>		
Select at least one International Dimension (I) course <sup>3</sup>		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
PLNT 1213	Introduction to Plant and Soil Systems	3
BIOL 1114	Introductory Biology (LN) <sup>4</sup>	4
<i>Written &amp; Oral Communications</i>		

Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
<b>Hours Subtotal</b>		<b>15</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGED 4803	International Study Tour in Agricultural Education (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
ANSI 3903	Agricultural Animals of the World (I)	
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
Select one of the following:		3
HORT 1013	Principles of Horticultural Science (LN)	
HORT 3084	Plant Propagation	
HORT 3113	Greenhouse Management	
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 3222	Metals and Welding	2
MCAG 4101	Ag Electrification	1
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Agricultural Economics and Agribusiness</i>		
Select one of the following:		3
ACCT 2103	Financial Accounting	
ACCT 3183	Agribusiness Accounting and Taxation	
AGEC 3183	Agribusiness Accounting and Taxation	
Select 15 hours of the following:		15
AGEC 3213	Quantitative Methods in Agricultural Economics	
AGEC 3323	Agricultural Product Marketing and Sales	
AGEC 3333	Agricultural Marketing and Price Analysis	
AGEC 3403	Agricultural Small Business Management	
AGEC 3423	Farm and Agribusiness Management	
AGEC 3463	Agricultural Cooperatives	
AGEC 3503	Natural Resource Economics	
AGEC 3603	Agricultural Finance	
AGEC 3703	Issues in Agricultural Policy	
AGEC 3713	Agricultural Law	
AGEC 4213	Advanced Quantitative Methods in Agricultural Economics	
AGEC 4333	Commodity Futures Markets	
AGEC 4213	Advanced Quantitative Methods in Agricultural Economics	

AGEC 4343	International Agricultural Markets and Trade (I)	
AGEC 4403	Advanced Farm and Ranch Management	
AGEC 4423	Advanced Agribusiness Management	
AGEC 4503	Environmental Economics and Resource Development	
AGEC 4513	Farm Appraisal	
AGEC 4703	American Agricultural Policy	
AGEC 4723	Rural Economics Development	
AGEC 4803	International Agricultural Economics Tour (I)	

#### Professional Core

AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3
AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3
AGED 4203	Professional Development in Agricultural Education	3
AGED 4200	Student Teaching in Agricultural Education	9
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
SPED 3202	Educating Exceptional Learners (D)	2
<b>Hours Subtotal</b>		<b>66</b>

#### Electives

Select 4 hours or hours to complete required total for degree <sup>5</sup>		4
<b>Hours Subtotal</b>		<b>4</b>
<b>Total Hours</b>		<b>125</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> Completed in the Professional Core: SPED 3202 Educating Exceptional Learners (D)

<sup>3</sup> Completed in Related Courses: AGED 4713 International Programs in Agricultural Education and Extension (I) or AGECE 4803 International Agricultural Economics Tour (I) or AGLE 3803 Global Leadership in Agriculture (I) or ANSI 3903 Agricultural Animals of the World (I)

<sup>4</sup> If used as (N) course above, hours in this block reduced by 4.

<sup>5</sup> These hours may be applied to the foreign language proficiency requirement per teacher certification (see below)

(i.e., a grade of "C" or better or completion of two years of the same foreign language in high school with a "B" average or better).

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Required for graduation and recommendation for Licensure/Standard Certification

1. 2.50 overall GPA;
2. 2.50 GPA in Major Requirements; and
3. 2.50 GPA in Professional Requirements.

The student must earn minimum grades of "C" in each course in the College/Departmental Requirements, Major Requirements, Professional Core Requirements, and demonstrate proficiency in a foreign language

## Agricultural Education: Agricultural Communications, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 133**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Course designated (A) <sup>1</sup>		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course <sup>3</sup>		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	

FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
Select one of the following:		3
HORT 1013	Principles of Horticultural Science (LN)	
HORT 3084	Plant Propagation	
HORT 3113	Greenhouse Management	
PLNT 1213	Introduction to Plant and Soil Systems	3
SOIL 2124	Fundamentals of Soil Science (N)	4
NREM 2013	Ecology of Natural Resources	3
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 3222	Metals and Welding	2
MCAG 4101	Ag Electrification	1
<i>Biological Sciences</i>		
BIOL 1114	Introductory Biology (LN) <sup>4</sup>	4
<i>Written &amp; Oral Communications</i>		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
<b>Hours Subtotal</b>		36
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGED 4803	International Study Tour in Agricultural Education (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
ANSI 3903	Agricultural Animals of the World (I)	
AGCM 3123	New Media in Agricultural Communications	3
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGCM 3223	Web Design for Agricultural Organizations	3
AGCM 3233	Basic Photography and Photo Editing for Agriculture	3
AGCM 4113	Features Writing and Editing for Agricultural Publications	3
AGCM 4203	Professional Development in Agricultural Communications	3
AGCM 4300	Internships in Agricultural Communications (2 hours)	2
AGEC 4403	Advanced Farm and Ranch Management	3
AGCM 4413	Agricultural Communications Capstone	3
<i>Professional Core</i>		
AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3
AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3

AGED 4203	Professional Development in Agricultural Education	3
AGED 4200	Student Teaching in Agricultural Education (9 hours)	9
EPSY 3213 or EPSY 3413	Psychology of Adolescence Child and Adolescent Development	3
SPED 3202	Educating Exceptional Learners (D)	2
<b>Hours Subtotal</b>		<b>56</b>
<b>Electives</b>		
Select 1 hour or hours to complete required total for degree <sup>5</sup>		1
<b>Hours Subtotal</b>		<b>1</b>
<b>Total Hours</b>		<b>133</b>

- Degrees that follow this plan must be completed by the end of Summer 2023.

<sup>1</sup> suggested: MATH 1483 Mathematical Functions and Their Uses (A), MATH 1493 Applications of Modern Mathematics (A) or MATH 1513 College Algebra (A)

<sup>2</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>3</sup> Completed in the Professional Core: SPED 3202 Educating Exceptional Learners (D)

<sup>4</sup> If used as (N), hours in College/Departmental Requirements reduced by 4.

<sup>5</sup> These hours may be applied to the foreign language proficiency requirement per teacher certification (see below)

## Required for graduation and recommendation for Licensure/Standard Certification

1. 2.50 overall GPA;
2. 2.50 GPA in Major Requirements; and
3. 2.50 GPA in Professional Requirements.

The student must earn minimum grades of "C" in each course in the College/Departmental Requirements, Major Requirements, Professional Core Requirements, and demonstrate proficiency in a foreign language (i.e., a grade of "C" or better or completion of two years of the same foreign language in high school with a "B" average or better).

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.



## Agricultural Education: Animal Agriculture, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 133**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1483	Mathematical Functions and Their Uses (A) <sup>1</sup>	3
or MATH 1513	College Algebra (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
MATH 2103	Business Calculus (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1111	Animal and Food Science Experience	1

ANSI 1124	Introduction to the Animal Sciences	4
ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
HORT 1013	Principles of Horticultural Science (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
MCAG 3222	Metals and Welding	2
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 4101	Ag Electrification	1
<i>Chemistry</i>		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Written &amp; Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>4</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<b>Hours Subtotal</b>		32
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 3242	Advanced Livestock Evaluation	2
or ANSI 3310	Advanced Competitive Evaluation	
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select at least two species of the following:		6
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
<i>Professional Agriculture Education Core</i>		
AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3
AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3

AGED 4203	Professional Development in Agricultural Education <sup>5</sup>	3
AGED 4200	Student Teaching in Agricultural Education <sup>5</sup>	9
EPSY 3213	Psychology of Adolescence	3
SPED 3202	Educating Exceptional Learners (D)	2
<b>Hours Subtotal</b>		60
<b>Electives</b>		
Select 1 hour or hours to complete required total for degree <sup>6</sup>		1
<b>Hours Subtotal</b>		1
Total Hours		133

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (N) course above, hours in this block reduced by 4.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3

<sup>4</sup> If used as (S) course above, hours in this block reduced by 3

<sup>5</sup> AGED 4203 Professional Development in Agricultural Education & AGED 4200 Student Teaching in Agricultural Education are taken during student teaching semester.

<sup>6</sup> These hours may be applied to the foreign language proficiency requirement per teacher certification (see below)

## Required for graduation and recommendation for Licensure/Standard Certification

1. 2.50 overall GPA;
2. 2.50 GPA in Major Requirements; and
3. 2.50 GPA in Professional Requirements.

The student must earn minimum grades of "C" in each course in the College/Departmental Requirements, Major Requirements, Professional Core Requirements, and demonstrate proficiency in a foreign language (i.e., a grade of "C" or better or completion of two years of the same foreign language in high school with a "B" average or better).

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Agricultural Education: Horticultural Sciences, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 125**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH (A)		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
SPCH 2713	Introduction to Speech Communication (S) <sup>1</sup>	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S) <sup>2</sup>		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course <sup>3</sup>		
Select at least one International Dimension (I) course <sup>4</sup>		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
PLNT 1213	Introduction to Plant and Soil Systems	3
BIOL 1114	Introductory Biology (LN) <sup>5</sup>	4

## Written & Oral Communications

Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing	
<b>Hours Subtotal</b>		15
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGED 4803	International Study Tour in Agricultural Education (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
ANSI 3903	Agricultural Animals of the World (I)	
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
HORT 1013	Principles of Horticultural Science (LN)	3
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 3222	Metals and Welding	2
MCAG 4101	Ag Electrification	1
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Horticulture Courses</i>		
BOT 1404	Plant Biology (LN)	4
HORT 3084	Plant Propagation	4
Select a minimum of 8 hours from HORT prefix courses <sup>6</sup>		8
<i>Professional Core</i>		
AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3
AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3
AGED 4203	Professional Development in Agricultural Education <sup>7</sup>	3
AGED 4200	Student Teaching in Agricultural Education <sup>7</sup>	9
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
SPED 3202	Educating Exceptional Learners (D)	2
<b>Hours Subtotal</b>		64
<b>Electives</b>		
Select 6 hours or hours to complete required total for degree <sup>8</sup>		6

<b>Hours Subtotal</b>	<b>6</b>
Total Hours	125

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> suggested: STAT 2013 Elementary Statistics (A); PSYC 1113 Introductory Psychology (S)
- <sup>3</sup> Completed in the Professional Core: SPED 3202 Educating Exceptional Learners (D)
- <sup>4</sup> Completed in Related Courses: AGED 4713 International Programs in Agricultural Education and Extension (I)
- <sup>5</sup> If used as (N) course above, hours in this block reduced by 4.
- <sup>6</sup> excluding HORT 1003 Home Horticulture, HORT 4990 Horticultural Problems, HORT 5110 Advanced Horticultural Problems. At least three of these hours must be at or above the 3000-level. No more than one hour of HORT 2010 Internship in Horticulture or Landscape Management may be used.
- <sup>7</sup> NOTE: AGED 4203 Professional Development in Agricultural Education & AGED 4200 Student Teaching in Agricultural Education are taken during student teaching semester.
- <sup>8</sup> These hours may be applied to the foreign language proficiency requirement per teacher certification (see below)

## Required for graduation and recommendation for Licensure/Standard Certification

1. 2.50 overall GPA;
2. 2.50 GPA in Major Requirements; and
3. 2.50 GPA in Professional Requirements.

The student must earn minimum grades of "C" in each course in the College/Departmental Requirements, Major Requirements, Professional Core Requirements, and demonstrate proficiency in a foreign language (i.e., a grade of "C" or better or completion of two years of the same foreign language in high school with a "B" average or better).

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Education: Multidisciplinary, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Course designated (A) <sup>1</sup>		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S) <sup>3</sup>		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course (included in Major Requirements)		
Select at least one International Dimension (I) course (included in Major Requirements)		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
Select one of the following:		3

FDSC 1133	Fundamentals of Food Science	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
Select one of the following:		3
HORT 1013	Principles of Horticultural Science (LN)	
HORT 3084	Plant Propagation	
HORT 3113	Greenhouse Management	
PLNT 1213	Introduction to Plant and Soil Systems	3
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 3222	Metals and Welding	2
MCAG 4101	Ag Electrification	1
<i>Biological Sciences</i>		
BIOL 1114	Introductory Biology (LN) <sup>4</sup>	4
<i>Written &amp; Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	3
or ENGL 3323	Technical Writing	
<b>Hours Subtotal</b>		33
<b>Major Requirements</b>		
<i>Enrichment Courses</i>		
To include courses from four of the following areas:		12
Agricultural Communications, Agricultural Economics, Agricultural Education, Agricultural Leadership, Animal Science, Biochemistry, Entomology, Forestry, Horticulture, Mechanized Agriculture, Natural Resource Ecology and Management, Plant Pathology, Plant Science, and Soil Science		
<i>International Agriculture</i>		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGED 4803	International Study Tour in Agricultural Education (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
ANSI 3903	Agricultural Animals of the World (I)	
<i>Professional Core</i>		
AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3
AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3
AGED 4203	Professional Development in Agricultural Education <sup>5</sup>	3
AGED 4200	Student Teaching in Agricultural Education <sup>5</sup>	9
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
SPED 3202	Educating Exceptional Learners (D)	2
<b>Hours Subtotal</b>		42

**Electives**

Select 5 hours or hours to complete required total for degree <sup>6</sup>	5
<b>Hours Subtotal</b>	<b>5</b>
Total Hours	120

- <sup>1</sup> suggested: MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1493 Applications of Modern Mathematics (A) or MATH 1513 College Algebra (A)
- <sup>2</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>3</sup> suggested: STAT 2013 Elementary Statistics (A); PSYC 1113 Introductory Psychology (S)
- <sup>4</sup> If used as (N) course above, hours in this block reduced by 4.
- <sup>5</sup> AGED 4203 Professional Development in Agricultural Education & AGED 4200 Student Teaching in Agricultural Education are taken during student teaching semester.
- <sup>6</sup> These hours may be applied to the foreign language proficiency requirement per teacher certification (see below)

## Required for graduation and recommendation for Licensure/Standard Certification

1. 2.50 overall GPA;
2. 2.50 GPA in Major Requirements; and
3. 2.50 GPA in Professional Requirements.

The student must earn minimum grades of "C" in each course in the College/Departmental Requirements, Major Requirements, Professional Core Requirements, and demonstrate proficiency in a foreign language (i.e., a grade of "C" or better or completion of two years of the same foreign language in high school with a "B" average or better).

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.



## Agricultural Education: Natural Resources, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 125**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Course designated (A) <sup>1</sup>		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S) <sup>3</sup>		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course (included in Major Requirements)		
Select at least one International Dimension (I) course (included in Major Requirements)		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
Select one of the following:		3

AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGED 4803	International Study Tour in Agricultural Education (I)	
ANSI 3903	Agricultural Animals of the World (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
FDSC 1133	Fundamentals of Food Science	3
or FDSC 2253	Meat Animal and Carcass Evaluation	
Select one of the following:		3
HORT 1013	Principles of Horticultural Science (LN)	
HORT 3084	Plant Propagation	
HORT 3113	Greenhouse Management	
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 3222	Metals and Welding	2
MCAG 4101	Ag Electrification	1
PLNT 1213	Introduction to Plant and Soil Systems	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Biological Sciences</i>		
BIOL 1114	Introductory Biology (LN) <sup>4</sup>	4
<i>Written &amp; Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	3
or ENGL 3323	Technical Writing	
<b>Hours Subtotal</b>		33
<b>Major Requirements</b>		
<i>Core Courses</i>		
NREM 1014	Introduction to Natural History (LN)	4
NREM 2013	Ecology of Natural Resources	3
Select three of the following:		9
NREM 3503	Principles of Wildlife Ecology and Management	
NREM 3613	Principles of Rangeland Management	
NREM 4414	Fisheries Management	
Select one of the following:		3
NREM 3713	Wildland Fire Ecology and Management	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4053	Natural Resource Recreation	
<i>Professional Agriculture Education Core</i>		
AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3
AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3
AGED 4203	Professional Development in Agricultural Education	3
AGED 4200	Student Teaching in Agricultural Education	9
EPSY 3213	Psychology of Adolescence	3
SPED 3202	Educating Exceptional Learners (D)	2
<b>Hours Subtotal</b>		46

<b>Electives</b>	
Select 6 hours or hours to complete required total for degree <sup>5</sup>	6
<b>Hours Subtotal</b>	<b>6</b>
Total Hours	125

<sup>1</sup> suggested: MATH 1483 Mathematical Functions and Their Uses (A), MATH 1493 Applications of Modern Mathematics (A) or MATH 1513 College Algebra (A)

<sup>2</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>3</sup> suggested: STAT 2013 Elementary Statistics (A); PSYC 1113 Introductory Psychology (S)

<sup>4</sup> If used as (N) course above, hours in this block reduced by 4.

<sup>5</sup> These hours may be applied to the foreign language proficiency requirement per teacher certification (see below)

## Required for graduation and recommendation for Licensure/Standard Certification

1. 2.50 overall GPA;
2. 2.50 GPA in Major Requirements; and
3. 2.50 GPA in Professional Requirements.

The student must earn minimum grades of "C" in each course in the College/Departmental Requirements, Major Requirements, Professional Core Requirements, and demonstrate proficiency in a foreign language (i.e., a grade of "C" or better or completion of two years of the same foreign language in high school with a "B" average or better).

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Leadership

The Agricultural Leadership curriculum is guided by five core values: commitment to agriculture, authentic leadership, diversity, critical thinking and professionalism. Agricultural leadership faculty align course objectives, learning opportunities and student experiences with the five core values. Beginning students study historical and theoretical foundations in leadership, authentic leadership and transformational leadership before exploring contemporary leadership issues, leadership program facilitation and current scholarship in the discipline. Specific topics within course work include leadership styles, power, decision-making, ethical leadership, motivational theories and team processes.

In addition to leadership course work, the curriculum provides a broad introduction to the agricultural sciences and natural resources and allows students to develop an area of emphasis or pursue a minor in areas such as Animal Science, Soil Science or Agricultural Economics.

## Minor in Leadership Education

The minor is designed to prepare students to serve as leadership educators within the context of their chosen major. Students explore career options in leadership education, develop an understanding of their own leadership style and philosophy, acquire knowledge about leadership theories, explore contemporary issues in leadership, evaluate current leadership research and learn to design and facilitate leadership training. Requirements of the minor include 17 hours of leadership course work, including six hours of controlled electives.

## Undergraduate Programs

- Agricultural Leadership, BSAG (p. 843)
- Agricultural Leadership: Extension Education, BSAG (p. 845)
- Agricultural Leadership: International Studies, BSAG (p. 847)
- Leadership Education (LDED), Minor (p. 849)

## Graduate Programs

Students may pursue graduate studies in agricultural leadership through the Master of Agriculture in Agricultural Leadership or the department's Doctor of Philosophy or Master of Science in Agricultural Education. The Master of Agriculture degree in Agricultural Leadership is an advanced studies program for practitioners seeking to develop their knowledge related to leadership and its application to the agricultural industry. Graduates pursue careers in extension, government, corporate agriculture, and human resources and training. The Master of Agriculture program requires 32 approved semester hours of course work including a 17 hour area of emphasis. Graduate course work in agricultural leadership includes leadership theory and practice, developments in agricultural and extension education, and a creative component. More information on graduate studies in Agricultural Leadership is available under Agricultural Education graduate programs.

## Faculty

Robert Terry, Jr., PhD—Professor and Head

**Professors:** D. Dwayne Cartmell, PhD; M. Craig Edwards, PhD; James P. Key, EdD (emeritus); J. Shane Robinson, PhD; Shelly R. Sitton, PhD; Penny L. Weeks, PhD; William G. Weeks, PhD

**Associate Professors:** Jon W. Ramsey, PhD; Jeff Sallee, PhD

**Assistant Professors:** Marshall Baker, PhD; Angel Riggs, PhD

## Agricultural Leadership, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Course designated (A)		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
SOIL 1113	Land, Life and the Environment (N) <sup>1</sup>	3
or SOIL 2124	Fundamentals of Soil Science (N)	
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course (Included in Major Requirements)		
Select at least one International Dimension (I) course (Included in Major Requirements)		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
ENTO 2003	Insects and Society (N)	3
or ENTO 3003	Livestock Entomology	

Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
PLNT 1213	Introduction to Plant and Soil Systems	3
or HORT 1013	Principles of Horticultural Science (LN)	
<i>Written &amp; Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>2</sup>	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<b>Hours Subtotal</b>		<b>20</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGLE 1511	Introduction to Leadership in Agricultural Sciences and Natural Resources	1
AGLE 2303	Agricultural Leaders in Society (S)	3
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	3
AGLE 3101	Introduction to Agricultural Leadership	1
AGLE 3303	Agricultural Leadership: Theory and Practice	3
AGLE 3403	Facilitating Social Change in Agriculture	3
AGLE 3803	Global Leadership in Agriculture (I)	3
AGLE 4101	Seminar in Leadership Education	1
AGLE 4203	Professional Development in Agriculture	3
AGLE 4300	Agricultural Leadership Internship (6 hours)	6
Select 6 hours of the following:		6
AGLE 3333	Contemporary Issues in Leadership	
AGLE 3503	Introduction to Cooperative Extension	
AGLE 4303	Facilitating Leadership Education Programs	
<i>Additional Requirements</i>		
AGEC	Select 3 hours of upper-division	3
Select 3 hours of NREM		3
<i>Related Courses</i>		
To be selected from areas related to agriculture and/or agricultural leadership		15
<b>Hours Subtotal</b>		<b>54</b>
<i>Electives</i>		
Select 6 hours or hours to complete required total for degree		6
<b>Hours Subtotal</b>		<b>6</b>
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, then hours are reduced by three.

## **Other Requirements**

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## **Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Leadership: Extension Education, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Course designated (A)		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
SOIL 1113	Land, Life and the Environment (N) <sup>1</sup>	3
or SOIL 2124	Fundamentals of Soil Science (N)	
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course (Included in Major Requirements)		
Select at least one International Dimension (I) course (Included in Major Requirements)		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
ENTO 2003	Insects and Society (N)	3

or ENTO 3003	Livestock Entomology	
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
PLNT 1213	Introduction to Plant and Soil Systems	3
or HORT 1013	Principles of Horticultural Science (LN)	
<i>Written &amp; Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>2</sup>	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<b>Hours Subtotal</b>		<b>20</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGLE 1511	Introduction to Leadership in Agricultural Sciences and Natural Resources	1
AGLE 2303	Agricultural Leaders in Society (S)	3
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	3
AGLE 3101	Introduction to Agricultural Leadership	1
AGLE 3303	Agricultural Leadership: Theory and Practice	3
AGLE 3403	Facilitating Social Change in Agriculture	3
AGLE 3803	Global Leadership in Agriculture (I)	3
AGLE 4101	Seminar in Leadership Education	1
AGLE 4203	Professional Development in Agriculture	3
AGLE 4300	Agricultural Leadership Internship (6 hours)	6
Select 6 hours of the following:		6
AGLE 3333	Contemporary Issues in Leadership	
AGLE 3503	Introduction to Cooperative Extension	
AGLE 4303	Facilitating Leadership Education Programs	
<i>Additional Requirements</i>		
AGEC 4723	Rural Economics Development	3
ENTO 3501	Entomology for Educators	1
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
Select 3 hours of NREM		3
NSCI 2114	Principles of Human Nutrition (N)	4
SPED 3202	Educating Exceptional Learners (D)	2
<i>Related Courses</i>		
To be selected from areas related to youth development, extension education, agriculture and/or agricultural leadership		11
<b>Hours Subtotal</b>		<b>60</b>
<i>Electives</i>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.



<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, then hours are reduced by three.

## **Other Requirements**

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## **Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Agricultural Leadership: International Studies, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Course designated (A)		3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) <sup>1</sup>	
CHEM 1215	General Chemistry (LN) <sup>1</sup>	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	
SOIL 1113	Land, Life and the Environment (N) <sup>1</sup>	3
or SOIL 2124	Fundamentals of Soil Science (N)	
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course (Included in Major Requirements)		
Select at least one International Dimension (I) course (Included in Major Requirements)		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
ENTO 2003	Insects and Society (N)	3

or ENTO 3003	Livestock Entomology	
Select one of the following:		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
PLNT 1213	Introduction to Plant and Soil Systems	3
or HORT 1013	Principles of Horticultural Science (LN)	
<i>Written &amp; Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>2</sup>	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<b>Hours Subtotal</b>		<b>20</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGLE 1511	Introduction to Leadership in Agricultural Sciences and Natural Resources	1
AGLE 2303	Agricultural Leaders in Society (S)	3
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	3
AGLE 3101	Introduction to Agricultural Leadership	1
AGLE 3303	Agricultural Leadership: Theory and Practice	3
AGLE 3403	Facilitating Social Change in Agriculture	3
AGLE 3803	Global Leadership in Agriculture (I)	3
AGLE 4101	Seminar in Leadership Education	1
AGLE 4203	Professional Development in Agriculture	3
AGLE 4300	Agricultural Leadership Internship (6 hours)	6
Select 6 hours of the following:		6
AGLE 3333	Contemporary Issues in Leadership	
AGLE 3503	Introduction to Cooperative Extension	
AGLE 4303	Facilitating Leadership Education Programs	
<i>Additional Requirements</i>		
AGLE 4803	International Agricultural Leadership Tour (or approved international experience)	3
Select 3 hours of NREM		3
Select 3 hours of the following:		3
AGEC 4343	International Agricultural Markets and Trade (I)	
AGED 4713	International Programs in Agricultural Education and Extension (I)	
ANSI 3903	Agricultural Animals of the World (I)	
or NSCI 3543	Food and the Human Environment (IS)	
Select 10 hours from courses in the same foreign language		10
<i>Related Courses</i>		
To be selected from areas related to youth development, extension education, agriculture and/or agricultural leadership		8
<b>Hours Subtotal</b>		<b>60</b>
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, then hours are reduced by three.

## **Other Requirements**

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## **Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Leadership Education (LDED), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 17 hours

Code	Title	Hours
<b>Minor Requirements</b>		
AGLE 1511	Introduction to Leadership in Agricultural Sciences and Natural Resources	1
AGLE 2303	Agricultural Leaders in Society (S)	3
AGLE 3303	Agricultural Leadership: Theory and Practice	3
AGLE 4101	Seminar in Leadership Education	1
AGLE 4303	Facilitating Leadership Education Programs	3
Select two of the following:		6
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	
AGLE 3403	Facilitating Social Change in Agriculture	
AGLE 3503	Introduction to Cooperative Extension	
AGLE 3803	Global Leadership in Agriculture (I)	
EPSY 3213 or EPSY 3413	Psychology of Adolescence Child and Adolescent Development	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

# Agriculture

## Graduate Programs

The Master of Agriculture degree is designed for students interested in graduate professional training. The degree is offered with specializations in: Agribusiness and Agricultural Leadership.

## Purpose

The purpose of this degree is to provide a program which will give additional specialization in technical fields, as well as increased breadth of training. Students who are interested in working toward the PhD degree will generally follow the regular Master of Science degree program.

## Character of Program

This program provides a greater breadth of study than the Master of Science program. Emphasis is on practical application of the technical aspects of the discipline as well as discipline interrelationships. In some areas of specialization, the focus is on an applied research concept and a broader program of study than is normally available with the specialized research degree.

## Admission Requirements

A baccalaureate degree in Agriculture or a related field is required for admission. The candidate must meet requirements for acceptance into the Graduate College and be recommended by the departmental graduate committee responsible for the program.

## Degree Requirements

The requirements for this degree are the same as those listed in the Catalog, "Graduate College" section, under "The Master's Degree."

In addition, each candidate approved for study under this program will be assigned an adviser and advisory committee with whom he or she will develop a plan of study in accordance with guidelines and requirements established in the department responsible for the program.

## International Agriculture

Shida R. Henneberry, PhD—Professor and Director

### Master of Agriculture in International Agriculture (MAIA)

The Master of Agriculture in International Agriculture (MAIA) is a multidisciplinary degree program that provides students the diverse background necessary to design, implement, and manage agricultural programs in developed and developing areas. The program prepares candidates for positions in the public and private sectors related to international agricultural development and marketing. Graduates work in international agribusinesses, non-profit organizations, development agencies, government and diplomatic service, education, agricultural extension, agricultural trade associations and commodity groups and other positions in global agriculture. Others pursue a personal desire to make a difference in the world by entering the Peace Corps, doing agricultural development work in a developing country, or working in areas recovering from a natural disaster. The MAIA is for students who prefer to blend theory and practice to improve the lives of people, develop professional skills and network through an international agricultural experience, develop a focus area to support professional goals, develop

broader understanding of world cultures and issues, and engage in international travel.

Three alternatives exist for satisfying requirements for the MAIA degree:

1. 32 credit hours, including two credit hours for a formal report,
2. 36 credit hours and a creative component, and
3. 36 credit hours, including six hours for a professional internship.

A minimum of 21 credit hours must be earned at the 5000 level or above. The creative component, research for formal report, and professional internship are expected to be in the area of international agriculture. Each student must take 17 semester credit hours of approved core courses, a minimum of 12 semester credit hours of focus area course, and at least three hours of electives. Each student is required to have an international experience of four weeks or longer.

### Master of Science in International Agriculture (MSIA)

The Master of Science in International Agriculture is designed to prepare candidates for positions in the public and private sectors related to agricultural sciences and natural resources, or for continuation in a Ph.D. program. The MSIA accommodates those students who prefer to take theoretical courses preparing them for research. This program will provide students the theoretical, science, and research backgrounds necessary to design, implement, and manage agricultural programs in developed and developing countries. It allows participants to blend theory and practice to improve the lives of people. Advanced study leading to the Master of Science degree in the field of International Agriculture prepares students for such professional careers as business analyst, international trade and development specialist, college-level educator, agricultural extension specialist, and professional work with non-profit organizations, government sectors, and agricultural commodity groups. The program is multidisciplinary, allowing students the freedom to focus on the area of study they choose.

Three alternatives exist for satisfying requirements for the M.S. degree:

1. With thesis, 30 credit hours, consisting of 24 hours of course work and six hours for a thesis
2. With report, 32 credit hours, consisting of 30 hours of course work and two hours of research
3. With no thesis or report, 32 credit hours of course work and a creative component

Degree candidates are expected to conduct research related to a topic on international agriculture. The prerequisites include two courses in statistics, mathematics, or quantitative analysis; nine additional semester credit hours in agricultural sciences and natural resources or related areas.

## Faculty

**Professor and Associate Dean, Academic Programs:** Cynda R Clary, PhD

**Professor and Interim Assistant Dean, Academic Programs:** Karen Hickman, PhD

**Professor and Interim Assistant Dean, Academic Programs:** Deborah Van Overbeke, PhD

**Regents Professor and Director, Masters of Agriculture in International Agriculture:** Shida R. Henneberry, PhD

**Coordinator, Prospective Student Services:** Kristi Bishop, MS

**Coordinator, Student Success:** Amy Gazaway, MS

**Coordinator, Student Success:** Katie Smithson, MS

**Director, CASNR Multicultural Programs:** José Uscanga, MS

**Graduate Certification:** Anna Salas, BS



## Animal Science

Animal science focuses on the science, art and business of the production of beef cattle, dairy cattle, horses, poultry, sheep, goats, swine and pet/companion animals. An animal scientist is concerned with the application of the principles of the biological, physical and social sciences to the problems associated with domestic animal production and management.

Animal science is also concerned with food production. The food industry is one of the largest and most important industries in the United States. Food scientists are concerned with the processing, safety, quality control and marketing of food.

Undergraduate students may elect to pursue a Bachelor of Science degree in the department by majoring in either animal science or food science. Internship programs providing one to six months of off-campus work experience are available in all animal science options and are part of the curriculum for food science. Participation in undergraduate organizations (Animal Science Leadership Alliance, Block and Bridle, Dairy Science, Horsemen's Association, Food Science Club, Meat Science Association, Oklahoma Collegiate Cattlewomen, Oklahoma Collegiate Cattlemen, Pre-Vet Club) judging teams (dairy cattle, horses, livestock, meat, or meat animal evaluation) and academic programs (honors, undergraduate research scholars, and academic quadrathlon) improves social, communication, leadership and academic skills and abilities.

## Animal Science

Undergraduate students may elect study emphasis programs in the areas of Animal Biotechnology, Business, Livestock Merchandising, Pre-Veterinary Animal Science, Production, and Ranch Operations, or a double major with Agricultural Communications or with Agricultural Education. In addition, students have the opportunity to concentrate their studies on one or more animal species.

Students interested in veterinary medicine may complete the pre-veterinary medicine requirements at the same time they are working toward a BS degree in animal science. In addition, pre-vet students gain valuable insight into the care and management of animals throughout the Animal Science curriculum.

Undergraduate students follow a similar curriculum during the first two years which includes basic courses in the physical, biological and social sciences, and a series of introductory courses in agriculture and business. Upper-class students take a basic core of advanced animal science courses, including genetics, reproductive physiology, and nutrition. As seniors, students complete a series of advanced animal science courses which are designed to apply knowledge obtained in previous courses to livestock systems. Every opportunity is taken in teaching to utilize the excellent herds and flocks owned or operated by the department.

Students completing a degree with a major in Animal Science have a wide choice of challenging careers, including ownership or management of farms, ranches, feedlots; employment with state and federal agencies concerned with inspection, grading or regulation; banking and financial activities, sales and service positions with companies involved with feeds, pharmaceuticals or other animal products; biotechnology; opportunities in Agricultural Extension or teaching; and work in the processing, distributing and merchandising of dairy, poultry and meat products.

## Minor in Animal Science

The minor is designed to give students the core courses in Animal Science to supplement their chosen major. Animal Science coursework required for the minor will provide students with the knowledge to be competitive and succeed in the animal agriculture industry. The requirements include ANSI 1124 Introduction to the Animal Sciences and 18 additional hours of core Animal Science courses that the student can select to personalize their programs. The basic core of advanced Animal Science courses include genetics, reproductive physiology, and nutrition. Students can then complete a series of advanced animal science courses designed to apply knowledge obtained in previous courses to animal systems.

## Food Science

Food science is an applied field. A food scientist is someone who applies the basic sciences: biology, physics, chemistry, and mathematics to further our understanding of the factors that affect food quality, safety, and nutrition. Food science is applied to the selection, preservation, processing, packaging, distribution, and use of safe, nutritious, and wholesome foods.

There are four study emphasis programs in the food science major: Science, Industry, Meat Science and Food Safety.

The Science emphasis gives students a well rounded background in chemistry, physics, mathematics and biology as well as food science. Students who elect this option usually have a primary interest in science and will be prepared to enter graduate education programs in food science.

This Science emphasis is also an excellent choice for students interested in professional schools such as medical school, dental school, pharmacy, physical therapy and veterinary medicine. Students who elect not to pursue a graduate degree or a professional degree are prepared to work in any facet of the food industry, especially those jobs focused on research, product development and food analysis.

The Industry emphasis provides a basic understanding of the chemical and physical processes of food processing. Students pursuing this option are prepared to enter food plant management, quality assurance, quality control, product development and sales.

The Meat Science emphasis provides a background knowledge and understanding in live animal production, slaughter and fabrication, and meat processing along with a basic understanding of chemical and physical processes of meat production. Students pursuing this option are prepared to enter the meat industry working in quality assurance, slaughter/fabrication, meat processing, product development and sales.

The Food Safety emphasis provides knowledge and experience in food safety issues and practices affecting all sectors of the food industry from production agriculture to wholesale and retail distribution channels. Students pursuing this option are prepared to enter the food industry with expertise in food safety programs, auditing, and quality assurance.

## Minor in Food Science

The minor includes the core courses in Food Science. Requirements include FDSC 1133 Fundamentals of Food Science and 18 additional hours of core Food Sciences courses that the student can select from to personalize their programs. The basic core of food science courses include food chemistry, food microbiology, quality control, and food analysis, as well as meat science courses for students interested in the

meat industry or dairy and dairy products courses for students interested in the dairy industry. Students can complete their program with advanced courses in these areas.

## Undergraduate Programs

- Animal Science (ANSI), Minor (p. 854)
- Animal Science: Agricultural Communications Double Major, BSAG (p. 855)
- Animal Science: Agricultural Education Double Major, BSAG (p. 857)
- Animal Science: Animal Biotechnology, BSAG (p. 859)
- Animal Science: Business, BSAG (p. 861)
- Animal Science: Livestock Merchandising, BSAG (p. 863)
- Animal Science: Pre-Veterinary Animal Science, BSAG (p. 865)
- Animal Science: Production, BSAG (p. 867)
- Animal Science: Ranch Operations, BSAG (p. 869)
- Food Science (FDSC), Minor (p. 871)
- Food Science: Food Industry, BSAG (p. 872)
- Food Science: Food Safety, BSAG (p. 874)
- Food Science: Meat Science, BSAG (p. 876)
- Food Science: Science, BSAG (p. 878)

## Graduate Programs

The Department of Animal Science offers programs leading to the Doctor of Philosophy or Master of Science degree in Animal Science and contributes to the interdepartmental food science graduate program. Research areas of emphasis are available in Animal Breeding (quantitative and molecular genetics), Animal Behavior, Animal Nutrition, Grazing Livestock, Nutrition and Management, Immunology, Animal Reproduction and Physiology, Animal Biotechnology, and Meat Science.

## Prerequisites

Admission to the graduate program requires an undergraduate major in Animal Science, Dairy Science or Poultry Science, or in closely-related biological sciences or biochemistry. In addition, students with a major in Dairy Manufacturing, Microbiology, Human Nutrition, Food Science, or Food Technology can qualify for the program in Food Science. A student enrolling in a degree program must have been accepted by an adviser prior to official admission. In all cases, the student's graduate adviser or committee may recognize specific undergraduate deficiencies and require measures to attain proficiency.

## Faculty

Clint Rusk, PhD—Professor and Head

**Professors:** Gerald Q. Fitch, PhD; David L. Lalman, PhD; Gretchen Mafi, PhD; Peter Muriana, PhD; Leon J. Spicer, PhD; Chris Richards, PhD; Deb VanOverbeke, PhD; Guolong Zhang, PhD

**Associate Professors:** Scott Carter, PhD; Steven Cooper, PhD; Udaya DeSilva, PhD; Mark Z. Johnson, PhD; Ryan Reuter, PhD; Dan Stein, PhD

**Assistant Professors:** Blake Bloomberg, PhD; Kris Hiney, PhD; Ravi Jadeja, PhD; Divya Jaroni, PhD; Adel Pezeshki, PhD; Ranjith Ramanathan, PhD; Blake Wilson, PhD

**Clinical Instructors:** Justin Crosswhite, MS; Mellissa Crosswhite, PhD

**Assistant Extension Specialists:** Rusty Gosz, MS; Gant Mourer, MS

**Coordinator, Student Success:** Carrie Doyle, MS

## Animal Science (ANSI), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 22 hours

Code	Title	Hours
<b>Minor Requirements</b>		
ANSI 1124	Introduction to the Animal Sciences	4
Select 18 hours of the following: <sup>1</sup>		18
ANSI 2253	Meat Animal and Carcass Evaluation	
ANSI 3333	Meat Science	
ANSI 3423	Animal Genetics	
ANSI 3433	Animal Breeding	
ANSI 3443	Animal Reproduction	
ANSI 3523	Pet and Companion Animal Management	
ANSI 3543	Principles of Animal Nutrition	
ANSI 3623	Livestock Behavior Handling	
ANSI 3653	Applied Animal Nutrition	
ANSI 3753	Basic Nutrition for Pets	
ANSI 4023	Poultry Science	
ANSI 4203	Rangeland and Pasture Utilization	
ANSI 4333	Processed Meat	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4803	Animal Growth and Performance	
ANSI 4863	Capstone for Animal Agriculture	

<sup>1</sup> At least 3 of these credits must be from 4000-level courses.

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Animal Science: Agricultural Communications Double Major, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 130**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1483	Mathematical Functions and Their Uses (A) <sup>1</sup>	3
or MATH 1513	College Algebra (A)	
Select one of the following:		3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
MATH 1613	Trigonometry (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4

### Additional Requirements

Select one of the following:		3
ENTO 3003	Livestock Entomology	
ENVR 1113	Elements of Environmental Science	
NREM 1014	Introduction to Natural History (LN) <sup>2</sup>	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N) <sup>2</sup>	
Select two of the following:		5
ANSI 2112	Live Animal Evaluation	
ANSI 2233	The Meat We Eat	
or FDSC 2233	The Meat We Eat	
or FDSC 2253	Meat Animal and Carcass Evaluation	
FDSC 1133	Fundamentals of Food Science	
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>3</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>3</sup>	
<b>Hours Subtotal</b>		<b>26</b>
<b>Major Requirements</b>		
<i>Animal Science Core Courses</i>		
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
Select 6 hours of the following:		6
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4713	Beef Seedstock Management and Sales	
<i>Agricultural Communications Core Courses</i>		
AGCM 3123	New Media in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Web Design for Agricultural Organizations	3
AGCM 3233	Basic Photography and Photo Editing for Agriculture	3
or AGCM 4233	Agricultural Photography Tour	

AGCM 4113	Features Writing and Editing for Agricultural Publications	3
AGCM 4203	Professional Development in Agricultural Communications	3
AGCM 4300	Internships in Agricultural Communications (2 hours)	2
AGCM 4403	Planning Campaigns for Agriculture and Natural Resources	3
AGCM 4413	Agricultural Communications Capstone	3
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3703	Issues in Agricultural Policy	3
AGEC 3713	Agricultural Law	3
FIN 2123	Personal Finance	3
or ACCT 2103	Financial Accounting	3
<i>Related Courses</i>		
Select 2 hours of the following:		2
ANSI 1111	Animal and Food Science Experience	
ANSI 4910	Animal Industry Internship (1-6 hours)	
ANSI, AGECE, AGCM, FIN, NREM, PLNT, MKTG, ENTO, MGMT		
<b>Hours Subtotal</b>		<b>64</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
Total Hours		130

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as [N] course above, hours in this block reduced by 4.

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Animal Science: Agricultural Education Double Major, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 133**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1483	Mathematical Functions and Their Uses (A) <sup>1</sup>	3
or MATH 1513	College Algebra (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
MATH 2103	Business Calculus (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1

ANSI 1124	Introduction to the Animal Sciences	4
<i>Additional Requirements</i>		
ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
HORT 1013	Principles of Horticultural Science (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
MCAG 3222	Metals and Welding	2
MCAG 3011	Ag Structures	1
MCAG 3211	Engines and Power	1
MCAG 4101	Ag Electrification	1
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>31</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 3242	Advanced Livestock Evaluation	2
or ANSI 3310	Advanced Competitive Evaluation	
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
Select 6 hours of the following:		6
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Professional Agriculture Education Core</i>		
AGED 3101	Laboratory and Clinical Experiences in Agricultural Education	1
AGED 3103	Foundations and Philosophies of Teaching Agricultural Education	3
AGED 3203	Planning the Community Program in Agricultural Education	3



AGED 4103	Methods and Skills of Teaching and Management in Agricultural Education	3
AGED 4203	Professional Development in Agricultural Education <sup>5</sup>	3
AGED 4200	Student Teaching in Agricultural Education <sup>5</sup>	9
EPSY 3213	Psychology of Adolescence	3
SPED 3202	Educating Exceptional Learners (D)	2
<i>Related Courses</i>		
Select 2 hours of the following:		2
ANSI 1111	Animal and Food Science Experience	
ANSI 3903	Agricultural Animals of the World (I)	
Any course with an (I)		
AGEC, FIN, NREM, ANSI, MCAG, PLNT, ENTO, MGMT, SOIL, EEE, MKTG		
<b>Hours Subtotal</b>		<b>62</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>133</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as [N] course above, hours in this block reduced by 4

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3

<sup>4</sup> If used as (S) course above, hours in this block reduced by 3

<sup>5</sup> NOTE: AGED 4203 Professional Development in Agricultural Education, AGED 4200 Student Teaching in Agricultural Education are taken during teaching semester.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Animal Science: Animal Biotechnology, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Basic Animal Science Course</i>		

ANSI 1124	Introduction to the Animal Sciences	4
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
<i>College Requirements</i>		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		21
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 3423	Animal Genetics	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 4843	Applications of Biotechnology in Animal Science	3
ANSI 4863	Capstone for Animal Agriculture	3
<i>Option</i>		
Select one option (p. 860)		9
<i>Additional Core Courses</i>		
CHEM 1225	General Chemistry (LN)	5
or CHEM 1515	General Chemistry (LN)	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1014	Descriptive Physics (N)	4
or PHYS 1114	General Physics (LN)	
MICR 3033	Cell and Molecular Biology	3
or BIOL 4215	Mammalian Physiology	
Select one of the following:		4
ANSI 3414	Form and Function of Livestock and Poultry	
BIOL 1604	Animal Biology	
BIOL 3204	Physiology	
Select 5 hours upper division organic chemistry		5
BIOC 3653	Survey of Biochemistry	3
<i>Related Courses</i>		
Select 6 hours of the following:		6
Minimum of 3 upper division hours required		
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))	
ANSI 1111	Animal and Food Science Experience	
ANSI 3333	Meat Science	
ANSI 4803	Animal Growth and Performance	
ANSI 4910	Animal Industry Internship	
MATH 2144	Calculus I (A)	
MATH 2153	Calculus II (A)	

MATH 2163	Calculus III	
PHYS 1214	General Physics (LN)	
ANSI <sup>5</sup>		
BIOC		
BIOL		
ENTO		
FDSC		
MICR		
STAT		
<b>Hours Subtotal</b>		<b>59</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		<b>0</b>
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used for [N] requirement, hours in this block reduced by CHEM course hours and related courses increased

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3

<sup>4</sup> If used as (S) course above, hours in this block reduced by 3

<sup>5</sup> No more than 3 hours from ANSI 4900 Special Problems

## Options

### Option 1

Code	Title	Hours
Select 6 hours of the following:		6
ANSI 3433	Animal Breeding	
ANSI 3623	Livestock Behavior Handling	
ANSI 3653	Applied Animal Nutrition	
Select 3 hours of the following:		3
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	

### Option 2

Code	Title	Hours
Select 9 hours of the following:		9
ANSI 4803	Animal Growth and Performance	
MICR 3253	Immunology	
MICR 4123	Virology	
MICR 4233	Advanced Cell and Molecular Biology	
BIOL 4134	Embryology	
BIOL 4283	Endocrinology	

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Animal Science: Business, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4

<i>College Requirements</i>		
CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>18</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select 5 hours of the following:		5
ANSI 2112	Live Animal Evaluation	
ANSI 2233	The Meat We Eat	
ANSI 2253	Meat Animal and Carcass Evaluation	
FDSC 1133	Fundamentals of Food Science	
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
Select 6 hours of the following:		6
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
<i>Additional Core Courses</i>		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
AGEC 3423	Farm and Agribusiness Management	3
AGEC 3713	Agricultural Law	3
or LSB 3213	Legal and Regulatory Environment of Business	
Select 12 upper division hours of AGECE, ECON, FIN, MKTG, MGMT		12
Students pursuing a minor should consult their adviser when choosing classes in this section		
<i>Related Courses</i>		
Selected 9 hours from any upper division courses from CASNR, SSB, MMJ or SC		9
Recommended courses:		
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))	
ANSI 1111	Animal and Food Science Experience	
ANSI 3333	Meat Science	

ANSI 3623	Livestock Behavior Handling	
ANSI 4203	Rangeland and Pasture Utilization	
ANSI 4803	Animal Growth and Performance	
ANSI 4910	Animal Industry Internship	
ECON 2103	Introduction to Microeconomics (S)	
ECON 2203	Introduction to Macroeconomics	
FIN 2123	Personal Finance	
FIN 3113	Finance	
LSB 4323	Law of Commercial Transactions and Debtor-Creditor Relationships	
PLNT 4613	Forage and Grazinglands Resource Management	
MGMT 3013	Fundamentals of Management (S)	
MKTG 3213	Marketing (S)	
NREM 2013	Ecology of Natural Resources	
NREM 3613	Principles of Rangeland Management	
SOIL 2124	Fundamentals of Soil Science (N)	
<b>Hours Subtotal</b>		<b>62</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		<b>0</b>
<b>Total Hours</b>		<b>120</b>

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours and related courses increased
- <sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3
- <sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Animal Science: Livestock Merchandising, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A)	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
STAT 2013	Elementary Statistics (A)	3
or STAT 2023	Elementary Statistics for Business and Economics (A)	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN)	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4

### College Requirements

CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	

### Written and Oral Communications

AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	

Select one of the following: <sup>4</sup> 3

AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	

**Hours Subtotal** 18

### Major Requirements

#### Core Courses

ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
ANSI 3242	Advanced Livestock Evaluation	2
or ANSI 3310	Advanced Competitive Evaluation	
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3623	Livestock Behavior Handling	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3

Select 6 hours of the following: 6

ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	

#### Additional Core Courses

ACCT 2103	Financial Accounting	3
SC 2183	Introduction to Strategic Communications	3
AGEC 3713	Agricultural Law	3
or LSB 3213	Legal and Regulatory Environment of Business	

#### Related Courses

Select 19 hours, minimum of 8 upper division hours required 19

#### Recommended courses:

AGCM 2113	Introduction to Agricultural Communications	
AGCM 3113	Writing and Editing for Agricultural Publications	
AGCM 3123	New Media in Agricultural Communications	
AGCM 3213	Layout and Design for Agricultural Publications	
AGCM 3223	Web Design for Agricultural Organizations	



AGCM 3233	Basic Photography and Photo Editing for Agriculture
AGCM 4113	Features Writing and Editing for Agricultural Publications
AGCM 4203	Professional Development in Agricultural Communications
AGEC 3323	Agricultural Product Marketing and Sales
MC 2003	Mass Media Style and Structure
MC 2023	Electronic Communication
MKTG 3213	Marketing (S)
MKTG 3313	Personal Marketing and Professional Development
MKTG 3513	Sales Management
MMJ 3153	Fundamentals of Audio and Video Production
MMJ 3263	Multimedia Reporting
MMJ 3823	Photography I
MMJ 3943	Photojournalism
ACCT 2203	Managerial Accounting
ANSI 1111	Animal and Food Science Experience
ANSI 4910	Animal Industry Internship
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))
ANSI, FIN, SC, AGECE, MGMT, SPM, EEE, MKTG, FDSC, MMJ	
<b>Hours Subtotal</b>	<b>62</b>
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>120</b>

- Degrees that follow this plan must be completed by the end of Summer 2023.

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours and related courses increased.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>4</sup> If used as (S) course above, hours in this block reduced by 3 and related courses increased by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.

## Animal Science: Pre-Veterinary Animal Science, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
CHEM 1515	General Chemistry (LN) <sup>1</sup>	5
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4

ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>2</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		17
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 3423	Animal Genetics	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3903	Agricultural Animals of the World (I) (or any designated (I))	3
<i>Option</i>		
Select one option (p. 865)		9
<i>Additional Core Courses</i>		
MICR 2123	Introduction to Microbiology	5
& MICR 2132	and Introduction to Microbiology Laboratory	
PHYS 1114	General Physics (LN)	4
PHYS 1214	General Physics (LN)	4
Select one of the following:		4
BIOL 1604	Animal Biology	
BIOL 3204	Physiology	
ANSI 3414	Form and Function of Livestock and Poultry	
Select 5 hours of upper division organic chemistry		5
BIOC 3653	Survey of Biochemistry	3
<i>Related Courses</i>		
Select Alternative 1 or 2 (p. 866)		20
<b>Hours Subtotal</b>		63
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

## Options

### Option 1

Code	Title	Hours
Select 9 hours of the following:		
ANSI 3433	Animal Breeding	
ANSI 3443	Animal Reproduction	
ANSI 3623	Livestock Behavior Handling	
ANSI 3653	Applied Animal Nutrition	
		9

## Option 2

Code	Title	Hours
Select 9 hours of the following:		9
FDSC 3113	Quality Control	
FDSC 3154	Food Microbiology	
FDSC 3333	Meat Science	
FDSC 3373	Food Chemistry I	
FDSC 3603	Processing Dairy Foods	
FDSC 4763	Analysis of Food Products	

these changes do not result in semester credit hours being added or do not delay graduation.

- Degrees that follow this plan must be completed by the end of Summer 2023.

## Alternatives

### Alternative 1

First 2 semesters in the College of Veterinary Medicine.

### Alternative 2

Code	Title	Hours
ANSI 1111	Animal and Food Science Experience	1
ANSI 4863	Capstone for Animal Agriculture	3
Select 3 hours of the following:		3
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
Upper division FDSC courses		
Select 10 hours of the following (minimum of 9 upper division hours required):		10
ANSI 4843	Applications of Biotechnology in Animal Science	
MICR 3033	Cell and Molecular Biology	
Select up to 6 hours of the following:		6
AG 3010	Internships in Agriculture	
ANSI 4900	Special Problems	
or ANSI 4910	Animal Industry Internship	
Select any upper division course in AGECE, ANSI, BIOL, ENTO, MICR, NREM, PLNT, SOIL		

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as

## Animal Science: Production, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN)	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4

<i>College Requirements</i>		
CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
<i>Additional Requirements</i>		
CHEM 1225	General Chemistry (LN) <sup>2</sup>	5
or CHEM 1515	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>23</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
AGEC 3423	Farm and Agribusiness Management	3
or AGECE 3403	Agricultural Small Business Management	
ANSI 2112	Live Animal Evaluation	2
ANSI 2253	Meat Animal and Carcass Evaluation	3
ANSI 3333	Meat Science	3
or FDSC 3603	Processing Dairy Foods	
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3623	Livestock Behavior Handling	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4803	Animal Growth and Performance	3
ANSI 4863	Capstone for Animal Agriculture	3
ENTO 3003	Livestock Entomology	3
Select 9 hours of the following:		9
ANSI 4023	Poultry Science	
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4643	Swine Science	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
<i>Related Courses</i>		
Select 7 hours of the following:		7
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))	
ANSI 1111	Animal and Food Science Experience	
ANSI 4910	Animal Industry Internship	
AGEC 3713	Agricultural Law	
or LSB 3213	Legal and Regulatory Environment of Business	
MCAG 1413	Introduction to Engineering in Agriculture	

PLNT 2013	Applied Plant Science	
SOIL 2124	Fundamentals of Soil Science (N)	
BIOL 3204	Physiology	
AGEC, ANSI <sup>5</sup> , ENTO, EEE, FIN, MCAG, MGMT, MKTG, NREM, PLNT, SOIL		
<b>Hours Subtotal</b>		<b>57</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		<b>0</b>
<b>Total Hours</b>		<b>120</b>

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, hours in this block reduced by 3.
- <sup>5</sup> No more than 3 hours from ANSI 4900 Special Problems.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Animal Science: Ranch Operations, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
PLNT 1213	Introduction to Plant and Soil Systems	3

<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4
<i>College Requirements</i>		
CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
<i>Additional Requirements</i>		
CHEM 1225	General Chemistry (LN) <sup>2</sup>	5
or CHEM 1515	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>23</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
ANSI 3333	Meat Science	3
ANSI 3423	Animal Genetics	3
ANSI 3433	Animal Breeding	3
ANSI 3443	Animal Reproduction	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3653	Applied Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
Select 9 hours of the following:		9
ANSI 4423	Horse Science	
ANSI 4543	Dairy Cattle Science	
ANSI 4553	Sheep Science	
ANSI 4613	Beef Cow-Calf Management	
ANSI 4633	Stocker and Feedlot Cattle Management	
ANSI 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
Select 9 hours of the following:		9
BOT 3005	Field Botany	
ANSI 4203	Rangeland and Pasture Utilization	
PLNT 4613	Forage and Grazinglands Resource Management	
NREM 2013	Ecology of Natural Resources	
NREM 3613	Principles of Rangeland Management	
NREM 4613	Rangeland Resources Planning	
NREM 4783	Prescribed Fire	
NREM 4793	Advanced Prescribed Fire	
<i>Additional Core Courses</i>		
SOIL 2124	Fundamentals of Soil Science (N)	4
ACCT 2103	Financial Accounting	3
AGEC 3423	Farm and Agribusiness Management	3
or AGECE 3403	Agricultural Small Business Management	



*Related Courses*

Select 3 hours of the following:	3
ACCT 2203	Managerial Accounting
ANSI 1111	Animal and Food Science Experience
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))
ANSI 4910	Animal Industry Internship
ENTO 3003	Livestock Entomology
FIN 3113	Finance
LSB 3213	Legal and Regulatory Environment of Business
MGMT 3013	Fundamentals of Management (S)
MKTG 3213	Marketing (S)
BIOL 3204	Physiology
Any upper division: AGECE, ANSI, ENTO, EEE, FDSC, FIN, MGMT, MKTG, NREM, PLNT, SOIL	
<b>Hours Subtotal</b>	<b>57</b>
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> if used for (N) requirement, hours in this block are reduced by CHEM course hours.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Food Science (FDSC), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 20 hours

Code	Title	Hours
<b>Minor Requirements</b>		
FDSC 1133	Fundamentals of Food Science	3
Select 17 credits of the following:		17
FDSC 2253	Meat Animal and Carcass Evaluation	
FDSC 3113	Quality Control	
FDSC 3154	Food Microbiology	
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3333	Meat Science	
FDSC 3373	Food Chemistry I	
FDSC 3603	Processing Dairy Foods	
FDSC 4333	Processed Meat	
FDSC 4763	Analysis of Food Products	
FDSC 4910	Food Industry Internship <sup>1</sup>	
ANSI 3543	Principles of Animal Nutrition	
or NSCI 4323	Human Nutrition and Metabolism	
MCAG 4123	Principles of Food Engineering	

<sup>1</sup> Credits in FDSC 3310 Advanced Competitive Evaluation and FDSC 4910 Food Industry Internship may be used for this minor only if they involve activities approved by the Food Science Advisor in advance.

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Food Science: Food Industry, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4
<i>College Requirements</i>		

CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
<i>Additional Requirements</i>		
CHEM 1225	General Chemistry (LN)	5
or CHEM 1515	General Chemistry (LN)	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
Select one of the following:		3
ENVR 1113	Elements of Environmental Science	
HORT 1013	Principles of Horticultural Science (LN)	
BIOC 2344	Chemistry and Applications of Biomolecules	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>28</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 4863	Capstone for Animal Agriculture	3
FDSC 1133	Fundamentals of Food Science	3
FDSC 2233	The Meat We Eat	3
or FDSC 2253	Meat Animal and Carcass Evaluation	
FDSC 3113	Quality Control	3
FDSC 3123	HACCP in the Food Industry	3
FDSC 3154	Food Microbiology	4
FDSC 3373	Food Chemistry I	3
FDSC 4763	Analysis of Food Products	3
FDSC 4910	Food Industry Internship	3
HORT 3213	Fruit and Nut Production	3
NSCI 3223	Nutrition Across the Life Span	3
or ANSI 3543	Principles of Animal Nutrition	
Select 9 hours of the following:		9
FDSC 3232	Advanced Meat Evaluation	
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3333	Meat Science	
FDSC 3603	Processing Dairy Foods	
FDSC 4113	Quality Control II	
FDSC 4153	Advanced Food Microbiology	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4333	Processed Meat	
FDSC 4373	Food Chemistry II	
FDSC 4910	Food Industry Internship	
MCAG 4123	Principles of Food Engineering	
MICR 3033	Cell and Molecular Biology	
MICR 3223	Advanced Microbiology	
NSCI 3543	Food and the Human Environment (IS)	
NSCI 3223	Nutrition Across the Life Span	

*Related Courses*

Select 9 hours of the following:	9
ANSI 1111      Animal and Food Science Experience	
ANSI 3903      Agricultural Animals of the World (I) (or any course designated (I))	
ACCT, AGECE, ANSI, AGCM, FDSC, HRAD, HORT, PLNT, MICR, MGMT, MKTG, MATH, NSCI, STAT, Foreign Language	
<b>Hours Subtotal</b>	<b>52</b>
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Food Science: Food Safety, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
or STAT 2023	Elementary Statistics for Business and Economics (A)	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
FDSC 1133	Fundamentals of Food Science	3
<i>College Requirements</i>		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
<i>Additional Requirements</i>		
CHEM 1515	General Chemistry (LN)	5
MICR 2123	Introduction to Microbiology	3

MICR 2132	Introduction to Microbiology Laboratory	2
BIOC 2344	Chemistry and Applications of Biomolecules	3
or ENVR 1113	Elements of Environmental Science	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>27</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 4863	Capstone for Animal Agriculture	3
FDSC 2233	The Meat We Eat	3
or FDSC 2253	Meat Animal and Carcass Evaluation	
FDSC 3113	Quality Control	3
FDSC 3123	HACCP in the Food Industry	3
FDSC 3154	Food Microbiology	4
FDSC 3373	Food Chemistry I	3
FDSC 4113	Quality Control II	3
FDSC 4153	Advanced Food Microbiology	3
FDSC 4763	Analysis of Food Products	3
FDSC 4900	Special Problems	3
FDSC 4910	Food Industry Internship	6
Select one of the following:		3
AGEC 3713	Agricultural Law	
AGEC 3703	Issues in Agricultural Policy	
LSB 3213	Legal and Regulatory Environment of Business	
<i>Related Courses</i>		
Select 13 hours of the following:		13
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3333	Meat Science	
FDSC 3603	Processing Dairy Foods	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4333	Processed Meat	
FDSC 4373	Food Chemistry II	
NSCI 3543	Food and the Human Environment (IS)	
ANSI 1111	Animal and Food Science Experience	
HORT 3213	Fruit and Nut Production	
ENVR 3113	Sampling and Analyses for Solving Environmental Problems	
MICR 3033	Cell and Molecular Biology	
BIOL 3163	Environmental Biology	
<b>Hours Subtotal</b>		<b>53</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>120</b>

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Food Science: Meat Science, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A)	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) <sup>1</sup>	
STAT 2013	Elementary Statistics (A) <sup>1</sup>	
STAT 2023	Elementary Statistics for Business and Economics (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course.		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan.		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
<i>Basic Animal Science Course</i>		
ANSI 1124	Introduction to the Animal Sciences	4
<i>College Requirements</i>		

CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
<i>Additional Requirements</i>		
CHEM 1225	General Chemistry (LN)	5
or CHEM 1515	General Chemistry (LN)	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
Select one of the following:		3
BIOC 2344	Chemistry and Applications of Biomolecules	
ENVR 1113	Elements of Environmental Science	
HORT 1013	Principles of Horticultural Science (LN)	
PLNT 1213	Introduction to Plant and Soil Systems	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>28</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 3543	Principles of Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
FDSC 1133	Fundamentals of Food Science	3
FDSC 2253	Meat Animal and Carcass Evaluation	3
FDSC 3113	Quality Control	3
FDSC 3123	HACCP in the Food Industry	3
FDSC 3154	Food Microbiology	4
FDSC 3232	Advanced Meat Evaluation	2
FDSC 3333	Meat Science	3
FDSC 3373	Food Chemistry I	3
FDSC 4333	Processed Meat	3
FDSC 4763	Analysis of Food Products	3
FDSC 4910	Food Industry Internship	3
<i>Related Courses</i>		
Select 13 hours of the following:		13
ANSI 1111	Animal and Food Science Experience	
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))	
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3603	Processing Dairy Foods	
FDSC 4113	Quality Control II	
FDSC 4153	Advanced Food Microbiology	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4373	Food Chemistry II	
ACCT, AGECE, ANSI, AGCM, CHEM, FDSC, HRAD, HORT, PLNT, MICR, MGMT, MKTG, MATH, NSCI, STAT, Foreign Language		
<b>Hours Subtotal</b>		<b>52</b>
<b>Electives</b>		



Select 0 hours or hours to complete required total for degree	0
<hr/> Total Hours	<hr/> 120

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours
- <sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3
- <sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Food Science: Science, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
or STAT 2023	Elementary Statistics for Business and Economics (A)	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Any course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
FDSC 1133	Fundamentals of Food Science	3
<i>College Requirements</i>		
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
<i>Additional Requirements</i>		
CHEM 1515	General Chemistry (LN)	5
MICR 2123	Introduction to Microbiology	3

MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1014	Descriptive Physics (N)	4
or PHYS 1114	General Physics (LN)	
ENVR 1113	Elements of Environmental Science	3
or HORT 1013	Principles of Horticultural Science (LN)	
<i>Written and Oral Communications</i>		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources <sup>3</sup>	3
or ENGL 3323	Technical Writing	
Select one of the following: <sup>4</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>31</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
FDSC 2233	The Meat We Eat	3
or FDSC 2253	Meat Animal and Carcass Evaluation	
ANSI 4863	Capstone for Animal Agriculture	3
BIOC 3653	Survey of Biochemistry	3
FDSC 3113	Quality Control	3
FDSC 3123	HACCP in the Food Industry	3
FDSC 3154	Food Microbiology	4
FDSC 3373	Food Chemistry I	3
FDSC 4153	Advanced Food Microbiology	3
FDSC 4763	Analysis of Food Products	3
CHEM 3015	The Chemistry of Organic Compounds	5
NSCI 3223	Nutrition Across the Life Span	3
or ANSI 3543	Principles of Animal Nutrition	
<i>Related Courses</i>		
Select 13 hours of the following (at least 6 hours upper division hours required):		13
ANSI 1111	Animal and Food Science Experience	
ANSI 4843	Applications of Biotechnology in Animal Science	
ANSI 3903	Agricultural Animals of the World (I) (or any course designated (I))	
FDSC 3232	Advanced Meat Evaluation	
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3333	Meat Science	
FDSC 3603	Processing Dairy Foods	
FDSC 4113	Quality Control II	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4333	Processed Meat	
FDSC 4373	Food Chemistry II	
FDSC 4910	Food Industry Internship	
ANSI, BIOC, CHEM, FDSC, HRAD, HORT, PLNT, MICR, MATH, NSCI, STAT, Foreign Language		
<b>Hours Subtotal</b>		<b>49</b>
<b>Electives</b>		

Select 0 hours or hours to complete required total for degree	0
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Total Hours	120
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- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used for (N) requirement, hours in this block are reduced by CHEM course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Biochemistry and Molecular Biology

Biochemistry, the central scientific discipline linking the chemical, physical and biological sciences, exerts a profound influence on the progress of medicine and agriculture. By applying concepts and methods of chemistry and physics to the fundamental problems of biology, biochemists have made great progress in their effort to understand the chemistry of living organisms. Major discoveries concerning the biochemistry of genetic material provide the tools of molecular biology that are essential to contemporary life sciences research.

Biochemists and molecular biologists are concerned with living things and thus, must be fluent in the concepts of biological sciences. Since a biochemist's tools include many techniques derived from the physical sciences, he or she must receive sound education in mathematics, physics and chemistry. Our academic programs are designed to integrate these disciplines, preparing students for a wide range of professional careers.

Challenging positions for well-trained biochemists and molecular biologists are available in colleges and universities, state and federal laboratories, research institutes, medical centers and in an increasing number of industrial organizations, particularly the pharmaceutical and food industries. Biochemists are involved with research on the chemistry of processes occurring in plants, animals, and various microorganisms, and with the discovery and development of antibiotics, vitamins, hormones, enzymes, insecticides and molecular genetics techniques.

The Department of Biochemistry and Molecular Biology administers two BS degree options in Biochemistry and Molecular Biology through the College of Agricultural Sciences and Natural Resources, and a BS degree in Biochemistry through the College of Arts and Sciences. In 2016, the two BS degree options administered through the College of Agricultural Sciences and Natural Resources became accredited by the American Society of Biochemistry and Molecular Biology. This provides students taking these degree options an opportunity to take the American Society of Biochemistry and Molecular Biology certification exam. An honors program is available in all three degree plans. Also available is a 4+1 Year Masters by Coursework program. The undergraduate curriculum provides a broad background in chemistry and the biological sciences and permits flexibility to meet particular interests of the student. Courses in biochemistry are based on general, organic and analytical chemistry. The undergraduate curriculum also provides students with sufficient background in the basic sciences of mathematics, physics, chemistry and biology needed for graduate study in most disciplines of contemporary science of agriculture or medicine and other allied health subjects, and is excellent for pre-professional students. The Department's research activities provide opportunities for part-time employment of undergraduate majors to improve their professional competence.

### Minor in Biochemistry and Molecular Biology

This minor is designed to give students a firm background in the fundamentals of Biochemistry and Molecular Biology and to develop critical thinking skills for the interpretation of new findings in these disciplines. Students will gain primary knowledge in modern biochemistry through two lecture courses (BIOC 3713 Biochemistry I and BIOC 3813 Biochemistry II). Hands on training with experimental tools of these disciplines will be emphasized during the Biochemistry and Molecular Biology laboratory course (BIOC 3723 Biochemistry and Molecular Biology Laboratory). The knowledge gained by this minor gives a

science educator, a laboratory technician, an industrial employee or a life sciences researcher the ability to apply these disciplines. This minor will also demonstrate competency in these disciplines to post-graduate health institutions.

### Undergraduate Programs

- Biochemistry (BIOC), Minor (p. 882)
- Biochemistry and Molecular Biology, BSAG (p. 883)
- Biochemistry and Molecular Biology: Pre-Medical or Pre-Veterinary Science, BSAG (p. 885)

### Graduate Programs

Many career opportunities in biochemistry require advanced course work, and so part of the Department of Biochemistry and Molecular Biology's curriculum is focused on its graduate program leading to the MS or PhD degree. This graduate program is also an integral part of the extensive basic research activities supported by the Oklahoma Agricultural Experiment Station.

### Prerequisites

Although a BS in Chemistry or Biochemistry is preferred, students with strong backgrounds in other biological or physical science disciplines are eligible for the graduate programs in Biochemistry and Molecular Biology. Individuals not having at least eight semester credit hours each of organic chemistry and calculus, plus four credit hours each of analytical and physical chemistry, must take appropriate undergraduate courses to make up deficiencies. The results of the three general GRE exams (verbal, quantitative, analytical) are required for entrance to the Graduate College. The preferred minimum GRE scores required for admission to the Biochemistry and Molecular Biology graduate program are: Verbal Reasoning 154 (64%); Quantitative Reasoning 153 (65%); and Analytical Writing 4.0 (48%).

### Degree Requirements

A more detailed description of the graduate study program in Biochemistry and Molecular Biology is available on the Department's website: <http://biochemistry.okstate.edu/graduate-program>. The requirements listed below complement the general graduate requirements described in the "Graduate College" section of the Catalog. All Biochemistry and Molecular Biology graduate students are expected to attend and participate in the Department's Graduate Student Association Journal Club and the Department's Seminar Series throughout the academic year.

### The Master of Science Degree

Twenty-four (24) credit hours of formal graduate courses are required, including:

Code	Title	Hours
BIOC 5002	Research Compliance and Biochemistry Graduate Colloquium	2
BIOC 5753	Biochemical Principles	3
BIOC 5824	Biochemical Laboratory Methods	4
BIOC 5853	Metabolism	3
BIOC 5930	Advanced Biochemical Techniques	1-4

In addition, a student must present an acceptable research thesis (six hours of BIOC 5000 Research) and pass a final oral examination covering

their thesis work and related material. Research advisers are selected at the end of the student's first semester.

A non-thesis Master of Science degree is also available. It does not require a research thesis, but requires a report and extensive technical training in the laboratory. The non-thesis MS plan requires thirty (30) credit hours of coursework and two (2) hours of research. The non-thesis MS is not recommended for students wishing to pursue a PhD.

The Doctor of Philosophy Degree. The PhD program course requirements are determined with the assistance and approval of the student's advisory committee and are based on whether a BS or MS has previously been earned:

- a. a minimum total of (60) graduate credits are required if a student enters the PhD program having earned an MS in a related discipline;
- b. a minimum total of ninety (90) graduate credits are required if a student enters the PhD program having earned not higher than a BS in a related discipline.

A formal "Plan of Study" with a minimum of 30 credit hours of graduate coursework, a minimum of 15 credit hours of research, and a minimum total of

- a. 60 credit hours or
- b. 90 credit hours must be approved by the student's advisory committee and submitted to the OSU Graduate College before completing
  - a. 17 credit hours or
  - b. 28 credit hours of graduate study.

The student's advisory committee is selected at the end of the student's second semester. All graduate students must maintain a B average in their graduate coursework. A grade of C in a single graduate course can place the student on academic probation.

The Department offers research experience in a variety of areas. Formal PhD program graduate coursework includes all of the courses listed for the MS degree, at least four of the advanced graduate courses in biochemistry (6000 level) including BIOC 6740 Physical Biochemistry, and additional courses and lab experience appropriate to the student's interests. Each student will take a series of preliminary examinations in January of his or her third semester.

Each student also presents and defends their research thesis proposal sometime in their 4th -5th semester, and at the end of their program presents their research and defends their dissertation in a final oral examination. The doctoral dissertation must contain a substantial original contribution to the discipline of biochemistry and molecular biology.

## Bioinformatics Graduate Certificate Program

The Department of Biochemistry and Molecular Biology also offers the Bioinformatics Graduate Certificate Program - a multi-disciplinary program that involves faculty in Departments across the University. This Program's mission is to train post-baccalaureate students in the techniques required to generate, analyze, and interpret complex biologically-derived data sets. The Graduate Certificate in Bioinformatics requires completion of 16 credit hours of course work eligible for graduate credit. A minimum of 12 credit hours must be at the 5000 level or above. Required courses include 9 credit hours from the core

areas of life sciences, statistics and computer sciences. Additional information on this Certificate Program is available online: <http://www.bioinformatics.okstate.edu/>.

## Review Process for Admission

The Department's Graduate Studies Committee reviews all eligible applications for the graduate program in Biochemistry and Molecular Biology. To be eligible for committee review, each applicant must submit an application for admission to the Graduate College, along with transcripts of all academic records, GRE scores and TOEFL scores if their undergraduate education was in a language other than English. Applicants must submit to the Department three reference letters, a current resume, and a statement of purpose.

## Faculty

John E. Gustafson, PhD—Professor and Head

**Regents Professors:** Robert L. Matts, PhD; Andrew J. Mort, PhD  
**Professors:** Randy D. Allen, PhD; Patricia Canaan, PhD; Junpeng Deng, PhD; Patricia Rayas-Duarte, PhD; Jose L. Soulages, PhD; Ramanjulu Sunkar, PhD

**Associate Professor:** Rita Miller, PhD

**Assistant Professors:** Charles Chen, PhD; Donald Ruhl, PhD; Kevin Wilson, PhD; Ellie Nguyen, PhD

**Associate Research Professor:** Estela L. Arrese, PhD

**Associate Research Scientists:** Steven D. Hartson, PhD; Peter R. Hoyt, PhD

**Instructor:** Judy A. Hall, MS

**Adjunct Faculty:** Robert L. Burnap, PhD; Richard A. Dixon, PhD; Udaya DeSilva, PhD; Haobo Jiang, PhD; Veronique A. Lacombe, PhD; Jerry R. Malayer, PhD; Kenneth L. McNally; Smita Mohanty, PhD; Rolf A. Prade, PhD; Kay Scheets, PhD; Lloyd Sumner, PhD; William Schneider, PhD; Million Tadege, PhD; Guolong (Glenn) Zhang, PhD; Carey Pope, PhD  
**Professors Emeriti:** Chang-An Yu, PhD; Linda Yu, PhD; Margaret Essenberg, PhD; Richard Essenberg, PhD; Ulrich Melcher, PhD; Sharon Ford, PhD; Earl D. Mitchell, PhD; Robert Gholson, PhD; Eldon C. Nelson, PhD

## Biochemistry (BIOC), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 20 hours

Code	Title	Hours
<b>Minor Requirements</b>		
CHEM 1515	General Chemistry (LN)	5
CHEM 3053	Organic Chemistry	3
CHEM 3153	Organic Chemistry	3
BIOC 3713	Biochemistry I	3
BIOC 3723	Biochemistry and Molecular Biology Laboratory	3
BIOC 3813	Biochemistry II	3

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Biochemistry and Molecular Biology, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 2144	Calculus I (A) <sup>1</sup>	4
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
Select 5 hours courses designated N		5
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
From two of the following groups, select one course:		6
Group 1:		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
Group 2:		
SOIL 1113	Land, Life and the Environment (N)	

SOIL 2124	Fundamentals of Soil Science (N)	
Group 3:		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
Group 4:		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>3</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>3</sup>	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
BIOC 3723	Biochemistry and Molecular Biology Laboratory	3
BIOC 3813	Biochemistry II	3
BIOC 3224	Physical Chemistry for Biologists	4
or CHEM 3433	Physical Chemistry I	
BIOC 4883	Senior Seminar in Biochemistry	3
BIOC 4990	Undergraduate Research (2 hrs) <sup>4</sup>	2
CHEM 1515	General Chemistry (LN)	5
CHEM 2113	Principles of Analytical Chemistry	3
CHEM 3053	Organic Chemistry	3
CHEM 3112	Organic Chemistry Lab	2
CHEM 3153	Organic Chemistry	3
Select one of the following:		3
MATH 2153	Calculus II (A)	
STAT 2013	Elementary Statistics (A)	
STAT 4013	Statistical Methods I (A)	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1114	General Physics (LN)	4
or PHYS 2014	General Physics (LN)	
PHYS 1214	General Physics (LN)	4



or PHYS 2114	General Physics (LN)	
BIOL 1114	Introductory Biology (LN)	4
BIOL 1604	Animal Biology	4
or BOT 1404	Plant Biology (LN)	
Select one of the following:		3
BIOL 3023	General Genetics	
ANSI 3423	Animal Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
Select one of the following:		4
BIOL 3204	Physiology	
BOT 3463	Plant Physiology	
ENTO 3044	Insect Physiology	
<b>Related Courses</b>		
Select a minimum of 5 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following:		5
ANSI 3543	Principles of Animal Nutrition	
BIOC 1990	Freshman Research in Biochemistry (up to 2 hours) <sup>4</sup>	
BIOC 2101	The Experiments Behind the Facts of Real Science	
BIOC 2202	Medicine and Molecules	
BIOC 3003	Hypothesis-Driven Undergraduate Research	
BIOC 4113	Molecular Biology	
BIOC 4523	Biochemistry of the Cell	
BIOC 4990	Undergraduate Research <sup>4</sup>	
BIOL 3034	General Ecology	
BIOL 3104	Invertebrate Zoology	
BIOL 3114	Vertebrate Morphology	
BIOL 3214	Human Anatomy	
BIOL 3233	Human Reproduction	
BIOL 4104	General Parasitology	
BIOL 4133	Evolution	
BIOL 4174	Mammalogy	
BIOL 4215	Mammalian Physiology	
BIOL 4223	Mammalian Physiology Laboratory	
BIOL 4243	Introductory Pharmacology	
BIOL 4283	Endocrinology	
BIOL 4293	Behavioral Neuroendocrinology	
BIOL 4215	Mammalian Physiology	
BOT 3462	Plant Physiology Laboratory	
CHEM 2122	Quantitative Analysis Laboratory	
CHEM 3353	Descriptive Inorganic Chemistry	
CHEM 3532	Physico-Chemical Measurements	
CHEM 3553	Physical Chemistry II	
CHEM 4020	Modern Methods of Chemical Analysis	
CHEM 4320	Chemical and Spectrometric Identification of Organic Compounds	
ENTO 4854	Medical and Veterinary Entomology	
MATH 2163	Calculus III	
MATH 2233	Differential Equations	
MATH 3013	Linear Algebra	
MATH 3263	Linear Algebra and Differential Equations	

MICR 3143	Medical Mycology
MICR 3154	Food Microbiology
MICR 3223	Advanced Microbiology
MICR 3253	Immunology
MICR 4012	Molecular Microbiology Laboratory I
MICR 4112	Molecular Microbiology Laboratory II
MICR 4123	Virology
MICR 4203	Bioinformatics
MICR 4053	Pathogenic Microbiology
MICR 4052	Pathogenic Microbiology Lab
MICR 4233	Advanced Cell and Molecular Biology
MICR 4253	Concepts in Medical Genetics
MICR 4263	Microbial Genetics: from Genes to Genomes
MICR 4323	Biological Energy Transduction
MICR 4423	Bacterial Cell Walls
NSCI 4123	Human Nutrition and Metabolism I
PHYS 4313	Molecular Biophysics
STAT 4013	Statistical Methods I (A) (if not used as (A) above))

<b>Hours Subtotal</b>	67
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#### Electives

Select 0 hours or hours to complete required total for degree	0
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<b>Total Hours</b>	120
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- College & Departmental requirements that may be used to meet GE requirements.
- If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- If used as (S) course above, hours in this block reduced by 3.
- Total hours of BIOC 1990 Freshman Research in Biochemistry and BIOC 4990 Undergraduate Research may not exceed 10 hours.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Biochemistry and Molecular Biology: Pre-Medical or Pre-Veterinary Science, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 2144	Calculus I (A) <sup>1</sup>	4
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
5 hours courses designated N		5
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
From two of the following groups, select one course:		6
Group 1:		
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 1113	Elements of Forestry	
Group 2:		

SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Group 3:		
ANSI 1124	Introduction to the Animal Sciences	
FDSC 1133	Fundamentals of Food Science	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
Group 4:		
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3713	Biochemistry I	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>3</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>3</sup>	
<b>Hours Subtotal</b>		13
<b>Major Requirements</b>		
<i>Core Courses</i>		
BIOC 3723	Biochemistry and Molecular Biology Laboratory	3
BIOC 3813	Biochemistry II	3
BIOL 1114	Introductory Biology (LN)	4
BIOL 1604	Animal Biology	4
or BOT 1404	Plant Biology (LN)	
CHEM 1515	General Chemistry (LN)	5
CHEM 3053	Organic Chemistry	3
CHEM 3112	Organic Chemistry Lab	2
CHEM 3153	Organic Chemistry	3
Select one of the following:		3
MATH 2153	Calculus II (A)	
STAT 2013	Elementary Statistics (A)	
STAT 4013	Statistical Methods I (A)	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1114	General Physics (LN)	4
or PHYS 2014	General Physics (LN)	
PHYS 1214	General Physics (LN)	4
or PHYS 2114	General Physics (LN)	

<i>Related Courses</i>	
Option:	
Select an option (p. 886)	20
<b>Hours Subtotal</b>	<b>63</b>
<b>Electives</b>	
Select 4 hours or hours to complete required total for degree.	4
<b>Hours Subtotal</b>	<b>4</b>
<b>Total Hours</b>	<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

## Options

### Option 1

With the approval of the advisor, department head, and dean, hours of basic sciences from an accredited chiropractic, dental medial, optometry, osteopathic, pharmacy, podiatry, or veterinary medical school to total 57 hours.

### Option 2

Code	Title	Hours
BIOC 3224 or CHEM 3433	Physical Chemistry for Biologists Physical Chemistry I	3-4
BIOC 4883	Senior Seminar in Biochemistry	3
Select one of the following:		3
BIOL 3023	General Genetics	
ANSI 3423	Animal Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
Select one of the following:		4
BIOL 3204	Physiology	
BOT 3463	Plant Physiology	
ENTO 3044	Insect Physiology	
Select a minimum of 6 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following:		6
ANSI 3543	Principles of Animal Nutrition	
BIOC 1990	Freshman Research in Biochemistry (up to 2 hours) <sup>1</sup>	
BIOC 2101	The Experiments Behind the Facts of Real Science	
BIOC 2202	Medicine and Molecules	
BIOC 3003	Hypothesis-Driven Undergraduate Research	
BIOC 4113	Molecular Biology	
BIOC 4523	Biochemistry of the Cell	
BIOC 4990	Undergraduate Research <sup>1</sup>	
BIOL 3034	General Ecology	
BIOL 3104	Invertebrate Zoology	
BIOL 3114	Vertebrate Morphology	
BIOL 3214	Human Anatomy	
BIOL 3233	Human Reproduction	
BIOL 4104	General Parasitology	

BIOL 4133	Evolution
BIOL 4174	Mammalogy
BIOL 4215	Mammalian Physiology
BIOL 4223	Mammalian Physiology Laboratory
BIOL 4243	Introductory Pharmacology
BIOL 4283	Endocrinology
BIOL 4293	Behavioral Neuroendocrinology
BIOL 4215	Mammalian Physiology
BOT 3462	Plant Physiology Laboratory
CHEM 2113	Principles of Analytical Chemistry
CHEM 2122	Quantitative Analysis Laboratory
CHEM 3353	Descriptive Inorganic Chemistry
CHEM 3532	Physico-Chemical Measurements
CHEM 3553	Physical Chemistry II
CHEM 4020	Modern Methods of Chemical Analysis (1-5 hrs)
CHEM 4320	Chemical and Spectrometric Identification of Organic Compounds
ENTO 4854	Medical and Veterinary Entomology
MATH 2163	Calculus III
MATH 2233	Differential Equations
MATH 3013	Linear Algebra
MATH 3263	Linear Algebra and Differential Equations
MICR 3143	Medical Mycology
MICR 3154	Food Microbiology
MICR 3223	Advanced Microbiology
MICR 3253	Immunology
MICR 4012	Molecular Microbiology Laboratory I
MICR 4112	Molecular Microbiology Laboratory II
MICR 4123	Virology
MICR 4203	Bioinformatics
MICR 4053	Pathogenic Microbiology
MICR 4052	Pathogenic Microbiology Lab
MICR 4233	Advanced Cell and Molecular Biology
MICR 4253	Concepts in Medical Genetics
MICR 4263	Microbial Genetics: from Genes to Genomes
MICR 4323	Biological Energy Transduction
MICR 4423	Bacterial Cell Walls
NSCI 4123	Human Nutrition and Metabolism I
PHYS 4313	Molecular Biophysics
STAT 4013	Statistical Methods I (A) (if not used as (A) above))
<b>Total Hours</b>	<b>19-20</b>

<sup>1</sup> Total hours of BIOC 1990 Freshman Research in Biochemistry and BIOC 4990 Undergraduate Research may not exceed 10 hours.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## **Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Biosystems and Agricultural Engineering

The Department of Biosystems and Agricultural Engineering is administered jointly by the College of Agricultural Sciences and Natural Resources and the College of Engineering, Architecture and Technology.

Biosystems engineers are professionals who create and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of food, feed, fiber and other biological products, while at the same time providing for a quality environment and preserving and protecting natural resources. Biosystems engineers directly address problems and opportunities related to food, water, energy, and the environment - all of which are critical to the quality of life in our society. Subject-matter specialization is provided through the following four undergraduate option areas: bioprocessing and food processing, environment and natural resources, machine systems, and pre-medical.

Biosystems engineering courses integrate engineering sciences, physical sciences, and biological sciences, and teach students to address real-world challenges. With the guidance of experienced faculty, students work both as individuals and in teams to design creative solutions to complex problems.

The overall objective of the undergraduate biosystems engineering degree program is to provide the comprehensive education necessary to prepare students for successful, productive and rewarding careers in engineering for agricultural, food and biological systems.

Within a few years of graduation, Biosystems Engineering program graduates will become top professionals, managers or leaders in a wide variety of industries and organizations involved with Biosystems engineering, where they apply discovery, problem solving, and leadership skills for the benefit of their organization and the society at large.

The undergraduate educational program is divided into two components—pre-professional and professional. In the pre-professional portion of the biosystems engineering program (usually equivalent to two years of study) the focus is on the underlying biological, physical, chemical and mathematical principles of engineering, supplemented by appropriate general education courses in English, social sciences and humanities. Students who demonstrate proficiency in this portion of the program are eligible for admission to the professional school in Biosystems Engineering.

The professional school of biosystems engineering curriculum (typically two years) builds systematically upon the scientific knowledge acquired in the pre-professional curriculum. In professional school, students have the opportunity to focus on the option areas given above. The degree is accredited by the Engineering Accreditation Commission of the Accreditation Board of ABET, <http://www.abet.org>.

Each professional school course builds upon preceding engineering courses to develop in the student the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work incorporates the social and economic aspects of technical problems, and stresses the responsibilities as engineering professionals to behave ethically and promote occupational and public safety. The program culminates in senior year design courses in which students integrate the analysis, synthesis and other abilities they have developed

throughout the earlier portions of their study into a capstone experience. At this point, they are able to design components, systems and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. The students have also developed and displayed the ability to conduct experiments essential to specific studies and to analyze the experimental results and draw meaningful conclusions.

An integral part of this education continuum from basic science through comprehensive engineering design is learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. Moreover, the program provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and used as a part of their problem-solving experiences. Finally, the students' experiences in solving ever-more-challenging problems enable them to continue to learn independently throughout their professional careers.

A wide variety of employment opportunities are available for biosystems engineers in industry, public service and education. Some of these opportunities include positions in energy industry, governmental agencies, consulting engineering firms, and agricultural and food equipment industries. Biosystems engineers are employed throughout the U.S. as well as internationally.

### Undergraduate Programs

- Biosystems Engineering: Bioprocessing & Food Processing, BSBE (p. 1442)
- Biosystems Engineering: Environmental and Natural Resources, BSBE (p. 1444)
- Biosystems Engineering: Machine Systems & Agricultural Engineering, BSBE (p. 1446)
- Biosystems Engineering: Pre-Medical, BSBE (p. 1448)

### Graduate Programs

The Department of Biosystems and Agricultural Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees in Biosystems Engineering. These degrees emphasize research and development.

Excellent laboratory and computer facilities are available for students to explore research and design in such areas as bioprocessing and food engineering, machine vision, sensor and control technology, waste management and utilization, hydrology, water quality, porous media flow, and intelligent systems for agricultural machine design and production.

Research projects are supported by the Oklahoma Agricultural Experiment Station and by state, federal and private grants and contracts. A well-trained faculty members, many of whom are registered professional engineers with research, consulting and design experience, guide the graduate students' activities and plan programs to meet students' needs. Graduate students design experiments and special equipment to conduct their work. They are expected to demonstrate, by supporting research or by designs, the ability to identify a problem, define alternatives, propose a solution, organize a design or an experimental investigation, manage the project to completion and report the results through peer-reviewed papers and professional presentations.

## Admission Requirements

Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. Students without accredited degrees may be admitted provisionally and may be required to take additional courses. A student must be accepted by an adviser in the department prior to official admission to the graduate program.

## Degree Requirements

A candidate for the graduate degrees listed above follows an approved plan of study which must satisfy at least the minimum University requirements for that particular degree.

## Faculty

John N. Veenstra, PhD, PE, BCEE, Professor and Interim Head

**Professor and Decker Dawson Chair:** John N. Veenstra, PhD, PE, BCEE

**Regents Professor:** Glenn O. Brown, PhD, PE

**Professor, and Orville L. and Helen Buchanan Endowed Chair:** Carol Jones, PhD, PE

**Professor and Biobased Products and Energy Center Director:** Raymond L. Huhnke, PhD, PE

**Professor, Sarkeys Chair, and Assistant Director Natural Resources, Oklahoma Cooperative Extension Service:** Randal K. Taylor, PhD, PE  
**Director, Capital Projects for CASNR and Assistant Director, Oklahoma Agricultural Experiment Station:** Randy L. Raper, PhD, PE

**Professors:** Danielle D. Bellmer, PhD; Timothy J. Bowser, PhD, PE; Michael Buser, PhD; Nurhan Dunford, PhD, PE; Daniel E. Storm, PhD, PE; Dan Thomas, PhD, PE; Ning Wang, PhD, PE; Paul Weckler, PhD, PE

**Professors Emeriti:** Billy J. Barfield, PhD, PE; Ronald L. Elliott, PhD, PE; Michael D. Smolen, PhD; John Solie, PhD

**Associate Professors:** Hasan Atiyeh, PhD, PE; Robert Scott Frazier, PhD, PE; Douglas W. Hamilton, PhD, PE; Ajay Kumar, PhD, PE; Yu Mao, PhD

**Adjunct Associate Professor:** Derek Whitelock, PhD

**Assistant Professors:** John Long, PhD; Saleh Taghvaeian, PhD

**Adjunct Assistant Professor:** Sherry L. Hunt, PhD

**Associate Researchers:** J. D. Carlson PhD; Ron Miller, PhD

**Assistant Extension Specialist:** Albert J. Sutherland, MS

**Teaching Associate:** Ryan Clarke; Brent Haken



## Entomology and Plant Pathology

The mission for the Department of Entomology and Plant Pathology is to discover, develop and disseminate science based knowledge concerning arthropods and plant pathogens. Entomology is the science and study of insects and related arthropods. Plant Pathology is the science and study of bacteria, viruses, fungi, and nematodes that cause diseases in plants. A strong academic background in the physical and biological sciences is essential for success in both disciplines. Research and education programs range from basic studies of cellular, physiological, and genetic aspects to broad ecological and population studies and focus on the development of practical pest management strategies.

The undergraduate program in entomology leads to the BS in Entomology and offers students opportunities to explore the diversity of nature through the study of arthropods and their interactions with plants, animals, and human culture. Specialized course work in entomology includes insect identification, biology, ecology, physiology, biochemistry, population dynamics, medical and veterinary entomology, and insect pest management.

Plant pathology as a discipline encompasses the science required to understand the causes of plant diseases as well as prevention and controlling diseases. Undergraduate level courses are available in Plant Pathology and are valuable additions to programs in entomology, horticulture, agronomy, ecology and botany. Specialized course work in plant pathology includes pathogen identification, genetics, host pathogen physiology, biotechnology, molecular genetics and disease management.

There are many, and diverse, career opportunities for graduates of these programs, including positions involved with pest management in crops and livestock production, stored products such as grains and processed foods and protecting structural systems such as houses from termites and agricultural biotechnology. Undergraduate options in entomology include insect biology and ecology, bioforensics and pre-medical/pre-veterinary sciences. Undergraduates of the entomology program are prepared to enter graduate programs in several disciplines, including entomology and plant pathology and have been successful in seeking and receiving professional degrees in medical and veterinary science programs. Others gain employment with private industry, research laboratories or county, state or federal agencies. Some develop their own businesses as consultants and/or entrepreneurs.

### Minor in Entomology

This minor is designed to provide students with a basic understanding of insect biology, ecology and classification. Students are also instructed on applications of Entomology related to ecosystem function, conservation and agricultural impacts. Directed electives in this major also allow students to explore aspects of insect behavior, aquatic entomology, specific applications of entomology in horticulture, forestry, agronomy, and stored product scenarios. Requirements of the minor include 15 hours from core courses.

### Minor in Pest Management

This minor is designed to introduce students to pests including insects, plant pathogens, and weeds that damage, reduce the quality or increase production costs of agricultural crops or livestock, turf or ornamental plants, and trees. Integrated management methods for these pests will be presented including cultural, biological, and chemical control strategies. The minor is intended for students majoring in horticulture, plant and soil science, natural resource ecology and management, animal

science, environmental science, entomology, or other majors in biological sciences. Requirements of the minor include 18 hours with 9-12 hours from core courses.

## Undergraduate Programs

- Entomology (ENTO), Minor (p. 892)
- Entomology: Bio-Forensics, BSAG (p. 893)
- Entomology: Insect Biology and Ecology, BSAG (p. 895)
- Entomology: Pre-Veterinary and Pre-Medical, BSAG (p. 897)
- Pest Management (PEST), Minor (p. 899)

## Graduate Programs

The Department of Entomology and Plant Pathology offers programs of study that lead to the MS of Entomology and Plant Pathology, the PhD in Entomology or the PhD in Plant Pathology. These programs offer students opportunities to specialize in a wide range of basic or applied research fields. To qualify for graduate study in entomology and/or plant pathology an applicant should obtain a solid background in the basic sciences, especially biology, chemistry, mathematics, English and communications skills. All requirements of the Graduate College must be satisfied for entry to the graduate programs. In addition, applicants for graduate programs should take the Graduate Record Examination and submit their scores. Students applying to the graduate program must be accepted into a research program by a major professor. The applicant must secure appropriate financial support in the form of a scholarship, fellowship, or graduate assistantship to be negotiated with the major professor and department and be approved by the departmental screening committee and department head before being admitted to the Department. Each graduate student is under the direction of the major professor as adviser and a selected faculty advisory committee. The program of study will be adapted to the individual's needs within departmental and Graduate College guidelines. Graduate students are required to meet with their advisory committees every six months for program reports and examinations. Each student will follow a program of study and research approved by the student's committee and, must submit an approved thesis or dissertation, and present a public defense. Students supported as half-time research assistants are expected to be active participants in the research projects of their major professors. Additional information regarding the graduate programs in Entomology and Plant Pathology may be obtained from the department's website at: [www.entopl.okstate.edu](http://www.entopl.okstate.edu) (<http://www.entopl.okstate.edu>).

## Faculty

Phillip G. Mulder, Jr., PhD—Professor and Head

**Director, National Institute for Microbial Forensics and Food &**

**Agricultural Biosecurity (NIMFFAB):** Kitty Cardwell, PhD

**Associate Director, National Institute for Microbial Forensics and Food &**

**Agricultural Biosecurity (NIMFFAB):** Astri C. Wayadande, PhD

**Regents Professors:** Kristopher L. Giles, PhD; Haobo Jiang, PhD

**Regents Professor Emeritus:** Jacqueline Fletcher, PhD

**Endowed Professor Structural and Urban Entomology & Interim Pesticide**

**Coordinator:** Bradford M. Kard, PhD

**Professors:** John P. Damicone, PhD; Robert M. Hunger, PhD; Tom A. Royer,

PhD; Justin Talley, PhD; Nathan Walker, PhD

**Professors Emeriti:** Robert W. Barker, PhD; Carol Bender, PhD; Richard

C. Berberet, PhD; Jim T. Criswell, PhD; Kenneth Conway, PhD; Jack W.

Dillwith, PhD; Jonathon Edelson, PhD; Larry J. Littlefield, PhD; John R.

Sauer, PhD; Russell E. Wright, PhD



**Adjunct Professors:** Charles Abramson, PhD; Norman C. Elliott, PhD; Hassan A. Melouk, PhD; Richard Nelson, PhD; Gary Puterka, PhD; Hal Reed, PhD

**Associate Professors:** Carla Garzon, PhD; Li Maria Ma, PhD; Stephen Marek, PhD; Francisco Ochoa Corona, PhD; George Opit, PhD; Eric Rebek, PhD

**Adjunct Associate Professors:** J. Scott Armstrong, PhD; Kristen Baum, PhD; Carmen Greenwood, PhD; J.P. Michaud, PhD; Kiran Mysore, PhD; Carolyn Young, PhD

**Assistant Professors:** W. Wyatt Hoback, PhD; Bruce Noden, PhD

**Adjunct Assistant Professors:** Rebecca Bennett, PhD; Steven Frank, PhD; Deborah Jaworski, PhD; Jacquelyn Lee, PhD; Brian McCornack, PhD; Michael Reiskind, PhD; Kay Scheets, PhD; Damon Smith, PhD

**Assistant Researcher Professional:** Ali Zarrabi, PhD

**Assistant Researcher Scientist:** Trenna Blagden, PhD

**Associate Extension Specialist:** Andrine Shufran, PhD

**Assistant Extension Specialists:** Jen Olson, MS; Steven Kelly Seuhs, MS

**Director, Oklahoma Agricultural Leadership Program and Extension**

**Associate (Stored Products):** Edmond Bonjour, MS

## Entomology (ENTO), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 15

Code	Title	Hours
<b>Minor Requirements</b>		
ENTO 2993	Introduction to Entomology (LN)	3
Select one of the following:		3-4
ENTO 3044	Insect Physiology	
ENTO 4464	Insect Biology and Classification	
ENTO 4223	Ecological Methodology	
ENTO 4854	Medical and Veterinary Entomology	
Select 8-9 credit hours from any other ENTO courses to achieve the 15 minimum credits		8-9

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Entomology: Bio-Forensics, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 1513	College Algebra (A) <sup>1</sup>	
MATH 1613	Trigonometry (A) <sup>1</sup>	
MATH 2103	Business Calculus (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S) <sup>1</sup>		8
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
Course cannot be used here and as an (N)		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S)	3
ENTO 2993	Introduction to Entomology (LN)	3
STAT 2013	Elementary Statistics (A)	3
Select one of the following:		3
ANSI 1124	Introduction to the Animal Sciences	

BIOC 2344	Chemistry and Applications of Biomolecules	
ENVR 1113	Elements of Environmental Science	
FDSC 1133	Fundamentals of Food Science	
HORT 1013	Principles of Horticultural Science (LN)	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
NREM 1014	Introduction to Natural History (LN)	
NREM 1113	Elements of Forestry	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 2124	Fundamentals of Soil Science (N)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>19</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select two of the following:		8
ENTO 3044	Insect Physiology	
ENTO 4464	Insect Biology and Classification	
ENTO 4854	Medical and Veterinary Entomology	
<i>Additional Core Courses</i>		
ENTO 4573	Introduction to Forensic Entomology	3
SOC 4333	Criminology (S)	3
SOC 4743	Criminalistics: Introduction to Forensic Sciences	3
<i>Additional Entomology</i>		
ENTO 4800	Entomology Practicum	3
ENTO 2143	Global Issues in Agricultural Biosecurity and Forensics	3
<i>Related Courses</i>		
Genetics:		
Select one of the following:		3
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
ANSI 3423	Animal Genetics	
Chemistry:		
CHEM 1515	General Chemistry (LN)	5
Organic chemistry (5 upper division hours)		5
BIOC 3653	Survey of Biochemistry	3
Lab Courses:		
CHEM 2113	Principles of Analytical Chemistry	3

CHEM 2122	Quantitative Analysis Laboratory	2
BIOC 3723	Biochemistry and Molecular Biology Laboratory	3
Additional Biological Sciences:		
Select 7 hours of the following:		7
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	
MICR 3033	Cell and Molecular Biology	
MICR 4123	Virology	
MICR 4203	Bioinformatics	
MICR 4233	Advanced Cell and Molecular Biology	
MICR 4253	Concepts in Medical Genetics	
MICR 4263	Microbial Genetics: from Genes to Genomes	
MICR 4323	Biological Energy Transduction	
BIOL 3204	Physiology	
BIOL 4215	Mammalian Physiology	
BIOL 4243	Introductory Pharmacology	
BIOL 4283	Endocrinology	
BIOL 4293	Behavioral Neuroendocrinology	
BIOL 4303	Organismal Ecotoxicology	
Upper level entomology, plant pathology, biological sciences, forensic sciences courses not taken for credit in other categories.		
Additional Math and Science:		
Select 7 hours of the following:		7
MATH 2144	Calculus I (A)	
MATH 2153	Calculus II (A)	
BOT 1404	Plant Biology (LN)	
CHEM 3153	Organic Chemistry	
PHYS 1114	General Physics (LN)	
PHYS 1214	General Physics (LN)	
STAT 2331	SAS Programming	
STAT 4013	Statistical Methods I (A)	
STAT 4023	Statistical Methods II (A)	
BIOL 1604	Animal Biology	
BIOL 4133	Evolution	
Other math and science courses not taken for credit in other categories		
Foreign Language:		
Up to 10 credit hours of upper division foreign language may be substituted for Additional Natural Resources or Biological Sciences		
<b>Hours Subtotal</b>		61
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		120

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

# Entomology: Insect Biology and Ecology, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 1513	College Algebra (A) <sup>1</sup>	
MATH 1613	Trigonometry (A) <sup>1</sup>	
MATH 2103	Business Calculus (A) <sup>1</sup>	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		8
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
Course cannot be used here and as an (N)		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S)	3
ENTO 2993	Introduction to Entomology (LN)	3
STAT 2013	Elementary Statistics (A)	3

Select one of the following:		3
ANSI 1124	Introduction to the Animal Sciences	
BIOC 2344	Chemistry and Applications of Biomolecules	
ENVR 1113	Elements of Environmental Science	
FDSC 1133	Fundamentals of Food Science	
HORT 1013	Principles of Horticultural Science (LN)	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
NREM 1014	Introduction to Natural History (LN)	
NREM 1113	Elements of Forestry	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 2124	Fundamentals of Soil Science (N)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
Select one of the following: <sup>3</sup>		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>19</b>
<b>Major Requirements</b>		
With approval from the adviser and the department head, a maximum of 30 hours of science courses from an accredited doctoral health program may be substituted for major requirements other than the ENTO core courses of eight hours		
<i>Core Courses</i>		
Select 8 hours of the following:		8
ENTO 3044	Insect Physiology	
ENTO 4464	Insect Biology and Classification	
ENTO 4854	Medical and Veterinary Entomology	
<i>Additional Entomology</i>		
ENTO 4800	Entomology Practicum	3
Any entomology or plant pathology course not taken as a core course		12
<i>Related Courses</i>		
<i>Genetics:</i>		
Select one of the following:		3
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
ANSI 3423	Animal Genetics	
<i>Ecology:</i>		
Select one of the following:		3
BIOL 3034	General Ecology	
NREM 4033	Ecology Of Invasive Species	
<i>Chemistry:</i>		
CHEM 1225	General Chemistry (LN) <sup>1</sup>	5

or CHEM 1515	General Chemistry (LN)	
Select one of the following:		3
BIOC 3653	Survey of Biochemistry	
CHEM 3015	The Chemistry of Organic Compounds	
CHEM 3053	Organic Chemistry	
Additional Natural Resources or Biological Sciences:		
Select 12 hours of the following:		12
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3653	Survey of Biochemistry	
BOT 1404	Plant Biology (LN)	
BOT 3463	Plant Physiology	
BIOL 1604	Animal Biology	
HORT 3153	Turf Management	
HORT 3084	Plant Propagation	
NREM 2013	Ecology of Natural Resources	
NREM 3063	Natural Resource Biometrics	
NREM 3101	Forest Resource Field Studies	
NREM 3213	Forest Ecology	
NREM 3613	Principles of Rangeland Management	
NREM 4213	Forest Biology	
PLNT 2013	Applied Plant Science	
PLNT 3554	Plant Genetics and Biotechnology	
PLNT 4113	Advanced Weed Science	
PLNT 4123	Plant-Environment Interactions	
PLNT 4353	Plant Breeding	
PLP 3343	Principles of Plant Pathology	
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	
SOIL 4213	Precision Agriculture	
SOIL 4363	Environmental Soil Science	
SOIL 4893	Soil Chemistry and Environmental Quality	
BIOL 1604	Animal Biology	
BIOL 3104	Invertebrate Zoology	
BIOL 4104	General Parasitology	
BIOL 4133	Evolution	
Other upper level natural science courses not taken for credit in other categories		
Additional Math and Science:		
Select 12 hours of the following:		12
MATH 2103	Business Calculus (A)	
MATH 2144	Calculus I (A)	
MATH 2153	Calculus II (A)	
CHEM 3153 & CHEM 3112	Organic Chemistry and Organic Chemistry Lab	
PHYS 1114	General Physics (LN)	
PHYS 1214	General Physics (LN)	
STAT 2331	SAS Programming	
STAT 4013	Statistical Methods I (A)	
STAT 4023	Statistical Methods II (A)	
STAT 4043	Applied Regression Analysis	
BIOL 4133	Evolution	

Other math and science courses not taken for credit in other categories	
Foreign Language:	
Up to 10 credit hours of upper division foreign language may be substituted for Additional Natural Resources or Biological Sciences	
<b>Hours Subtotal</b>	61
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	120

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>3</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Entomology: Pre-Veterinary and Pre-Medical, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
or MATH 2103	Business Calculus (A)	
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
CHEM 1515	General Chemistry (LN) <sup>1</sup>	5
<i>Social &amp; Behavioral Sciences (S)</i>		
SPCH 2713	Introduction to Speech Communication (S) <sub>1</sub>	3
or SPCH 3733	Elements of Persuasion (S)	
<i>General Education</i>		
Any course designated (A), (H), (N), or (S)		3
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
CASNR Course cannot be used here and as an (N)		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S)	3
ENTO 2993	Introduction to Entomology (LN)	3

PHYS 1114 & PHYS 1214	General Physics (LN) and General Physics (LN)	8
STAT 2013 or STAT 2023	Elementary Statistics (A) Elementary Statistics for Business and Economics (A)	3
Select one of the following:		3
ANSI 1124	Introduction to the Animal Sciences	
BIOC 2344	Chemistry and Applications of Biomolecules	
ENVR 1113	Elements of Environmental Science	
FDSC 1133	Fundamentals of Food Science	
HORT 1013	Principles of Horticultural Science (LN)	
LA 1013	Introduction to Landscape Architecture and Landscape Management	
NREM 1014	Introduction to Natural History (LN)	
NREM 1113	Elements of Forestry	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 2124	Fundamentals of Soil Science (N)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>2</sup>	
<b>Hours Subtotal</b>		24
<b>Major Requirements</b>		
<i>Core ENTO Courses</i>		
ENTO 3003	Livestock Entomology	3
ENTO 3044	Insect Physiology	4
ENTO 4464	Insect Biology and Classification	4
ENTO 4854	Medical and Veterinary Entomology	4
ENTO 4800	Entomology Practicum (3 Hours)	3
<i>Additional Core Courses</i>		
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	5
BIOL 1604 or BIOL 3204	Animal Biology Physiology	4
Select one of the following:		5
CHEM 3015	The Chemistry of Organic Compounds	
CHEM 3053 & CHEM 3112	Organic Chemistry and Organic Chemistry Lab	
CHEM 3153 & CHEM 3112	Organic Chemistry and Organic Chemistry Lab	
BIOC 3653	Survey of Biochemistry	3
Select one of the following:		3
ANSI 3423	Animal Genetics (Vet)	
BIOL 3023	General Genetics (Med)	
<i>Related Courses</i>		
Select Alternative 1 or Alternative 2 (p. 898)		18
<b>Hours Subtotal</b>		56



**Electives**

Select 0 hours or hours to complete required total for degree	0
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Total Hours	120
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<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

**Alternatives****Alternative 1**

Complete the first 2 semesters in a College of Veterinary Medicine or Medical School

**Alternative 2**

Code	Title	Hours
Select 9 hours of the following:		9

ENTO 3021	Postharvest, Structural, and Urban Arthropod Pests	
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ENTO 3331	Insect Pests of Agronomic Crops	
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ENTO 3421	Horticultural Insects	
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ENTO 3461	Insects in Forest Ecosystems	
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ENTO 4733	Insect Behavior and Chemical Ecology	
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ENTO 4923	Applications of Biotechnology in Pest Management	
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ENTO 4800	Entomology Practicum (3 hours)	
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Select 9 hours of the following:		9
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ANSI 3543	Principles of Animal Nutrition	
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ANSI 4843	Applications of Biotechnology in Animal Science	
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BIOL 3023	General Genetics	
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MICR 3033	Cell and Molecular Biology	
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MICR 3253	Immunology	
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MATH 2144	Calculus I (A)	
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MATH 2153	Calculus II (A)	
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MATH 2163	Calculus III	
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BIOL 3114	Vertebrate Morphology	
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BIOL 3204	Physiology	
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BIOL 3214	Human Anatomy	
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BIOL 4104	General Parasitology	
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BIOL 4113	Conservation Genetics	
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BIOL 4134	Embryology	
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BIOL 4215	Mammalian Physiology	
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BIOL 4273	Environmental Physiology	
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BIOL 4283	Endocrinology	
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BIOL 4293	Behavioral Neuroendocrinology	
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**Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

**Other Requirements**

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Pest Management (PEST), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 18 hours

Code	Title	Hours
<b>Minor Requirements</b>		
Select one or both of the following:		3-6
ENTO 2993	Introduction to Entomology (LN)	
PLP 3343	Principles of Plant Pathology	
Select 3-6 hours of the following:		3-6
PLP 3663	Turfgrass Integrated Pest Management	
PLNT 4013	Principles of Weed Science	
PLNT 4113	Advanced Weed Science	
PLNT 4123	Plant-Environment Interactions	
ENTO 3003	Livestock Entomology	
ENTO 3021	Postharvest, Structural, and Urban Arthropod Pests	
ENTO 3331	Insect Pests of Agronomic Crops	
ENTO 3421	Horticultural Insects	
ENTO 3461	Insects in Forest Ecosystems	
ENTO 4854	Medical and Veterinary Entomology	
ENTO 4923	Applications of Biotechnology in Pest Management	
Select 3-4 hours of the following:		3-4
BOT 1404	Plant Biology (LN)	
PLNT 1213	Introduction to Plant and Soil Systems	
PLNT 2013	Applied Plant Science	
HORT 1013	Principles of Horticultural Science (LN)	
ANSI 1124	Introduction to the Animal Sciences	
MICR 2123	Introduction to Microbiology	
NREM 1113	Elements of Forestry	
NREM 2013	Ecology of Natural Resources	
SOIL 2124	Fundamentals of Soil Science (N)	
Select additional hours to total 18 hours, from any of the following, or other upper level course approved by the minor's departmental adviser:		2
ENTO 3003	Livestock Entomology	
ENTO 3021	Postharvest, Structural, and Urban Arthropod Pests	
ENTO 3044	Insect Physiology	
ENTO 3331	Insect Pests of Agronomic Crops	
ENTO 3421	Horticultural Insects	
ENTO 3461	Insects in Forest Ecosystems	
ENTO 4223	Ecological Methodology	
ENTO 4464	Insect Biology and Classification	
ENTO 4484	Aquatic Entomology	
ENTO 4854	Medical and Veterinary Entomology	
PLP 3343	Principles of Plant Pathology	
PLP 3553	Fungi: Myths and More	
PLP 3663	Turfgrass Integrated Pest Management	

ENTO/PLP 2143	Global Issues in Agricultural Biosecurity and Forensics
ENTO/PLP 4923	Applications of Biotechnology in Pest Management
PLNT 4013	Principles of Weed Science
PLNT 4113	Advanced Weed Science
PLNT 4123	Plant-Environment Interactions
SOIL 4363	Environmental Soil Science
SOIL 4483	Soil Microbiology
NREM 3613	Principles of Rangeland Management
NREM 4033	Ecology Of Invasive Species

## Additional OSU Requirements Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Environmental Sciences

(soil environmental chemistry); Arthur Stoecker, PhD (natural resource economics)

The College of Agricultural Sciences and Natural Resources offers an undergraduate major in environmental sciences. This interdisciplinary program is designed to improve the current and future welfare of the human race through understanding environmental policies based on scientific principles in accordance with the true benefits and costs as evaluated by an informed society.

As an interdisciplinary and science-oriented major, the student takes courses in biology, chemistry, math, physics, statistics, and social sciences. The student may choose one of three areas of emphasis (options): Environmental Policy, Natural Resources, or Water Resources. Depending on the option, upper-division course work will involve problem-solving work in water and soil quality, economic and social policy, political science, resource management and engineering. The student will also be exposed in general education subjects, including communications, philosophy, ethics and sociology.

A primary goal is to enable graduates to solve environmental problems based on scientific principles and in accordance with society's needs. Successful completion of this major earns the student the Bachelor of Science in Agricultural Sciences and Natural Resources degree.

The environmental sciences undergraduate major is directly supported by faculty from the departments of Agricultural Economics, Biosystems and Agricultural Engineering, Entomology and Plant Pathology, Horticulture and Landscape Architecture, Natural Resource Ecology and Management, and Plant and Soil Sciences. The major and its students also benefit from working in and out of the classroom or laboratory with faculty who are conducting cutting-edge research related to environmental problems through the Freshman Research Scholars Program.

Graduates work in such areas as land-use planning, environmental management, natural resources management, waste disposal, water and soil quality, environmental remediation and policy analysis. Industries associated with the extraction, utilization and manipulation of natural resources have increased the number of employees with environmental training to address regulation compliance, litigation, monitoring, public relations and management practices.

Graduates may also work with federal, state and local government agencies involved in regulation, resource management and policy development. Graduates, particularly those who have gone on to earn advanced degrees, find employment with consulting firms that are involved with solving environmental problems. Many graduates go on to graduate school or pursue a degree from a professional school, such as law or medicine.

## Undergraduate Programs

- Environmental Science (ENVR), Minor (p. 901)
- Environmental Science: Environmental Policy, BSAG (p. 902)
- Environmental Science: Natural Resources, BSAG (p. 904)
- Environmental Science: Water Resources, BSAG (p. 906)

## Faculty

Brian J. Carter, PhD—Professor and Director

**Professors:** Karen Hickman, PhD (plant ecology); Gail W.T. Wilson, PhD (restoration ecology)

**Associate Professors:** Tracy Boyer, PhD (natural resource economics); Tyson E. Ochsner, PhD (soil and water resources); Chad Penn, PhD

## Environmental Science (ENVR), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 19 hours

Code	Title	Hours
<b>Minor Requirements</b>		
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
AGEC 3503	Natural Resource Economics	3
or AGECE 4503	Environmental Economics and Resource Development	
ENVR 3113	Sampling and Analyses for Solving Environmental Problems	3
or ENVR 4893	Soil Chemistry and Environmental Quality	
NREM 4023	Restoration Ecology	3
or NREM 4033	Ecology Of Invasive Species	
Select one of the following:		3-4
NREM 4443	Watershed Hydrology and Water Quality	
GEOL 4453	Hydrogeology	
BAE 4314	Design Hydrology	

## Other Requirements

- At least nine upper-division hours must be taken at OSU.

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Environmental Science: Environmental Policy, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 124**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>1</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		40
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
CHEM 3013	The Chemistry of Organic Compounds	

BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	The Chemistry of Organic Compounds	
<i>Additional Requirements</i>		
If CHEM 1414 taken, then must have both CHEM 3015 and BIOC 2344		
BOT 1404	Plant Biology (LN)	4
CHEM 1314	General Chemistry (LN)	4
or CHEM 1215	General Chemistry (LN)	
CHEM 1515	General Chemistry (LN)	5
or CHEM 1225	General Chemistry (LN)	
GEOL 1114	Physical Geology (LN)	4
or BIOL 1604	Animal Biology	
PHYS 1114	General Physics (LN)	4
MATH 1513	College Algebra (A)	6
& MATH 2103	and Business Calculus (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
BCOM 3113	Written Communication	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
ENGL 3323	Technical Writing <sup>2</sup>	
<b>Hours Subtotal</b>		41
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGEC 3503	Natural Resource Economics	3
BIOL 3034	General Ecology	4
ENVR 3113	Sampling and Analyses for Solving Environmental Problems	3
ENVR 4811	Professional and Capstone Planning	1
ENVR 4813	Environmental Science Applications and Problem Solving	3
Select one of the following:		3
NREM 4043	Natural Resource Administration and Policy	
ENVR 4512	Environmental Impact Analysis	
POLS 4363	Environmental Law And Policy	
NREM 4443	Watershed Hydrology and Water Quality	3
ENVR 4893	Soil Chemistry and Environmental Quality	3
or BIOL 4303	Organismal Ecotoxicology	
<i>Additional Core Courses</i>		
AGEC 4503	Environmental Economics and Resource Development	3
Select one of the following:		3
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4043	Natural Resource Administration and Policy	
NREM 4053	Natural Resource Recreation	
Select one of the following:		3
SOC 4433	Environmental Sociology (S)	
LA 4423	Sustainable Planning and Design	
LA 4453	Principles of Landscape Analysis for Site Design	

**Related Courses**

Select 11 hours of the following:	11
ANTH 3353 Cultural Anthropology (IS)	
BCOM 3223 Oral Communication	
BOT 3253 Environment and Society (N)	
BOT 3263 Plants and People (N)	
CIVE 3853 Environmental Engineering Laboratory	
ECON 2103 Introduction to Microeconomics (S)	
ECON 3903 Economics of the Environment	
ENTO 2003 Insects and Society (N)	
ENTO 2223 Insects in Global Public Health (N)	
ENTO 2993 Introduction to Entomology (LN)	
ENTO 4223 Ecological Methodology	
ENTO 4484 Aquatic Entomology	
ENVR 4363 Environmental Soil Science	
ENVR 4893 Soil Chemistry and Environmental Quality	
ENVR 4913 Animal Waste Management	
GEOG 2344 Digital Tools for Environmental Exploration (LN)	
GEOG 4203 Fundamentals of Geographic Information Systems	
GEOL 3503 Environmental Geology	
GEOL 4453 Hydrogeology	
HORT 2123 Environmental Issues in Horticultural Science	
LA 4423 Sustainable Planning and Design	
LA 4433 Land Use and City Planning	
NREM 3083 Geospatial Technologies for Natural Resources	
NREM 3613 Principles of Rangeland Management	
NREM 4403 Wetland Ecology and Management	
NREM 4473 Global Issues of Water and Ecosystem Management	
PHYS 1214 General Physics (LN)	
or PHYS 2114 General Physics (LN)	
POLS 3493 Public Policy	
SOC 1113 Introductory Sociology (S)	
BIOL 4434 Limnology	
SOIL 3433 Soil Genesis, Morphology, and Classification	
SOIL 4234 Soil Nutrient Management	
SOIL 4463 Soil and Water Conservation	
SOIL 4483 Soil Microbiology	
SOIL 4683 Soil, Water, and Weather	
<b>Hours Subtotal</b>	<b>43</b>
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>124</b>

**Other Requirements**

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

**Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above then hours in this block are 0.

## Environmental Science: Natural Resources, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 124**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>1</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
CHEM 3013	The Chemistry of Organic Compounds	

BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	The Chemistry of Organic Compounds	
<i>Additional Requirements</i>		
If CHEM 1414 taken, then must have both CHEM 3015 and BIOC 2344		
BOT 1404	Plant Biology (LN)	4
or BIOL 1604	Animal Biology	
CHEM 1314	General Chemistry (LN)	4
or CHEM 1215	General Chemistry (LN)	
CHEM 1515	General Chemistry (LN)	5
or CHEM 1225	General Chemistry (LN)	
PHYS 1114	General Physics (LN)	4
Select one of the following:		4
PHYS 1214	General Physics (LN)	
MATH 2144	Calculus I (A)	
GEOL 1114	Physical Geology (LN)	
Select one of the following:		5
MATH 1715	Precalculus (A)	
MATH 1513	College Algebra (A)	
& MATH 1613	and Trigonometry (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
BCOM 3113	Written Communication	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
ENGL 3323	Technical Writing <sup>2</sup>	
<b>Hours Subtotal</b>		<b>40</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGEC 3503	Natural Resource Economics	3
BIOL 3034	General Ecology	4
ENVR 3113	Sampling and Analyses for Solving Environmental Problems	3
ENVR 4811	Professional and Capstone Planning	1
ENVR 4813	Environmental Science Applications and Problem Solving	3
Select one of the following:		3
NREM 4043	Natural Resource Administration and Policy	
ENVR 4512	Environmental Impact Analysis	
POLS 4363	Environmental Law And Policy	
NREM 4443	Watershed Hydrology and Water Quality	3
ENVR 4893	Soil Chemistry and Environmental Quality	3
or BIOL 4303	Organismal Ecotoxicology	
<i>Additional Core Courses</i>		
Select one of the following:		3
ENVR 4363	Environmental Soil Science	
ENVR 4913	Animal Waste Management	
SOIL 4683	Soil, Water, and Weather	
Select one of the following:		3
NREM 3613	Principles of Rangeland Management	
NREM 4023	Restoration Ecology	



NREM 4033	Ecology Of Invasive Species	
<i>Related Courses</i>		
Select 15 hours of the following:		15
AGEC 3713	Agricultural Law	
AGEC 4503	Environmental Economics and Resource Development	
ANTH 3353	Cultural Anthropology (IS)	
BCOM 3223	Oral Communication	
BOT 3005	Field Botany	
BOT 3253	Environment and Society (N)	
BOT 3263	Plants and People (N)	
BOT 4023	Community Ecology	
CIVE 3853	Environmental Engineering Laboratory	
ECON 2103	Introduction to Microeconomics (S)	
ECON 3903	Economics of the Environment	
ENTO 2003	Insects and Society (N)	
ENTO 2223	Insects in Global Public Health (N)	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 4223	Ecological Methodology	
ENTO 4484	Aquatic Entomology	
ENVR 4363	Environmental Soil Science	
ENVR 4893	Soil Chemistry and Environmental Quality	
ENVR 4913	Animal Waste Management	
GEOG 2344	Digital Tools for Environmental Exploration (LN)	
GEOG 4203	Fundamentals of Geographic Information Systems	
GEOL 3503	Environmental Geology	
GEOL 4453	Hydrogeology	
HORT 2123	Environmental Issues in Horticultural Science	
LA 4423	Sustainable Planning and Design	
LA 4433	Land Use and City Planning	
MICR 2123	Introduction to Microbiology	
MICR 2132	Introduction to Microbiology Laboratory	
MICR 3103	Microbes: Friends or Foes (N)	
NREM 3083	Geospatial Technologies for Natural Resources	
NREM 4403	Wetland Ecology and Management	
NREM 4473	Global Issues of Water and Ecosystem Management	
PHYS 1214	General Physics (LN)	
or PHYS 2114	General Physics (LN)	
POLS 3493	Public Policy	
SOC 1113	Introductory Sociology (S)	
SOC 4433	Environmental Sociology (S)	
SOIL 3433	Soil Genesis, Morphology, and Classification	
SOIL 4234	Soil Nutrient Management	
SOIL 4463	Soil and Water Conservation	
SOIL 4483	Soil Microbiology	
SOIL 4683	Soil, Water, and Weather	
BIOL 4434	Limnology	

<b>Hours Subtotal</b>	44
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	124

- College & Departmental requirements that may be used to meet GE requirements.
- If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above then hours in this block are 0.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Environmental Science: Water Resources, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 124**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>1</sup>	3
or SPCH 2713	Introduction to Speech Communication (S)	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
CHEM 3013	The Chemistry of Organic Compounds	

BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	The Chemistry of Organic Compounds	
<i>Additional Requirements</i>		
If CHEM 1414 taken, then must have both CHEM 3015 and BIOC 2344		
BOT 1404	Plant Biology (LN)	4
or BIOL 1604	Animal Biology	
CHEM 1314	General Chemistry (LN)	4
or CHEM 1215	General Chemistry (LN)	
CHEM 1515	General Chemistry (LN)	5
or CHEM 1225	General Chemistry (LN)	
PHYS 1114	General Physics (LN)	4
Select one of the following:		4
PHYS 1214	General Physics (LN)	
MATH 2144	Calculus I (A)	
GEOL 1114	Physical Geology (LN)	
Select one of the following:		5
MATH 1715	Precalculus (A)	
MATH 1513	College Algebra (A)	
& MATH 1613	and Trigonometry (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
BCOM 3113	Written Communication	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
ENGL 3323	Technical Writing <sup>2</sup>	
<b>Hours Subtotal</b>		<b>40</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
AGEC 3503	Natural Resource Economics	3
BIOL 3034	General Ecology	4
ENVR 3113	Sampling and Analyses for Solving Environmental Problems	3
ENVR 4811	Professional and Capstone Planning	1
ENVR 4813	Environmental Science Applications and Problem Solving	3
Select one of the following:		3
NREM 4043	Natural Resource Administration and Policy	
ENVR 4512	Environmental Impact Analysis	
POLS 4363	Environmental Law And Policy	
NREM 4443	Watershed Hydrology and Water Quality	3
ENVR 4893	Soil Chemistry and Environmental Quality	3
or BIOL 4303	Organismal Ecotoxicology	
<i>Additional Core Courses</i>		
Select one of the following:		3
ENVR 4363	Environmental Soil Science	
ENVR 4893	Soil Chemistry and Environmental Quality	
ENVR 4913	Animal Waste Management	
SOIL 4683	Soil, Water, and Weather	3
Select one of the following:		3
BIOL 4434	Limnology	

NREM 4473	Global Issues of Water and Ecosystem Management
GEOL 4453	Hydrogeology
<i>Related Courses</i>	
Select 12 hours of the following:	12
AGEC 3713	Agricultural Law
AGEC 4503	Environmental Economics and Resource Development
ANTH 3353	Cultural Anthropology (IS)
BCOM 3223	Oral Communication
BOT 3253	Environment and Society (N)
BOT 3263	Plants and People (N)
CHEM 2113	Principles of Analytical Chemistry
CHEM 2122	Quantitative Analysis Laboratory
CIVE 3853	Environmental Engineering Laboratory
ECON 2103	Introduction to Microeconomics (S)
ECON 3903	Economics of the Environment
ENTO 2003	Insects and Society (N)
ENTO 2223	Insects in Global Public Health (N)
ENTO 2993	Introduction to Entomology (LN)
ENTO 4223	Ecological Methodology
ENTO 4484	Aquatic Entomology
ENVR 4363	Environmental Soil Science
ENVR 4893	Soil Chemistry and Environmental Quality
ENVR 4913	Animal Waste Management
GEOG 2344	Digital Tools for Environmental Exploration (LN)
GEOG 4203	Fundamentals of Geographic Information Systems
GEOL 3503	Environmental Geology
GEOL 4453	Hydrogeology
HORT 2123	Environmental Issues in Horticultural Science
LA 4423	Sustainable Planning and Design
LA 4433	Land Use and City Planning
MATH 2133	Calculus for Technology Programs II (A)
or MATH 2153	Calculus II (A)
MICR 2123	Introduction to Microbiology
MICR 2132	Introduction to Microbiology Laboratory
NREM 3083	Geospatial Technologies for Natural Resources
NREM 3613	Principles of Rangeland Management
NREM 4023	Restoration Ecology
NREM 4033	Ecology Of Invasive Species
NREM 4403	Wetland Ecology and Management
PHYS 1214	General Physics (LN)
or PHYS 2114	General Physics (LN)
SOC 1113	Introductory Sociology (S)
SOC 4433	Environmental Sociology (S)
SOIL 3433	Soil Genesis, Morphology, and Classification
SOIL 4234	Soil Nutrient Management
SOIL 4463	Soil and Water Conservation

SOIL 4483	Soil Microbiology
SOIL 4683	Soil, Water, and Weather
BIOL 4303	Organismal Ecotoxicology
BIOL 4434	Limnology
<b>Hours Subtotal</b>	<b>44</b>
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>124</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above then hours in this block are 0.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Horticulture and Landscape Architecture

**Horticulture** is the science, business and art associated with the culture, production, preservation and processing of flowers, trees, shrubs, turfgrass, vegetables, fruits and nuts. It also includes the proper environmental use and maintenance of plants in the landscape. Horticulture is involved with the production and processing of a significant part of the nation's food supply. It provides a major source of the beauty in and around homes, cities, parks, highways, golf courses and other public areas. Educational opportunities for study in horticulture cover a wide variety of plants and subjects and range from the cellular to the whole plant level. Factors such as nutrition, irrigation, genetics, propagation, control of flowering, and fruit and seed production are considered in their relationship to culture, production, conservation of resources, harvesting, processing and storage. Students can prepare themselves for careers in public garden management (arboreta, parks and zoos), golf course management, horticulture business, environment and sustainability areas, sales and marketing, production, teaching, extension and research.

**Landscape Architecture** is an environmental design discipline. It applies artistic and scientific principles to the design, planning, and management of both natural and built environments. Landscape architects work a wide variety of projects including garden design, residential design, community planning, urban design, parks and recreation, commercial /campus design, and sustainable site design. The design process involves creative expression that comes from an understanding of the context of site (or landscape), natural systems, cultural systems and social dynamics. It requires one to interpret, imagine, draw, conceptualize, synthesize, and construct project ideas that transform both the landscapes and the users of those landscapes. As issues of sustainability are becoming more critical, Landscape Architects are poised to address them, as they design the interface between humankind and the urban, suburban, and natural environment.

The Department of Horticulture and Landscape Architecture offers undergraduate programs leading to the following degrees:

- BS in Horticulture,
- BS in Landscape Management and
- BLA in Landscape Architecture

[www.hortla.okstate.edu](http://www.hortla.okstate.edu) (<http://www.hortla.okstate.edu>)

**Horticulture Science** emphasis is on preparing students for science-based careers, including laboratory science or graduate study. This option provides the training and expertise for production, maintenance, and preservation of fruits, nuts, vegetables, nursery crops, flower crops, etc. Training can be general or be chosen to emphasize a particular commodity area of horticulture. Students learn plant care techniques and the role plants and landscape applications play in sustaining the environment.

**Horticulture Business** option features opportunity to combine horticulture with principles of running a business. A built-in requirement for a formal academic minor in a business area is a feature of this option.

**Turf Management** provides the training for turfgrass production and for management of turfgrass in golf courses, parks, athletic fields, home landscapes, airports and along highways.

**Public Horticulture** focuses on the people-plant interface, particularly in urban settings. Students may choose to specialize in either garden management or urban horticulture. The program is appropriate for those interested in careers in arboreta, botanic gardens, zoos, horticultural societies, park systems, museums, habitat creation and restoration (especially disturbed areas and/or wetlands) civic garden centers, and specialty crop production in developed areas. The option can also lead to graduate study. Students have the opportunity to be involved in The Botanic Garden at OSU and the department's television show, Oklahoma Gardening.

**Landscape Architecture** is the study of artistic, scientific and technical principles as they are applied to landscape planning, design, and management services. Landscape architects develop detailed landscape plans to be aesthetically pleasing, functional, and compatible with the built and natural environment. Students will experience a strong landscape design curriculum that is supported with courses in art, construction, horticulture, ecology, environmental science, and social science. This five-year Bachelor of Landscape Architecture (BLA) degree focuses on professional practice. This degree is nationally accredited by the Landscape Architectural Accreditation Board (LAAB). Study plans may be tailored to the individual with emphasis areas in Design, Environmental Planning, and Horticulture. Typical employers of landscape architects include landscape architecture firms, architectural/engineering firms and government agencies dealing with land planning, environmental and conservation applications, urban planning and parks/recreation.

**Landscape Management** emphasizes the construction and management phases of landscape development, including plants, environmental applications, and structures. This four-year program leads to a BS degree accredited by the National Association of Landcare Professionals (NALP). Courses includes basic landscape architectural design, construction technology, business and horticulture. Students may emphasize either landscape design or business management. Students emphasizing business management may complete a minor in Management through the OSU Spears School of Business. Graduates are employed by landscape contracting companies, design-build firms, landscape maintenance companies, landscape nurseries, and governmental agencies.

## Minor in Horticulture

Additional formal training in horticulture can benefit students in career areas as diverse as education, interior design, or entrepreneurship. The minor includes 15 hours of core courses in soil science, plant biology, and horticultural science, along with advanced cross-commodity applications in plant propagation. The core provides the basic prerequisites for further study. Students then select at least eight hours of controlled electives in horticulture according to their areas of interest. A total of 23 hours is required for the minor.

## Undergraduate Programs

- Horticulture: Horticultural Business, BSAG (p. 910)
- Horticulture: Horticultural Science, BSAG (p. 912)
- Horticulture: Public Horticulture, BSAG (p. 914)
- Horticulture: Turf Management, BSAG (p. 916)
- Landscape Architecture, BLA (p. 918)
- Landscape Management, BSAG (p. 921)

## Graduate Programs

The department offers programs of study leading to the degrees of Master of Science in Horticulture (with areas of specialization including Horticultural Science, Sustainable Landscape Design and Management, Phytochemistry and Turfgrass Science). Doctoral students can participate in multidisciplinary PhD programs in Crop Science, Environmental Science, Food Science, and Plant Science. Areas of study include floriculture crops, fruit and nut crops, vegetables, ornamental nursery crops, and turf. In addition to commodity-oriented specialties, students may emphasize food processing, environmental applications, plant extraction applications, postharvest physiology, or stress physiology disciplines. Applicants should indicate their interest area(s). Research opportunities range from whole plant production/management studies to fundamental cellular studies. Additional information on programs, application procedures, and financial assistance is available at: <http://www.hortla.okstate.edu/students/graduate-program/>.

## Prerequisites

Admission requires a bachelor's degree in Horticulture, Landscape Architecture, or a related field with at least a 3.00 ("B") grade-point average. Students with course work deficiencies in fundamental areas may be required to take remedial courses to attain proficiency in accordance with the advisory committee's guidance. In addition to Graduate College requirements, applicants must submit official GRE scores, a statement of research and career interests, and three letters of reference.

Admission to the program requires approval by the graduate committee, a departmental adviser on the Graduate Faculty, the department head, and Graduate College. The program of study and research will be directed by the student's graduate adviser and advisory committee.

## Faculty

Janet C. Cole, PhD, —Regents Professor and Head

**Professors:** Louis Anella, PhD; Lynn Brandenberger, PhD; Niels Maness, PhD; William McGlynn, PhD; Dennis Martin, PhD; Michael A. Schnelle, PhD

**Associate Professors:** Bruce Dunn, PhD; Michael Holmes, MLA; Justin Moss, PhD

**Assistant Professors:** Qing Luo, MLA; Cheryl Mihalko, MLA; Bo Zhang, PhD

**Assistant Extension Specialists:** Casey Hentges, MS; David Hillock, MS; Shelley Mitchell, PhD

# Horticulture: Horticultural Business, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2023	Elementary Statistics for Business and Economics (A)	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
BOT 1404	Plant Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>42</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
or ECON 2103	Introduction to Microeconomics (S)	
HORT 1013	Principles of Horticultural Science (LN)	3
SOIL 2124	Fundamentals of Soil Science (N)	4

## Written and Oral Communications

BCOM 3113	Written Communication	3
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>2</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>2</sup>	

**Hours Subtotal** 17

## Major Requirements

### Core Courses

ACCT 2103	Financial Accounting	3
ENTO 2993	Introduction to Entomology (LN)	3
HORT 2010	Internship in Horticulture or Landscape Management (3 hours)	3
HORT 3084	Plant Propagation	4
HORT 3113	Greenhouse Management	3
MGMT 3013	Fundamentals of Management (S)	3
MSIS 2103	Business Computer Concepts and Applications	3
PLP 3343	Principles of Plant Pathology	3
SPAN (3 credits)		3

### Related Courses

Select one option (p. 911) 15

Select 18 hours of the following: <sup>3</sup> 18

HORT 2513	Herbaceous Plant Materials	
HORT 2613	Woody Plant Materials	
HORT 3013	Arboriculture	
HORT 3153	Turf Management	
HORT 3213	Fruit and Nut Production	
HORT 3433	Commercial Vegetable Production	
HORT 3513	Landscape Irrigation	
HORT 3612	Bidding and Estimating	
HORT 3713	Urban Horticulture Production	
HORT 4053	International Experience in Horticulture (I)	
HORT 4133	Temperature Stress Physiology	
HORT 4453	Turfgrass Physiology and Ecology	
HORT 4543	Sustainable Nursery Production	
HORT 4713	Public Garden Management	
HORT 4773	Applied Landscape Planning	
HORT 4901	Horticulture in Controlled Environments Laboratory	
HORT 4903	Horticulture in Controlled Environments	
HORT 4933	Principles of Sustainable and Organic Horticulture	
HORT 4943	International Horticulture	
HORT 4953	Plant Growth and Development	
or HORT 4963	Horticulture Physiology	
HORT 4973	Sustainable Landscape Management	

### Electives

Select 0 hours or hours to complete required total for degree 0



<b>Hours Subtotal</b>	61
<b>Total Hours</b>	120

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used as (S) course above, hours in this block are reduced by three.
- <sup>3</sup> 15 hours must be upper-division.

## Options

Select either option

- the College of Agricultural Sciences and Natural Resources minor in Agricultural Economics and Agribusiness or option
- the Spears School of Business minor in General Business or option
- the Spears School of Business minor in Entrepreneurship.

### Option A

Select five upper-division (3 hour) AGECE courses excluding AGECE 3010 Internship in Agricultural Economics, AGECE 3101 Professional Career Development, AGECE 3183 Agribusiness Accounting and Taxation, AGECE 3990 Special Problems in Agricultural Economics, AGECE 4101 Agricultural Economics Seminar, AGECE 4990 Problems of Agricultural Economics. If ECON 2103 Introduction to Microeconomics (S) is taken instead of AGECE 1113 Introduction to Agricultural Economics (S), then ECON 2203 Introduction to Macroeconomics is required.

### Option B

Code	Title	Hours
Select 15 hours of the following:		15
ACCT 2203	Managerial Accounting	
ECON 2203	Introduction to Macroeconomics	
FIN 3113	Finance	
LSB 3213	Legal and Regulatory Environment of Business	
MKTG 3213	Marketing (S)	

### Option C

Code	Title	Hours
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	3
Select 6 hours of the following:		6
EEE 3020	Business Plan Laboratory	
EEE 3033	Women and Minority Entrepreneurship (D)	
EEE 4010	Special Topics in Entrepreneurship	
EEE 4113	Dilemmas and Debates in Entrepreneurship	
EEE 4263	Corporate Entrepreneurship	
EEE 4313	Emerging Enterprise Consulting	
EEE 4483	Entrepreneurship and New Technologies	
EEE 4533	Growing Small and Family Ventures	
EEE 4610	Entrepreneurship Practicum	
EEE 4653	Venture Capital	
EEE 4663	Imagination in Entrepreneurship	
LSB 3010	Special Topics in Legal Studies in Business	
ECON 3033	Economics of Entrepreneurship and Innovation	

ENGR 4113	Intellectual Property Law for Technical Professionals (S)	
MKTG 4550	Problems In Marketing	
MKTG 4973	New Product Development	
DHM 4453	Product Development Processes	
In addition, 6 hours of unrestricted electives must be taken in order to complete the minimum number of 120 total hours		6

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- A 2.25 GPA or higher is required in courses listed in the Major Requirements column above.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.



# Horticulture: Horticultural Science, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 1583	Applied Geometry and Trigonometry (A) <sup>1</sup>	
MATH 1613	Trigonometry (A) <sup>1</sup>	
3 hours STAT <sup>1</sup> designated (A)		
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
BOT 1404	Plant Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		42
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
or ECON 2103	Introduction to Microeconomics (S)	

HORT 1013	Principles of Horticultural Science (LN)	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Written and Oral Communications</i>		
ENGL 3323	Technical Writing <sup>3</sup>	3
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>2</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>2</sup>	
<b>Hours Subtotal</b>		17
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select one of the following:		3
BOT 3463	Plant Physiology	
HORT 4953	Plant Growth and Development	
HORT 4963	Horticulture Physiology	
CHEM 1225	General Chemistry (LN)	5
or CHEM 1515	General Chemistry (LN)	
ENTO 2993	Introduction to Entomology (LN)	3
HORT 2010	Internship in Horticulture or Landscape Management (3 hours)	3
HORT 3084	Plant Propagation	4
HORT 3113	Greenhouse Management	3
PLP 3343	Principles of Plant Pathology	3
Select 3 hours of Genetics		3
Select 3 hours of Organic Chemistry <sup>4</sup>		3
<i>Related Courses</i>		
Select 12 hours of 3000- or 4000- level courses in Botany or the College of Agricultural Sciences and Natural Resources		12
Recommended:		
BOT 3005	Field Botany	
BOT 3024	Plant Diversity	
BOT 3114	Plant Taxonomy	
BOT 3233	Plant Anatomy	
ENTO 3663	Turfgrass Integrated Pest Management	
ENTO 4223	Ecological Methodology	
ENTO 4923	Applications of Biotechnology in Pest Management	
HORT upper-division		
PLNT 4013	Principles of Weed Science	
PLNT 4123	Plant-Environment Interactions	
PLNT 4353	Plant Breeding	
SOIL 3433	Soil Genesis, Morphology, and Classification	
SOIL 3883	Sustainable Agriculture Concepts and Practice	
SOIL 4213	Precision Agriculture	
SOIL 4234	Soil Nutrient Management	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	
SOIL 4483	Soil Microbiology	
SOIL 4893	Soil Chemistry and Environmental Quality	

Select 18 hours of the following: <sup>5</sup>	18
HORT 2513 Herbaceous Plant Materials	
HORT 2613 Woody Plant Materials	
HORT 3013 Arboriculture	
HORT 3153 Turf Management	
HORT 3213 Fruit and Nut Production	
HORT 3433 Commercial Vegetable Production	
HORT 3513 Landscape Irrigation	
HORT 3612 Bidding and Estimating	
HORT 3713 Urban Horticulture Production	
HORT 4053 International Experience in Horticulture (I)	
HORT 4133 Temperature Stress Physiology	
HORT 4453 Turfgrass Physiology and Ecology	
HORT 4543 Sustainable Nursery Production	
HORT 4713 Public Garden Management	
HORT 4773 Applied Landscape Planning	
HORT 4901 Horticulture in Controlled Environments Laboratory	
HORT 4903 Horticulture in Controlled Environments	
HORT 4933 Principles of Sustainable and Organic Horticulture	
HORT 4943 International Horticulture	
HORT 4973 Sustainable Landscape Management	
<b>Hours Subtotal</b>	<b>60</b>
<i>Electives</i>	
Select 1 hour or hours to complete required total for degree	1
<b>Hours Subtotal</b>	<b>1</b>
<hr/>	
Total Hours	120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (S) course above, hours in this block are reduced by three.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above, then hours in this block are reduced by three.

<sup>4</sup> CHEM 3013 The Chemistry of Organic Compounds or BIOC 2344 Chemistry and Applications of Biomolecules recommended.

<sup>5</sup> 12 hours must be upper-division.

these changes do not result in semester credit hours being added or do not delay graduation.

- Degrees that follow this plan must be completed by the end of Summer 2023.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- A 2.25 GPA or higher is required in courses listed in the Major Requirements column above.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as

## Horticulture: Public Horticulture, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 1583	Applied Geometry and Trigonometry (A) <sup>1</sup>	
MATH 1613	Trigonometry (A) <sup>1</sup>	
3 hours STAT <sup>1</sup> designated (A)		
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
BOT 1404	Plant Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		42
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
or ECON 2103	Introduction to Microeconomics (S)	

HORT 1013	Principles of Horticultural Science (LN)	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>2</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>2</sup>	
<b>Hours Subtotal</b>		17
<b>Major Requirements</b>		
<i>Core Courses</i>		
ENTO 2993	Introduction to Entomology (LN)	3
HORT 2010	Internship in Horticulture or Landscape Management (3 hours)	3
HORT 2513	Herbaceous Plant Materials	3
HORT 2613	Woody Plant Materials	3
HORT 3084	Plant Propagation	4
HORT 3113	Greenhouse Management	3
HORT 3153	Turf Management	3
MGMT 3013	Fundamentals of Management (S)	3
PLP 3343	Principles of Plant Pathology	3
PLNT 4013	Principles of Weed Science	3
<i>Related Courses</i>		
Alternatives:		
Select one alternative (p. 914)		30
<b>Hours Subtotal</b>		61
<i>Electives</i>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		120

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (S) course above, hours in this block are reduced by three.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above, then hours in this block are reduced by three.

## Alternatives

### Alternative 1: Public Garden Management

Code	Title	Hours
ACCT 2103	Financial Accounting	3
HORT 4713	Public Garden Management	3
PLNT 3554	Plant Genetics and Biotechnology	4
Select 20 hours of the following: <sup>1</sup>		20
Select 5 HORT hours		
Select 6 BOT or NREM hours		

Select 3 AGED/AGLE/RMTR/PSYC hours

Select 6 MGMT hours

<sup>1</sup> 11 hours must be upper division.

## Alternative 2: Urban Horticulture

Code	Title	Hours
HORT 3013	Arboriculture	3
HORT 3513	Landscape Irrigation	3
HORT 3713	Urban Horticulture Production	3
HORT 4773	Applied Landscape Planning	3
NREM 2013	Ecology of Natural Resources	3
SOIL 4363	Environmental Soil Science	3
or SOIL 4463	Soil and Water Conservation	
Select one of the following:		3
SOC 3133	Racial and Ethnic Relations (DS)	
SOC 3423	Urban Sociology	
SOC 4433	Environmental Sociology (S)	
Select 9 hours of the following:		9
HORT 3213	Fruit and Nut Production	
HORT 3433	Commercial Vegetable Production	
HORT 4543	Sustainable Nursery Production	
HORT 4933	Principles of Sustainable and Organic Horticulture	
or HORT 4973	Sustainable Landscape Management	

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- A 2.25 GPA or higher is required in courses listed in the Major Requirements column above.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Horticulture: Turf Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
Select one of the following:		3
MATH 1583	Applied Geometry and Trigonometry (A) <sup>1</sup>	
MATH 1613	Trigonometry (A) <sup>1</sup>	
3 hours STAT <sup>1</sup> designated (A)		
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
BOT 1404	Plant Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		42
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
or ECON 2103	Introduction to Microeconomics (S)	

HORT 1013	Principles of Horticultural Science (LN)	3
SOIL 2124	Fundamentals of Soil Science (N) <sup>2</sup>	4
<i>Written and Oral Communications</i>		
BCOM 3113	Written Communication	3
or ENGL 3323	Technical Writing	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>2</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>2</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>2</sup>	
<b>Hours Subtotal</b>		17
<b>Major Requirements</b>		
<i>Core Courses</i>		
CHEM 1225	General Chemistry (LN)	5
or CHEM 1515	General Chemistry (LN)	
ENTO 2993	Introduction to Entomology (LN)	3
HORT 2010	Internship in Horticulture or Landscape Management (3 hours)	3
HORT 2613	Woody Plant Materials	3
HORT 3153	Turf Management	3
HORT 3513	Landscape Irrigation	3
HORT 4453	Turfgrass Physiology and Ecology	3
HORT 4773	Applied Landscape Planning	3
MCAG 3211	Engines and Power	1
PLNT 4013	Principles of Weed Science	3
PLP 3343	Principles of Plant Pathology	3
PLP 3663	Turfgrass Integrated Pest Management	3
SOIL 4234	Soil Nutrient Management	4
SPAN 3 credits		3
3 hours of Organic Chemistry <sup>4</sup>		3
<i>Related Courses</i>		
Select 9 hours of the following: <sup>5</sup>		9
ACCT 2103	Financial Accounting	
AGEC upper-division		
MSIS 2103	Business Computer Concepts and Applications (or CS (3 hours))	
BCOM 3223	Oral Communication	
BCOM 3333	Advanced Business Communication	
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	
HORT 3253	Personnel and Financial Management for Horticulture	
LSB 3213	Legal and Regulatory Environment of Business	
or AGECE 3713	Agricultural Law	
MGMT 3013	Fundamentals of Management (S)	
MKTG 3213	Marketing (S)	
Select 6 hours of the following: <sup>6</sup>		6
AGEC 3503	Natural Resource Economics	
BOT 3233	Plant Anatomy	
BOT 3463	Plant Physiology	
GEOG 3023	Climatology (N)	

GEOG 3033	Meteorology (N)	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
HORT 3013	Arboriculture	
HORT 3113	Greenhouse Management	
HORT 3612	Bidding and Estimating	
HORT 4133	Temperature Stress Physiology	
HORT 4493	Athletic Field Management	
HORT 4953	Plant Growth and Development	
HORT 4963	Horticulture Physiology	
HORT 4973	Sustainable Landscape Management	
PLNT 3554	Plant Genetics and Biotechnology	
PLNT 4113	Advanced Weed Science	
PLNT 4123	Plant-Environment Interactions	
SOIL 3433	Soil Genesis, Morphology, and Classification	
SOIL 4213	Precision Agriculture	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	
SOIL 4893	Soil Chemistry and Environmental Quality	
<b>Hours Subtotal</b>		61
<i>Electives</i>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>120</b>

- Degrees that follow this plan must be completed by the end of Summer 2023.

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (S) course above, hours in this block are reduced by three.

<sup>3</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above, then hours in this block are reduced by three.

<sup>4</sup> CHEM 3013 The Chemistry of Organic Compounds or BIOC 2344 Chemistry and Applications of Biomolecules recommended.

<sup>5</sup> 6 hours must be upper-division.

<sup>6</sup> Must be upper-division.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- A 2.25 GPA or higher is required in courses listed in the Major Requirements column above.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.

# Landscape Architecture, BLA

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average:** 2.00

**Total Hours:** 150

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1583	Applied Geometry and Trigonometry (A) <sup>1</sup>	3
or MATH 1613	Trigonometry (A)	
<i>Humanities (H)</i>		
LA 3673	History and Theory of Landscape Architecture (H) <sup>1</sup>	3
Course designated (H)		3
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
SOIL 2124	Fundamentals of Soil Science (N) <sup>1</sup>	4
<i>Social &amp; Behavioral Sciences (S)</i>		
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>1</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>1</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>1</sup>	
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		42
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		

AG 1011	First Year Seminar	1
LA 1013	Introduction to Landscape Architecture and Landscape Management	3
<i>Written and Oral Communications</i>		
BCOM 3113	Written Communication <sup>2</sup>	3
or ENGL 3323	Technical Writing	
<i>Economics</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>3</sup>	3
or ECON 2103	Introduction to Microeconomics (S)	
<b>Hours Subtotal</b>		10
<b>Major Requirements</b>		
<i>Core Courses</i>		
Visual Communication:		
LA 2213	Visual Communication I for Landscape Architecture	3
LA 2223	Visual Communication II for Landscape Architecture	3
LA 2323	Computer-Aided Design	3
ART 1103	Drawing I	3
Surveying:		
MCAG 2313	Surveying	3
Construction:		
LA 3884	Architectural Construction 1: Site Grading	4
LA 3894	Landscape Architectural Construction II: Sustainable Applications	4
LA 4894	Landscape Architectural Construction 3: Materials and Methods	4
Planning:		
LA 4453	Principles of Landscape Analysis for Site Design	3
Select 9 hours of the following:		9
LA 4423	Sustainable Planning and Design	
LA 4433	Land Use and City Planning	
LA 4583	Landscape Environmental Planning	
NREM 2013	Ecology of Natural Resources	
GEOG 3123	Urban Geography (S)	
Design:		
LA 3315	Studio I: Principles and Theory of Design	5
LA 3325	Studio 2: Site Design	5
LA 4034	Landscape Planting Design	4
LA 4415	Studio III: Recreation and Open Space Design	5
LA 4425	Ecological Planning and Community Design	5
LA 4515	Studio 5: Urban Design	5
LA 4525	Studio 6: Collaborative	5
Plant Material:		
HORT 2613	Woody Plant Materials	3
Professional Practice:		
LA 3112	Landscape Architecture National Survey	2
LA 3682	Professional Practice and Office Procedure	2
LA 4112	Landscape Architecture Career Survey	2
Internship:		
LA 3010	Internship in Landscape Architecture	2



**Emphasis Areas**

Select 11 hours from one of the emphasis areas (p. 919)	11
<b>Hours Subtotal</b>	<b>95</b>
<b>Electives</b>	
Select 3 hours or hours to complete required total for degree.	3
<b>Hours Subtotal</b>	<b>3</b>
<b>Total Hours</b>	<b>150</b>

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above, then hours in this area are zero.
- <sup>3</sup> If used as (S) course above, hours in this block are reduced by three.

**Emphasis Areas**

These courses may apply to any area: LA 2513 Native American Symbolism in Landscape Design (D), LA 3010 Internship in Landscape Architecture, LA 4053 International Experience in Landscape Architecture - Asia (I), LA 4063 International Experience in Landscape Architecture - Peru (I) LA 4423 Sustainable Planning and Design, LA 4990 Landscape Architecture Special Problems, LA 5110 Advanced Special Problems, Courses listed or other courses approved by Program Director.

**Design**

Code	Title	Hours
ARCH 1112	Introduction to Architecture	2
ARCH 1216	Architectural Design Studio I	6
ARCH 2003	Architecture and Society (HI)	3
ARCH 2116	Architectural Design Studio II	6
ARCH 2216	Architectural Design Studio III	6
ARCH 2263	Building Systems	3
ARCH 5193	Management of Architectural Practice	3
ARCH 5373	Field Study in Europe II	3
ART 1113	Drawing II	3
ART 1203	Visual Thinking: Image and Surface	3
ART 1303	Visual Thinking: Form and Space	3
ART 1603	Introduction to Art (H)	3
ART 2003	Studio Methods and Preparation	3
ART 2113	Life Drawing	3
ART 3110	Life Drawing Studio	3
DHM 1123	Graphics for Interior Design I	3
DHM 3233	Heritage of Interior Design I (H)	3
DHM 4143	Design for Special Needs	3
DHM 4573	Sustainable Design for Apparel and Interiors	3

**Environmental Planning**

Code	Title	Hours
AGEC 3503	Natural Resource Economics	3
BOT 1404	Plant Biology (LN)	4
BOT 3253	Environment and Society (N)	3
ENVR 1113	Elements of Environmental Science	3
ENVR 4813	Environmental Science Applications and Problem Solving	3

GEOG 1113	Introduction to Cultural Geography (IS)	3
GEOG 1114	Physical Geography (LN)	4
GEOG 1713	World Regional Geography (IS)	3
GEOG 2344	Digital Tools for Environmental Exploration (LN)	4
GEOG 3123	Urban Geography (S)	3
GEOG 3153	Conservation of Natural Resources (S)	3
GEOG 3173	Cultural Geography (S)	3
GEOG 3703	Geography Of Oklahoma (S)	3
GEOG 4113	Environment and Development	3
GEOG 4123	Geographical Aspects of Urban Planning	3
GEOG 4143	Geography of Travel and Tourism	3
GEOG 4153	Geography of Outdoor Recreation	3
GEOG 4333	Remote Sensing	3
GEOG 4343	Geographic Information Systems: Resource Management Applications	3
GEOL 1114	Physical Geology (LN)	4
GEOL 3073	Geomorphology	3
HIST 3463	Modern Latin America (HI)	3
HIST 4063	Historic Preservation	3
HIST 4503	American Urban History (H)	3
HIST 4523	American Environmental History (H)	3
POLS 4363	Environmental Law And Policy	3
POLS 4593	Natural Resources and Environmental Policy	3
SOC 3423	Urban Sociology	3
SOC 4433	Environmental Sociology (S)	3
NREM 2013	Ecology of Natural Resources	3
NREM 4063	Ecotourism and Wilderness Management	3
NREM 4093	Natural Resources, People and Sustainable Development (I)	3
NREM 4403	Wetland Ecology and Management	3
BIOL 4303	Organismal Ecotoxicology	3

**Horticulture**

Code	Title	Hours
HORT 1013	Principles of Horticultural Science (LN)	3
HORT 2513	Herbaceous Plant Materials	3
HORT 3013	Arboriculture	3
HORT 3153	Turf Management	3
HORT 3513	Landscape Irrigation	3
HORT 3612	Bidding and Estimating	2
HORT 4453	Turfgrass Physiology and Ecology	3
HORT 4543	Sustainable Nursery Production	3
HORT 4713	Public Garden Management	3
HORT 4990	Horticultural Problems	1-6
BOT 1404	Plant Biology (LN)	4

**Other Studies**

Requires study plan approved by adviser, program director, and department head.

## **Other Requirements**

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## **Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Landscape Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1583	Applied Geometry and Trigonometry (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
or BOT 1404	Plant Biology (LN)	
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
HORT 1013	Principles of Horticultural Science (LN)	3
<i>Social &amp; Behavioral Sciences (S)</i>		
Course designated (S)		3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>41</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
AGEC 1113	Introduction to Agricultural Economics (S) <sup>2</sup>	3
or ECON 2103	Introduction to Microeconomics (S)	
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Written and Oral Communications</i>		
ENGL 3323	Technical Writing <sup>3</sup>	3
or BCOM 3113	Written Communication	

AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>2</sup>	3
or SPCH 3733	Elements of Persuasion (S)	
<b>Hours Subtotal</b>		<b>14</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ACCT 2103	Financial Accounting	3
HORT 2010	Internship in Horticulture or Landscape Management (2 hours)	2
or LA 3010	Internship in Landscape Architecture	
HORT 2513	Herbaceous Plant Materials	3
HORT 2613	Woody Plant Materials	3
HORT 3013	Arboriculture	3
HORT 3153	Turf Management	3
HORT 3513	Landscape Irrigation	3
HORT 3612	Bidding and Estimating	2
LA 2213	Visual Communication I for Landscape Architecture	3
LA 2223	Visual Communication II for Landscape Architecture	3
LA 2323	Computer-Aided Design	3
LA 3315	Studio I: Principles and Theory of Design	5
LA 3884	Architectural Construction 1: Site Grading	4
LA 4894	Landscape Architectural Construction 3: Materials and Methods	4
LSB 3213	Legal and Regulatory Environment of Business	3
MCAG 2313	Surveying	3
MKTG 3213	Marketing (S)	3
SPAN 3 credits		3
<i>Related Courses</i>		
Select one emphasis (p. 921)		9
<b>Hours Subtotal</b>		<b>65</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		
<b>Total Hours</b>		<b>120</b>

- College & Departmental requirements that may be used to meet GE requirements.
- If used as (S) course above, hours in this block are reduced by three.
- If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above, then hours in this block are reduced by three.

## Emphasis Areas Management Emphasis

Take MGMT 3313 Human Resource Management and MGMT 4073 Management and Ethical Leadership to complete a minor in management.

Code	Title	Hours
ACCT 2203	Managerial Accounting	3
or ECON 2203	Introduction to Macroeconomics	
MGMT 3013	Fundamentals of Management (S)	3
MGMT 3123	Managing Behavior and Organizations	3

## Design Emphasis

Code	Title	Hours
LA 3325	Studio 2: Site Design	5
LA 4034	Landscape Planting Design	4

Other Studies: Requires study plan approved by adviser, program director, and department head

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.
- A 2.25 GPA or higher is required in courses listed in the Major Requirements column above.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## International Agriculture

Shida R. Henneberry, PhD—Professor and Director

### Master of Agriculture in International Agriculture (MAIA)

The Master of Agriculture in International Agriculture (MAIA) is a multidisciplinary degree program that provides students the diverse background necessary to design, implement, and manage agricultural programs in developed and developing areas. The program prepares candidates for positions in the public and private sectors related to international agricultural development and marketing. Graduates work in international agribusinesses, non-profit organizations, development agencies, government and diplomatic service, education, agricultural extension, agricultural trade associations and commodity groups and other positions in global agriculture. Others pursue a personal desire to make a difference in the world by doing agricultural development work in a developing country, or working in areas recovering from a natural disaster. The MAIA is for students who prefer to blend theory and practice to improve the lives of people, develop professional skills and network through an international agricultural experience, develop a focus area to support professional goals, develop broader understanding of world cultures and issues, and engage in international travel.

Three alternatives exist for satisfying requirements for the MAIA degree:

1. 32 credit hours, including two credit hours for a formal report,
2. 36 credit hours and a creative component, and
3. 36 credit hours, including six hours for a professional internship.

A minimum of 21 credit hours must be earned at the 5000 level or above. The creative component, research for formal report, and professional internship are expected to be in the area of international agriculture. Each student must take 17 semester credit hours of approved core courses, a minimum of 12 semester credit hours of focus area course, and at least three hours of electives. Each student is required to have an international experience of four weeks or longer.

### Master of Science in International Agriculture (MSIA)

The Master of Science in International Agriculture is designed to prepare candidates for positions in the public and private sectors related to agricultural sciences and natural resources, or for continuation in a Ph.D. program. The MSIA accommodates those students who prefer to take theoretical courses preparing them for research. This program will provide students the theoretical, science, and research backgrounds necessary to design, implement, and manage agricultural programs in developed and developing countries. It allows participants to blend theory and practice to improve the lives of people. Advanced study leading to the Master of Science degree in the field of International Agriculture prepares students for such professional careers as business analyst, international trade and development specialist, college-level educator, agricultural extension specialist, and professional work with non-profit organizations, government sectors, and agricultural commodity groups. The program is multidisciplinary, allowing students the freedom to focus on the area of study they choose.

Three alternatives exist for satisfying requirements for the M.S. degree:

1. With thesis, 30 credit hours, consisting of 24 hours of course work and six hours for a thesis\*
2. With report, 32 credit hours, consisting of 30 hours of course work and two hours of research\*
3. With no thesis or report, 32 credit hours of course work and a creative component\*

Degree candidates are expected to conduct research related to a topic on international agriculture. The course requirements include one course in quantitative or qualitative analysis and one course in research methodology, and a minimum of nine additional hours in graduate-level courses in agricultural sciences and natural resources or related areas

## Natural Resource Ecology and Management

Faculty in the Department of Natural Resource Ecology and Management (NREM) have expertise in conducting interdisciplinary instruction, research, and extension education which focus on the natural resources of fisheries, forests, rangeland, and wildlife within and beyond the boundaries of Oklahoma. Increased public understanding of the ecology and management of these natural resources which are important in agriculture, hunting and fishing, ecotourism, forest production and use, as well as the conservation of wildlife habitat is an important goal of the faculty in NREM.

The NREM faculty support undergraduate and graduate programs in Fisheries, Forestry, Rangeland, and Wildlife. The NREM curriculum prepares students to plan, implement, and research the management, protection, and sustainable use of natural resources within Oklahoma and throughout the world. The department provides an integrated education in renewable natural resource management, conservation, and utilization, as well as a valuable perspective for understanding and solving critical contemporary environmental problems at local, regional, and global scales.

Courses in NREM study options fulfill the requirements for many applied and professional careers in the natural resource disciplines, including preparation for graduate programs and certification with the Society of American Foresters, The Wildlife Society and The American Fisheries Society. Graduates may be employed by governmental agencies, non-profit organizations, private agencies or individuals. Federal agencies hiring NREM graduates include U.S. Department of Agriculture, U.S. Forest Service, U.S. Bureau of Land Management, U.S. Geological Survey, U.S. Fish and Wildlife Service, Agricultural Research Service, Bureau of Indian Affairs, National Park Service, Animal and Plant Health Inspection Service, and the Natural Resources Conservation Service. In addition, state, county, and municipal governments employ NREM graduates in a variety of resource management consultant, restoration, service, and technical positions.

### Natural Resource Ecology and Management Degree Options

**Fisheries and Aquatic Ecology** is an option designed for students with interest in the management of fish populations and habitats. Courses offer research techniques and methodology in fisheries science, including sampling design, habitat measurements, sampling techniques and abundance estimation, age and growth analysis, recreational surveys, data analysis and report writing.

**Forest Ecology and Management** emphasizes the science-based conservation and management of forest lands, ecosystems and related natural resources. Students gain the skills that are necessary for the measurement, assessment, and valuation of natural resources and the evaluation of management strategies for forest and related wildlands. Successful completion of the curriculum will provide competency in the general areas of basic science, forest biology, forest mensuration, forest economics, natural resource policy, decision-making and problem solving, and communications. The option is accredited by the Society of American Foresters (SAF), the specialized accrediting body for forestry programs in the U.S. Requirements for this option include the successful completion of two, three-week field camps in May, which are scheduled to follow the sophomore and junior years, and are held annually in diverse forest settings. Field forestry skills, forest ecology, integrated natural

resource management, and state-of-the-art operations are emphasized at camp.

**Rangeland Ecology and Management** program emphasizes understanding management of grasslands, shrub lands, and forests for forage and habitat production. This includes the effects of grazing, fire, and other disturbances on biotic and abiotic processes. Students learn to integrate their knowledge of soil, water and vegetation attributes into management of public or private wild lands for multiple uses.

**Wildlife Ecology and Management** option provides insight into the biological basis for management of wildlife populations and habitats, with emphasis on current management problems. This option combines research techniques, including aging and sexing, wildlife and vegetation sampling, and wildlife population and habitat analysis with the methodology of wildlife science.

**Wildlife Biology and Preveterinary Science** option provides ecological background and training in natural wildlife science and population dynamics in addition to the basic sciences necessary to prepare students for graduate education in wildlife biology or veterinary medicine. The option combines research and management training in population ecology with basic biology and chemistry.

Students entering the NREM department are encouraged to join and become active members of one of the many student organizations: Society of American Foresters, Society for Range Management, The Wildlife Society, and the American Fisheries Society. Participation in one or more of these organizations provides students the opportunity to attend state, regional, or national meetings where they will gain valuable advantages through networking, student competitions, and interacting with various career-related activities.

### Undergraduate Programs

- Fisheries and Aquatic Ecology (FAEC), Minor (p. 926)
- Forestry (FOR), Minor (p. 927)
- Natural Resource Ecology & Management: Fisheries & Aquatic Ecology, BSAG (p. 928)
- Natural Resource Ecology & Management: Forest Ecology & Management, BSAG (p. 930)
- Natural Resource Ecology & Management: Rangeland Ecology & Management, BSAG (p. 932)
- Natural Resource Ecology & Management: Wildlife Biology & Preveterinary Science, BSAG (p. 934)
- Natural Resource Ecology & Management: Wildlife Ecology & Management, BSAG (p. 936)
- Natural Resource Ecology and Management (NREM), Minor (p. 938)
- Rangeland Ecology and Management (REM), Minor (p. 939)
- Wildlife Ecology (WLEC), Minor (p. 940)

### Graduate Programs

The Department offers the MS and PhD degrees in Natural Resource Ecology and Management with specializations in Fisheries and Aquatic Ecology, Forest Resources, Rangeland Ecology and Management, and Wildlife Ecology and Management. In addition, students may work toward the MS and PhD degrees in the Environmental Science Graduate Program and the PhD degree in the Plant Science Graduate Program with faculty members from the Department.

The overall goals of the Department are to provide high quality advanced training and instruction in the application of the scientific method to problems in natural resource ecology and management. This includes problem analysis and identification, research methods, synthesis of results and communication of findings. The Department strives to develop the capability for original and creative work under the guidance of established professionals and scientists. Graduate instruction is a critical component of the research, instruction and extension missions of the Department.

Students work directly with a member of the faculty to design a program of study to serve individual career goals. The prerequisite for graduate study in the Department is a bachelor's degree in an area aligned with the student's research interests with a minimum overall GPA of 3.00. Please refer to the website [nrem.okstate.edu](http://nrem.okstate.edu) (<http://nrem.okstate.edu>) for a full description of the application process. A student must be accepted by a member of the Department's faculty prior to official admission to the program.

## Faculty

Robert J. (Jim) Ansley Jr., PhD— Professor and Head

**Regents Professor:** Samuel D. Fuhlendorf, PhD

**Professors:** Craig A. Davis, PhD; Karen R. Hickman, PhD; Salim Hiziroglu, PhD; Thomas Kuzmic, PhD; Thomas B. Lynch, PhD; Rodney E. Will, Jr., PhD; Gail W.T. Wilson, PhD

**Associate Professors:** R. Dwayne Elmore, PhD; Timothy J. O'Connell, PhD; Daniel E. Shoup, PhD; Chris Zou, PhD

**Assistant Professors:** W. Sue Fairbanks, PhD; Laura E. Goodman, PhD; Omkar Joshi, PhD; Scott R. Loss, PhD

**Adjunct Associate Professors:** Shannon Brewer, PhD; James Long, PhD

**Non-tenure Track Faculty:** Marley Beem, PhD; Mark S. Gregory, MS; John R. Weir, MS



## Fisheries and Aquatic Ecology (FAEC), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 22 hours

Code	Title	Hours
<b>Minor Requirements</b>		
NREM 3013	Applied Ecology and Conservation	3
NREM 4403	Wetland Ecology and Management	3
or NREM 4424	Fisheries Techniques	
NREM 4414	Fisheries Management	4
BIOL 4434	Limnology	4
Select 8 hours of the following:		8
ENTO 4484	Aquatic Entomology	
BIOL 4113	Conservation Genetics	
or BIOL 4413	Biology of Fishes	
NREM 3012	Applied Ecology Laboratory	
NREM 4403	Wetland Ecology and Management	
or NREM 4424	Fisheries Techniques	
NREM 4452	Pond Management	
NREM 4453	Aquaculture (if not previously used)	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Forestry (FOR), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 23 hours

Code	Title	Hours
<b>Minor Requirements</b>		
NREM 1113	Elements of Forestry	3
NREM 2103	Forest Measurements I	3
NREM 2134	Dendrology	4
NREM 3013	Applied Ecology and Conservation	3
NREM 3224	Silviculture	4
Select a minimum of 6 additional hours (at least three hours must be upper division) of the following:		6
NREM 1213	Introduction to Wood Properties and Products	
NREM 2112	Timber Harvesting	
NREM 3012	Applied Ecology Laboratory	
NREM 3063	Natural Resource Biometrics	
NREM 3101	Forest Resource Field Studies	
NREM 3102	Forest Measurements II	
NREM 3103	Natural Resource Field Studies	
NREM 4213	Forest Biology	
NREM 4333	Forest Resource Management: Planning and Decision-Making	
NREM 4443	Watershed Hydrology and Water Quality	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Natural Resource Ecology & Management: Fisheries & Aquatic Ecology, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 125**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
NREM 1012	Introduction to Natural Resource Ecology and Management	2
NREM 2013	Ecology of Natural Resources	3
<i>Natural Sciences</i>		
BIOL 1604	Animal Biology	4

BOT 1404	Plant Biology (LN)	4
CHEM 1215	General Chemistry (LN)	4
or CHEM 1314	General Chemistry (LN)	
CHEM 1225	General Chemistry (LN)	5
or CHEM 1515	General Chemistry (LN)	
GEOL 1114	Physical Geology (LN) <sup>2</sup>	4
or PHYS 1014	Descriptive Physics (N)	

### *Written and Oral Communications*

Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S) <sup>4</sup>	

**Hours Subtotal** 33

### **Major Requirements**

#### *Core Courses*

Select one of the following:		3
ANSI 3423	Animal Genetics	
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3523	Fish and Wildlife Population Biology	3
NREM 4001	Issues In Global Change	1
NREM 4414	Fisheries Management	4
NREM 4424	Fisheries Techniques	4
NREM 4443	Watershed Hydrology and Water Quality	3
NREM 4452	Pond Management	2
NREM 4453	Aquaculture	3
STAT 3013	Intermediate Statistical Analysis	3
or STAT 4013	Statistical Methods I (A)	
BIOL 3104	Invertebrate Zoology	4
or ENTO 4484	Aquatic Entomology	
BIOL 4413	Biology of Fishes	3
BIOL 4434	Limnology	4

#### *Related Courses*

Select courses from among the following or other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area.<sup>5</sup>

Select 6 hours of the following:		6
AGEC 3503	Natural Resource Economics	
ENVR 4512	Environmental Impact Analysis	
ENVR 4813	Environmental Science Applications and Problem Solving	
GEOG 3153	Conservation of Natural Resources (S)	
HIST 4523	American Environmental History (H)	
NREM 4043	Natural Resource Administration and Policy	

NREM 4053	Natural Resource Recreation	
NREM 4063	Ecotourism and Wilderness Management	
POLS 4363	Environmental Law And Policy	
POLS 4593	Natural Resources and Environmental Policy	
SOC 4433	Environmental Sociology (S)	
Select 4 hours of the following:		4
ANSI 3543	Principles of Animal Nutrition	
BOT 3005	Field Botany	
BOT 4214	Ecology of Algae and Aquatic Plants	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
NREM 3083	Geospatial Technologies for Natural Resources	
NREM 3101	Forest Resource Field Studies	
NREM 3103	Natural Resource Field Studies	
NREM 3224	Silviculture	
NREM 3502	Wildlife Law Enforcement	
NREM 3503	Principles of Wildlife Ecology and Management	
NREM 3613	Principles of Rangeland Management	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4043	Natural Resource Administration and Policy	
NREM 4053	Natural Resource Recreation	
NREM 4063	Ecotourism and Wilderness Management	
NREM 4093	Natural Resources, People and Sustainable Development (I)	
NREM 4403	Wetland Ecology and Management	
NREM 4473	Global Issues of Water and Ecosystem Management	
NREM 4524	Wildlife Management Techniques	
NREM 4533	Wildlife Management for Game Species	
NREM 4543	Wildlife Management for Biodiversity	
NREM 4960	Undergraduate Internship	
NREM 4980	Undergraduate Research	
NREM 4990	Special Topics in Natural Resource Ecology and Management	
BIOL 3023	General Genetics	
BIOL 3114	Vertebrate Morphology	
BIOL 3153	Animal Behavior	
BIOL 3513	Principles of Conservation Biology	
BIOL 4113	Conservation Genetics	
BIOL 4133	Evolution	
BIOL 4174	Mammalogy	
BIOL 4273	Environmental Physiology	
BIOL 4303	Organismal Ecotoxicology	
BIOL 4363	Principles of Toxicology	
<b>Hours Subtotal</b>		<b>52</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>125</b>

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used as (N) course above, then hours are reduced by course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, then hours are reduced by three.
- <sup>5</sup> May not use a course used above in Core Courses. Also may not use the same class for credit in both groups below.

## Other Requirements

- Students must earn minimum grades of “C” or “P” in each course listed in Major Requirements.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above. A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Natural Resource Ecology & Management: Forest Ecology & Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 130**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
NREM 1012	Introduction to Natural Resource Ecology and Management	2
NREM 1113	Elements of Forestry	3
NREM 1213	Introduction to Wood Properties and Products	3

NREM 2103	Forest Measurements I	3
NREM 2112	Timber Harvesting	2
NREM 2134	Dendrology	4
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Natural Sciences</i>		
BOT 1404	Plant Biology (LN) <sup>2</sup>	4
CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>4</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>4</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>4</sup>	
<b>Hours Subtotal</b>		<b>36</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
Summer Camp Courses:		
NREM 3101	Forest Resource Field Studies	1
NREM 3102	Forest Measurements II	2
NREM 3103	Natural Resource Field Studies	3
Fall and Spring Courses:		
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3063	Natural Resource Biometrics	3
NREM 3083	Geospatial Technologies for Natural Resources	3
NREM 3224	Silviculture	4
NREM 3713	Wildland Fire Ecology and Management	3
NREM 4001	Issues In Global Change	1
NREM 4043	Natural Resource Administration and Policy	3
NREM 4213	Forest Biology	3
NREM 4234	Forest Management and Economics	4
NREM 4443	Watershed Hydrology and Water Quality	3
NREM 3503	Principles of Wildlife Ecology and Management	3
Select one of the following:		3
NREM 3613	Principles of Rangeland Management	
NREM 4053	Natural Resource Recreation	
NREM 4063	Ecotourism and Wilderness Management	
NREM 4414	Fisheries Management	
Capstone Course		
NREM 4333	Forest Resource Management: Planning and Decision-Making	3
<i>Related Courses</i>		

Select 7 hours of the following or of other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area:<sup>5</sup>

ACCT 2103	Financial Accounting
ACCT 2203	Managerial Accounting
AGEC 3423	Farm and Agribusiness Management
BIOL 3513	Principles of Conservation Biology
ENTO 2993	Introduction to Entomology (LN)
ENTO 3461	Insects in Forest Ecosystems
FIN 3113	Finance
GEOG 4343	Geographic Information Systems: Resource Management Applications
GEOL 1114	Physical Geology (LN)
HORT 2613	Woody Plant Materials
HORT 3013	Arboriculture
LSB 3213	Legal and Regulatory Environment of Business
MGMT 3013	Fundamentals of Management (S)
MKTG 3213	Marketing (S)
NREM 3502	Wildlife Law Enforcement
NREM 3613	Principles of Rangeland Management
NREM 4023	Restoration Ecology
NREM 4033	Ecology Of Invasive Species
NREM 4053	Natural Resource Recreation
NREM 4063	Ecotourism and Wilderness Management
NREM 4093	Natural Resources, People and Sustainable Development (I)
NREM 4403	Wetland Ecology and Management
NREM 4414	Fisheries Management
NREM 4452	Pond Management
NREM 4453	Aquaculture
NREM 4473	Global Issues of Water and Ecosystem Management
NREM 4533	Wildlife Management for Game Species
NREM 4543	Wildlife Management for Biodiversity
NREM 4783	Prescribed Fire
NREM 4793	Advanced Prescribed Fire
NREM 4960	Undergraduate Internship
NREM 4980	Undergraduate Research
NREM 4990	Special Topics in Natural Resource Ecology and Management
PHYS 1114	General Physics (LN)
PLP 3343	Principles of Plant Pathology

**Hours Subtotal** 54

#### Electives

Select 0 hours or hours to complete required total for degree 0

**Total Hours** 130

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (N) course above, then hours are reduced by course hours.

<sup>3</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>4</sup> If used as (S) course above, then hours are reduced by three.

<sup>5</sup> May not use a course used above in Core Courses.

## Other Requirements

- Students must earn minimum grades of “C” or “P” in each course listed in Major Requirements.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Natural Resource Ecology & Management: Rangeland Ecology & Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 125**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113 or ENGL 1313	Composition I Critical Analysis and Writing I	3
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
NREM 1012	Introduction to Natural Resource Ecology and Management	2
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Natural Sciences</i>		

BIOL 1604	Animal Biology	4
BOT 1404	Plant Biology (LN) <sup>2</sup>	4
CHEM 1215 or CHEM 1314	General Chemistry (LN) <sup>2</sup> General Chemistry (LN)	4
CHEM 1225 or CHEM 1515	General Chemistry (LN) <sup>2</sup> General Chemistry (LN)	5
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>4</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>4</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>4</sup>	
<b>Hours Subtotal</b>		<b>33</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
BOT 3005	Field Botany	5
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3063	Natural Resource Biometrics	3
NREM 3083	Geospatial Technologies for Natural Resources	3
NREM 3503	Principles of Wildlife Ecology and Management	3
NREM 3613	Principles of Rangeland Management	3
NREM 4001	Issues In Global Change	1
NREM 4023	Restoration Ecology	3
NREM 4033	Ecology Of Invasive Species	3
NREM 4043	Natural Resource Administration and Policy	3
NREM 4613	Rangeland Resources Planning	3
NREM 4783	Prescribed Fire	3
NREM 4053	Natural Resource Recreation	3
or NREM 4063	Ecotourism and Wilderness Management	
NREM 4443	Watershed Hydrology and Water Quality	3
or NREM 4473	Global Issues of Water and Ecosystem Management	
ANSI 3543	Principles of Animal Nutrition	3
SOIL 3433	Soil Genesis, Morphology, and Classification	3
<i>Related Courses</i>		
Select 2 hours of the following or of other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area: <sup>5</sup>		2
AGEC 3423	Farm and Agribusiness Management	
AGEC 3503	Natural Resource Economics	
ANSI 1124	Introduction to the Animal Sciences	
ANSI 3433	Animal Breeding	
ANSI 3653	Applied Animal Nutrition	



ANSI 4203	Rangeland and Pasture Utilization
ANSI 4613	Beef Cow-Calf Management
BIOL 3034	General Ecology
BIOL 3513	Principles of Conservation Biology
BIOL 4113	Conservation Genetics
BIOL 4133	Evolution
BIOL 4174	Mammalogy
BIOL 4303	Organismal Ecotoxicology
BIOL 4413	Biology of Fishes
BOT 3024	Plant Diversity
BOT 3114	Plant Taxonomy
BOT 3463	Plant Physiology
BOT 4023	Community Ecology
ENTO 2993	Introduction to Entomology (LN)
ENTO 3331	Insect Pests of Agronomic Crops
ENTO 4223	Ecological Methodology
ENVR 1113	Elements of Environmental Science
ENVR 4512	Environmental Impact Analysis
GEOG 3023	Climatology (N)
GEOG 3033	Meteorology (N)
GEOG 3153	Conservation of Natural Resources (S)
GEOG 3333	Spatial Analysis (A)
GEOG 4053	Biogeography
GEOG 4333	Remote Sensing
GEOG 4343	Geographic Information Systems: Resource Management Applications
GEOL 3503	Environmental Geology
NREM 2134	Dendrology
NREM 3101	Forest Resource Field Studies
NREM 3103	Natural Resource Field Studies
NREM 3224	Silviculture
NREM 3502	Wildlife Law Enforcement
NREM 3713	Wildland Fire Ecology and Management
NREM 4053	Natural Resource Recreation
NREM 4063	Ecotourism and Wilderness Management
NREM 4093	Natural Resources, People and Sustainable Development (I)
NREM 4213	Forest Biology
NREM 4403	Wetland Ecology and Management
NREM 4452	Pond Management
NREM 4453	Aquaculture
NREM 4464	Ornithology
NREM 4473	Global Issues of Water and Ecosystem Management
NREM 4524	Wildlife Management Techniques
NREM 4533	Wildlife Management for Game Species
NREM 4543	Wildlife Management for Biodiversity
NREM 4603	Rangeland and Pasture Utilization
NREM 4793	Advanced Prescribed Fire
NREM 4960	Undergraduate Internship
NREM 4980	Undergraduate Research
NREM 4990	Special Topics in Natural Resource Ecology and Management

PLP 3343	Principles of Plant Pathology
PLNT 1213	Introduction to Plant and Soil Systems
POLS 4593	Natural Resources and Environmental Policy
SOIL 3433	Soil Genesis, Morphology, and Classification
SOIL 4463	Soil and Water Conservation
SOIL 4483	Soil Microbiology
SOIL 4683	Soil, Water, and Weather
<b>Hours Subtotal</b>	<b>52</b>
<b>Electives</b>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>125</b>

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used as (N) course above, then hours are reduced by course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, then hours are reduced by three.
- <sup>5</sup> May not use a course used above in Core Courses.

## Other Requirements

- Students must earn minimum grades of “C” or “P” in each course listed in Major Requirements.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Natural Resource Ecology & Management: Wildlife Biology & Preveterinary Science, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 130**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 2103	Business Calculus (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
NREM 1012	Introduction to Natural Resource Ecology and Management	2
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Natural Sciences</i>		
BIOL 1604	Animal Biology	4

BOT 1404	Plant Biology (LN) <sup>2</sup>	4
CHEM 1314	General Chemistry (LN) <sup>2</sup>	4
CHEM 1515	General Chemistry (LN) <sup>2</sup>	5
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1114	General Physics (LN) <sup>2</sup>	4
PHYS 1214	General Physics (LN) <sup>2</sup>	4
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>4</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>4</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>4</sup>	
<b>Hours Subtotal</b>		<b>43</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
ANSI 3543	Principles of Animal Nutrition	3
Select one of the following:		3
BIOC 3653	Survey of Biochemistry	
BIOC 3713	Biochemistry I	
BIOC 3723	Biochemistry and Molecular Biology Laboratory	
BIOL 3023	General Genetics	3
Select one of the following:		5
CHEM 3015	The Chemistry of Organic Compounds	
or CHEM 3053	Organic Chemistry	
CHEM 3153	Organic Chemistry	
& CHEM 3112	and Organic Chemistry Lab	
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3503	Principles of Wildlife Ecology and Management	3
NREM 4001	Issues In Global Change	1
NREM 4524	Wildlife Management Techniques	4
BIOL 3204	Physiology	4
Select two of the following:		7
NREM 4464	Ornithology	
BIOL 4413	Biology of Fishes	
BIOL 4174	Mammalogy	
<i>Related Courses</i>		
Select courses from among the options, or other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area <sup>5</sup>		9
Select an option (p. 935)		
<b>Hours Subtotal</b>		<b>47</b>
<i>Electives</i>		

Select 0 hours or hours to complete required total for degree 0  
 Total Hours 130

- <sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.
- <sup>2</sup> If used as (N) course above, then hours are reduced by course hours.
- <sup>3</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.
- <sup>4</sup> If used as (S) course above, then hours are reduced by three.
- <sup>5</sup> May not use a course used above in Core Courses.

## Options

### Option 1

Code	Title	Hours
Select 9 hours of the following:		9
ANSI 1124	Introduction to the Animal Sciences	
ANSI 3443	Animal Reproduction	
ANSI 3523	Pet and Companion Animal Management	
ANSI 3653	Applied Animal Nutrition	
ANSI 3753	Basic Nutrition for Pets	
BIOC 3713	Biochemistry I	
BIOC 3723	Biochemistry and Molecular Biology Laboratory	
BIOC 3813	Biochemistry II	
BOT 3005	Field Botany	
ENTO 2993	Introduction to Entomology (LN)	
ENTO 3003	Livestock Entomology	
ENTO 4854	Medical and Veterinary Entomology	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
MICR 3033	Cell and Molecular Biology	
MICR 3143	Medical Mycology	
MICR 4123	Virology	
NREM 3083	Geospatial Technologies for Natural Resources	
NREM 3101	Forest Resource Field Studies	
NREM 3103	Natural Resource Field Studies	
NREM 3224	Silviculture	
NREM 3502	Wildlife Law Enforcement	
NREM 3613	Principles of Rangeland Management	
NREM 3713	Wildland Fire Ecology and Management	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4043	Natural Resource Administration and Policy	
NREM 4093	Natural Resources, People and Sustainable Development (I)	
NREM 4403	Wetland Ecology and Management	
NREM 4414	Fisheries Management	
NREM 4424	Fisheries Techniques	
NREM 4452	Pond Management	
NREM 4453	Aquaculture	
NREM 4464	Ornithology	

NREM 4473	Global Issues of Water and Ecosystem Management
NREM 4533	Wildlife Management for Game Species
NREM 4543	Wildlife Management for Biodiversity
NREM 4613	Rangeland Resources Planning
NREM 4783	Prescribed Fire
NREM 4793	Advanced Prescribed Fire
NREM 4960	Undergraduate Internship
NREM 4980	Undergraduate Research
NREM 4990	Special Topics in Natural Resource Ecology and Management
PLNT 1213	Introduction to Plant and Soil Systems
BIOL 3114	Vertebrate Morphology
BIOL 3153	Animal Behavior
BIOL 3163	Environmental Biology
BIOL 3513	Principles of Conservation Biology
BIOL 4104	General Parasitology
BIOL 4113	Conservation Genetics
BIOL 4215	Mammalian Physiology
BIOL 4223	Mammalian Physiology Laboratory
BIOL 4273	Environmental Physiology
BIOL 4283	Endocrinology
BIOL 4293	Behavioral Neuroendocrinology
BIOL 4303	Organismal Ecotoxicology
BIOL 4363	Principles of Toxicology

### Option 2

Complete the first year of professional program.

With the approval of the advisor, department head, and dean, a maximum of 12 hours from an accredited dental, medical, optometry, osteopathic, pharmacy, podiatry, or veterinary medical school may be used to complete hours.

## Other Requirements

- Students must earn minimum grades of "C" or "P" in each course listed in Major Requirements.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

# Natural Resource Ecology & Management: Wildlife Ecology & Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 125**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 1513	College Algebra (A) <sup>1</sup>	3
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
NREM 1012	Introduction to Natural Resource Ecology and Management	2
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Natural Sciences</i>		
BIOL 1604	Animal Biology	4

BOT 1404	Plant Biology (LN) <sup>2</sup>	4
CHEM 1215	General Chemistry (LN) <sup>2</sup>	4
or CHEM 1314	General Chemistry (LN)	
CHEM 1225	General Chemistry (LN) <sup>2</sup>	5
or CHEM 1515	General Chemistry (LN)	
GEOL 1114	Physical Geology (LN)	4
or PHYS 1014	Descriptive Physics (N)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing <sup>3</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>4</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>4</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>4</sup>	
<b>Hours Subtotal</b>		<b>34</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
Select one of the following:		3
ANSI 3423	Animal Genetics	
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
BOT 3005	Field Botany	5
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3503	Principles of Wildlife Ecology and Management	3
NREM 3523	Fish and Wildlife Population Biology	3
NREM 4001	Issues In Global Change	1
NREM 4464	Ornithology	4
NREM 4524	Wildlife Management Techniques	4
NREM 4533	Wildlife Management for Game Species	3
NREM 4543	Wildlife Management for Biodiversity	3
BIOL 4174	Mammalogy	4
Select one of the following:		3
NREM 4403	Wetland Ecology and Management	
NREM 4414	Fisheries Management	
BIOL 4413	Biology of Fishes	
<i>Related Courses</i>		
Select courses from among the following, or other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area <sup>5</sup>		
Select 6 hours of the following:		6
AGEC 3503	Natural Resource Economics	
ENVR 4512	Environmental Impact Analysis	
ENVR 4813	Environmental Science Applications and Problem Solving	
GEOG 3153	Conservation of Natural Resources (S)	
HIST 4523	American Environmental History (H)	

NREM 4043	Natural Resource Administration and Policy
NREM 4053	Natural Resource Recreation
NREM 4063	Ecotourism and Wilderness Management
POLS 4363	Environmental Law And Policy
POLS 4593	Natural Resources and Environmental Policy
SOC 4433	Environmental Sociology (S)
Select 4 hours of the following: 4	
ANSI 3543	Principles of Animal Nutrition
ENTO 2993	Introduction to Entomology (LN)
GEOG 4343	Geographic Information Systems: Resource Management Applications
NREM 2134	Dendrology
NREM 3083	Geospatial Technologies for Natural Resources
NREM 3101	Forest Resource Field Studies
NREM 3103	Natural Resource Field Studies
NREM 3224	Silviculture
NREM 3502	Wildlife Law Enforcement
NREM 3613	Principles of Rangeland Management
NREM 3713	Wildland Fire Ecology and Management
NREM 4023	Restoration Ecology
NREM 4033	Ecology Of Invasive Species
NREM 4043	Natural Resource Administration and Policy
NREM 4053	Natural Resource Recreation
NREM 4063	Ecotourism and Wilderness Management
NREM 4093	Natural Resources, People and Sustainable Development (I)
NREM 4403	Wetland Ecology and Management
NREM 4414	Fisheries Management
NREM 4424	Fisheries Techniques
NREM 4443	Watershed Hydrology and Water Quality
NREM 4452	Pond Management
NREM 4453	Aquaculture
NREM 4473	Global Issues of Water and Ecosystem Management
NREM 4613	Rangeland Resources Planning
NREM 4783	Prescribed Fire
NREM 4793	Advanced Prescribed Fire
NREM 4960	Undergraduate Internship
NREM 4980	Undergraduate Research
NREM 4990	Special Topics in Natural Resource Ecology and Management
BIOL 3153	Animal Behavior
BIOL 3513	Principles of Conservation Biology
BIOL 4113	Conservation Genetics
BIOL 4133	Evolution
BIOL 4363	Principles of Toxicology
BIOL 4413	Biology of Fishes

**Hours Subtotal** 51  
**Electives**

Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>125</b>

- 1 College & Departmental requirements that may be used to meet GE requirements.
- 2 If used as (N) course above, then hours are reduced by course hours.
- 3 If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.
- 4 If used as (S) course above, then hours are reduced by three.
- 5 May not use a course used above in Core Courses.

## Other Requirements

- Students must earn minimum grades of “C” or “P” in each course listed in Major Requirements.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Natural Resource Ecology and Management (NREM), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 20 hours

Code	Title	Hours
<b>Minor Requirements</b>		
NREM 1012	Introduction to Natural Resource Ecology and Management	2
NREM 3013	Applied Ecology and Conservation	3
Select a minimum of 9 additional hours of the following:		9
NREM 1014	Introduction to Natural History (LN)	
NREM 1113	Elements of Forestry	
NREM 3503	Principles of Wildlife Ecology and Management	
NREM 3613	Principles of Rangeland Management	
NREM 3713	Wildland Fire Ecology and Management	
NREM 4414	Fisheries Management	
Select 6 additional hours not already used previously, or select of the following:		6
SOIL 2124	Fundamentals of Soil Science (N)	
NREM 3012	Applied Ecology Laboratory	
NREM 3083	Geospatial Technologies for Natural Resources	
NREM 3101	Forest Resource Field Studies	
NREM 3103	Natural Resource Field Studies	
NREM 3224	Silviculture	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4043	Natural Resource Administration and Policy	
NREM 4053	Natural Resource Recreation	
NREM 4063	Ecotourism and Wilderness Management	
NREM 4093	Natural Resources, People and Sustainable Development (I)	
NREM 4403	Wetland Ecology and Management	
NREM 4443	Watershed Hydrology and Water Quality	
NREM 4464	Ornithology	
NREM 4524	Wildlife Management Techniques	
NREM 4613	Rangeland Resources Planning	
NREM 4783	Prescribed Fire	

and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).

- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Additional OSU Requirements Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor



## Rangeland Ecology and Management (REM), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 22 hours

Code	Title	Hours
<b>Minor Requirements</b>		
NREM 2013	Ecology of Natural Resources	3
NREM 3013	Applied Ecology and Conservation	3
NREM 3613	Principles of Rangeland Management	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select a minimum of 9 hours of the following:		9
NREM 3012	Applied Ecology Laboratory	
NREM 3083	Geospatial Technologies for Natural Resources	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4613	Rangeland Resources Planning	
NREM 4783	Prescribed Fire	
NREM 4793	Advanced Prescribed Fire	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).



## Wildlife Ecology (WLEC), Minor

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 22 hours

Code	Title	Hours
<b>Minor Requirements</b>		
BOT 1404	Plant Biology (LN)	4
NREM 3013	Applied Ecology and Conservation	3
NREM 3503	Principles of Wildlife Ecology and Management	3
Select a minimum of 12 additional hours of the following:		12
NREM 3012	Applied Ecology Laboratory	
NREM 4464	Ornithology	
NREM 4524	Wildlife Management Techniques	
NREM 4533	Wildlife Management for Game Species	
NREM 4543	Wildlife Management for Biodiversity	
BIOL 4174	Mammalogy	
BIOL 4413	Biology of Fishes	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Plant and Soil Sciences

The goal of the department is to meet societal needs for food, fiber, energy, and intrinsic value related to the conservation and management of plant and soil resources. Teaching, research and extension efforts are designed to spur innovation and provide understanding regarding management of agricultural and environmental resources to increase long-term sustainability food production systems.

Undergraduate students select an option of study from: agronomic business, crop production and management, plant biotechnology and improvement, or soil and water resources. Students may choose to specialize in an area such as: entrepreneurship, forage and livestock production, pest management, plant genetics, precision agriculture, or environmental management. In addition, students can fulfill prerequisites for professional programs such as pharmacy school. Students interested in professional certification will complete the necessary course requirements in their degree programs. Students have flexibility to work with their academic advisers to develop a plan of study to suit their interests. Many undergraduate students work with the research faculty on projects providing the student an opportunity to assist in gathering new information related to plant breeding and genetics, biotechnology, environmental remediation, plant physiology, crop production, weed science, soil nutrient management, soil chemistry, soil physics, water quality, and land restoration.

Upon completion of a Bachelor of Science program, students are employed by private firms, public institutions, state and federal agencies, or non-profit organizations that require personnel with expertise in plant and soil systems. Typical careers include: federal employment in soil and rangeland conservation; crop consulting; technical sales and service for seed, fertilizer or agricultural chemical supply companies; farm or ranch operation; research positions as plant and soil scientists with federal agencies, state agricultural experiment stations or private industries; teaching and extension positions with colleges and universities; and a broad range of employment or ownership in retail businesses supplying feed, seed, grain, fertilizers, equipment, agricultural chemicals and other agricultural supplies and services. Demand for individuals with experience in plant and soil sciences will continue as long as society demands a safe, secure food supply balanced with a desire to conserve natural resources.

### Minor in Agronomy or Soil Science

The Department of Plant and Soil Sciences offers two minors, Agronomy (24 hours) and Soil Science (19 hours). Students pursuing a minor in Agronomy will take courses in areas that are most important for understanding the science of crop production, including genetics and biotechnology, weed science, and nutrient management in order to prepare them for careers that support crop production. The Soil Science minor has a great deal of flexibility (12 credits of controlled electives) that will allow students to explore diverse aspects of soils ranging from chemistry to conservation while helping them prepare for a variety of environment-related careers.

### Undergraduate Programs

- Agronomy (AGRN), Minor (p. 943)
- Horticulture (HORT), Minor (p. 944)
- Plant and Soil Sciences: Agronomic Business, BSAG (p. 945)
- Plant and Soil Sciences: Crop Production and Management, BSAG (p. 947)

- Plant and Soil Sciences: Plant Biotechnology and Improvement, BSAG (p. 949)
- Plant and Soil Sciences: Soil and Water Resources, BSAG (p. 951)
- Soil Science (SOIL), Minor (p. 953)

## Graduate Programs

Programs of course work and research are offered leading to the Master of Science degree in plant and soil sciences. A Doctor of Philosophy degree can be attained in Crop Science or Soil Science. Specific programs are available in the areas of plant breeding and molecular biology, biotechnology, bioenergy, environmental remediation, forage and pasture management, weed science, crop physiology, crop management, conservation cropping systems, soil morphology and genesis, soil microbiology, soil fertility and plant nutrition, soil physics, soil-water management, soil chemistry, soil and water quality, and waste management. Applicants should indicate their specific area of interest upon application. Plant and soil sciences faculty also serve on advisory committees for the Environmental Science and Plant Science interdisciplinary degree programs.

The graduate programs in plant and soil sciences prepare individuals for successful careers in a variety of areas including research, teaching, environmental sciences, waste management, farming and ranching, extension education, agricultural business, and all aspects of crop production.

### Prerequisites

Admission to the graduate program requires a BS degree in plant and soil sciences, agronomy or a closely related field. Applicants should have completed basic courses in plant and soil sciences, agronomy, biology, chemistry and mathematics required of undergraduate majors. Deficiencies in fundamental course requirements will be met by the student under the direction of the student's advisory committee. Applicants must be accepted by an adviser in an appropriate discipline prior to official admission.

### Degree Requirements

Students must follow approved plans of study that meet the minimum University and program requirements for the respective degrees they are pursuing.

The Master of Science degree in plant and soil sciences may be earned by using the thesis option. This plan requires a minimum of 30 credit hours of course work, including six credit hours of PLNT, or SOIL 5000 Master's Thesis.

The degree plans of study for the Doctor of Philosophy degree in crop science and soil science are developed individually for each candidate and must be approved by the student's advisory committee. Doctoral programs in crop science and soil science require 60 credit hours beyond the MS degree, including a minimum of 15 credit hours of PLNT or SOIL 6000 Doctoral Thesis. All students must meet certain requirements in basic disciplines such as statistics, mathematics, botany, and chemistry. Study of a foreign language is not required, but can be incorporated if the student and advisory committee feel that it is desirable.

### Faculty

Jeff Edwards, PhD—Professor and Head

**Regents Professors:** Brett F. Carver, PhD; Donald S. Murray, PhD; William R. Raun, PhD; Hailin Zhang, PhD

**Professors:** Brian J. Carter, PhD; Shiping Deng, PhD; Jeffrey T. Edwards, PhD; Yangi Wu, PhD; Liuling Yan, PhD

**Associate Professors:** Michael P. Anderson, PhD; D. Brian Arnall, PhD; V. Gopal Kakani, PhD; Tyson E. Ochsner, PhD; Million Tadege, PhD; Jason G. Warren, PhD

**Assistant Professors:** Sergio M. Abit, Jr., PhD; Phil Alderman, PhD; Beatrix J. Haggard, PhD; Josh Lofton, PhD; Misha Manuchehri, PhD; Alex Rocateli, PhD

## Agronomy (AGRN), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 20 hours

Code	Title	Hours
<b>Minor Requirements</b>		
PLNT 1213	Introduction to Plant and Soil Systems	3
PLNT 2013	Applied Plant Science	3
PLNT 4013	Principles of Weed Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
SOIL 4234	Soil Nutrient Management	4
Select 3 hours of the following:		3
PLNT 4470	Problems and Special Study	
PLNT 4123	Plant-Environment Interactions	
PLNT 4353	Plant Breeding	
PLNT 4573	Bioenergy Feedstock Production	
PLNT 4613	Forage and Grazinglands Resource Management	
SOIL 4213	Precision Agriculture	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Horticulture (HORT), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

**Total Hours:** 23 hours

Code	Title	Hours
<b>Minor Requirements</b>		
SOIL 2124	Fundamentals of Soil Science (N)	4
BOT 1404	Plant Biology (LN)	4
HORT 1013	Principles of Horticultural Science (LN)	3
HORT 3084	Plant Propagation	4
Select a minimum of 8 hours of HORT prefix courses excluding 1003, 4671, 4990, 5110; at least three of these hours must be at the 3000-level or above		8

### Other Requirements

- No more than one hour of HORT 2010 Internship in Horticulture or Landscape Management may be used for minor.

### Additional OSU Requirements

#### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).

## Plant and Soil Sciences: Agronomic Business, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENTO 2993	Introduction to Entomology (LN)	3
or ANSI 1124	Introduction to the Animal Sciences	
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Additional Requirements</i>		
CHEM 1515	General Chemistry (LN) <sup>2</sup>	5
or CHEM 1225	General Chemistry (LN)	

BIOL 1114	Introductory Biology (LN)	4
MATH 1513	College Algebra (A) <sup>3</sup>	3
or MATH 2103	Business Calculus (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>4</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S) <sup>5</sup>	
<b>Hours Subtotal</b>		<b>25</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
BOT 1404	Plant Biology (LN)	4
PLNT 1101	Orientation to Plant and Soil Sciences	1
PLNT 2013	Applied Plant Science	3
PLNT 2041	Career Development in Plant and Soil Sciences	1
PLNT 4013	Principles of Weed Science	3
PLNT 4123	Plant-Environment Interactions	3
PLNT 4571	Professional Preparation in Plant and Soil Sciences	1
PLNT 4080	Professional Internship (3 hours)	3
or PLNT 4990	Senior Thesis in Plant and Soil Sciences	
PLNT 4470	Problems and Special Study (4 hours)	1-3
ANSI 4203	Rangeland and Pasture Utilization	3
or PLNT 4573	Bioenergy Feedstock Production	
Select one of the following:		4
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	The Chemistry of Organic Compounds	
PHYS 1014	Descriptive Physics (N)	
SOIL 2124	Fundamentals of Soil Science (N)	4
SOIL 4213	Precision Agriculture	3
SOIL 4234	Soil Nutrient Management	4
AGEC 3323	Agricultural Product Marketing and Sales	3
AGEC 3713	Agricultural Law	3
ACCT 2103	Financial Accounting	3
or AGECE 3183	Agribusiness Accounting and Taxation	
<i>Related Courses</i>		
Select 5 hours of the following:		5
AGEC 3213	Quantitative Methods in Agricultural Economics	
AGEC 3333	Agricultural Marketing and Price Analysis	
AGEC 3403	Agricultural Small Business Management	
AGEC 3463	Agricultural Cooperatives	
AGEC 3503	Natural Resource Economics	

AGEC 3603	Agricultural Finance
AGEC 3703	Issues in Agricultural Policy
AGEC 4333	Commodity Futures Markets
AGEC 4403	Advanced Farm and Ranch Management
AGEC 4423	Advanced Agribusiness Management
AGEC 4503	Environmental Economics and Resource Development
AGEC 4513	Farm Appraisal
AGEC 4703	American Agricultural Policy
AGEC 4803	International Agricultural Economics Tour (I)
EEE 3020	Business Plan Laboratory
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior
EEE 3033	Women and Minority Entrepreneurship (D)
EEE 4113	Dilemmas and Debates in Entrepreneurship
EEE 4263	Corporate Entrepreneurship
EEE 4313	Emerging Enterprise Consulting
EEE 4403	Social Entrepreneurship
EEE 4483	Entrepreneurship and New Technologies
EEE 4513	Strategic Entrepreneurial Management
EEE 4533	Growing Small and Family Ventures
EEE 4610	Entrepreneurship Practicum
EEE 4663	Imagination in Entrepreneurship
EEE 4653	Venture Capital
ECON 3033	Economics of Entrepreneurship and Innovation
<b>Hours Subtotal</b>	<b>55</b>
<i>Electives</i>	
Select 0 hours or hours to complete required total for degree	0
<b>Total Hours</b>	<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (N) course above, hours in this block reduced by 5

<sup>3</sup> If used as (A) course above, hours in this block reduced by 3.

<sup>4</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>5</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as

these changes do not result in semester credit hours being added or do not delay graduation.

- Degrees that follow this plan must be completed by the end of Summer 2023.



## Plant and Soil Sciences: Crop Production and Management, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENTO 2993	Introduction to Entomology (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Additional Requirements</i>		
CHEM 1515	General Chemistry (LN) <sup>2</sup>	5
or CHEM 1225	General Chemistry (LN)	
BIOL 1114	Introductory Biology (LN)	4

MATH 1513	College Algebra (A) <sup>3</sup>	3
or MATH 2144	Calculus I (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>4</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S) <sup>5</sup>	
<b>Hours Subtotal</b>		<b>25</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
BOT 1404	Plant Biology (LN)	4
BOT 3463	Plant Physiology	3
PLNT 1101	Orientation to Plant and Soil Sciences	1
PLNT 2013	Applied Plant Science	3
PLNT 2041	Career Development in Plant and Soil Sciences	1
PLNT 4013	Principles of Weed Science	3
PLNT 4123	Plant-Environment Interactions	3
PLNT 4353	Plant Breeding	3
PLNT 4571	Professional Preparation in Plant and Soil Sciences	1
PLNT 4573	Bioenergy Feedstock Production	3
PLNT 4080	Professional Internship (3 hours)	3
or PLNT 4990	Senior Thesis in Plant and Soil Sciences	
PLNT 4470	Problems and Special Study (1 hour)	1
ANSI 4203	Rangeland and Pasture Utilization	3
BIOL 3023	General Genetics	3
or ANSI 3423	Animal Genetics	
Select one of the following:		4
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	The Chemistry of Organic Compounds	
PHYS 1014	Descriptive Physics (N)	
SOIL 2124	Fundamentals of Soil Science (N)	4
SOIL 4213	Precision Agriculture	3
SOIL 4234	Soil Nutrient Management	4
<i>Related Courses</i>		
Select 5 hours of the following:		5
Upper division PLNT including PLNT 4470		
PLP 3343	Principles of Plant Pathology	
PLP 3553	Fungi: Myths and More	
PLP 3663	Turfgrass Integrated Pest Management	
ENTO 3003	Livestock Entomology	
ENTO 3021	Postharvest, Structural, and Urban Arthropod Pests	

ENTO 3331	Insect Pests of Agronomic Crops	
ENTO 3421	Horticultural Insects	
ENTO 3461	Insects in Forest Ecosystems	
ENTO 4854 or ENTO 4923	Medical and Veterinary Entomology Applications of Biotechnology in Pest Management	
SOIL 4483	Soil Microbiology	
SOIL 4683	Soil, Water, and Weather	
SOIL 4463	Soil and Water Conservation	
SOIL 3433	Soil Genesis, Morphology, and Classification	
SOIL 4893	Soil Chemistry and Environmental Quality	
SOIL 4363	Environmental Soil Science	
ANSI 1124	Introduction to the Animal Sciences	
ANSI 2123	Livestock Feeding	
ANSI 3543	Principles of Animal Nutrition	
ANSI 3653	Applied Animal Nutrition	
HORT 4953	Plant Growth and Development	
HORT 4963	Horticulture Physiology	
HORT 4133	Temperature Stress Physiology	
HORT 3113	Greenhouse Management	
MCAG 1413	Introduction to Engineering in Agriculture	
MCAG 2313	Surveying	
MCAG 3011 or MCAG 3211	Ag Structures Engines and Power	
MCAG 4112	Land Measurement and Site Analysis	
MCAG 4203	Irrigation Principles	
MCAG 4212	Safety and Health in Agribusiness	
GEOG 2344	Digital Tools for Environmental Exploration (LN)	
GEOG 3023	Climatology (N)	
GEOG 3033	Meteorology (N)	
NREM 3613	Principles of Rangeland Management	
NREM 3013	Applied Ecology and Conservation	
NREM 3012	Applied Ecology Laboratory	
<b>Hours Subtotal</b>		<b>55</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		<b>0</b>
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (N) course above, hours in this block reduced by 5.

<sup>3</sup> If used as (A) course above, hours in this block reduced by 3.

<sup>4</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>5</sup> If used as (S) course above, hours in this block reduced by 3.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

# Plant and Soil Sciences: Plant Biotechnology and Improvement, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENTO 2993	Introduction to Entomology (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
<i>Additional Requirements</i>		
CHEM 1515	General Chemistry (LN) <sup>2</sup>	5
BIOL 1114	Introductory Biology (LN)	4
MATH 1513	College Algebra (A) <sup>3</sup>	3

or MATH 2144	Calculus I (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>4</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S) <sup>5</sup>	
<b>Hours Subtotal</b>		<b>25</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
BOT 1404	Plant Biology (LN)	4
BOT 3463	Plant Physiology	3
PLNT 1101	Orientation to Plant and Soil Sciences	1
PLNT 2013	Applied Plant Science	3
PLNT 2041	Career Development in Plant and Soil Sciences	1
PLNT 4013	Principles of Weed Science	3
PLNT 4123	Plant-Environment Interactions	3
PLNT 4353	Plant Breeding	3
PLNT 4571	Professional Preparation in Plant and Soil Sciences	1
PLNT 4573	Bioenergy Feedstock Production	3
or PLNT 4933	Plant Biotechnology and Transgenic Plants	
PLNT 4080	Professional Internship (3 hours)	3
or PLNT 4990	Senior Thesis in Plant and Soil Sciences	
PLNT 4470	Problems and Special Study (1 hour)	1
BIOL 3023	General Genetics	3
or ANSI 3423	Animal Genetics	
CHEM 3053	Organic Chemistry	3
BIOC 3713	Biochemistry I	3
SOIL 2124	Fundamentals of Soil Science (N)	4
SOIL 4234	Soil Nutrient Management	4
PLP 3343	Principles of Plant Pathology	3
<i>Related Courses</i>		
Select 6 hours of the following:		6
BIOC 3723	Biochemistry and Molecular Biology Laboratory	
BIOC 3813	Biochemistry II	
CHEM 3153	Organic Chemistry	
BOT 3005	Field Botany	
or BOT 3114	Plant Taxonomy	
MICR 3223	Advanced Microbiology	
MICR 2132	Introduction to Microbiology Laboratory	
MICR 2123	Introduction to Microbiology	
SOIL 4483	Soil Microbiology	
HORT 4953	Plant Growth and Development	

HORT 4963	Horticulture Physiology	
HORT 4133	Temperature Stress Physiology	
HORT 3113	Greenhouse Management	
<b>Hours Subtotal</b>		<b>55</b>
Upper-level PLNT		
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (N) course above, hours in this block reduced by 5.

<sup>3</sup> If used as (A) course above, hours in this block reduced by 3.

<sup>4</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>5</sup> If used as (S) course above, hours in this block reduced by 3.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Plant and Soil Sciences: Soil and Water Resources, BSAG

**Requirements for Students Matriculating in or before Academic Year 2017-2018.** Learn more about University Academic Regulation 3.1 (p. 783).

**Minimum Overall Grade Point Average: 2.00**

**Total Hours: 120**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
STAT 2013	Elementary Statistics (A) <sup>1</sup>	3
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	General Chemistry (LN) <sup>1</sup>	4
or CHEM 1215	General Chemistry (LN)	
Course designated (N)		3
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		9
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources</i>		
AG 1011	First Year Seminar	1
ENVR 1113	Elements of Environmental Science	3
or NREM 2013	Ecology of Natural Resources	
SOIL 2124	Fundamentals of Soil Science (N)	4
<i>Additional Requirements</i>		
CHEM 1515	General Chemistry (LN) <sup>2</sup>	5
or CHEM 1225	General Chemistry (LN)	

BIOL 1114	Introductory Biology (LN)	4
Select one of the following:		4
PHYS 1114	General Physics (LN)	
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	The Chemistry of Organic Compounds	
MATH 1513	College Algebra (A) <sup>3</sup>	3
or MATH 2144	Calculus I (A)	
<i>Written and Oral Communications</i>		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
BCOM 3443	Business Communication for International Students	
ENGL 3323	Technical Writing <sup>4</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3733	Elements of Persuasion (S) <sup>5</sup>	
<b>Hours Subtotal</b>		<b>30</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
PLNT 1101	Orientation to Plant and Soil Sciences	1
PLNT 1213	Introduction to Plant and Soil Systems	3
PLNT 2041	Career Development in Plant and Soil Sciences	1
PLNT 4571	Professional Preparation in Plant and Soil Sciences	1
PLNT 4080	Professional Internship (3 hours)	3
or PLNT 4990	Senior Thesis in Plant and Soil Sciences	
SOIL 3433	Soil Genesis, Morphology, and Classification	3
SOIL 4234	Soil Nutrient Management	4
SOIL 4483	Soil Microbiology	3
SOIL 4683	Soil, Water, and Weather	3
SOIL 4893	Soil Chemistry and Environmental Quality	3
SOIL 4463	Soil and Water Conservation	3
GEOG 2344	Digital Tools for Environmental Exploration (LN)	4
GEOL 1114	Physical Geology (LN)	4
GEOL 4453	Hydrogeology	3
or NREM 4443	Watershed Hydrology and Water Quality	
<i>Emphasis</i>		
Select one emphasis area (p. 952)		11
<b>Hours Subtotal</b>		<b>50</b>
<b>Electives</b>		
Select 0 hours or hours to complete required total for degree		0
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

<sup>2</sup> If used as (N) course above, hours in this block reduced by 5.

<sup>3</sup> If used as (A) course above, hours in this block reduced by 3.

<sup>4</sup> If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

<sup>5</sup> If used as (S) course above, hours in this block reduced by 3.

## Emphasis Areas

### Conservation Emphasis

Code	Title	Hours
NREM 3613	Principles of Rangeland Management	3
NREM 3013	Applied Ecology and Conservation	3
NREM 3012	Applied Ecology Laboratory	2
Select 3 hours of upper level SOIL, NREM or ENVR		3

### Environmental Management Emphasis

Code	Title	Hours
SOIL 4363	Environmental Soil Science	3
AGEC 3503	Natural Resource Economics	3
Select 2 hours of upper level SOIL, PLNT or NREM		2
Select one of the following:		3
BOT 3253	Environment and Society (N)	
NREM 4043	Natural Resource Administration and Policy	
POLS 4363	Environmental Law And Policy	
POLS 4593	Natural Resources and Environmental Policy	

### Geology Emphasis

Code	Title	Hours
GEOL 1224	Evolution of the Earth (LN)	4
GEOL 2254	Practical Mineralogy	4
Select 3 hours of SOIL or GEOL		3

### Precision Agriculture Emphasis

Code	Title	Hours
SOIL 4213	Precision Agriculture	3
NREM 3083	Geospatial Technologies for Natural Resources	3
or GEOG 4333	Remote Sensing	
Select 2 hours of upper level SOIL, PLNT or NREM		2
Select one of the following:		3
CS 1103	Computer Programming	
CS 1113	Computer Science I (A)	
MSIS 3363	Advanced Management Information Systems Programming	

### Crop Production Emphasis

Code	Title	Hours
PLNT 2013	Applied Plant Science	3
SOIL 4213	Precision Agriculture	3
PLP 3343	Principles of Plant Pathology	3
Select 2 hours of upper level PLNT or SOIL		2

## Pre-professional Emphasis

Select 11 hours of upper level GEOG, GEOL, PLNT or SOIL.

## Other Requirements

- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

## Soil Science (SOIL), Minor

### Requirements for Students Matriculating in or before Academic Year

2017-2018. Learn more about University Academic Regulation 3.1

(p. 783).

**Total Hours:** 19 hours

Code	Title	Hours
<b>Minor Requirements</b>		
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
PLNT 1213	Introduction to Plant and Soil Systems	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 2013	Ecology of Natural Resources	
ENVR 1113	Elements of Environmental Science	
BAE 2013	Modeling in Biosystems Engineering	
CIVE 3813	Environmental Engineering Science	
Select two of the following:		6
SOIL 3433	Soil Genesis, Morphology, and Classification	
SOIL 4483	Soil Microbiology	
SOIL 4683	Soil, Water, and Weather	
SOIL 4893	Soil Chemistry and Environmental Quality	
Select two of the following:		6
SOIL 3883	Sustainable Agriculture Concepts and Practice	
SOIL 4213	Precision Agriculture	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	

## Additional OSU Requirements

### Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (<https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf>).