COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES

College Administration

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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 (DASNR), 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 and food sciences, 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, forest ecology and management, 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 sciences, 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 and food science programs. 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 1.7 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, Multicultural Programs Leaders, Freshmen in Transition, Career Services, Prospective Student Services, assistance with tutoring or other services, and liaison to the OSU Writing 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 classwork 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 resource ecology and management as offered in the College of Agricultural Sciences and Natural Resources, include 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 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
Leaders of Excellence in Animal and Food Sciences
Beekeeping Club
Biochemistry Club
Biochemistry & Molecular Biology Graduate Student Association
Biosystems and Agricultural Engineering Graduate Student Association
Block and Bridle Club
CASNR Ambassadors
CASNR Career Liaisons
CASNR Student Council
Collegiate 4-H
Collegiate American Farmers and Ranchers
Collegiate Farm Bureau
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 Science Club
Freshmen in Transition
Horseman's Association
Horticulture Club
Horticulture Club Judging Team
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
OSU Student Chapter of the Society for Range Management/Range Club
Pi Alpha Xi
Plant ID Team
Plant and Soil Sciences Graduate Student Organization
Pre-Veterinary Science Club
Rodeo Association

Sanborn Entomology Club
Sigma Alpha
Sigma Lambda Alpha (Landscape Architecture Honor Society)
Society of American Foresters/Forestry Club
Soils and Water Conservation Society
Soil Judging Team
StORM
Student Organization for International Agriculture
Swine Club
The FARM Theory
Turf Club
Weed Science Team
Wildlife Society
Xi Sigma Pi

Academic Areas

- Agricultural Communications (p. 860)
- Agricultural Economics (p. 867)
- Agricultural Education (p. 894)
- Agricultural Leadership (p. 907)
- Animal and Food Sciences (p. 915)
- Biochemistry and Molecular Biology (p. 944)
- Biosystems and Agricultural Engineering (p. 953)
- Entomology and Plant Pathology (p. 955)
- Environmental Sciences (p. 965)
- Horticulture and Landscape Architecture (p. 973)
- International Agriculture (p. 989)
- Natural Resource Ecology and Management (p. 990)
- Plant and Soil Sciences (p. 1007)

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. 869)
- Agribusiness: Accounting Double Major, BSAG (p. 871)
- Agribusiness: Agricultural Communications Double Major, BSAG (p. 873)
- Agribusiness: Community and Regional Analysis, BSAG (p. 875)
- Agribusiness: Crop and Soil Sciences, BSAG (p. 877)
- Agribusiness: Farm and Ranch Management, BSAG (p. 879)
- Agribusiness: International, BSAG (p. 881)
- Agribusiness: Natural Resources, BSAG (p. 883)
- Agribusiness: Pre-Law, BSAG (p. 885)
- Agribusiness: Pre-Veterinary Business Management, BSAG (p. 887)
- Agricultural Communications, BSAG (p. 861)
- Agricultural Communications: Agribusiness Double Major, BSAG (p. 863)
- Agricultural Communications: Animal Science Double Major, BSAG (p. 865)
- Agricultural Economics, BSAG (p. 890)
- Agricultural Education: Agricultural Business and Economics, BSAG (p. 895)
- Agricultural Education: Agricultural Communications, BSAG (p. 897)
- Agricultural Education: Animal Agriculture, BSAG (p. 899)
- Agricultural Education: Horticultural Sciences, BSAG (p. 901)
- Agricultural Education: Multidisciplinary, BSAG (p. 903)
- Agricultural Education: Natural Resources, BSAG (p. 905)
- Agricultural Leadership, BSAG (p. 909)
- Agricultural Leadership: Extension Education, BSAG (p. 911)
- Agricultural Leadership: International Studies, BSAG (p. 913)
- Animal Science: Agricultural Communications Double Major, BSAG (p. 918)
- Animal Science: Agricultural Education Double Major, BSAG (p. 920)
- Animal Science: Animal Biotechnology, BSAG (p. 922)
- Animal Science: Business, BSAG (p. 924)
- Animal Science: Livestock Merchandising, BSAG (p. 926)
- Animal Science: Pre-Veterinary Animal Science, BSAG (p. 928)
- Animal Science: Production, BSAG (p. 930)
- Animal Science: Ranch Operations, BSAG (p. 932)
- Biochemistry and Molecular Biology, BSAG (p. 947)
- Biochemistry and Molecular Biology: Pre-Medical or Pre-Veterinary Science, BSAG (p. 950)
- Entomology: Bio-Forensics, BSAG (p. 958)
- Entomology: Insect Biology and Ecology, BSAG (p. 960)
- Entomology: Pre-Veterinary and Pre-Medical, BSAG (p. 962)
- Environmental Science: Environmental Policy, BSAG (p. 967)
- Environmental Science: Natural Resources, BSAG (p. 969)
- Environmental Science: Water Resources, BSAG (p. 971)
- Food Science: Food Industry, BSAG (p. 936)
- Food Science: Food Safety, BSAG (p. 938)
- Food Science: Meat Science, BSAG (p. 940)
- Food Science: Science, BSAG (p. 942)
- Horticulture: Horticultural Business, BSAG (p. 976)
- Horticulture: Horticultural Science, BSAG (p. 978)
- Horticulture: Public Horticulture, BSAG (p. 980)
- Horticulture: Turf Management, BSAG (p. 982)
- Landscape Architecture, BLA (p. 984)
- Landscape Management, BSAG (p. 987)
- Natural Resource Ecology & Management: Fisheries & Aquatic Ecology, BSAG (p. 994)
- Natural Resource Ecology & Management: Forest Ecology & Management, BSAG (p. 996)
- Natural Resource Ecology & Management: Rangeland Ecology & Management, BSAG (p. 998)
- Natural Resource Ecology & Management: Wildlife Biology & Preveterinary Science, BSAG (p. 1000)
- Natural Resource Ecology & Management: Wildlife Ecology & Management, BSAG (p. 1002)
- Plant and Soil Sciences: Agronomic Business, BSAG (p. 1010)

- Plant and Soil Sciences: Crop Production and Management, BSAG (p. 1012)
- Plant and Soil Sciences: Plant Biotechnology and Improvement, BSAG (p. 1014)
- Plant and Soil Sciences: Soil and Water Resources, BSAG (p. 1016)

Certificates

- Equine Enterprise Management (EEM) (p. 934)

Minors

- Agricultural Economics and Agribusiness (AEAB), Minor (p. 889)
- Agricultural Leadership (AGLE), Minor (p. 908)
- Agricultural Real Estate Appraisal (AREA), Minor (p. 892)
- Agronomy (AGRN), Minor (p. 1009)
- Animal Science (ANSI), Minor (p. 917)
- Biochemistry (BIOC), Minor (p. 946)
- Entomology (ENTO), Minor (p. 957)
- Environmental Economics, Politics and Policy (EEPP), Minor (p. 893)
- Environmental Science (ENVR), Minor (p. 966)
- Fisheries and Aquatic Ecology (FAEC), Minor (p. 992)
- Food Science (FDSC), Minor (p. 935)
- Forestry (FOR), Minor (p. 993)
- Horticulture (HORT), Minor (p. 975)
- Natural Resource Ecology and Management (NREM), Minor (p. 1004)
- Pest Management (PEST), Minor (p. 964)
- Rangeland Ecology and Management (REM), Minor (p. 1005)
- Soil Science (SLSI), Minor (p. 1018)
- Wildlife Ecology (WLEC), Minor (p. 1006)

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.

- Agribusiness, MAG (p. 867)
- Agricultural Communication, MS (p. 860)
- Agricultural Economics, MS/PhD (p. 867)
- Agricultural Education, MS/PhD (p. 894)
- Agricultural Leadership, MAG (p. 907)
- Animal Science, MS/PhD (p. 916)
- Biochemistry and Molecular Biology, MS/PhD (p. 944)
- Crop Science, PhD (p. 1007)
- Entomology, MS/PhD (p. 955)
- Fisheries and Aquatic Ecology, MS/PhD (p. 991)
- Food Science, MS/PhD (p. 916)
- Forest Resources, MS/PhD (p. 991)
- Horticulture, MS (p. 973)
- International Agriculture, MAG/MS (p.)
- Plant and Soil Sciences, MS (p. 1007)
- Plant Pathology, MS/PhD (p. 955)
- Rangeland Ecology and Management, MS/PhD (p. 991)
- Soil Science, PhD (p. 1007)
- Wildlife Ecology and Management, MS/PhD (p. 991)

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. 861)
- Agricultural Communications: Agribusiness Double Major, BSAG (p. 863)
- Agricultural Communications: Animal Science Double Major, BSAG (p. 865)

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 coursework, which includes a six-credit hour formal thesis following the graduate college format. The formal report option requires 32 approved semester credit hours of coursework, 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 coursework 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; Ruth Inman, PhD; Angel Riggs, PhD; Quisto Settle, PhD

Agricultural Communications, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
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)	
MATH 1813	Preparation for Calculus (A)	
STAT 2013	Elementary Statistics (A)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1314	Chemistry I (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [1]	
SPCH 2713	Introduction to Speech Communication (S) [1]	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
PLNT 1213	Introduction to Plant and Soil Systems	3
Select one course from each of the following lists:		
Group 1: [2]		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2102	Regional Diversity in Food Production, Selection and Consumption (D)	
FDSC 2233	The Meat We Eat	
or ANSI 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
or ANSI 2253	Meat Animal and Carcass Evaluation	
NSCI 2114	Principles of Human Nutrition (N)	
NSCI 3543	Food and the Human Environment (IS)	
Group 2: [2]		3
AGEC 4503	Environmental Economics and Resource Development	
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)	
SOIL 2124	Fundamentals of Soil Science (N)	
Group 3: [2]		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	
AGEC 3423	Farm and Agribusiness Management	
AGEC 3463	Agricultural Cooperatives	
AGLE 2303	Agricultural Leaders in Society (S)	
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	
AGLE 3403	Facilitating Social Change in Agriculture	
AGLE 3803	Global Leadership in Agriculture (I)	
Written & Oral Communications		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Hours Subtotal		23
Major Requirements		
Core Courses		
AGCM 3123	Audio and Video Storytelling in Agricultural Communications	3

AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Digital and Online Media in Agricultural Communications	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	
Related Courses		
To be selected from courses in the following areas:		16
AG, AGEC, AGED, AGLE, ANSI, ART, AST, ECON, ENTO, FDSC, HORT, NREM, PLNT, or SOIL		
EEE, ENGL, HTM, MC, MGMT, MKTG, MMJ, POLS, PSYC, SC, SOC, SPAN, SPCH, STAT, or TH		
Hours Subtotal		57
Electives		
0 or hours to complete required total for degree		
Total Hours		120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If used as (N) or (S) courses in General Education, 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 2025.

Agricultural Communications: Agribusiness Double Major, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1314	Chemistry I (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
Written & Oral Communications		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Select one of the following: [2]		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		17
Major Requirements		
Agricultural Communications Core Courses		
AGCM 3123	Audio and Video Storytelling in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Digital and Online Media in Agricultural Communications	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: [2]		3
FDSC 1133	Fundamentals of Food Science	
FDSC 2102	Regional Diversity in Food Production, Selection and Consumption (D)	
FDSC 2233	The Meat We Eat	
or ANSI 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
or ANSI 2253	Meat Animal and Carcass Evaluation	
NSCI 2114	Principles of Human Nutrition (N)	
NSCI 3543	Food and the Human Environment (IS)	
Agribusiness Core Courses		
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) [3]	3
AGEC 4503	Environmental Economics and Resource Development [3]	3
AGEC 4703	American Agricultural Policy [3]	3
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
Hours Subtotal		71
Electives		
0 or hours to complete required total for degree		
Total Hours		128

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If used as (N) or (S) course above, hours in this block reduced by 3 hours.

[3] AGEC 4503 Environmental Economics and Resource Development satisfies environmental science requirement and AGEC 4703 American Agricultural Policy satisfies policy requirement for the Agricultural Communications major. AGEC 4343 International Agricultural Markets and Trade (I) satisfies international dimension requirements. If another course is taken for these requirements, a different 4000-level AGEC course except AGEC 4990 Problems of Agricultural Economics may be taken. At least nine hours of 4000-level AGEC 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 2025.

Agricultural Communications: Animal Science Double Major, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1483	Mathematical Functions and Their Uses (A) [1]	3
or MATH 1513	College Algebra (A)	
STAT 2013	Elementary Statistics (A) [1]	3
or MATH 1613	Trigonometry (A)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
Select one of the following: [2]		3
ENTO 3003	Livestock Entomology	
ENVR 1113	Elements of Environmental Science	
NREM 1014	Introduction to Natural History (LN)	
or 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: [2]		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	
or ANSI 2253	Meat Animal and Carcass Evaluation	
FDSC 1133	Fundamentals of Food Science	
FDSC 2102	Regional Diversity in Food Production, Selection and Consumption (D)	
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Written & Oral Communications		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Select one of the following: [3]		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	
SPCH 2713	Introduction to Speech Communication (S) [3]	
Hours Subtotal		26
Major Requirements		
Agricultural Communications Core Courses		
AGCM 3123	Audio and Video Storytelling in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Digital and Online Media in Agricultural Communications	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	
Animal Science Core Courses		

ANSI 2111	Animal and Food Science Professional Development	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	
Related Courses		
To be selected from courses in agriculture, communications, or discipline-related areas to meet total		1
Hours Subtotal		64
Electives		*0*
0 or hours to complete required total for degree		
Total Hours		130

1 College & Departmental requirements that may be used to meet GE requirements

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

3 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 2025.

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, business, mathematical and statistical principles. Students may tailor study to a wide variety of career interests. The Agricultural Economics degree plan emphasizes in quantitative studies including calculus and statistical methods. The degree prepares students for graduate study in agricultural economics or related fields or for a variety of employment opportunities at competitive salaries in private industry and government agencies that require more quantitative skills.

Agribusiness

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 nine degree options: Farm and Ranch Management, Crop and Soil Science, International, Pre-Law, Pre-Veterinary Business Management, Natural Resources, and Community and Regional Analysis, or a double major with Agricultural Communications or Accounting. Agribusiness students also may develop a minor area of study or other 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 economics, 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. 869)
- Agribusiness: Accounting Double Major, BSAG (p. 871)
- Agribusiness: Agricultural Communications Double Major, BSAG (p. 873)
- Agribusiness: Community and Regional Analysis, BSAG (p. 875)
- Agribusiness: Crop and Soil Sciences, BSAG (p. 877)
- Agribusiness: Farm and Ranch Management, BSAG (p. 879)
- Agribusiness: International, BSAG (p. 881)
- Agribusiness: Natural Resources, BSAG (p. 883)
- Agribusiness: Pre-Law, BSAG (p. 885)
- Agribusiness: Pre-Veterinary Business Management, BSAG (p. 887)
- Agricultural Economics, BSAG (p. 890)

- Agricultural Economics and Agribusiness (AEAB), Minor (p. 889)
- Agricultural Real Estate Appraisal (AREA), Minor (p. 892)
- Environmental Economics, Politics and Policy (EEPP), Minor (p. 893)

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 coursework, 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 micro-economic 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 toward 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

R. Joe Schatzer, PhD—Professor and Interim Department Head
Regents Professors: B. Wade Brorsen, PhD; Damona G. Doye, PhD; Shida R. Henneberry, PhD; Phil Kenkel, PhD
Regents Service Professor: David Henneberry, PhD
Professors: Brian Adam, PhD; Chanjin Chung, PhD; Cynda R. Clary, PhD; Cheryl S. DeVuyst, PhD; Eric DeVuyst, PhD; Shannon Ferrell, JD; Rodney Holcomb, PhD; Rodney Jones, PhD; Dayton Lambert, PhD; Notie H. Lansford, PhD; F. Bailey Norwood, PhD; Derrell S. Peel, PhD; Larry D. Sanders, PhD; Brian Whitacre, PhD; Michael D. Woods, PhD
Associate Professors: Kellie Raper, PhD; David Shideler, PhD; Jeff Vitale, PhD
Assistant Professors: Amy Hagerman, PhD; Lixia He Lambert, PhD; John Michael Riley, PhD

Agribusiness, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
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	
NREM 3013	Applied Ecology and Conservation	
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	
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 [2]	
Select one of the following: [3]		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		13
Major Requirements		
Core Courses		
Select from one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
OR		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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	
Select 6 upper division hours from the following:		6
AGEC, ECON, AGCM 3213, MKTG 3213 or MGMT 3013		
Related Courses		
Check with your Advisor about using these hours and electives to minor in an area in CASNR or Spears School of Business (SSB)		
12 hours from CASNR or SSB courses not used elsewhere with at least 9 of the 12 hours upper division		12
Hours Subtotal		56
Electives		
Select 11 hours or hours to complete required total for degree [4]		11
Hours Subtotal		11
Total Hours		120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

[3] If used as (S) course above, hours in this block reduced by 3.

[4] 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 2025.

Agribusiness: Accounting Double Major, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 136

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 1213	Composition II	3
or ENGL 1413	Critical Analysis and Writing II	
or ENGL 3323	Technical Writing	
American History & Government		
HIST 1103	Survey of American History	3
or HIST 1483	American History to 1865 (H)	
or HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2103	Business Calculus (A)	3
or MATH 2123	Calculus for Technology Programs I (A)	
or MATH 2144	Calculus I (A)	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1,2,5,6]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
or CHEM 1014	Chemistry In Civilization (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [1]	3
or SPCH 2713	Introduction to Speech Communication (S)	
MGMT 3013	Fundamentals of Management (S) [1,3]	3
MKTG 3213	Marketing (S) [1,3]	3
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
At least one Diversity (D) course		
At least one International Dimension (I) course		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
Courses cannot be used here and as (N) course		
AG 1011	First Year Seminar	1
Select one course from two groups:		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	
NREM 3013	Applied Ecology and Conservation	
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	
Written and Oral Communications		
BCOM 3113	Written Communication [1,2,5,6]	3
Hours Subtotal		10
Major Requirements		
Agribusiness Core Courses		
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
3 hours from 4000-level AGEC excluding AGEC 4990		3
6 hours from AGEC 4000-level excluding AGEC 4990 [2,5,6]		6
3 hours upper-division AGEC not used elsewhere		3
ECON 3113	Intermediate Microeconomics [2,5,6]	3
or ECON 3023	Managerial Economics	
Accounting Required Courses		
Common Body [3]		
A GPA of 2.20 is required in the Common Body courses		
ACCT 2103	Financial Accounting [4,5]	3
ACCT 2203	Managerial Accounting [4,5]	3
AGEC 1113	Introduction to Agricultural Economics (S) [4]	3
or ECON 2103	Introduction to Microeconomics (S)	
BADM 3113	Interpersonal Skills	3
ECON 2203	Introduction to Macroeconomics [4]	3
EEE 2023	Introduction to Entrepreneurship	3
FIN 3113	Finance	3

LSB 3213	Legal and Regulatory Environment of Business [4]	3
or AGEC 3713	Agricultural Law	
MGMT 4513	Strategic Management	3
MSIS 2103	Business Data Science Technologies	3
MSIS 3223	Principles of Data Analytics	3
School of Accounting Major Requirements		
ACCT 3013	Federal Income Taxation [5,6,7]	3
ACCT 3103	Intermediate Accounting I [5,6,7]	3
ACCT 3113	Intermediate Accounting II [5,6,7]	3
ACCT 3203	Cost Accounting [5,6,7]	3
ACCT 3603	Accounting Information Systems [5,6,7]	3
ACCT 4133	Advanced Accounting [5,6,7]	3
ACCT 4503	Auditing and Assurance Services [5,6,7]	3
MSIS 4123	Information Assurance Management [5,6]	3
Hours Subtotal		86
Electives		
(or hours to complete required total for degree)		
MATH 1483 or MATH 1513 may need to be taken as prerequisite to required Calculus course		
Hours Subtotal		0
Total Hours		136

1 College or departments requirements that meet GE requirements and cannot be waived with an Associate's degree

2 15 hours School of Accounting core courses are used elsewhere including 6 hours of AGEC 4000-level courses

3 MGMT 3013 and MKTG 3213 are common body requirements, but are counted in general education requirements

4 15 hours Agribusiness core courses included in Accounting Common Body

5 A grade of "C" or better must be earned in these courses

6 A GPA of 2.20 is required in these 39 hours. 18 of these 39 hours must be taken in residence at OSU

7 15 of 21 required 3000- and 4000-level accounting hours must be taken in residence at OSU

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 2025.

Agribusiness: Agricultural Communications Double Major, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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		
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
Written & Oral Communications		
Select one of the following: [2]		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		11
Major Requirements		
Agribusiness Core Courses		
Select from one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
or		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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) [3]	3
AGEC 4503	Environmental Economics and Resource Development [3]	3
AGEC 4703	American Agricultural Policy [3]	3
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
Agricultural Communications Core Courses		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
AGCM 3123	Audio and Video Storytelling in Agricultural Communications	3
AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Digital and Online Media in Agricultural Communications	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 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 2102	Regional Diversity in Food Production, Selection and Consumption (D)	
FDSC 2233	The Meat We Eat	
or ANSI 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
or ANSI 2253	Meat Animal and Carcass Evaluation	
NSCI 2114	Principles of Human Nutrition (N)	
NSCI 3543	Food and the Human Environment (IS)	
Hours Subtotal		79
Electives		
or hours to complete required total for degree [4]		
Hours Subtotal		0
Total Hours		130

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If used as (S) course above, hours in this block reduced by 3.

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

[4] 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 2025.

Agribusiness: Community and Regional Analysis, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 1213	Composition II	3
or ENGL 1413	Critical Analysis and Writing II	
or ENGL 3323	Technical Writing	
American History & Government		
HIST 1103	Survey of American History	3
or HIST 1483	American History to 1865 (H)	
or HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought		
MATH 2103	Business Calculus (A) [1]	3
or MATH 2123	Calculus for Technology Programs I (A)	
or MATH 2144	Calculus I (A)	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A)	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
or CHEM 1014	Chemistry In Civilization (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
At least one Diversity (D) course		
At least one International Dimension (I) course		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
Course cannot be used here and as an (N)		
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	
NREM 3013	Applied Ecology and Conservation	
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	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	3
or BCOM 3113	Written Communication	
or BCOM 3443	Business Communication for International Students	
or ENGL 3323	Technical Writing	
If ENGL 3323 is substituted for ENGL 1213 above, hours in this block are reduced by 3.		
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	3
or SPCH 2713	Introduction to Speech Communication (S)	
or SPCH 3733	Elements of Persuasion (S)	
If used as (S) course above, hours in this block reduced by 3.		
Hours Subtotal		13
Major Requirements		
Core Courses		
Select from one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
or		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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 4723	Rural Economics Development	3
6 additional 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	
6 upper division hours from:		6
AGEC, ECON, MKTG 3213 or MGMT 3013		
Related Courses		
ECON 3423	Public Finance	3
9 hours from the following courses:		9
ECON 4643	International Economic Development (IS)	
ECON 4913	Urban and Regional Economics	
GEOG 3123	Urban Geography (S)	
GEOG 3163	Economic Geography (S)	
GEOG 3183	Transportation Geography	
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	
GEOG 4373	Spatial Analysis of Public Health	
GEOG 4443	Sustainable Tourism and Geography	
POLS 2033	Introduction to Public Administration	
POLS 3493	Public Policy	
POLS 3613	State and Local Government	
POLS 4403	Urban Politics and Management	
POLS 4413	Government Budgeting	
SOC 3423	Urban Sociology	
SOC 4533	World Population Problems	
Hours Subtotal		56
Electives		11
(or hours to complete required total for degree)		
MATH 1483 or MATH 1513 may need to be taken as prerequisite to required Calculus course		
Hours Subtotal		11
Total Hours		120

[1] College and Departmental requirements that meet GE requirements

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 2025.

Agribusiness: Crop and Soil Sciences, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
SOIL 2124	Fundamentals of Soil Science (N) [2]	4
PLNT 1213	Introduction to Plant and Soil Systems [2]	3
or HORT 1013	Principles of Horticultural Science (LN)	
or NREM 1113	Elements of Forestry	
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or BCOM 3113	Written Communication	
or BCOM 3443	Business Communication for International Students	
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [4]	3
or SPCH 2713	Introduction to Speech Communication (S)	
or SPCH 3733	Elements of Persuasion (S)	
Hours Subtotal		14
Major Requirements		
Core Courses		
Select from one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
OR		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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	
Minor Areas		
Select at least one of the following minors:		22
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 22 hours	
Hours Subtotal	66
Electives	
0 hours to complete required total for degree [5]	
Total Hours	120

1. College & Departmental requirements that may be used to meet GE requirements.
2. Depending upon minor chosen.
3. If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
4. If used as (S) course above, hours in this block reduced by 3.
5. 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 2025.

Agribusiness: Farm and Ranch Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
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	
NREM 3013	Applied Ecology and Conservation	
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	
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 [2]	
Select one of the following: [3]		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		13
Major Requirements		
Core Courses		
Select one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
OR		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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 AGEC 4000 excluding AGEC 4990		6
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
Select 6 upper division hours of the following:		6
AGEC, ECON, MKTG 3213 or MGMT 3013		
Related Courses		
15 hours from the following course prefixes that are not used elsewhere with at least 9 of the 15 hours upper division:		15
ANSI, ENTO, HORT, NREM, MCAG, PLNT, PLP, SOIL		
Hours Subtotal		59
Electives		
8 hours or hours to complete required total for degree [4]		8
Hours Subtotal		8
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 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 2025.

Agribusiness: International, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
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	
NREM 3013	Applied Ecology and Conservation	
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	
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 [2]	
Select one of the following: [3]		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		13
Major Requirements		
Core Courses		
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 3803	International Agricultural Economics Tour (I)	3

AGEC 4343	International Agricultural Markets and Trade (I)	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	
6 upper division hours from:		6
AGEC, ECON, MKTG 3213 or MGMT 3013		
International Related Courses		
Select 12 hours from courses in same foreign language [5]		12
Select 6 additional hours from courses in above foreign language or upper-division courses designated (I)		6
Hours Subtotal		65
Electives		
2 hours or hours to complete required total for degree [6]		2
Hours Subtotal		2
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 An international student may substitute 3 hours of AGEC 3810 Domestic Agricultural Economics Tour for AGEC 3803 International Agricultural Economics Tour (I).

5 A native speaker of a foreign language may substitute 18 hours towards one or more minors for the 18 hours in the same foreign language or upper-division courses designated (I).

6 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 2025.

Agribusiness: Natural Resources, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 1213	Composition II	3
or ENGL 1413	Critical Analysis and Writing II	
or ENGL 3323	Technical Writing	
American History & Government		
HIST 1103	Survey of American History	3
or HIST 1483	American History to 1865 (H)	
or HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2103	Business Calculus (A) [1]	3
or MATH 2123	Calculus for Technology Programs I (A)	
or MATH 2144	Calculus I (A)	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
or CHEM 1014	Chemistry In Civilization (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
At least one Diversity (D) course		
At least one International Dimension (I) course		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
Course cannot be used here and as (N) course		
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	
NREM 3013	Applied Ecology and Conservation	
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	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [2]	3
or BCOM 3113	Written Communication	
or BCOM 3443	Business Communication for International Students	
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	3
or SPCH 2713	Introduction to Speech Communication (S)	
or SPCH 3733	Elements of Persuasion (S)	
Hours Subtotal		13
Major Requirements		
Core Courses		
Select one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
OR		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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 3503	Natural Resource Economics	3
AGEC 3603	Agricultural Finance	3
AGEC 3713	Agricultural Law	3

AGEC 4503	Environmental Economics and Resource Development	3
6 additional 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	
3 upper division hours from:		3
AGEC, ECON, MKTG 3213 or MGMT 3013		
Related Courses:		
GEOG 4203	Fundamentals of Geographic Information Systems	3
9 hours from the following courses:		9
AST 4112	Land Measurement and Site Analysis	
AST 4203	Irrigation Principles	
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 3163	Economic Geography (S)	
GEOG 4053	Biogeography	
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 4323	Computer Cartography	
GEOG 4333	Remote Sensing	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
GEOG 4353	Geographic Information Systems: Socioeconomic Applications	
GEOL 1014	Geology and Human Affairs (LN)	
GEOL 3043	Geology of the National Parks (N)	
GEOL 3503	Environmental Geology (N)	
NREM any upper-division		
POLS 4363	Environmental Law And Policy	
POLS 4593	Natural Resources and Environmental Policy	
RMRT 4473	Recreation In the Natural Environment	
RMRT 4553	Tourism in Recreation Settings	
SOC 4433	Environmental Sociology (S)	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	
SOIL 4683	Soil, Water, and Weather	
SOIL 4893	Soil Chemistry and Environmental Quality	
Hours Subtotal		56
Electives		11
(or hours to complete required total for degree)		
MATH 1483 or MATH 1513 may need to be taken as prerequisite to required Calculus course		
Hours Subtotal		11
Total Hours		120

1 College and Departmental requirements that meet GE requirements

2 If ENGL 3323 is substituted for ENGL 1213 above, hours in this block are reduced by 3

3 If used as (S) course above, hours in this block reduced by 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 2025.

Agribusiness: Pre-Law, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
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	
NREM 3013	Applied Ecology and Conservation	
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	
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 [2]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	
SPCH 2713	Introduction to Speech Communication (S) [3]	
SPCH 3733	Elements of Persuasion (S) [3]	
Hours Subtotal		13
Major Requirements		
Core Courses		
Select one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
OR		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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 of AGEC 4000 level excluding AGEC 4990		9
ECON 2203	Introduction to Macroeconomics	3
ECON 3113	Intermediate Microeconomics	3
or ECON 3023	Managerial Economics	
Related Courses		
Select Alternative A, B or C (p. 886)		21
Hours Subtotal		59
Electives		
8 hours or hours to complete required total for degree [4]		8
Hours Subtotal		8
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 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 6 upper division hours from AGEC, ECON, MKTG 3213, or MGMT 3013

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

Alternative B

Select 6 upper division hours from AGEC, ECON, MKTG 3213, or MGMT 3013

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	

Alternative C

With approval of Advisor and Department Head a maximum of 29 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 2025.

Agribusiness: Pre-Veterinary Business Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 2103	Business Calculus (A) [1]	
MATH 2123	Calculus for Technology Programs I (A) [1]	
MATH 2144	Calculus I (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) (or equivalent STAT course designated A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		*13*
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN)	
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1515	Chemistry II (LN)	
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		0
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
From two of the following groups, select one course: [2]		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	
NREM 3013	Applied Ecology and Conservation	
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	
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 [3]	
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)	
Hours Subtotal		13
Major Requirements		
Core Courses		
ACCT 2103	Financial Accounting	3
or ACCT 2003	Survey of Accounting	
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
ANSI 3423	Animal Genetics	3
or BIOL 3023	General Genetics	
or PLNT 3554	Plant Genetics and Biotechnology	

ANSI 3543	Principles of Animal Nutrition	3
BIOC 3653	Survey of Biochemistry	3
Select 5 hours of upper division organic chemistry:		5
CHEM 3013 & CHEM 3012	Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory	
or		
CHEM 3053 & CHEM 3153 & CHEM 3112	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1114	College Physics I (LN)	4
PHYS 1214	College Physics II (LN)	4
BIOL 1604	Animal Biology	4
or BIOL 3204	Physiology	
or ANSI 3414	Form and Function of Livestock and Poultry	
Alternatives		
Choose one of two alternatives (p. 888)		16
Hours Subtotal		67
Electives		
0 hours to complete required total for degree [4]		
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

2 Course cannot be used here and as an (N).

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

4 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	3
or ECON 3023	Managerial Economics	
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 2025.

Agricultural Economics and Agribusiness (AEAB), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 21 hours

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

1 ACCT 3183 Agribusiness Accounting and Taxation or AGEC 3183 Agribusiness Accounting and Taxation may be substituted for ACCT 2103 Financial Accounting

2 Excluding AGEC 3010 Internship in Agricultural Economics, AGEC 3101 Professional Career Development, AGEC 3183 Agribusiness Accounting and Taxation, AGEC 3810, 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.
- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1014	Chemistry In Civilization (LN) [1]	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		8
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
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	
NREM 3013	Applied Ecology and Conservation	
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	
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 [2]	
Select one of the following: [3]		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		13
Major Requirements		
Core Courses		
Select from one of the following pairs of courses:		6
ACCT 2103	Financial Accounting	
ACCT 2203	Managerial Accounting	
OR		
ACCT 2003	Survey of Accounting	
ACCT 3003	Foundational Accounting Skills	
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
ECON 3123	Intermediate Macroeconomics	3
MATH 2153	Calculus II (A)	3

MATH 3013	Linear Algebra (A)	3
STAT 4013	Statistical Methods I (A)	3
STAT 4043	Applied Regression Analysis	3
or ECON 4223	Business and Economic Forecasting	
15 additional hours from upper-division AGEC with at least 12 hours 4000-level except AGEC 4990		15
Related Courses		
Hours Subtotal		59
Electives		
Select 8 hours or hours to complete required total for degree [4]		8
Hours Subtotal		8
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 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 2025.

Agricultural Real Estate Appraisal (AREA), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 24 hours

Code	Title	Hours
Minor Requirements		
ACCT 2103	Financial Accounting	3
ACCT 2203	Managerial Accounting	3
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
STAT 2023	Elementary Statistics for Business and Economics (A)	3

Other Requirements

- At least nine hours of the AGEC courses must be taken at OSU.
- A grade-point average of 2.0 for courses that count for the 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 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 (EEPP), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 21 hours

Code	Title	Hours
Minor Requirements		
AGEC 1113	Introduction to Agricultural Economics (S)	3
or ECON 2103	Introduction to Microeconomics (S)	
AGEC 3503	Natural Resource Economics	3
or ECON 3903	Economics of the Environment	
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	
AGEC 4703	American Agricultural Policy	
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 4053	Natural Resource Recreation	
or RMRT 4473	Recreation In the Natural Environment	
NREM 4093	Natural Resources, People and Sustainable Development (I)	
POLS 3493	Public Policy	
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

- At least nine upper-division hours must be taken at OSU.
- A grade-point average of 2.0 for courses that count for the 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 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 (http://caepnet.org) (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. 895)
- Agricultural Education: Agricultural Communications, BSAG (p. 897)
- Agricultural Education: Animal Agriculture, BSAG (p. 899)
- Agricultural Education: Horticultural Sciences, BSAG (p. 901)
- Agricultural Education: Multidisciplinary, BSAG (p. 903)
- Agricultural Education: Natural Resources, BSAG (p. 905)

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 coursework, 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 coursework, 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 Master of Science degree. Evidence of academic ability (2.80 GPA or above) in undergraduate coursework 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; Ruth Inman, PhD; Angel Riggs, PhD; Quisto Settle, PhD

Agricultural Education: Agricultural Business and Economics, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.50
Total Hours: 121

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH or STAT (A)		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
SPCH 2713	Introduction to Speech Communication (S) [1]	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course [2]		
Select at least one International Dimension (I) course [3]		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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) [4]	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 [2]	
Hours Subtotal		15
Major Requirements		
Core Courses		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (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	
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Agricultural Economics and Agribusiness		
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 3803	International Agricultural Economics Tour (I)	
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	
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
Hours Subtotal		66
Electives [5]		
Hours Subtotal		0
Total Hours		121

1 College & Departmental requirements that may be used to meet GE requirements.

2 Completed in the Professional Core: SPED 3202 Educating Exceptional Learners (D).

3 Completed in Related Courses: AGED 4713 International Programs in Agricultural Education and Extension (I) or AGEC 3803 International Agricultural Economics Tour (I) or AGLE 3803 Global Leadership in Agriculture (I) or ANSI 3903 Agricultural Animals of the World (I).

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

5 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 2025.

Agricultural Education: Agricultural Communications, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.50
Total Hours: 132

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH (A) or STAT (A) [1]		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [2]	3
SPCH 2713	Introduction to Speech Communication (S) [2]	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course [3]		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
AG 1011	First Year Seminar	1
ANSI 1124	Introduction to the Animal Sciences	4
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
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
Biological Sciences		
BIOL 1114	Introductory Biology (LN) [4]	4
Written & Oral Communications		
AGCM 2113	Introduction to Agricultural Communications	3
AGCM 3113	Writing and Editing for Agricultural Publications	3
Hours Subtotal		36
Major Requirements		
Core Courses		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGEC 3803	International Agricultural Economics Tour (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
ANSI 3903	Agricultural Animals of the World (I)	
AGCM 3123	Audio and Video Storytelling in Agricultural Communications	3
AGEC 3213	Quantitative Methods in Agricultural Economics	3
AGCM 3223	Digital and Online Media in Agricultural Communications	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
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 hours)	9
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
SPED 3202	Educating Exceptional Learners (D)	2
Hours Subtotal		56
Electives [5]		
Hours Subtotal		0
Total Hours		132

[1] Suggested: MATH 1483 Mathematical Functions and Their Uses (A),MATH 1493 Applications of Modern Mathematics (A) or MATH 1513 College Algebra (A)

[2] College & Departmental requirements that may be used to meet GE requirements.

[3] Completed in the Professional Core: SPED 3202 Educating Exceptional Learners (D)

[4] If used as (N), hours in College/Departmental Requirements reduced by 4.

[5] 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.
- 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 2025.

Agricultural Education: Animal Agriculture, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.50
Total Hours: 132

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH (A) or STAT (A)		6
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
Select one of the following courses:		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
Chemistry		
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [4]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Hours Subtotal		32
Major Requirements		
Core Courses		
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	
Professional Agriculture Education 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 [5]	3

AGED 4200	Student Teaching in Agricultural Education [5]	9
EPSY 3213	Psychology of Adolescence	3
SPED 3202	Educating Exceptional Learners (D)	2
Hours Subtotal		60
Electives [6]		
Hours Subtotal		0
Total Hours		132

1. College & Departmental requirements that may be used to meet GE requirements.
2. If used as (N) course above, hours in this block reduced by 4.
3. If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3
4. If used as (S) course above, hours in this block reduced by 3
5. AGED 4203 Professional Development in Agricultural Education & AGED 4200 Student Teaching in Agricultural Education are taken during student teaching semester.
6. 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 2025.

Agricultural Education: Horticultural Sciences, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.50
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH or STAT (A)		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
SPCH 2713	Introduction to Speech Communication (S) [1]	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S) [2]		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course [3]		
Select at least one International Dimension (I) course [4]		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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) [5]	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	
Hours Subtotal		15
Major Requirements		
Core Courses		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGEC 3803	International Agricultural Economics Tour (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	
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
HORT 1013	Principles of Horticultural Science (LN)	3
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Horticulture Courses		
HORT 3084	Plant Propagation	4
PBIO 1404	Plant Biology (LN)	4
Select a minimum of 8 hours from HORT prefix courses [6]		8
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 [7]	3
AGED 4200	Student Teaching in Agricultural Education [7]	9
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
SPED 3202	Educating Exceptional Learners (D)	2
Hours Subtotal		64
Electives		
Select 1 hour or hours to complete required total for degree [8]		1

Hours Subtotal	1
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

2 suggested: STAT 2013 Elementary Statistics (A); PSYC 1113 Introductory Psychology (S)

3 Completed in the Professional Core: SPED 3202 Educating Exceptional Learners (D)

4 Completed in Related Courses: AGED 4713 International Programs in Agricultural Education and Extension (I)

5 If used as (N) course above, hours in this block reduced by 4.

6 excluding HORT 1003 , 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.

7 NOTE: AGED 4203 Professional Development in Agricultural Education & AGED 4200 Student Teaching in Agricultural Education are taken during student teaching semester.

8 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 2025.

Agricultural Education: Multidisciplinary, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.50
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH (A) or STAT (A) [1]		3
(Suggested: MATH 1483 or MATH 1493 or MATH 1513)		
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [2]	3
SPCH 2713	Introduction to Speech Communication (S) [2]	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S) [3]		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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)		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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	
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
NREM 2013	Ecology of Natural Resources	3
PLNT 1213	Introduction to Plant and Soil Systems	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Biological Sciences		
BIOL 1114	Introductory Biology (LN) [4]	4
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	3
or ENGL 3323	Technical Writing	
Hours Subtotal		33
Major Requirements		
Enrichment Courses		
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		
International Agriculture		
Select one of the following:		3
AGED 4713	International Programs in Agricultural Education and Extension (I)	
AGEC 3803	International Agricultural Economics Tour (I)	
AGLE 3803	Global Leadership in Agriculture (I)	
ANSI 3903	Agricultural Animals of the World (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 [5]	3
AGED 4200	Student Teaching in Agricultural Education [5]	9
EPSY 3213	Psychology of Adolescence	3
or EPSY 3413	Child and Adolescent Development	
SPED 3202	Educating Exceptional Learners (D)	2

Hours Subtotal	42
Electives	
Select 5 hours or hours to complete required total for degree [6]	5
Hours Subtotal	5
Total Hours	120

1. suggested: MATH 1483 Mathematical Functions and Their Uses (A) or MATH 1493 Applications of Modern Mathematics (A) or MATH 1513 College Algebra (A)
2. College & Departmental requirements that may be used to meet GE requirements.
3. suggested: STAT 2013 Elementary Statistics (A); PSYC 1113 Introductory Psychology (S)
4. If used as (N) course above, hours in this block reduced by 4.
5. AGED 4203 Professional Development in Agricultural Education & AGED 4200 Student Teaching in Agricultural Education are taken during student teaching semester.
6. 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 2025.

Agricultural Education: Natural Resources, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.50
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH or STAT (A) [1]		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [2]	3
SPCH 2713	Introduction to Speech Communication (S) [2]	3
or AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S) [3]		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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)		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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)	
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	
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
PLNT 1213	Introduction to Plant and Soil Systems	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Biological Sciences		
BIOL 1114	Introductory Biology (LN) [4]	4
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	3
or ENGL 3323	Technical Writing	
Hours Subtotal		33
Major Requirements		
Core Courses		
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 3153	Forest Health and Disturbance Ecology	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4053	Natural Resource Recreation	
Professional Agriculture Education 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
SPED 3202	Educating Exceptional Learners (D)	2
Hours Subtotal		46
Electives		

Select 1 hour or hours to complete required total for degree [5]	1
Hours Subtotal	1
Total Hours	120

1. suggested: MATH 1483 Mathematical Functions and Their Uses (A), MATH 1493 Applications of Modern Mathematics (A) or MATH 1513 College Algebra (A)
2. College & Departmental requirements that may be used to meet GE requirements.
3. suggested: STAT 2013 Elementary Statistics (A); PSYC 1113 Introductory Psychology (S)
4. If used as (N) course above, hours in this block reduced by 4.
5. This hour 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 2025.

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 coursework include leadership styles, power, decision-making, ethical leadership, motivational theories and team processes.

In addition to leadership coursework, 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 coursework, including six hours of controlled electives.

Undergraduate Programs

- Agricultural Leadership, BSAG (p. 909)
- Agricultural Leadership: Extension Education, BSAG (p. 911)
- Agricultural Leadership: International Studies, BSAG (p. 913)

- Agricultural Leadership (AGLE), Minor (p. 908)

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 coursework including a 17-hour area of emphasis. Graduate coursework 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; Ruth Inman, PhD; Angel Riggs, PhD; Quisto Settle, PhD

Agricultural Leadership (AGLE), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 15 hours

Code	Title	Hours
Minor Requirements		
AGLE 2303	Agricultural Leaders in Society (S)	3
AGLE 2403	Agricultural Leadership in a Multicultural Society (DS)	3
AGLE 3303	Agricultural Leadership: Theory and Practice	3
AGLE 3403	Facilitating Social Change in Agriculture	3
AGLE 3803	Global Leadership in Agriculture (I)	3

- A grade-point average of 2.0 for courses that count for the 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 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 Leadership, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH (A) or STAT (A)		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) [1]	
CHEM 1314	Chemistry I (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
SOIL 1113	Land, Life and the Environment (N) [1]	3
or SOIL 2124	Fundamentals of Soil Science (N)	
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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)		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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)	
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [2]	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Hours Subtotal		20
Major Requirements		
Core Courses		
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	
Additional Requirements		
AGEC	Select 3 hours of upper-division	3
Select 3 hours of NREM		3
Related Courses		
To be selected from areas related to agriculture and/or agricultural leadership including any courses with prefixes in CASNR, plus EPSY, PSYC, and MGMT.		15
Hours Subtotal		54
Electives		
Select 6 hours or hours to complete required total for degree		6
Hours Subtotal		6
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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 2025.

Agricultural Leadership: Extension Education, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH (A) or STAT (A)		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1314	Chemistry I (LN) [1]	
SOIL 1113	Land, Life and the Environment (N) [1]	3
or SOIL 2124	Fundamentals of Soil Science (N)	
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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)		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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)	
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [2]	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Hours Subtotal		20
Major Requirements		
Core Courses		
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	
Additional Requirements		
AGEC 4723	Rural Economics Development	3
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
Related Courses		
To be selected from areas related to youth development, extension education, agriculture and/or agricultural leadership including any courses with prefixes in CASNR, plus EPSY, PSYC, and MGMT.		12
Hours Subtotal		60
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

[3] 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 2025.

Agricultural Leadership: International Studies, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH (A) or STAT (A)		3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1014	Chemistry In Civilization (LN) [1]	
CHEM 1215	Chemical Principles I (LN) [1]	
CHEM 1314	Chemistry I (LN) [1]	
SOIL 1113	Land, Life and the Environment (N) [1]	3
or SOIL 2124	Fundamentals of Soil Science (N)	
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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)		
College/Departmental Requirements		
Agricultural Sciences and Natural Resources		
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)	
Written & Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [2]	3
or ENGL 3323	Technical Writing	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Hours Subtotal		20
Major Requirements		
Core Courses		
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	
Additional Requirements		
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 9 hours from courses in the same foreign language		9
Related Courses		
To be selected from areas related to youth development, extension education, agriculture and/or agricultural leadership including any courses with prefixes in CASNR, plus EPSY, PSYC, and MGMT.		9

Hours Subtotal	60
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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 2025.

Animal and Food Sciences

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 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 an Animal Science degree have a wide choice of challenging careers, including ownership or management of farms, ranches or 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 the student can select to personalize their programs. The basic core of advanced Animal Science courses includes: 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 their 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 Science courses the student can select from to personalize their programs. The basic core of Food Science courses includes: 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: Agricultural Communications Double Major, BSAG (p. 918)
- Animal Science: Agricultural Education Double Major, BSAG (p. 920)
- Animal Science: Animal Biotechnology, BSAG (p. 922)
- Animal Science: Business, BSAG (p. 924)
- Animal Science: Livestock Merchandising, BSAG (p. 926)
- Animal Science: Pre-Veterinary Animal Science, BSAG (p. 928)
- Animal Science: Production, BSAG (p. 930)
- Animal Science: Ranch Operations, BSAG (p. 932)
- Food Science: Food Industry, BSAG (p. 936)
- Food Science: Food Safety, BSAG (p. 938)
- Food Science: Meat Science, BSAG (p. 940)
- Food Science: Science, BSAG (p. 942)

- Animal Science (ANSI), Minor (p. 917)
- Food Science (FDSC), Minor (p. 935)

Certificates

- Equine Enterprise Management (EEM) (https://okstate-curr.courseleaf.com/agricultural-sciences-natural-resources/animal-science/equine-enterprise-management-ug-certificate)

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 Food Science Program. 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: Paul Beck, PhD; Scott Carter, PhD; Steven Cooper, PhD; Udaya DeSilva, PhD; Divya Jaroni, PhD; Janeen Salak-Johnson, PhD; Mark Z. Johnson, PhD; Ranjith Ramanathan, PhD; Ryan Reuter, PhD; Dan Stein, PhD
Assistant Professors: Blake Bloomberg, PhD; Andrew Foote, PhD; Darren Hagen, PhD: Kris Hiney, PhD; Ravi Jadeja, PhD; Adel Pezeshki, PhD; Blake Wilson, PhD
Teaching Instructors: Justin Crosswhite, MS; Mellissa Crosswhite, PhD
Associate Extension Specialist: Rusty Gosz, MS

Animal Science (ANSI), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 22 hours

Code	Title	Hours
Minor Requirements		
ANSI 1124	Introduction to the Animal Sciences	4
Select 18 hours of the following: [1]		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 4703	Equine Enterprise Management	
ANSI 4803	Animal Growth and Performance	
ANSI 4863	Capstone for Animal Agriculture	

[1] At least 3 of these credits must be from 4000-level courses.

Other Requirements

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1483	Mathematical Functions and Their Uses (A) [1]	3
or MATH 1513	College Algebra (A)	
Select one of the following:		3
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
MATH 1613	Trigonometry (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
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) [2]	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N) [2]	
SOIL 2124	Fundamentals of Soil Science (N)	
Select two of the following:		5
ANSI 2112	Live Animal Evaluation	
ANSI 2233	The Meat We Eat	
or ANSI 2253	Meat Animal and Carcass Evaluation	
FDSC 1133	Fundamentals of Food Science	
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Written and Oral Communications		
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) [3]	
SPCH 2713	Introduction to Speech Communication (S) [3]	
SPCH 3733	Elements of Persuasion (S) [3]	
Hours Subtotal		27
Major Requirements		
Animal Science Core Courses		
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 4703	Equine Enterprise Management	
ANSI 4713	Beef Seedstock Management and Sales	
Agricultural Communications Core Courses		
AGCM 3123	Audio and Video Storytelling in Agricultural Communications	3

AGCM 3213	Layout and Design for Agricultural Publications	3
AGCM 3223	Digital and Online Media in Agricultural Communications	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 2003	Survey of Accounting	
Related Courses		
Select 1 hour of the following:		1
ANSI, AGEC, AGCM, FIN, NREM, PLNT, MKTG, ENTO, MGMT		
Hours Subtotal		63
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		130

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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 2025.

Animal Science: Agricultural Education Double Major, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 133

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1483	Mathematical Functions and Their Uses (A) [1]	3
or MATH 1513	College Algebra (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
MATH 2103	Business Calculus (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
AST 3011	Ag Structures	1
AST 3211	Engines and Power	1
AST 3222	Metals and Welding	2
AST 4101	Ag Electrification	1
HORT 1013	Principles of Horticultural Science (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		32
Major Requirements		
Core Courses		
ANSI 3242	Advanced Livestock Evaluation	2
or ANSI 3310	Advanced Competitive Evaluation	
or ANSI 3222	Advanced Equine Evaluation	
or ANSI 3232	Advanced Meat 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
Professional Agriculture Education 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 [5]	3
AGED 4200	Student Teaching in Agricultural Education [5]	9
EPSY 3213	Psychology of Adolescence	3
SPED 3202	Educating Exceptional Learners (D)	2
Related Courses		
Select 1 hour of the following:		1
AGEC, AST, FIN, NREM, ANSI, FDSC, PLNT, ENTO, MGMT, SOIL, EEE, MKTG		
Hours Subtotal		61
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		133

[1] College & Departmental requirements that may be used to meet GE requirements.

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

[3] If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3

[4] If used as (S) course above, hours in this block reduced by 3

[5] 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 2025.

Animal Science: Animal Biotechnology, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
Select one of the following:		3
HORT 1013	Principles of Horticultural Science (LN)	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
CHEM 1314	Chemistry I (LN) [2]	4
or CHEM 1215	Chemical Principles I (LN)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		22
Major Requirements		
Core Courses		
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
Choose Option 1 or 2 from below: (p. 923)		9
Additional Core Courses		
CHEM 1225	Chemical Principles II (LN)	5
or CHEM 1515	Chemistry II (LN)	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1014	Descriptive Physics (N)	4
or PHYS 1114	College Physics I (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 of upper division organic chemistry		5
CHEM 3013 & CHEM 3012	Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory	
or		
CHEM 3053 & CHEM 3153 & CHEM 3112	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
BIOC 3653	Survey of Biochemistry	3

Related Courses	
Select 5 hours of the following:	5
Minimum of 3 upper division hours required	
ANSI, BIOC, BIOL, CHEM, ENTO, FDSC, MICR, PHYS, STAT [5]	
No more than 3 hours from ANSI 4900	
Hours Subtotal	58
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

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

5 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 2025.

Animal Science: Business, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
Select one of the following courses:		3
HORT 1013	Principles of Horticultural Science (LN)	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
ANSI 1124	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		19
Major Requirements		
Core Courses		
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 5 hours of the following:		5
ANSI 2112	Live Animal Evaluation	
ANSI 2233	The Meat We Eat	
ANSI 2253	Meat Animal and Carcass Evaluation	
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
or ACCT 2003	Survey of Accounting	
ACCT 2203	Managerial Accounting	3
or FIN 2123	Personal Finance	
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 AGEC, EEE, ECON, FIN, MKTG, MGMT		12
Students pursuing a minor should consult their adviser when choosing classes in this section		
Related Courses		

Selected 8 hours from any upper-division courses from CASNR, SSB, MMJ or SC	8
Hours Subtotal	61
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 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 2025.

Animal Science: Livestock Merchandising, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
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)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN)	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
PLNT 1213	Introduction to Plant and Soil Systems	3
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	
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		23
Major Requirements		
Core Courses		
ANSI 3242	Advanced Livestock Evaluation	2
or ANSI 3222	Advanced Equine Evaluation	
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
or FIN 2123	Personal Finance	
SC 2183	Introduction to Strategic Communications	3
or MC 1143	Media in a Diverse Society (DS)	
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
ANSI, AGCM, ACCT, FIN, SC, AGEC, MGMT, MC, SPM, EEE, MKTG, FDSC, MMJ		
Hours Subtotal		57
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If used for (N) requirement, hours in this block are reduced by CHEM course hours and related courses increased.

[3] If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

[4] 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.
- Degrees that follow this plan must be completed by the end of Summer 2025.

Animal Science: Pre-Veterinary Animal Science, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
CHEM 1515	Chemistry II (LN) [1]	5
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
PLNT 1213	Introduction to Plant and Soil Systems	3
ANSI 1124	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [2]	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)	
Hours Subtotal		18
Major Requirements		
Core Courses		
ANSI 3423	Animal Genetics	3
ANSI 3543	Principles of Animal Nutrition	3
ANSI 3903	Agricultural Animals of the World (I)	3
Option		
Select Option 1 or 2: (p. 928)		9
Additional Core Courses		
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	5
PHYS 1114	College Physics I (LN)	4
PHYS 1214	College Physics II (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
Related Courses		
Select Alternative 1 or 2: (p. 929)		19
Hours Subtotal		62
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] 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
9 hours:		9
ANSI 3443	Animal Reproduction	
ANSI 3623	Livestock Behavior Handling	
ANSI 3653	Applied Animal Nutrition	

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	

Alternatives

Alternative 1

First 2 semesters in the College of Veterinary Medicine.

Alternative 2

Code	Title	Hours
ANSI 3433	Animal Breeding	3
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 4633	Stocker and Feedlot Cattle 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
Select any upper division course in AG, AGEC, ANSI, BIOL, CHEM, ENTO, FDSC, 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 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 2025.

Animal Science: Production, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN)	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
PLNT 1213	Introduction to Plant and Soil Systems	3
ANSI 1124	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2112	Live Animal Evaluation	2
ANSI 2253	Meat Animal and Carcass Evaluation	3
or ANSI 2233	The Meat We Eat	
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
Additional Requirements		
CHEM 1225	Chemical Principles II (LN) [2]	5
or CHEM 1515	Chemistry II (LN)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		29
Major Requirements		
Core Courses		
ACCT 2103	Financial Accounting	3
or ACCT 2003	Survey of Accounting	
AGEC 3423	Farm and Agribusiness Management	3
or AGEC 3403	Agricultural Small Business Management	
Select one of the following courses:		3
ANSI 3333	Meat Science	
ANSI 3533	Equine Management and Production	
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	
Related Courses		
Select 6 hours of the following:		6
AGEC, ANSI[5], AST,BIOL, ENTO, EEE, FDSC, FIN, LSB, MGMT, MKTG, NREM, PLNT, SOIL		

Hours Subtotal	51
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used for (N) requirement, hours in this block are reduced by CHEM course hours.

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

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

5 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 2025.

Animal Science: Ranch Operations, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
PLNT 1213	Introduction to Plant and Soil Systems	3
ANSI 1124	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2112	Live Animal Evaluation	2
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
Additional Requirements		
CHEM 1225	Chemical Principles II (LN) [2]	5
or CHEM 1515	Chemistry II (LN)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		29
Major Requirements		
Core Courses		
ANSI 3333	Meat Science	3
or ANSI 3623	Livestock Behavior Handling	
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 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
ANSI 4203	Rangeland and Pasture Utilization	
ANSI 4973	Rangeland Resources Planning	
or NREM 4613	Rangeland Resources Planning	
PBIO 4005	Field Botany	
NREM 3613	Principles of Rangeland Management	
NREM 4783	Prescribed Fire	
NREM 4793	Advanced Prescribed Fire	
Additional Core Courses		
SOIL 2124	Fundamentals of Soil Science (N)	4
ACCT 2103	Financial Accounting	3
or ACCT 2003	Survey of Accounting	
AGEC 3423	Farm and Agribusiness Management	3
or AGEC 3403	Agricultural Small Business Management	
Related Courses		

Select 2 hours of the following:	2
Any upper division: ACCT, AGEC, ANSI, BIOL, ENTO, EEE, FDSC, FIN, LSB, MGMT, MKTG, NREM, PLNT, SOIL	
Hours Subtotal	51
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 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 2025.

Equine Enterprise Management (EEM), Undergraduate Certificate

Total Hours: 20 Hours

Code	Title	Hours
ACCT 2103	Financial Accounting	
ANSI 3533	Equine Management and Production	
ANSI 4423	Horse Science	
ANSI 4703	Equine Enterprise Management	
Select one AGEC course from the following:		3
AGEC 3323	Agricultural Product Marketing and Sales	
AGEC 3403	Agricultural Small Business Management	
AGEC 3423	Farm and Agribusiness Management	
AGEC 3713	Agricultural Law	
Select five credit hours from the following:		5
ANSI 1401	Equine Behavior and Handling	
ANSI 3222	Advanced Equine Evaluation	
ANSI 3310	Advanced Competitive Evaluation	
ANSI 3402	Equine Training Methods	
ANSI 3633	Equine Sales Preparation	
ANSI 3643	Equine Breeding and Foaling [1]	
ANSI 4900	Special Problems	
ANSI 4910	Animal Industry Internship [2]	

[1] New courses that are currently listed as ANSI 4900 but will be changed to these numbers by Fall 2019

[2] Equine-Oriented

For additional information on this program, please contact Dr. Steven Cooper, Department of Animal Science, 201j Animal Science Building, 405-744-9291.

Food Science (FDSC), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 20 hours

Code	Title	Hours
Minor Requirements		
FDSC 1133	Fundamentals of Food Science	3
Select 17 credits of the following:		17
ANSI 3543	Principles of Animal Nutrition	
or NSCI 4123	Human Nutrition and Metabolism I	
AST 4123	Principles of Food Engineering	
FDSC 2233	The Meat We Eat	
FDSC 2253	Meat Animal and Carcass Evaluation	
FDSC 3113	Quality Control	
FDSC 3123	HACCP in the Food Industry	
FDSC 3133	Plant Sanitation for Food Processing Operations	
FDSC 3154	Food Microbiology	
FDSC 3232	Advanced Meat Evaluation	
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3333	Meat Science	
FDSC 3373	Food Chemistry I	
FDSC 3603	Processing Dairy Foods	
FDSC 4113	Quality Control II	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4333	Processed Meat	
FDSC 4763	Analysis of Food Products	
FDSC 4910	Food Industry Internship [1]	

[1] 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.

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
or MATH 1483	Mathematical Functions and Their Uses (A)	
Select one of the following:		3
MATH 1613	Trigonometry (A) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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 2111	Animal and Food Science Professional Development	1
ANSI 2253	Meat Animal and Carcass Evaluation	3
or ANSI 2233	The Meat We Eat	
FDSC 1133	Fundamentals of Food Science	3
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
CHEM 1225	Chemical Principles II (LN)	5
or CHEM 1515	Chemistry II (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	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		31
Major Requirements		
Core Courses		
ANSI 4863	Capstone for Animal Agriculture	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 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 12 hours of the following:		12
AST 4123	Principles of Food Engineering	
ANSI 3232	Advanced Meat Evaluation	
ANSI 3310	Advanced Competitive Evaluation	
ANSI 3333	Meat Science	
FDSC 3603	Processing Dairy Foods	
FDSC 4113	Quality Control II	
FDSC 4143	Food Safety Modernization Act	
FDSC 4153	Advanced Food Microbiology	
FDSC 4233	Food Safety Audit Schemes	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4333	Processed Meat	
FDSC 4910	Food Industry Internship	
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 3903	Agricultural Animals of the World (I) (or any course designated (I))	
ACCT, AGEC, ANSI, AGCM, FDSC, HORT, HTM, PLNT, MICR, MGMT, MKTG, MATH, NSCI, STAT, Foreign Language		
Hours Subtotal		49
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used for (N) requirement, hours in this block are reduced by CHEM course hours.

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

4 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 2025.

Food Science: Food Safety, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
or STAT 2023	Elementary Statistics for Business and Economics (A)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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 2111	Animal and Food Science Professional Development	1
FDSC 1133	Fundamentals of Food Science	3
ANSI 2253	Meat Animal and Carcass Evaluation	3
or ANSI 2233	The Meat We Eat	
CHEM 1314	Chemistry I (LN) [2]	4
CHEM 1515	Chemistry II (LN)	5
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	
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		31
Major Requirements		
Core Courses		
ANSI 4863	Capstone for Animal Agriculture	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 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	
Related Courses		
Select 12 hours of the following:		12
FDSC 3310	Advanced Competitive Evaluation	
FDSC 3333	Meat Science	
FDSC 3603	Processing Dairy Foods	
FDSC 4143	Food Safety Modernization Act	
FDSC 4233	Food Safety Audit Schemes	
FDSC 4253	Pre-Harvest Food Safety	
FDSC 4333	Processed Meat	
FDSC 4373	Food Chemistry II	
NSCI 3543	Food and the Human Environment (IS)	
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	
Hours Subtotal		49
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used for (N) requirement, hours in this block are reduced by CHEM course hours.

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

4 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 2025.

Food Science: Meat Science, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
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) [1]	
STAT 2013	Elementary Statistics (A) [1]	
STAT 2023	Elementary Statistics for Business and Economics (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course.		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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	Introduction to the Animal Sciences	4
ANSI 2111	Animal and Food Science Professional Development	1
ANSI 2253	Meat Animal and Carcass Evaluation	3
or ANSI 2233	The Meat We Eat	
FDSC 1133	Fundamentals of Food Science	3
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
CHEM 1225	Chemical Principles II (LN)	5
or CHEM 1515	Chemistry II (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	
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		35
Major Requirements		
Core Courses		
ANSI 3543	Principles of Animal Nutrition	3
ANSI 4863	Capstone for Animal Agriculture	3
ANSI 3232	Advanced Meat Evaluation	2
ANSI 3333	Meat Science	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 4333	Processed Meat	3
FDSC 4763	Analysis of Food Products	3
FDSC 4910	Food Industry Internship	3
Related Courses		
Select 12 hours of the following (at least 6 upper division hours required):		12
ACCT, AGEC, ANSI, AGCM, CHEM, FDSC, HORT, HTM, PLNT, MICR, MGMT, MKTG, MATH, NSCI, STAT, Foreign Language		
Hours Subtotal		45
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If used for (N) requirement, hours in this block are reduced by CHEM course hours

[3] If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3

[4] 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 2025.

Food Science: Science, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
or STAT 2023	Elementary Statistics for Business and Economics (A)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Any course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
or ECON 2103	Introduction to Microeconomics (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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 2111	Animal and Food Science Professional Development	1
ANSI 2233	The Meat We Eat	3
or ANSI 2253	Meat Animal and Carcass Evaluation	
FDSC 1133	Fundamentals of Food Science	3
CHEM 1314	Chemistry I (LN) [2]	4
CHEM 1515	Chemistry II (LN)	5
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PHYS 1014	Descriptive Physics (N)	4
or PHYS 1114	College Physics I (LN)	
Select one of the following:		3
ENVR 1113	Elements of Environmental Science	
HORT 1013	Principles of Horticultural Science (LN)	
PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 1113	Land, Life and the Environment (N)	
SOIL 2124	Fundamentals of Soil Science (N)	
Written and Oral Communications		
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources [3]	3
or ENGL 3323	Technical Writing	
Select one of the following: [4]		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		35
Major Requirements		
Core Courses		
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	Survey of Organic Chemistry	5
NSCI 3223	Nutrition Across the Life Span	3
or ANSI 3543	Principles of Animal Nutrition	
Related Courses		
Select 12 hours of the following (at least 6 upper division hours required):		12
ANSI, BIOC, CHEM, FDSC, HORT, HTM, PLNT, MICR, MATH, NSCI, STAT, Foreign Language		
Hours Subtotal		45
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1. College & Departmental requirements that may be used to meet GE requirements.
2. If used for (N) requirement, hours in this block are reduced by CHEM course hours.
3. If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.
4. 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 2025.

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. 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 also available in undergraduate 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 and Molecular Biology, BSAG (p. 947)
- Biochemistry and Molecular Biology: Pre-Medical or Pre-Veterinary Science, BSAG (p. 950)
- Biochemistry (BIOC), Minor (p. 946)

Graduate Programs

Many career opportunities in biochemistry require advanced coursework, 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

Students with a Bachelor's degree in Biochemistry, Molecular Biology and Chemistry or with strong backgrounds in other biological or physical science disciplines are eligible to apply to the graduate programs in Biochemistry and Molecular Biology. Individuals should have at least two semesters of organic chemistry and one semester of biochemistry, molecular biology, calculus, analytical and physical chemistry. Students may be required to take appropriate undergraduate courses, if major deficiencies are identified. The Department of Biochemistry and Molecular Biology graduate program also requires that students report their scores on the standardized GRE exam: Verbal Reasoning; Quantitative Reasoning; and Analytical Writing.

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 coursework 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; Donald Ruhl, PhD; Kevin Wilson, PhD
Assistant Professors: Charles Chen, 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; Kitty Cardwell, PhD; Richard A. Dixon, PhD; Udaya DeSilva, PhD; Haobo Jiang, PhD; Veronique A. Lacombe, PhD; Jerry R. Malayer, PhD; Kenneth L. McNally, PhD; Smita Mohanty, PhD; Rolf A. Prade, PhD; Carey Pope, PhD; Kay Scheets, PhD; William Schneider, PhD; Lloyd Sumner, PhD; Million Tadege, PhD; Guolong (Glenn) Zhang, 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 20 hours

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

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
Select 5 hours courses designated N		5
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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 Core		
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	
Written and 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 [2]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	
SPCH 2713	Introduction to Speech Communication (S) [3]	
SPCH 3733	Elements of Persuasion (S) [3]	
Hours Subtotal		13
Major Requirements		
Core Courses		
BIOC 3723	Biochemistry and Molecular Biology Laboratory	3
BIOC 3813	Biochemistry II	3
BIOC 3223	Physical Chemistry for Biologists	3
or CHEM 3433	Physical Chemistry I	
BIOC 4883	Senior Seminar in Biochemistry	3
BIOC 4990	Undergraduate Research (2 hrs) [4]	2
CHEM 1515	Chemistry II (LN)	5
CHEM 2113	Principles of Analytical Chemistry	3
CHEM 3053	Organic Chemistry I	3
CHEM 3112	Organic Chemistry Laboratory	2
CHEM 3153	Organic Chemistry II	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	College Physics I (LN)	4
or PHYS 2014	University Physics I (LN)	
PHYS 1214	College Physics II (LN)	4

or PHYS 2114	University Physics II (LN)	
BIOL 1114	Introductory Biology (LN)	4
BIOL 1604	Animal Biology	4
or PBIO 1404	Plant Biology (LN)	
Select one of the following:		3
ANSI 3423	Animal Genetics	
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
Select one of the following:		4
BIOL 3204	Physiology	
ENTO 3044	Insect Morphology and Physiology	
PBIO 4463	Plant Physiology	
Related Courses		
Select a minimum of 6 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following:		6
ANSI 3433	Animal Breeding	
ANSI 3443	Animal Reproduction	
ANSI 3543	Principles of Animal Nutrition	
BIOC 1990	Freshman Research in Biochemistry and Molecular Biology (up to 2 hours) [4]	
BIOC 2202	Medicine and Molecules	
BIOC 2352	Fundamental Biochemistry	
BIOC 3003	Hypothesis-Driven Undergraduate Research	
BIOC 4113	Molecular Biology	
BIOC 4523	Biochemistry of the Cell	
BIOC 4723	Introduction to Bioinformatics	
BIOC 4990	Undergraduate Research [4]	
BIOL 3034	General Ecology	
BIOL 3104	Invertebrate Zoology	
BIOL 3114	Vertebrate Zoology	
BIOL 3214	Human Anatomy	
BIOL 3233	Human Reproduction	
BIOL 4104	General Parasitology	
BIOL 4133	Evolution	
BIOL 4134	Embryology	
BIOL 4174	Mammalogy	
BIOL 4215	Mammalian Physiology	
BIOL 4223	Mammalian Physiology Laboratory	
BIOL 4283	Endocrinology	
BIOL 4293	Behavioral Neuroendocrinology	
BIOL 4363	Principles of Toxicology	
CHEM 2122	Quantitative Analysis Laboratory	
CHEM 3353	Descriptive Inorganic Chemistry	
CHEM 3532	Physical Chemistry Laboratory	
CHEM 3553	Physical Chemistry II	
CHEM 4320	Chemical and Spectrometric Identification of Organic Compounds	
ENTO 4573	Introduction to Forensic Entomology	
ENTO 4733	Insect Behavior and Chemical Ecology	
ENTO 4854	Medical and Veterinary Entomology	
MATH 2163	Calculus III	
MATH 2233	Differential Equations	
MATH 3013	Linear Algebra (A)	
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 4013	Microbial Physiology & Ecology	
MICR 4112	Molecular Microbiology Capstone	
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	Antibiotics and Antibiotic Resistance	
NSCI 4023	Nutrition in the Pathophysiology of Chronic Disease	
NSCI 4123	Human Nutrition and Metabolism I	
NSCI 4143	Human Nutrition and Metabolism II	
PBIO 4233	Plant Anatomy	
PBIO 4423	Plant Mineral Nutrition	
PBIO 4462	Plant Physiology Laboratory	
PHYS 4313	Molecular Biophysics	
PLNT 4353	Plant Breeding	
STAT 4013	Statistical Methods I (A) (if not used as (A) above))	
Hours Subtotal		67
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 Total hours of BIOC 1990 Freshman Research in Biochemistry and Molecular Biology 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 2025.

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

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
5 hours courses designated N		5
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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 Core		
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	
Written and 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 [2]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [3]	
SPCH 2713	Introduction to Speech Communication (S) [3]	
SPCH 3733	Elements of Persuasion (S) [3]	
Hours Subtotal		13
Major Requirements		
Core Courses		
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 PBIO 1404	Plant Biology (LN)	
CHEM 1515	Chemistry II (LN)	5
CHEM 3053	Organic Chemistry I	3
CHEM 3112	Organic Chemistry Laboratory	2
CHEM 3153	Organic Chemistry II	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	College Physics I (LN)	4
or PHYS 2014	University Physics I (LN)	
PHYS 1214	College Physics II (LN)	4
or PHYS 2114	University Physics II (LN)	

Related Courses	
Option:	
Select an option (p. 951)	20
Hours Subtotal	63
Electives	
Select 4 hours or hours to complete required total for degree.	4
Hours Subtotal	4
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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 3223	Physical Chemistry for Biologists	3
or CHEM 3433	Physical Chemistry I	
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	
ENTO 3044	Insect Morphology and Physiology	
PBIO 4463	Plant Physiology	
Select a minimum of 6 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following:		7
ANSI 3433	Animal Breeding	
ANSI 3443	Animal Reproduction	
ANSI 3543	Principles of Animal Nutrition	
BIOC 1990	Freshman Research in Biochemistry and Molecular Biology (up to 2 hours) [1]	
BIOC 2202	Medicine and Molecules	
BIOC 2352	Fundamental Biochemistry	
BIOC 3003	Hypothesis-Driven Undergraduate Research	
BIOC 4113	Molecular Biology	
BIOC 4523	Biochemistry of the Cell	
BIOC 4723	Introduction to Bioinformatics	
BIOC 4990	Undergraduate Research [1]	
BIOL 3034	General Ecology	
BIOL 3104	Invertebrate Zoology	
BIOL 3114	Vertebrate Zoology	
BIOL 3214	Human Anatomy	
BIOL 3233	Human Reproduction	
BIOL 4104	General Parasitology	
BIOL 4133	Evolution	
BIOL 4134	Embryology	
BIOL 4174	Mammalogy	
BIOL 4215	Mammalian Physiology	
BIOL 4223	Mammalian Physiology Laboratory	
BIOL 4283	Endocrinology	
BIOL 4293	Behavioral Neuroendocrinology	
BIOL 4363	Principles of Toxicology	
CHEM 2113	Principles of Analytical Chemistry	
CHEM 2122	Quantitative Analysis Laboratory	
CHEM 3353	Descriptive Inorganic Chemistry	
CHEM 3532	Physical Chemistry Laboratory	
CHEM 3553	Physical Chemistry II	
CHEM 4320	Chemical and Spectrometric Identification of Organic Compounds	
ENTO 4573	Introduction to Forensic Entomology	
ENTO 4854	Medical and Veterinary Entomology	
MATH 2163	Calculus III	
MATH 2233	Differential Equations	
MATH 3013	Linear Algebra (A)	
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 4013	Microbial Physiology & Ecology	
MICR 4112	Molecular Microbiology Capstone	
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	Antibiotics and Antibiotic Resistance	
NSCI 4023	Nutrition in the Pathophysiology of Chronic Disease	
NSCI 4123	Human Nutrition and Metabolism I	
NSCI 4143	Human Nutrition and Metabolism II	
PBIO 4233	Plant Anatomy	
PBIO 4462	Plant Physiology Laboratory	
PBIO 4423	Plant Mineral Nutrition	
PHYS 4313	Molecular Biophysics	
PLNT 4353	Plant Breeding	
STAT 4013	Statistical Methods I (A) (if not used as (A) above)	
Total Hours		20

[1] Total hours of BIOC 1990 Freshman Research in Biochemistry and Molecular Biology 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 2025.

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.

Program Educational Objectives (PEOs) for the Biosystems Engineering (BAE) Undergraduate Degree Program at Oklahoma State University. 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 portion of the 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 listed above. The degree is accredited by the Engineering Accreditation Commission of ABET (see www.abet.org (http://www.abet.org)) under criteria for biological engineering and similarly named programs.

Each professional school course builds upon preceding engineering courses to develop in the student the ability to identify and solve meaningful engineering problems. The coursework is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The coursework incorporates the social and economic aspects of technical problems, and stresses the responsibilities of 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, students 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 that lead to meaningful conclusions.

The Biosystems Engineering program verifies that our students possess core engineering knowledge and capability by requiring students to take the Fundamentals of Engineering exam, which is an important step toward becoming a professional engineer. All candidates for the BS degree in Biosystems Engineering must take the Fundamentals of Engineering exam prior to receiving their degree.

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' experience in solving ever-more-challenging problems enables 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 governmental agencies, consulting engineering firms, and agricultural and food equipment industries. Biosystems engineers are employed throughout the U.S. as well as internationally.

Students interested in a degree in Biosystems Engineering may initially enroll in the College of Engineering, Architecture and Technology or the College of Agricultural Sciences and Natural Resources. Through either college, they will be assigned a Biosystems Engineering adviser.

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. 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 ABET Engineering Accreditation Commission, 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.

Undergraduate Programs

- Biosystems Engineering: Bioprocessing & Food Processing, BSBE (p. 1554)
- Biosystems Engineering: Environmental and Natural Resources, BSBE (p. 1556)
- Biosystems Engineering: Machine Systems & Agricultural Engineering, BSBE (p. 1558)
- Biosystems Engineering: Pre-Medical, BSBE (p. 1560)

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. 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 ABET Engineering Accreditation Commission, 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 Department Head
Professor Orville L. and Helen Buchanan Endowed Chair: Carol Jones, PhD, PE
Regents Professor/Director, Biobased Products and Energy Center: Raymond L. Huhnke, PhD, PE
Professor/Sarkey's Professor/Assistant Director and State Program Leader, Agricultural Natural Resources, Oklahoma Cooperative Extension Service: Randal K. Taylor, PhD, PE
Director, Capital Projects for CASNR/Assistant Director, Oklahoma Agricultural Experiment Station: Randy L. Raper, PhD, PE
Professors: Danielle D. Bellmer, PhD; Timothy J. Bowser, PhD, PE; Nurhan Dunford, PhD, PE; Dan Thomas, PhD, PE; Ning Wang, PhD, PE; Paul Weckler, PhD, PE
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, PE; Saleh Taghvaeian, PhD; Ali Mirchi, PhD
Adjunct Assistant Professor: Sherry L. Hunt, PhD
Research Associate Professor: J.D. Carlson, PhD
Assistant Extension Specialist: Wesley Lee, MS
Teaching Assistant Professor: Sara Alian, PhD

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, structural, urban 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 are 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: Bio-Forensics, BSAG (p. 958)
- Entomology: Insect Biology and Ecology, BSAG (p. 960)
- Entomology: Pre-Veterinary and Pre-Medical, BSAG (p. 962)

- Entomology (ENTO), Minor (p. 957)
- Pest Management (PEST), Minor (p. 964)

Graduate Programs

Advanced Degree 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 advisor and a selected faculty advisory committee. The program of study is 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. 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.entoplp.okstate.edu (http://www.entoplp.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
Regents Professors: Kristopher L. Giles, PhD; Haobo Jiang, PhD
Regents Professor Emerita: Jacqueline Fletcher, PhD
Endowed Professor Structural and Urban Entomology: Bradford M. Kard, PhD
Professors: John P. Damicone, PhD; Robert M. Hunger, PhD; Eric Rebek, PhD; Tom A. Royer, PhD; Justin Talley, PhD; Nathan Walker, PhD; Astri Wayadande, 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; J. Scott Armstrong, PhD; Kristen Baum, PhD; Norman C. Elliott, PhD; John Foster, PhD; Hassan A. Melouk, PhD; Richard Nelson, PhD; Hal Reed, PhD; Kiran Mysore, PhD
Associate Professors: Carla Garzon, PhD; Li Maria Ma, PhD; Stephen Marek, PhD; Francisco Ochoa Corona, PhD; George Opit, PhD
Adjunct Associate Professors: Carmen Greenwood, PhD; Brian McCornack, PhD; Carolyn Young, PhD; Ali Akhtar, PhD
Assistant Professors: W. Wyatt Hoback, PhD; Bruce Noden, PhD
Adjunct Assistant Professors: Francisco Flores, PhD; Deborah Jaworski, PhD; Jacquelyn Lee, PhD; Michael Reiskind, PhD; Kay Scheets, PhD
Assistant Research Professor: Andres Espindola Camacho, PhD
Research Associate Professors: Trenna Blagden, PhD; Ali Zarrabi, PhD
Associate Extension Specialist & Pesticide Coordinator: Kevin Shelton, MS
Associate Extension Specialists: Steven Kelly Seuhs, MS; Andrine Shufran, PhD
Director, Associate Extension Specialist-Plant Disease Diagnostics: Jen Olson, MS
Director, Oklahoma Agricultural Leadership Program and Associate Extension Specialist (Stored Products): Edmond Bonjour, MS

Entomology (ENTO), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 15 hours

Code	Title	Hours
Minor Requirements		
ENTO 2993	Introduction to Entomology (LN)	3
Select 12 credit hours from any other ENTO courses to achieve the 15 minimum credits. Students must have a minimum of 2.0 GPA in ENTO courses.		12

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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 1513	College Algebra (A) [1]	
MATH 1613	Trigonometry (A) [1]	
MATH 2103	Business Calculus (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S) [1]		8
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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		
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)	
Written and 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 [2]	
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)	
Hours Subtotal		19
Major Requirements		
Core Courses		
Select two of the following:		8
ENTO 3044	Insect Morphology and Physiology	
ENTO 4464	Insect Biology and Classification	
ENTO 4854	Medical and Veterinary Entomology	
Additional Core Courses		
ENTO 4573	Introduction to Forensic Entomology	3
SOC 4333	Criminology (S)	3
SOC 4743	Criminalistics: Introduction to Forensic Sciences	3
Additional Entomology		
ENTO 2143	Global Issues in Agricultural Biosecurity and Forensics	3
ENTO 4800	Entomology Practicum	3
Related Courses		
Genetics:		
Select one of the following:		3
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
ANSI 3423	Animal Genetics	
Chemistry:		
CHEM 1515	Chemistry II (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 Courses		
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 4283	Endocrinology	
BIOL 4293	Behavioral Neuroendocrinology	
BIOL 4303	Organismal Ecotoxicology (OR)	
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)	
PBIO 1404	Plant Biology (LN)	
CHEM 3153	Organic Chemistry II	
PHYS 1114	College Physics I (LN)	
PHYS 1214	College Physics II (LN)	
STAT 2331	SAS Programming	
STAT 4013	Statistical Methods I (A)	
STAT 4023	Statistical Methods II	
BIOL 1604	Animal Biology	
BIOL 4133	Evolution (OR)	
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		
Hours Subtotal		61
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are 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 2025.

Entomology: Insect Biology and Ecology, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 1483	Mathematical Functions and Their Uses (A)	
MATH 1513	College Algebra (A) [1]	
MATH 1613	Trigonometry (A) [1]	
MATH 2103	Business Calculus (A) [1]	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		8
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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		
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)	
Written and 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 [2]	
Select one of the following: [3]		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		19
Major Requirements		
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		
Core Courses		
Select 8 hours of the following:		8
ENTO 3044	Insect Morphology and Physiology	
ENTO 4464	Insect Biology and Classification	
Additional Entomology		
ENTO 4800	Entomology Practicum	3
Any entomology or plant pathology course not taken as a core course		12
Related Courses		
Genetics:		
Select one of the following:		3
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
ANSI 3423	Animal Genetics	
Ecology:		
Select one of the following:		3
BIOL 3034	General Ecology	
NREM 4033	Ecology Of Invasive Species	

Chemistry:		
CHEM 1225	Chemical Principles II (LN) [1]	5
or CHEM 1515	Chemistry II (LN)	
Select one of the following:		3
BIOC 3653	Survey of Biochemistry	
CHEM 3015	Survey of Organic Chemistry	
CHEM 3053	Organic Chemistry I	
Select 24 hours of the following:		24
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3653	Survey of Biochemistry	
BIOL 1604	Animal Biology	
ENTO 2003	Insects and Society (N)	
ENTO 2223	Insects in Global Public Health (N)	
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 3501	Entomology for Educators	
ENTO 3663	Turfgrass Integrated Pest Management	
ENTO 4223	Ecological Methodology	
ENTO 4400	Special Topics	
ENTO 4484	Aquatic Entomology	
ENTO 4733	Insect Behavior and Chemical Ecology	
ENTO 4854	Medical and Veterinary Entomology	
ENTO 4923	Applications of Biotechnology in Pest Management	
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 3613	Principles of Rangeland Management	
PBIO 1404	Plant Biology (LN)	
PBIO 4463	Plant Physiology	
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	
MATH 2103	Business Calculus (A)	
MATH 2144	Calculus I (A)	
MATH 2153	Calculus II (A)	
CHEM 3153 & CHEM 3112	Organic Chemistry II and Organic Chemistry Laboratory	
PHYS 1114	College Physics I (LN)	
PHYS 1214	College Physics II (LN)	
STAT 2331	SAS Programming	
STAT 4013	Statistical Methods I (A)	
STAT 4023	Statistical Methods II	
STAT 4043	Applied Regression Analysis	
BIOL 4133	Evolution	
Foreign Language: Up to 10 credit hours of upper division foreign language may be substituted		
Hours Subtotal		61
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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 2025.

Entomology: Pre-Veterinary and Pre-Medical, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
or MATH 2103	Business Calculus (A)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
CHEM 1515	Chemistry II (LN) [1]	5
Social & Behavioral Sciences (S)		
SPCH 2713	Introduction to Speech Communication (S) [1]	3
or SPCH 3733	Elements of Persuasion (S)	
General Education		
Any course designated (A), (H), (N), or (S)		3
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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		
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	College Physics I (LN) and College Physics II (LN)	8
STAT 2013	Elementary Statistics (A)	3
or STAT 2023	Elementary Statistics for Business and Economics (A)	
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)	
Written and 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 [2]	
Hours Subtotal		24
Major Requirements		
Core ENTO Courses		
ENTO 3003	Livestock Entomology	3
ENTO 3044	Insect Morphology and Physiology	4
ENTO 4464	Insect Biology and Classification	4
ENTO 4854	Medical and Veterinary Entomology	4
ENTO 4800	Entomology Practicum (3 Hours)	3
Additional Core Courses		
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	5
BIOL 1604	Animal Biology	4
or BIOL 3204	Physiology	
Select one of the following:		5
CHEM 3013 & CHEM 3012	Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory	
or		
CHEM 3053 & CHEM 3153 & CHEM 3112	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
BIOC 3653	Survey of Biochemistry	3
Select one of the following:		3
ANSI 3423	Animal Genetics (Vet)	
BIOL 3023	General Genetics (Med)	
Related Courses		

Select Alternative 1 or Alternative 2 (p. 963)	18
Hours Subtotal	56
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] 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 18 hours of the following:		18
ANSI 3543	Principles of Animal Nutrition	
ANSI 4843	Applications of Biotechnology in Animal Science	
BIOL 3023	General Genetics	
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 4733	Insect Behavior and Chemical Ecology	
ENTO 4923	Applications of Biotechnology in Pest Management	
ENTO 4800	Entomology Practicum (3 hours)	
MICR 3033	Cell and Molecular Biology	
MICR 3253	Immunology	
MATH 2144	Calculus I (A)	
MATH 2153	Calculus II (A)	
MATH 2163	Calculus III	
PSYC 1113	Introductory Psychology (S)	
SOC 1113	Introductory Sociology (S)	
BIOL 3114	Vertebrate Zoology	
BIOL 3204	Physiology	
BIOL 3214	Human Anatomy	
BIOL 4104	General Parasitology	
BIOL 4113	Conservation Genetics	
BIOL 4134	Embryology	
BIOL 4215	Mammalian Physiology	
BIOL 4273	Environmental Physiology	
BIOL 4283	Endocrinology	
BIOL 4293	Behavioral Neuroendocrinology	

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 2025.

Pest Management (PEST), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 18 hours

Code	Title	Hours
Minor Requirements		
Select one or both of the following:		3-6
ENTO 2993	Introduction to Entomology (LN)	
PLP 3343	Principles of Plant Pathology	
Select 6-10 hours of the following:		6-10
ENTO 2223	Insects in Global Public Health (N)	
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	
HORT 1013	Principles of Horticultural Science (LN)	
MICR 2123	Introduction to Microbiology	
NREM 1014	Introduction to Natural History (LN)	
NREM 2013	Ecology of Natural Resources	
PBIO 1404	Plant Biology (LN)	
PLNT 2013	Applied Plant Science	
PLNT 4013	Principles of Weed Science	
PLNT 4123	Plant-Environment Interactions	
PLP 3663	Turfgrass Integrated Pest Management	
or PLNT 1213	Introduction to Plant and Soil Systems	
SOIL 2124	Fundamentals of Soil Science (N)	
Additional hours to total 18 hours, from any of the following, or other upper-level course approved by the minor's departmental advisor:		
ENTO 3021	Postharvest, Structural, and Urban Arthropod Pests	
ENTO 3044	Insect Morphology and 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	
GEOG 3023	Climatology (N)	
HORT 3113	Greenhouse Management	
NREM 3613	Principles of Rangeland Management	
NREM 4033	Ecology Of Invasive Species	
PBIO 4233	Plant Anatomy	
PBIO 4463	Plant Physiology	
PLNT 4113	Advanced Weed Science	
PLNT 4123	Plant-Environment Interactions	
PLP 3343	Principles of Plant Pathology	
PLP 3553	Fungi: Myths and More	
PLP 3663	Turfgrass Integrated Pest Management	
SOIL 4363	Environmental Soil Science	
SOIL 4483	Soil Microbiology	

- A grade average of 2.0 for courses that count for the 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 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

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 coursework 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: Environmental Policy, BSAG (p. 967)
- Environmental Science: Natural Resources, BSAG (p. 969)
- Environmental Science: Water Resources, BSAG (p. 971)

- Environmental Science (ENVR), Minor (p. 966)

Faculty

Karen Hickman, PhD—Professor and Director
Professors: Tyson E. Ochsner, PhD (soil and water resources); Gail W.T. Wilson, PhD (restoration ecology)
Associate Professor: Sergio M. Abit, Jr, PhD (environmental soil science)

Environmental Science (ENVR), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 19 hours

Code	Title	Hours
Minor Requirements		
AGEC 3503	Natural Resource Economics	3
or AGEC 4503	Environmental Economics and Resource Development	
ENVR 1113	Elements of Environmental Science	3
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	
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3-4
BAE 4314	Design Hydrology	
GEOL 4453	Hydrogeology	
NREM 4443	Watershed Hydrology and Water Quality	

Other Requirements

- At least nine upper-division hours must be taken at OSU.
- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 124

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [1]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
CHEM 3013	Survey of Organic Chemistry	
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	Survey of Organic Chemistry	
Additional Requirements		
If CHEM 1414 taken, then must have both CHEM 3015 and BIOC 2344		
CHEM 1314	Chemistry I (LN)	4
or CHEM 1215	Chemical Principles I (LN)	
CHEM 1515	Chemistry II (LN)	5
or CHEM 1225	Chemical Principles II (LN)	
GEOL 1114	Physical Geology (LN)	4
or BIOL 1604	Animal Biology	
MATH 1513 & MATH 2103	College Algebra (A) and Business Calculus (A)	6
PBIO 1404	Plant Biology (LN)	4
PHYS 1114	College Physics I (LN)	4
Written and Oral Communications		
Select one of the following:		3
BCOM 3113	Written Communication	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
ENGL 3323	Technical Writing [2]	
Hours Subtotal		41
Major Requirements		
Core Courses		
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	
Additional Core Courses		
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	
PBIO 3253	Environment and Society (N)	
PBIO 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 (N)	
GEOL 4453	Hydrogeology	
LA 4423	Sustainable Planning and Design	
LA 4433	Land Use and City Planning	
NREM 2083	Geospatial Technologies for Natural Resources	
NREM 3613	Principles of Rangeland Management	
NREM 4403	Wetland Ecology and Management	
PHYS 1214	College Physics II (LN)	
or PHYS 2114	University Physics II (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	
Hours Subtotal		43
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		124

1 College & Departmental requirements that may be used to meet GE requirements.

2 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 2025.

Environmental Science: Natural Resources, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 124

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [1]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
CHEM 3013	Survey of Organic Chemistry	
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	Survey of Organic Chemistry	
Additional Requirements		
If CHEM 1414 is taken, then must have both CHEM 3015 and BIOC 2344		
PBIO 1404	Plant Biology (LN)	4
or BIOL 1604	Animal Biology	
CHEM 1314	Chemistry I (LN)	4
or CHEM 1215	Chemical Principles I (LN)	
CHEM 1515	Chemistry II (LN)	5
or CHEM 1225	Chemical Principles II (LN)	
PHYS 1114	College Physics I (LN)	4
Select one of the following:		4
PHYS 1214	College Physics II (LN)	
MATH 2144	Calculus I (A)	
GEOL 1114	Physical Geology (LN)	
Select one of the following:		5
MATH 1715	Precalculus (A)	
MATH 1513 & MATH 1613	College Algebra (A) and Trigonometry (A)	
Written and Oral Communications		
Select one of the following:		3
BCOM 3113	Written Communication	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
ENGL 3323	Technical Writing [2]	
Hours Subtotal		40
Major Requirements		
Core Courses		
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	
Additional Core Courses		
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	
Related Courses		
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	
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 (N)	
GEOL 4453	Hydrogeology	
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 2083	Geospatial Technologies for Natural Resources	
NREM 4403	Wetland Ecology and Management	
PBIO 3253	Environment and Society (N)	
PBIO 3263	Plants and People (N)	
PBIO 4005	Field Botany	
PHYS 1214	College Physics II (LN)	
or PHYS 2114	University Physics II (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	
Hours Subtotal		44
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		124

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] 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 2025.

Environmental Science: Water Resources, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 124

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [1]	3
or SPCH 2713	Introduction to Speech Communication (S)	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENVR 1113	Elements of Environmental Science	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
CHEM 3013	Survey of Organic Chemistry	
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	Survey of Organic Chemistry	
Additional Requirements		
If CHEM 1414 taken, then must have both CHEM 3015 and BIOC 2344		
PBIO 1404	Plant Biology (LN)	4
or BIOL 1604	Animal Biology	
CHEM 1314	Chemistry I (LN)	4
or CHEM 1215	Chemical Principles I (LN)	
CHEM 1515	Chemistry II (LN)	5
or CHEM 1225	Chemical Principles II (LN)	
PHYS 1114	College Physics I (LN)	4
Select one of the following:		4
PHYS 1214	College Physics II (LN)	
MATH 2144	Calculus I (A)	
GEOL 1114	Physical Geology (LN)	
Select one of the following:		5
MATH 1715	Precalculus (A)	
MATH 1513 & MATH 1613	College Algebra (A) and Trigonometry (A)	
Written and Oral Communications		
Select one of the following:		3
BCOM 3113	Written Communication	
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
ENGL 3323	Technical Writing [2]	
Hours Subtotal		40
Major Requirements		
Core Courses		
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	
Additional Core Courses		
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	

GEOL 4453	Hydrogeology	
Related Courses		
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	
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 (N)	
GEOL 4453	Hydrogeology	
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 2083	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	
PBIO 3253	Environment and Society (N)	
PBIO 3263	Plants and People (N)	
PHYS 1214	College Physics II (LN)	
or PHYS 2114	University Physics II (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	

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

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] 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 2025.

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 world'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 plant 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)

Horticulture Science emphasizes preparing students for science-based careers, including laboratory science or graduate study. This option provides 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 features the opportunity to combine horticulture with principles of running a business. A built-in requirement for a formal academic minor in a business area is included in 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 include 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. 976)
- Horticulture: Horticultural Science, BSAG (p. 978)
- Horticulture: Public Horticulture, BSAG (p. 980)
- Horticulture: Turf Management, BSAG (p. 982)
- Landscape Architecture, BLA (p. 984)
- Landscape Management, BSAG (p. 987)

- Horticulture (HORT), Minor (p. 975)

Graduate Programs

The department offers programs of study leading to the Master of Science degree in Horticulture (with areas of specialization including Horticultural Science, Phytochemistry and Turfgrass Science). Doctoral students can participate in multidisciplinary PhD programs in Crop Science, Environmental Science, or Food 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: www.hortla.okstate.edu/academics/graduate-program/graduate-program-w23 (http://www.hortla.okstate.edu/academics/graduate-program/graduate-program-w23).

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 coursework 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; Bruce Dunn, PhD; Michael Holmes, MLA; Niels Maness, PhD; William McGlynn, PhD; Dennis Martin, PhD; Justin Moss, PhD; Michael A. Schnelle, PhD
Associate Professor: Cheryl Mihalko, MLA
Assistant Professors: Charles Fontanier, PhD; Qing Luo, MLA; Bo Zhang, PhD; Lu Zhang, PhD
Associate Extension Specialists: David Hillock, MS; Shelley Mitchell, PhD
Assistant Extension Specialist: Casey Hentges, MS

Horticulture (HORT), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 23 hours

Code	Title	Hours
Minor Requirements		
HORT 1013	Principles of Horticultural Science (LN)	3
HORT 3084	Plant Propagation	4
PBIO 1404	Plant Biology (LN)	4
SOIL 2124	Fundamentals of Soil Science (N)	4
Select a minimum of 8 hours of HORT prefix courses excluding HORT 4990 and HORT 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.
- A grade-point average of 2.0 for courses that count for the 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 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: Horticultural Business, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2023	Elementary Statistics for Business and Economics (A)	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
PBIO 1404	Plant Biology (LN)	4
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
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
AGEC 1113	Introduction to Agricultural Economics (S) [2]	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) [2]	
SPCH 2713	Introduction to Speech Communication (S) [2]	
SPCH 3733	Elements of Persuasion (S) [2]	
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 Data Science Technologies	3
PLP 3343	Principles of Plant Pathology	3
SPAN (3 credits)		3
Related Courses		
Select one option (p. 977)		15
Select 18 hours from HORT (15 hours must be upper-division) excluding HORT 2010: [3]		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 3613	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 to complete required total for degree		0

Hours Subtotal	61
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 15 hours must be upper-division.

Options

Select either option

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

Option A

9 upper-division hours AGEC and 6 hours AGEC, excluding AGEC 3010, AGEC 3101, AGEC 3183, AGEC 3810, AGEC 3990, AGEC 4101, AGEC 4990.

Option B

Code	Title	Hours
ACCT 2203	Managerial Accounting	3
ECON 2203	Introduction to Macroeconomics	3
FIN 3113	Finance	3
LSB 3213	Legal and Regulatory Environment of Business	3
MKTG 3213	Marketing (S)	3

Option C

Code	Title	Hours
EEE 2023	Introduction to Entrepreneurship	3
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	3
And 9 additional hours (6 must be upper-division hours)		9

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 2025.

Horticulture: Horticultural Science, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 1583	Applied Geometry and Trigonometry (A) [1]	
MATH 1613	Trigonometry (A) [1]	
3 hours STAT[1] designated (A)		
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
PBIO 1404	Plant Biology (LN)	4
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
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
AGEC 1113	Introduction to Agricultural Economics (S) [2]	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		
ENGL 3323	Technical Writing [3]	3
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [2]	
SPCH 2713	Introduction to Speech Communication (S) [2]	
SPCH 3733	Elements of Persuasion (S) [2]	
Hours Subtotal		17
Major Requirements		
Core Courses		
Select one of the following:		3
HORT 4953	Plant Growth and Development	
HORT 4963	Horticulture Physiology	
PBIO 4463	Plant Physiology	
CHEM 1225	Chemical Principles II (LN)	5
or CHEM 1515	Chemistry II (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
ANSI 3423	Animal Genetics	3
or BIOL 3023	General Genetics	
CHEM 3013	Survey of Organic Chemistry	3
or BIOC 2344	Chemistry and Applications of Biomolecules	
Related Courses		
Select 12 upper-division hours from:		12
BIOC, ENTO, HORT, NREM, PBIO, PLNT, PLP, or SOIL		
Select 18 hours from HORT (12 hours must be upper division) excluding HORT 2010: [4]		18
Hours Subtotal		60
Electives		
Select 1 hour to complete required total for degree		1
Hours Subtotal		1
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 12 hours 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.
- Degrees that follow this plan must be completed by the end of Summer 2025.

Horticulture: Public Horticulture, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 1583	Applied Geometry and Trigonometry (A) [1]	
MATH 1613	Trigonometry (A) [1]	
3 hours STAT[1] designated (A)		
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
PBIO 1404	Plant Biology (LN)	4
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
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
AGEC 1113	Introduction to Agricultural Economics (S) [2]	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		
Select one of the following:		3
AGCM 3103	Written Communications in Agricultural Sciences and Natural Resources	
BCOM 3113	Written Communication	
ENGL 3323	Technical Writing [3]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [2]	
SPCH 2713	Introduction to Speech Communication (S) [2]	
SPCH 3733	Elements of Persuasion (S) [2]	
Hours Subtotal		17
Major Requirements		
Core Courses		
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
PLNT 4013	Principles of Weed Science	3
PLP 3343	Principles of Plant Pathology	3
Related Courses		
Alternatives:		
Select one alternative (p. 980)		30
Hours Subtotal		61
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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
Select 24 hours of the following: [1]		24
Select 9 HORT hours		
Select 6 PBIO or NREM hours		
Select 3 AGED/AGLE/RMRT/PSYC hours		
Select 6 MGMT hours		

[1] 15 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
SOIL 4363	Environmental Soil Science	3
or SOIL 4463	Soil and Water Conservation	
6 hours from NREM or MGMT		6
6 hours from HORT		6
3 hours LSB or MKTG		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.
- 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 2025.

Horticulture: Turf Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		3
MATH 1583	Applied Geometry and Trigonometry (A) [1]	
MATH 1613	Trigonometry (A) [1]	
3 hours STAT[1] designated (A)		
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
PBIO 1404	Plant Biology (LN)	4
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
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
AGEC 1113	Introduction to Agricultural Economics (S) [2]	3
or ECON 2103	Introduction to Microeconomics (S)	
HORT 1013	Principles of Horticultural Science (LN)	3
SOIL 2124	Fundamentals of Soil Science (N) [2]	4
Written and Oral Communications		
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) [2]	
SPCH 2713	Introduction to Speech Communication (S) [2]	
SPCH 3733	Elements of Persuasion (S) [2]	
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
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
HORT 4493	Athletic Field Management	3
MGMT 3013	Fundamentals of Management (S)	3
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
Related Courses		
Select one emphasis (p. 982)		18
Hours Subtotal		61
Electives		
Select 0 hours or hours to complete required total for degree		0
Hours Subtotal		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

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

4 CHEM 3013 Survey of Organic Chemistry or BIOC 2344 Chemistry and Applications of Biomolecules recommended.

5 6 hours must be upper-division.

6 Must be upper-division.

Emphases

Code	Title	Hours
Soils Emphasis:		
SOIL (6 hours from):		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	
SOIL (3 hours from):		3
SOIL 4213	Precision Agriculture	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	
9 hours from:		9
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3013	Survey of Organic Chemistry	
LSB 3213	Legal and Regulatory Environment of Business	
HORT, MGMT OR PLNT		

Code	Title	Hours
Management Emphasis:		
MGMT 3011	Business, Government and Society	1
MGMT 3123	Managing Behavior and Organizations	3
MGMT 3313	Human Resource Management	3
MGMT 4073	Management and Ethical Leadership	3
MGMT 3 hours upper-division		3
5 hours from:		5
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3013	Survey of Organic Chemistry	
LSB 3213	Legal and Regulatory Environment of Business	
HORT, 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.
- 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 2025.

Landscape Architecture, BLA

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 150

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1583	Applied Geometry and Trigonometry (A) [1]	3
or MATH 1613	Trigonometry (A)	
Humanities (H)		
LA 3673	History and Theory of Landscape Architecture (H) [1]	3
Course designated (H)		3
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
SOIL 2124	Fundamentals of Soil Science (N) [1]	4
Social & Behavioral Sciences (S)		
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [1]	
SPCH 2713	Introduction to Speech Communication (S) [1]	
SPCH 3733	Elements of Persuasion (S) [1]	
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
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
LA 1013	Introduction to Landscape Architecture and Landscape Management	3
Written and Oral Communications		
BCOM 3113	Written Communication [2]	3
or ENGL 3323	Technical Writing	
Economics		
AGEC 1113	Introduction to Agricultural Economics (S) [3]	3
or ECON 2103	Introduction to Microeconomics (S)	
Hours Subtotal		10
Major Requirements		
Core Courses		
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:		
AST 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	Studio 4: Landscape Ecology and Design	5
LA 4515	Studio 5: Urban Design	5
LA 4525	Studio 6: Community Development and Neighborhood Design	5
Plant Material:		
HORT 2613	Woody Plant Materials	3
Professional Practice:		
LA 3112	Landscape Architecture National Survey	2
LA 3682	Professional Practice & 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. 985)		11
Hours Subtotal		95
Electives		
Select 3 hours or hours to complete required total for degree.		3
Hours Subtotal		3
Total Hours		150

[1] College & Departmental requirements that may be used to meet GE requirements.

[2] If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above, then hours in this area are zero.

[3] 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
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 Global 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
PBIO 1404	Plant Biology (LN)	4
PBIO 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 4093	Natural Resources, People and Sustainable Development (I)	3
NREM 4403	Wetland Ecology and Management	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 3613	Bidding and Estimating	3
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
PBIO 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 2025.

Landscape Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1583	Applied Geometry and Trigonometry (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
or PBIO 1404	Plant Biology (LN)	
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
HORT 1013	Principles of Horticultural Science (LN)	3
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		41
Diversity (D) & International Dimension (I)		
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
AGEC 1113	Introduction to Agricultural Economics (S) [2]	3
or ECON 2103	Introduction to Microeconomics (S)	
SOIL 2124	Fundamentals of Soil Science (N)	4
Written and Oral Communications		
ENGL 3323	Technical Writing [3]	3
or BCOM 3113	Written Communication	
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [2]	3
or SPCH 2713	Introduction to Speech Communication (S)	
or SPCH 3733	Elements of Persuasion (S)	
Hours Subtotal		14
Major Requirements		
Core Courses		
ACCT 2103	Financial Accounting	3
AST 2313	Surveying	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
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
MKTG 3213	Marketing (S)	3
Select one of the following:		2
HORT 3612		
HORT 3613	Bidding and Estimating	
SPAN 3 credits		3
Related Courses		
Select one emphasis (p. 987)		9
Hours Subtotal		65
Electives		
Select 0 hours or hours to complete required total for degree		
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

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

3 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 2025.

International Agriculture

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 (p. 1778) 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.

Shida R. Henneberry, PhD—Professor and Director
Dwayne Cartmell, PhD—Professor and Assistant 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 14 semester credit hours of approved core courses, a minimum of 12 semester credit hours of focus area courses, and at least three hours of electives. Each student is required to complete 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 into 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 MSIA degree:

1. 30 credit hours, consisting of 24 hours of coursework and six hours for a thesis

2. 32 credit hours, consisting of 30 hours of coursework and two hours of formal report

3. 32 credit hours of coursework, including six hours for a creative component

Degree candidates are expected to conduct research related to a topic on international agriculture. The requirements include one course in statistics, or quantitative/qualitative analysis and one course in research methodology.

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 the general areas of 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 Undergraduate 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 plant species identification, 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, state-of-the-art operations and resource economics are emphasized at camp and integrated in the senior-level capstone course.

Rangeland Ecology and Management program emphasizes understanding management of grasslands, shrub lands, and forests for forage and habitat production. This includes the effects of livestock grazing, fire, invasive species and other disturbances on biotic and abiotic processes. The importance of prescribed fire as rangeland restoration tool, and the identification and value of native grass species for livestock forage and for other uses are emphasized. Students learn to integrate their knowledge of soil, water and vegetation attributes and natural resource policies 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

- Natural Resource Ecology & Management: Fisheries & Aquatic Ecology, BSAG (p. 994)
- Natural Resource Ecology & Management: Forest Ecology & Management, BSAG (p. 996)
- Natural Resource Ecology & Management: Rangeland Ecology & Management, BSAG (p. 998)
- Natural Resource Ecology & Management: Wildlife Biology & Preveterinary Science, BSAG (p. 1000)
- Natural Resource Ecology & Management: Wildlife Ecology & Management, BSAG (p. 1002)

- Fisheries and Aquatic Ecology (FAEC), Minor (p. 992)
- Forestry (FOR), Minor (p. 993)
- Natural Resource Ecology and Management (NREM), Minor (p. 1004)
- Rangeland Ecology and Management (REM), Minor (p. 1005)
- Wildlife Ecology (WLEC), Minor (p. 1006)

Graduate Programs

The Department offers 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's graduate program 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 through publications and presentations. 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) 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; R. Dwayne Elmore, PhD; Karen R. Hickman, PhD; Salim Hiziroglu, PhD; Thomas Kuzmic, PhD; Rodney E. Will, Jr., PhD; Gail W.T. Wilson, PhD
Associate Professors: 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; Bryan D. Murray, PhD
Adjunct Associate Professors: Shannon Brewer, PhD; James Long, PhD
Non-tenure Track Faculty: Marley Beem, PhD; John R. Weir, MS

Fisheries and Aquatic Ecology (FAEC), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 22 hours

Code	Title	Hours
Minor Requirements		
BIOL 4434	Limnology	4
NREM 3013	Applied Ecology and Conservation	3
NREM 4403	Wetland Ecology and Management	3
or NREM 4424	Fisheries Techniques	
NREM 4414	Fisheries Management	4
Select 8 hours of the following:		8
BIOL 4413	Biology of Fishes	
ENTO 4484	Aquatic Entomology	
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)	

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 23 hours

Code	Title	Hours
Minor Requirements		
NREM 1113	Elements of Forestry	3
NREM 2134	Dendrology	4
NREM 3013	Applied Ecology and Conservation	3
NREM 3123	Forest Measurements I	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 3111	Natural Resource Field Studies	
NREM 3143	Forest Biology	
NREM 4234	Forest Management and Economics	
NREM 4333	Forest Resource Management: Planning and Decision-Making	
NREM 4443	Watershed Hydrology and Water Quality	

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 125

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
NREM 1012	Introduction to Natural Resource Ecology and Management	2
Natural Sciences		
BIOL 1604	Animal Biology	4
CHEM 1215	Chemical Principles I (LN)	4
or CHEM 1314	Chemistry I (LN)	
CHEM 1225	Chemical Principles II (LN)	5
or CHEM 1515	Chemistry II (LN)	
GEOL 1114	Physical Geology (LN) [2]	4
or PHYS 1014	Descriptive Physics (N)	
PBIO 1404	Plant Biology (LN)	4
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 [3]	
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) [4]	
Hours Subtotal		30
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. [5]		
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	

POLS 4363	Environmental Law And Policy	
POLS 4593	Natural Resources and Environmental Policy	
SOC 4433	Environmental Sociology (S)	
Select 7 hours of the following:		7
ANSI 3543	Principles of Animal Nutrition	
BIOL 3023	General Genetics	
BIOL 3114	Vertebrate Zoology	
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	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
NREM 2013	Ecology of Natural Resources	
NREM 2083	Geospatial Technologies for Natural Resources	
NREM 3101	Forest Resource Field Studies	
NREM 3111	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 4093	Natural Resources, People and Sustainable Development (I)	
NREM 4403	Wetland Ecology and 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	
PBIO 4005	Field Botany	
Hours Subtotal		55
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		125

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. 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 2025.

Natural Resource Ecology & Management: Forest Ecology & Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
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 2112	Timber Harvesting	2
NREM 2134	Dendrology	4
NREM 3123	Forest Measurements I	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Natural Sciences		
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
PBIO 1404	Plant Biology (LN)	4
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 [3]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [4]	
SPCH 2713	Introduction to Speech Communication (S) [4]	
SPCH 3733	Elements of Persuasion (S) [4]	
Hours Subtotal		36
Major Requirements		
Core Courses		
NREM 2083	Geospatial Technologies for Natural Resources	3
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3063	Natural Resource Biometrics	3
NREM 3101	Forest Resource Field Studies	1
NREM 3111	Natural Resource Field Studies	1
NREM 3143	Forest Biology	3
NREM 3153	Forest Health and Disturbance Ecology	3
NREM 3224	Silviculture	4
NREM 3503	Principles of Wildlife Ecology and Management	3
NREM 4001	Issues In Global Change	1
NREM 4043	Natural Resource Administration and Policy	3
NREM 4234	Forest Management and Economics	4
NREM 4333	Forest Resource Management: Planning and Decision-Making	3
NREM 4443	Watershed Hydrology and Water Quality	3
Select one of the following:		2
NREM 3133	Forest Measurements II	
NREM 3102		
Select one of the following:		3
NREM 3613	Principles of Rangeland Management	
NREM 4053	Natural Resource Recreation	
NREM 4414	Fisheries Management	
Related Courses		
Select 9 hours of the following or of other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area: [5]		9

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 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 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	College Physics I (LN)
PLP 3343	Principles of Plant Pathology
SOIL 4463	Soil and Water Conservation
Hours Subtotal	54
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	130

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 2025.

Natural Resource Ecology & Management: Rangeland Ecology & Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 125

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
NREM 1012	Introduction to Natural Resource Ecology and Management	2
SOIL 2124	Fundamentals of Soil Science (N)	4
Natural Sciences		
BIOL 1604	Animal Biology	4
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
CHEM 1225	Chemical Principles II (LN) [2]	5
or CHEM 1515	Chemistry II (LN)	
PBIO 1404	Plant Biology (LN)	4
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 [3]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [4]	
SPCH 2713	Introduction to Speech Communication (S) [4]	
SPCH 3733	Elements of Persuasion (S) [4]	
Hours Subtotal		30
Major Requirements		
Core Courses		
ANSI 3543	Principles of Animal Nutrition	3
NREM 2083	Geospatial Technologies for Natural Resources	3
NREM 3012	Applied Ecology Laboratory	2
NREM 3013	Applied Ecology and Conservation	3
NREM 3063	Natural Resource Biometrics	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 4443	Watershed Hydrology and Water Quality	3
NREM 4603	Rangeland and Pasture Utilization	3
NREM 4613	Rangeland Resources Planning	3
NREM 4783	Prescribed Fire	3
PBIO 4005	Field Botany	5
SOIL 3433	Soil Genesis, Morphology, and Classification	3
Related Courses		
Select 5 hours of the following or of other courses in consultation with a faculty advisor for additional breadth, or to create a specialty emphasis area: [5]		5
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 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
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 (N)
NREM 2013	Ecology of Natural Resources
NREM 2134	Dendrology
NREM 3101	Forest Resource Field Studies
NREM 3111	Natural Resource Field Studies
NREM 3143	Forest Biology
NREM 3153	Forest Health and Disturbance Ecology
NREM 3224	Silviculture
NREM 3502	Wildlife Law Enforcement
NREM 4053	Natural Resource Recreation
NREM 4093	Natural Resources, People and Sustainable Development (I)
NREM 4403	Wetland Ecology and Management
NREM 4452	Pond Management
NREM 4453	Aquaculture
NREM 4464	Ornithology
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
PBIO 3024	Plant Diversity
PBIO 3114	Plant Taxonomy
PBIO 4463	Plant Physiology
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
Hours Subtotal	55
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	125

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 2025.

Natural Resource Ecology & Management: Wildlife Biology & Preveterinary Science, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2103	Business Calculus (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
NREM 1012	Introduction to Natural Resource Ecology and Management	2
SOIL 2124	Fundamentals of Soil Science (N)	4
Natural Sciences		
BIOL 1604	Animal Biology	4
CHEM 1314	Chemistry I (LN) [2]	4
CHEM 1515	Chemistry II (LN) [2]	5
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
PBIO 1404	Plant Biology (LN) [2]	4
PHYS 1114	College Physics I (LN) [2]	4
PHYS 1214	College Physics II (LN) [2]	4
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 [3]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [4]	
SPCH 2713	Introduction to Speech Communication (S) [4]	
SPCH 3733	Elements of Persuasion (S) [4]	
Hours Subtotal		43
Major Requirements		
Core Courses		
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 3013 & CHEM 3012	Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory	
or		
CHEM 3053 & CHEM 3153 & CHEM 3112	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
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 (or)	
BIOL 4174	Mammalogy	
Related Courses		
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 [5]		9
Select an option (p. 1001)		
Hours Subtotal		47

Electives

Select 0 hours or hours to complete required total for degree	0
Total Hours	130

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.

Options

Option 1

Code	Title	Hours
Select 9 hours of the following:		9
AG 3010	Internships in Agriculture	
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 [3]	
BIOC 3723	Biochemistry and Molecular Biology Laboratory	
BIOC 3813	Biochemistry II	
BIOL 3114	Vertebrate Zoology	
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	
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 2083	Geospatial Technologies for Natural Resources	
NREM 3101	Forest Resource Field Studies	
NREM 3111	Natural Resource Field Studies	
NREM 3153	Forest Health and Disturbance Ecology	
NREM 3224	Silviculture	
NREM 3502	Wildlife Law Enforcement	
NREM 3613	Principles of Rangeland 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 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	
PBIO 4005	Field Botany	
PLNT 1213	Introduction to Plant and Soil Systems	

Option 2

Complete the first year of professional program.

With the approval of the advisor, department head, and dean, a maximum of 9 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 2025.

Natural Resource Ecology & Management: Wildlife Ecology & Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 125

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1513	College Algebra (A) [1]	3
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
BIOL 1114	Introductory Biology (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		6
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
NREM 1012	Introduction to Natural Resource Ecology and Management	2
SOIL 2124	Fundamentals of Soil Science (N)	4
Natural Sciences		
BIOL 1604	Animal Biology	4
CHEM 1215	Chemical Principles I (LN) [2]	4
or CHEM 1314	Chemistry I (LN)	
CHEM 1225	Chemical Principles II (LN) [2]	5
or CHEM 1515	Chemistry II (LN)	
GEOL 1114	Physical Geology (LN)	4
or PHYS 1014	Descriptive Physics (N)	
PBIO 1404	Plant Biology (LN) [2]	4
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 [3]	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) [4]	
SPCH 2713	Introduction to Speech Communication (S) [4]	
SPCH 3733	Elements of Persuasion (S) [4]	
Hours Subtotal		34
Major Requirements		
Core Courses		
Select one of the following:		3
ANSI 3423	Animal Genetics	
BIOL 3023	General Genetics	
PLNT 3554	Plant Genetics and Biotechnology	
BIOL 4174	Mammalogy	4
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
Select one of the following:		3
NREM 4403	Wetland Ecology and Management	
NREM 4414	Fisheries Management	
BIOL 4413	Biology of Fishes	
PBIO 4005	Field Botany	5
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 [5]		
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	
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	
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	
ENTO 2993	Introduction to Entomology (LN)	
GEOG 4343	Geographic Information Systems: Resource Management Applications	
NREM 2134	Dendrology	
NREM 2083	Geospatial Technologies for Natural Resources	
NREM 3101	Forest Resource Field Studies	
NREM 3111	Natural Resource Field Studies	
NREM 3153	Forest Health and Disturbance Ecology	
NREM 3224	Silviculture	
NREM 3502	Wildlife Law Enforcement	
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 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 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	
Hours Subtotal		51
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		125

[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 2025.

Natural Resource Ecology and Management (NREM), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 20 hours

Code	Title	Hours
Minor Requirements		
NREM 3013	Applied Ecology and Conservation	3
Select a minimum of 11 additional hours of the following:		11
NREM 1014	Introduction to Natural History (LN)	
NREM 1113	Elements of Forestry	
NREM 3153	Forest Health and Disturbance Ecology	
NREM 3503	Principles of Wildlife Ecology and Management	
NREM 3613	Principles of Rangeland Management	
NREM 4414	Fisheries Management	
Select 6 additional hours not already used previously, or select from the following:		6
NREM 1012	Introduction to Natural Resource Ecology and Management	
NREM 2083	Geospatial Technologies for Natural Resources	
NREM 3012	Applied Ecology Laboratory	
NREM 3101	Forest Resource Field Studies	
NREM 3111	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 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	
SOIL 2124	Fundamentals of Soil Science (N)	

- A grade average of 2.0 for courses that count for the 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 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).

Rangeland Ecology and Management (REM), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 22 hours

Code	Title	Hours
Minor Requirements		
NREM 3013	Applied Ecology and Conservation	3
NREM 3613	Principles of Rangeland Management	3
NREM 4603	Rangeland and Pasture Utilization	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Select a minimum of 9 hours of the following:		9
NREM 2013	Ecology of Natural Resources	
NREM 2083	Geospatial Technologies for Natural Resources	
NREM 3012	Applied Ecology Laboratory	
NREM 4023	Restoration Ecology	
NREM 4033	Ecology Of Invasive Species	
NREM 4613	Rangeland Resources Planning	
NREM 4783	Prescribed Fire	
NREM 4793	Advanced Prescribed Fire	

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 22 hours

Code	Title	Hours
Minor Requirements		
NREM 3013	Applied Ecology and Conservation	3
NREM 3503	Principles of Wildlife Ecology and Management	3
PBIO 1404	Plant Biology (LN)	4
Select a minimum of 12 additional hours of the following:		12
BIOL 4174	Mammalogy	
BIOL 4413	Biology of Fishes	
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	

- A grade-point average of 2.0 for courses that count for the 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 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

- Plant and Soil Sciences: Agronomic Business, BSAG (p. 1010)
- Plant and Soil Sciences: Crop Production and Management, BSAG (p. 1012)
- Plant and Soil Sciences: Plant Biotechnology and Improvement, BSAG (p. 1014)
- Plant and Soil Sciences: Soil and Water Resources, BSAG (p. 1016)

- Agronomy (AGRN), Minor (p. 1009)
- Soil Science (SLSI), Minor (p. 1018)

Graduate Programs

Programs of coursework 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 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 degree plans of study for graduate programs in Plant and Soil Sciences are developed individually for each candidate and must adhere to guidelines in the Plant and Soil Sciences graduate student handbook and be approved by the student's advisory committee. The Master of Science degree in plant and soil sciences requires a minimum of 30 credit hours of course work beyond the BS degree, including six credit hours of PLNT or SOIL 5000 Master's Thesis. The department offers Doctor of Philosophy degrees in crop science and soil science. 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; William R. Raun, PhD; Hailin Zhang, PhD
Professors: Shiping Deng, PhD; Jeffrey T. Edwards, PhD; Tyson E. Ochsner, PhD; Yangi Wu, PhD; Liuling Yan, PhD
Associate Professors: Sergio M. Abit, Jr., PhD; Michael P. Anderson, PhD; D. Brian Arnall, PhD; V. Gopal Kakani, PhD; Million Tadege, PhD; Jason G. Warren, PhD
Assistant Professors: Phil Alderman, PhD; Seth Byrd, 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 20 hours

Code	Title	Hours
Minor Requirements		
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 4033	Applied Agricultural Meteorology	
PLNT 4123	Plant-Environment Interactions	
PLNT 4353	Plant Breeding	
PLNT 4470	Problems and Special Study	
PLNT 4573	Bioenergy Feedstock Production	
SOIL 4213	Precision Agriculture	

- A grade-point average of 2.0 for courses that count for the 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 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 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENTO 2993	Introduction to Entomology (LN)	3
or ANSI 1124	Introduction to the Animal Sciences	
PLNT 1213	Introduction to Plant and Soil Systems	3
Additional Requirements		
CHEM 1515	Chemistry II (LN) [2]	5
or CHEM 1225	Chemical Principles II (LN)	
BIOL 1114	Introductory Biology (LN)	4
MATH 1513	College Algebra (A) [3]	3
or MATH 2103	Business Calculus (A)	
Written and 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 [4]	
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) [5]	
Hours Subtotal		25
Major Requirements		
Core Courses		
PBIO 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 4470	Problems and Special Study (4 hours)	4
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	
Select one of the following:		3
ANSI 4203	Rangeland and Pasture Utilization	
NREM 4603	Rangeland and Pasture Utilization	
PLNT 4573	Bioenergy Feedstock Production	
Select one of the following:		4
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	Survey of Organic Chemistry	
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 AGEC 3183	Agribusiness Accounting and Taxation	
Related Courses		
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
EEE 3020	Business Plan Laboratory
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior
EEE 3033	Women and Minority Entrepreneurship
EEE 4010	Special Topics in Entrepreneurship
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 4653	Venture Capital
EEE 4663	Imagination in Entrepreneurship
ECON 3033	Economics of Entrepreneurship and Innovation
Hours Subtotal	55
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used as (N) course above, hours in this block reduced by 5

3 If used as (A) course above, hours in this block reduced by 3.

4 If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

5 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 2025.

Plant and Soil Sciences: Crop Production and Management, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENTO 2993	Introduction to Entomology (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
Additional Requirements		
CHEM 1515	Chemistry II (LN) [2]	5
or CHEM 1225	Chemical Principles II (LN)	
BIOL 1114	Introductory Biology (LN)	4
MATH 1513	College Algebra (A) [3]	3
or MATH 2144	Calculus I (A)	
Written and 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 [4]	
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) [5]	
Hours Subtotal		25
Major Requirements		
Core Courses		
PBIO 1404	Plant Biology (LN)	4
PBIO 4463	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
Select one of the following:		3
PLNT 4123	Plant-Environment Interactions	
PLNT 4573	Bioenergy Feedstock Production	
PLNT 4933	Plant Biotechnology and Transgenic Plants	
PLNT 4353	Plant Breeding	3
PLNT 4571	Professional Preparation in Plant and Soil Sciences	1
PLNT 4470	Problems and Special Study	1
PLNT 4080	Professional Internship (3 hours)	3
or PLNT 4990	Senior Thesis in Plant and Soil Sciences	
ANSI 4203	Rangeland and Pasture Utilization	3
or NREM 4603	Rangeland and Pasture Utilization	
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	Survey of Organic Chemistry	
PHYS 1014	Descriptive Physics (N)	
SOIL 2124	Fundamentals of Soil Science (N)	4
SOIL 4213	Precision Agriculture	3
SOIL 4234	Soil Nutrient Management	4
Related Courses		
Select 8 hours of the following:		8
Upper division PLNT including PLNT 4470		
PLNT 4033	Applied Agricultural Meteorology	
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	Medical and Veterinary Entomology
or ENTO 4923	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
AST 1413	Introduction to Engineering in Agriculture
AST 2313	Surveying
AST 3011	Ag Structures
AST 4112	Land Measurement and Site Analysis
AST 4203	Irrigation Principles
AST 4212	Safety and Health 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
Hours Subtotal	55
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used as (N) course above, hours in this block reduced by 5.

3 If used as (A) course above, hours in this block reduced by 3.

4 If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

5 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 2025.

Plant and Soil Sciences: Plant Biotechnology and Improvement, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENTO 2993	Introduction to Entomology (LN)	3
PLNT 1213	Introduction to Plant and Soil Systems	3
Additional Requirements		
CHEM 1515	Chemistry II (LN) [2]	5
BIOL 1114	Introductory Biology (LN)	4
MATH 1513	College Algebra (A) [3]	3
or MATH 2144	Calculus I (A)	
Written and 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 [4]	
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) [5]	
Hours Subtotal		25
Major Requirements		
Core Courses		
PBIO 1404	Plant Biology (LN)	4
PBIO 4463	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
or PLNT 4573	Bioenergy Feedstock Production	
or PLNT 4933	Plant Biotechnology and Transgenic Plants	
PLNT 4353	Plant Breeding	3
PLNT 4470	Problems and Special Study	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	
BIOL 3023	General Genetics	3
or ANSI 3423	Animal Genetics	
CHEM 3053	Organic Chemistry I	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
Related Courses		
Select 9 hours of the following:		9
BIOC 3723	Biochemistry and Molecular Biology Laboratory	
BIOC 3813	Biochemistry II	
CHEM 3153	Organic Chemistry II	
PBIO 4005	Field Botany	
or PBIO 3114	Plant Taxonomy	
PLNT 4033	Applied Agricultural Meteorology	
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	
Hours Subtotal		55
Upper-level PLNT		
Electives		
Select 0 hours or hours to complete required total for degree		0
Total Hours		120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used as (N) course above, hours in this block reduced by 5.

3 If used as (A) course above, hours in this block reduced by 3.

4 If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

5 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 2025.

Plant and Soil Sciences: Soil and Water Resources, BSAG

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 845)		
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	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
STAT 2013	Elementary Statistics (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1]	4
or CHEM 1215	Chemical Principles I (LN)	
Course designated (N)		3
Social & Behavioral Sciences (S)		
AGEC 1113	Introduction to Agricultural Economics (S) [1]	3
Additional General Education		
Courses designated (A), (H), (N), or (S)		9
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
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
ENVR 1113	Elements of Environmental Science	3
or NREM 2013	Ecology of Natural Resources	
SOIL 2124	Fundamentals of Soil Science (N)	4
Additional Requirements		
CHEM 1515	Chemistry II (LN) [2]	5
or CHEM 1225	Chemical Principles II (LN)	
BIOL 1114	Introductory Biology (LN)	4
Select one of the following:		4
PHYS 1114	College Physics I (LN)	
or PHYS 1014	Descriptive Physics (N)	
BIOC 2344	Chemistry and Applications of Biomolecules	
CHEM 3015	Survey of Organic Chemistry	
MATH 1513	College Algebra (A) [3]	3
or MATH 2144	Calculus I (A)	
Written and 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 [4]	
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) [5]	
Hours Subtotal		30
Major Requirements		
Core Courses		
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	
Related Courses		
Select from the following:		11
GEOL 1224	Evolution of the Earth (LN)	
GEOL 2254	Practical Mineralogy	
Upper-division GEOL courses		
SOIL 4363	Environmental Soil Science	
SOIL 4213	Precision Agriculture	
SOIL 4470	Problems and Special Study	

PLNT 2013	Applied Plant Science
PLNT 4033	Applied Agricultural Meteorology
PLNT 4470	Problems and Special Study
Upper-division PLNT courses	
NREM 3613	Principles of Rangeland Management
NREM 3013	Applied Ecology and Conservation
NREM 3012	Applied Ecology Laboratory
NREM 4043	Natural Resource Administration and Policy
GEOG 3023	Climatology (N)
GEOG 3033	Meteorology (N)
GEOG 3153	Conservation of Natural Resources (S)
GEOG 4333	Remote Sensing
AGEC 3703	Issues in Agricultural Policy
AGEC 3503	Natural Resource Economics
AGEC 3713	Agricultural Law
BAE 4314	Design Hydrology
Upper-division HORT and PLP courses that will count toward chosen minor	
Hours Subtotal	50
Electives	
Select 0 hours or hours to complete required total for degree	0
Total Hours	120

1 College & Departmental requirements that may be used to meet GE requirements.

2 If used as (N) course above, hours in this block reduced by 5.

3 If used as (A) course above, hours in this block reduced by 3.

4 If ENGL 3323 Technical Writing is used to satisfy ENGL 1213 Composition II above; hours in this block are reduced by 3.

5 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 2025.

Soil Science (SLSI), Minor

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (p. 844).

Total Hours: 19 hours

Code	Title	Hours
Minor Requirements		
SOIL 2124	Fundamentals of Soil Science (N)	4
Select one of the following:		3
BAE 2013	Modeling in Biosystems Engineering	
CIVE 3813	Environmental Engineering Science	
ENVR 1113	Elements of Environmental Science	
HORT 1013	Principles of Horticultural Science (LN)	
NREM 2013	Ecology of Natural Resources	
PLNT 1213	Introduction to Plant and Soil Systems	
Select two of the following:		6
SOIL 3433	Soil Genesis, Morphology, and Classification	
SOIL 4234	Soil Nutrient Management	
SOIL 4483	Soil Microbiology	
SOIL 4683	Soil, Water, and Weather	
SOIL 4893	Soil Chemistry and Environmental Quality	
Select two of the following:		6
SOIL 4213	Precision Agriculture	
SOIL 4363	Environmental Soil Science	
SOIL 4463	Soil and Water Conservation	

- A grade-point average of 2.0 for courses that count for the 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 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).