GRASSLAND ECOLOGY & MANAGEMENT

Description
Website: https://grassland.unl.edu/gecmprogram

Grassland Ecology and Management (GECM)
Students in grassland ecology and management benefit from a rich history of grassland science at the University of Nebraska–Lincoln and exceptional experiential learning opportunities throughout the state. Approximately 60% of the state's land mass is grassland. Students develop a strong base in grassland ecology and ecosystem assessment and learn how to apply fundamental principles and technology to the management and monitoring of terrestrial systems, including grasslands. The University of Nebraska is commonly recognized as the birthplace of prairie ecology. Building on this base, students learn how effective grassland management is essential for grassland biodiversity and resilience, wildlife habitat, conservation, livestock production, and other ecosystem services. Grassland ecology and management is for students excited about the study and management of private and public grasslands.

- An integration of disciplines involved in the study, conservation, and utilization of grasslands.
- Provides a strong background in the plant and physical sciences in preparation for studying the ecology and management of grasslands in upper level coursework.
- Foundation of the degree program is multiple use, emphasizing integrated grassland management for water, wildlife, forage, recreation, and aesthetics.
- Students learn through coursework, seminars, capstone experiences, and optional internships with state and federal agencies, research organizations, and private industry.
- Careers include managers of grassland resources on private and public lands with specialization in habitat management, grassland restoration/monitoring, or grassland management, positions with environmental consulting firms, natural resources districts, public land management agencies, land use planning agencies, and federal and state wildlife divisions.
- Curriculum meets the civil service requirements of the federal government for rangeland management specialist positions in such agencies as the Natural Resources Conservation Service, Bureau of Land Management, and Forest Service.
- Breadth of the curriculum prepares students for postgraduate education in most disciplines related to natural resource sciences.

Other
Scholarships and Financial Aid
In addition to other scholarships a student might receive, the grassland ecology and management program awards scholarships annually to qualifying new and current GECM students, based primarily on academic performance. For more information on these scholarships, contact Dr. Walter Schacht, 402-472-0205, wschacht1@unl.edu.

Academic Advising
Students are assigned a faculty advisor after admission into their program. The advisor serves as a resource regarding the degree, academic plans and progress, and career options. Students are encouraged to regularly consult with their advisor, especially before registering for classes.

College Requirements

College Admission
Requirements for admission into the College of Agricultural Sciences and Natural Resources (CASNR) are consistent with general University admission requirements (one unit equals one high school year): 4 units of English, 4 units of mathematics, 3 units of natural sciences, 3 units of social studies, and 2 units of foreign language. Students must also meet performance requirements (ACT composite of 20 or higher OR combined SAT score of 950 or higher OR rank in the top one-half of graduating class; transfer students must have a 2.0 (on a 4.0 scale) cumulative grade point average and 2.0 on the most recent term of attendance. For students entering the PGA Golf Management degree program, a certified golf handicap of 12 or better (e.g., USGA handicap card) or written ability (MS Word file) equivalent to a 12 or better handicap by a PGA professional or high school golf coach is required. For more information, please visit: http://pgm.unl.edu/requirements.

Admission Deficiencies/Removal of Deficiencies
Students who are admitted to CASNR with core course deficiencies must remove these deficiencies within the first 30 credit hours at the University of Nebraska–Lincoln, or within the first calendar year at Nebraska, whichever takes longer, excluding foreign languages. Students have up to 60 credit hours to remove foreign language deficiencies. College-level coursework taken to remove deficiencies may be used to meet degree requirements in CASNR.

Deficiencies in the required entrance subjects can be removed by completion of specified courses in the University or by correspondence.

The Office of Admissions, Alexander Building (south entrance), City Campus, provides information to new students on how deficiencies can be removed.

College Degree Requirements
Curriculum Requirements
The curriculum requirements of the College consist of three areas: ACE (Achievement-Centered Education); College of Agricultural Sciences and Natural Resources Core; and Degree Program requirements and electives. All three areas of the College Curriculum Requirements are incorporated within the description of the Major/Degree Program sections of the catalog. The individual major/degree program listings of classes insures that a student will meet the minimum curriculum requirements of the College.

Foreign Languages/Language Requirement
Two units of a foreign language are required. This requirement is usually met with two years of high school language.

Minimum Hours Required for Graduation
The College grants the bachelors degree in programs associated with agricultural sciences, natural resources and related programs. Students working toward a degree must earn at least 120 semester hours of credit. A minimum cumulative grade point average of C (2.0 on a 4.0 scale) must be maintained throughout the course of studies and is required for graduation. Some degree programs have a higher cumulative grade point
average required for graduation. Please check the degree program on its graduation cumulative grade point average.

Grade Rules
Removal of C-, D and F Grades
Only the most recent letter grade received in a given course will be used in computing a student's cumulative grade point average if the student has completed the course more than once and previously received a grade or grades below C in that course.

The previous grade (or grades) will not be used in the computation of the cumulative grade point average, but it will remain a part of the academic record and will appear on any transcript.

A student can remove from his/her cumulative average a course grade of C-, D+, D, D- or F if the student repeats the same course at the University of Nebraska and receives a grade other than P (pass), I (incomplete), N (no pass), W (withdrew), or NR (no report). If a course is no longer being offered, it is not eligible for the revised grade point average computation process.

For complete procedures and regulations, see the Office of the University Registrar website at http://www.unl.edu/regrec/course-repeats.

Pass/No Pass
Students in CASNR may take any course offered on a Pass/No Pass basis within the 24-hour limitation established by the Faculty Senate. However, a department may specify that the Pass/No Pass status of its courses be limited to non-majors or may choose to offer some courses for letter grades only.

GPA Requirements
A minimum cumulative grade point average of C (2.0 on a 4.0 scale) must be maintained throughout the course of studies and is required for graduation. Some degree programs have a higher cumulative grade point average required for graduation. Please check the degree program on its graduation cumulative grade point average.

Transfer Credit Rules
To be considered for admission, a transfer student, Nebraska resident or nonresident, must have an accumulated average of C (2.0 on a 4.0 scale) and a minimum C average in the last semester of attendance at another college. Transfer students who have completed less than 12 credit hours of college study must submit either ACT or SAT scores.

Ordinarily, credits earned at an accredited college are accepted by the University. The College, however, will evaluate all hours submitted on an application for transfer and reserves the right to accept or reject any of them. Sixty (60) is the maximum number of hours the University will accept from a two-year college. Ninety (90) is the maximum number of hours the University will accept from a four-year college. Transfer credit in the degree program must be approved by the degree program advisor on a Request for Substitution Form to meet specific course requirements, group requirements, or course level requirements in the major. At least 9 hours in the major field, including the capstone course, must be completed at the University of Nebraska-Lincoln regardless of the number of hours transferred.

The College will accept no more than 10 semester hours of C-, D+, D and D- grades from other schools. The C-, D+, D and D- grades can only be applied to free electives. This policy does not apply to the transfer of grades from UNO or UNK to the University of Nebraska-Lincoln.

Joint Academic Transfer Programs
The College of Agricultural Sciences and Natural Resources has agreements with many institutions to support joint academic programs. The transfer programs include dual degree programs and cooperative degree programs. Dual degree programs offer the opportunity to receive a degree from a participating institution and also to complete requirements for a bachelor of science degree in CASNR. Cooperative programs result in a single degree from either the University of Nebraska–Lincoln or the cooperating institution.

Dual Degree Programs
A to B Programs
The A to B Program, a joint academic program offered by the CASNR and participating community colleges, allows students to complete the first two years of a degree program at the participating community college and continue their education and study in a degree program leading toward a bachelor of science degree.

The A to B Program provides a basic knowledge plus specialized coursework. Students transfer into CASNR with junior standing. Depending on the community college, students enrolled in the A to B Program may complete the requirements for an associate of science at the community college, transfer to the University of Nebraska-Lincoln, and work toward a bachelor of science degree.

Participating community colleges include:
- Central Community College
- Metropolitan Community College
- Mid-Plains Community College
- Nebraska College of Technical Agriculture
- Northeast Community College
- Southeast Community College
- Western Nebraska Community College

3+2 Programs
Two specialized degree programs in animal science and veterinary science are offered jointly with an accredited college or school of veterinary medicine. These two programs permit CASNR animal science or veterinary science students to receive a bachelor of science degree from the University of Nebraska-Lincoln with a degree in animal science or veterinary science after successfully completing two years of the professional curriculum in veterinary medicine at an accredited veterinary school. Students who successfully complete the 3+2 Program, must complete the Application for Degree form and provide transcripts to the Credentials Clerk, Office of the University Registrar, 107 Canfield Administration Building. Students should discuss these degree programs with their academic advisor.

Cooperative Degree Programs
Academic credit from the University and a cooperating institution is applied towards a four-year degree from either the University of Nebraska–Lincoln (University degree-granting program) or the cooperating institution (non University degree-granting program). All have approved programs of study.

UNL Degree-Granting Programs
A University of Nebraska-Lincoln degree-granting program is designed to provide students the opportunity to complete a two-year program of study at one of the four-year institutions listed below, transfer to CASNR and complete the requirements for a bachelor of science degree.
Chadron State College. Chadron State College offers a 2+2 program leading to a grassland ecology and management degree program and a transfer program leading to a bachelor of science in agricultural education in the teaching option.

Wayne State College. Wayne State College offers a 3+1 program leading to a bachelor of science in plant biology in the ecology and management option.

University of Nebraska at Kearney. Transfer programs are available for students pursuing degree programs leading to a bachelor of science degree.

University of Nebraska at Omaha. The University of Nebraska at Omaha (UNO) cooperates with CASNR in providing four-semester pre-agricultural sciences, pre-natural resources, pre-food science and technology, pre-horticulture and pre-turfgrass and landscape management transfer programs.

A student enrolled in these programs may transfer all satisfactorily completed academic credits identified in the suggested program of study, and enter CASNR to study toward a degree program leading to a bachelor of science degree. The total program would require a minimum of four years or eight semesters (16 credit hours/semester or 120 credit hours).

Nebraska CASNR faculty teach horticulture and food science and technology courses at UNO to assist an urban population in better understanding the food processing, horticulture, and landscape horticulture industries.

For more information, contact the CASNR Dean's Office, 800-472-8800, ext. 2541.

Non University of Nebraska–Lincoln Degree-Granting Programs
CASNR cooperates with other institutions to provide coursework that is applied towards a degree at the cooperating institution. Pre-professional programs offered by CASNR allow students to complete the first two or three years of a degree program at the University prior to transferring and completing a degree at the cooperating institution.

Chadron State College—Range Science. The 3+1 Program in range science allows Chadron State College students to pursue a range science degree through Chadron State College. Students complete three years of coursework at Chadron State College and one year of specialized range science coursework (32 credit hours) at CASNR.

Dordt College (Iowa)—Agricultural Education: Teaching Option. This program allows students to pursue an Agricultural Education Teaching Option degree leading toward a bachelor of science in agricultural education. Students at Dordt College will complete 90 credit hours in the Agricultural Education: Teaching Option Transfer Program.

Residency
Students must complete at least 30 of the total hours for their degree using University of Nebraska–Lincoln credits. At least 18 of the 30 credit hours must be in courses offered through CASNR(1)(>299) including the appropriate ACE 10 degree requirement or an approved ACE 10 substitution offered through another Nebraska college and excluding independent study regardless of the number of hours transferred. Credit earned during education abroad may be used toward the residency requirement if students register through UNL and participate in prior-approved education abroad programs. University of Nebraska–Lincoln open enrollment and summer independent study courses count toward residence.

1 Includes courses taught by CASNR faculty through interdisciplinary prefixes (e.g., LIFE, MBIO, ENVR, SCIL, EAEP, HRTM, ENSC) and CASNR crosslisted courses taught by non-CASNR faculty.

Online and Distance Education
There are many opportunities to earn college credit online through the University of Nebraska–Lincoln. Some of these credits may be applicable not only as elective credits, but also toward the fulfillment of the College’s education requirements. Credits earned online may count toward residency. However, certain offerings may not be counted toward scholarship requirements or academic recognition criteria.

For further information, contact:
Office of Online and Distance Education
University of Nebraska–Lincoln
305 Brace Labs
Lincoln, NE 68588-0109
402-472-4681
http://online.unl.edu/

Independent Study Rules
Students wishing to take part in independent studies must obtain permission; complete and sign a contract form; and furnish copies of the contract to the instructor, advisor, departmental office, and the Dean's Office. The contract should be completed before registration. Forms are available in 103 Agricultural Hall or online at the CASNR website.

Independent study projects include research, literature review or extension of coursework under supervision and evaluation of a departmental faculty member.

Students may only count 12 hours of independent study toward their degrees and no more than 6 hours can be counted during their last 36 hours earned, excluding senior thesis, internships, and courses taught under an independent study number.

Other College Degree Requirements
Capstone Course Requirement
A capstone course is required for each CASNR degree program. A capstone course is defined as a course in which students are required to integrate diverse bodies of knowledge to solve a problem or formulate a policy of societal importance.

ACE Requirements
All students must fulfill the Achievement Centered Education (ACE) requirements. Information about the ACE program may be viewed at ace.unl.edu (https://ace.unl.edu).

The minimum requirements of CASNR reflect the common core of courses that apply to students pursuing degrees in the college. Students should work with an advisor to satisfy ACE outcomes 1, 2, 3, 4, 6 and 10 with the college requirements.

Catalog Rule
Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted to the University of Nebraska–Lincoln or when they were first admitted to a Joint Academic Transfer Program. In consultation with advisors, a student may choose to follow a subsequent catalog for any academic year in which they are admitted to and enrolled as a degree-seeking student at Nebraska in the College of Agricultural Sciences and Natural Resources. Students must complete all degree requirements from a single catalog year. The catalog
which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

**Learning Outcomes**

Graduates of grassland ecology and management will be able to:

1. Plan and manage for multiple ecosystem services, including wildlife habitat, biodiversity, conservation, and livestock production, on private and public grasslands.
2. Describe the interrelationships of ecological factors and processes with an emphasis on vegetation, fire, grazing animals, economics, and wildlife.
3. Assess rangeland health, use ecological site descriptions, determine carrying capacity, use GPS and GIS, conduct rangeland surveys, analyze quantitative field data, and interpret results of data analysis.
4. Use the principles of rangeland ecology to analyze and interpret the interactions of the plant, animal, environmental, and economic aspects of rangeland ecosystems.
5. Integrate conservation strategies that ensure sustained productivity and resilience of rangelands with livestock production and other rangeland-based enterprises.
6. Develop a comprehensive management plan for a unit of private or public rangeland, including economic analysis. Use decision support tools and technologies to develop and analyze management systems/strategies.
7. Critically analyze management systems, integrate a wide range of interrelated inputs and disciplines into a single process or system, and make decisions based on properly-collected information and sound reasoning and communicate them effectively to peers and stakeholders.

**Major Requirements**

### Core Requirements

**College Integrative Courses**

- SCIL 101: Science and Decision-Making for a Complex World
- NRES 438: Grassland Conservation: Planning and Management (Capstone ACE 10)

**Mathematics and Statistics**

- STAT 218: Introduction to Statistics (ACE 3)
- Select one course beyond college algebra of the following: 2-5
  - MATH 102: Trigonometry
  - MATH 103: College Algebra and Trigonometry
  - MATH 104: Applied Calculus (ACE 3)
  - MATH 106: Calculus I (ACE 3)

**Communication**

- Select one written communication (ACE 1) course of the following: 3
  - ENGL 150: Writing and Inquiry
  - ENGL 151: Writing and Argument
  - ENGL 254: Writing and Communities
  - JGEN 120: Basic Business Communication
  - JGEN 200: Technical Communication I
  - JGEN 300: Technical Communication II

- Select one oral communication (ACE 2) course of the following: 3
  - ALEC 102: Interpersonal Skills for Leadership
  - COMM 101: Communication in the 21st Century
  - COMM 209: Public Speaking
  - COMM 210: Communicating in Small Groups
  - COMM 215: Visual Communication
  - MRKT 257: Sales Communication
  - NRES 301: Environmental Communication Skills
  - TMFD 121: Visual Communication and Presentation

**Natural Resources**

- NRES 220: Principles of Ecology
- SOIL 153 / AGRO 153 / HORT 153: Soil Resources
- AECN 265 / NREE 265: Resource and Environmental Economics I
- GEOG 412 / NRES 412: Introduction to Geographic Information Systems
- NRES 312 / GEOG 312: Introduction to Geospatial Information Sciences

**Natural and Physical Sciences**

- CASNR Approved Life Sciences
  - LIFE 120: Fundamentals of Biology I
  - & LIFE 120L: Fundamentals of Biology I laboratory
  - LIFE 121: Fundamentals of Biology II
  - & LIFE 121L: Fundamentals of Biology II laboratory

- Select one sequence of the following: 8
  - CHEM 105: Chemistry in Context I
  - & CHEM 106: Chemistry in Context II
  - CHEM 109: General Chemistry I
  - & CHEM 110: General Chemistry II (ACE 4)
Grassland Ecology & Management Minor

NRES 245 / AGRO 245 Introduction to Grassland Ecology and Management 3
NRES 440 / AGRO 440 / RNGE 440 Great Plains Ecosystem 3
NRES 442 / AGRO 442 / RNGE 442 Wildland Plants 3
RNGE 340 / AGRO 340 Range Management and Improvement 3

Select two of the following (5 hr minimum):

AGRO 242 / HORT 242 / RNGE 242 North American Wildland Plants
AGRO 442 / RNGE 442 Wildland Plants
NRES 444 / AGRO 444 / RNGE 444 Ecosystem Monitoring and Assessment
NRES 438 Grassland Conservation: Planning and Management 3

Total Credit Hours 18

RNGE 240 Forage Crop and Pasture Management

Crosslisted with: AGRO 240, GRAS 240
Prerequisites: AGRO/HORT 131 or BIOS 101 or LIFE 120
Description: Principles basic to the establishment, management, and utilization of forage crops and pastures. Plant identification and selection, seeding, fertilization, irrigation, forage quality and utilization, hay and silage preservation, and grazing management. The role of forages and ranges in developing a sustainable agriculture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL/SPR

RNGE 242 North American Wildland Plants

Crosslisted with: AGRO 242, HORT 242, GRAS 242
Prerequisites: Permission.
Notes: AGRO/RNGE 240 recommended.
Description: Identification and description of two-hundred important wildland plants of North America. Characteristics of these plants evaluated in terms of management implications.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 4
Format: LEC
Offered: FALL/SPR
RNGE 295 Internship in Agronomy  
**Crosslisted with:** AGRO 295, SOIL 295  
**Prerequisites:** Sophomore standing and completion of internship approval form. The internship proposal is subject to approval by the department.  
**Description:** Participation in agronomic applications and in agronomy-related areas of agribusiness; agronomic research in lab, greenhouse, or field; participation in farming practices other than those in which the student has had previous experience; or preparation of teaching materials.  
**Credit Hours:** 1-3  
Min credits per semester: 1  
Max credits per semester: 3  
Max credits per degree: 5  
**Format:** LEC  
**Offered:** SPRING

RNGE 340 Range Management and Improvement  
**Crosslisted with:** AGRO 340, GRAS 340  
**Prerequisites:** AGRO 240.  
**Description:** The principles of range management within the ecosystem framework. Range improvement practices and grazing systems; plant control using biological, chemical and mechanical factors; prescribed burning; range seeding; range fertilization; and the integration of range with other forage resources.  
**Credit Hours:** 3  
Max credits per semester: 3  
Max credits per degree: 3  
**Format:** LEC  
**Offered:** SPRING  
**Prerequisite for:** AGRO 445, AGRO 845, ASCI 451, ASCI 851, RNGE 445

RNGE 440 Great Plains Ecosystem  
**Crosslisted with:** AGRO 440, AGRO 840, NRES 840, NRES 444, GRAS 440  
**Prerequisites:** Junior standing.  
**Notes:** BIOS 101 and 101L, or equivalent, recommended.  
**Description:** Characteristics of Great Plains ecosystems, interrelationships of ecological factors and processes, and their application in the management of grasslands. Interactions of fire, vegetation, grazing animals and wildlife.  
**Credit Hours:** 3  
Max credits per semester: 3  
Max credits per degree: 3  
**Format:** LEC  
**Offered:** SPRING

RNGE 441 Perennial Plant Function, Growth, and Development  
**Crosslisted with:** AGRO 441, AGRO 841, HORT 441, HORT 841, GRAS 441  
**Prerequisites:** AGRO 325 or equivalent.  
**Description:** Principles of crop physiology and developmental morphology in relation to function, growth, development, and survival of perennial forage, range, and turf plants. The relationship of physiology and morphological development on plant use and management.  
**Credit Hours:** 3  
Max credits per semester: 3  
Max credits per degree: 3  
**Format:** LEC  
**Offered:** SPRING

RNGE 442 Wildland Plants  
**Crosslisted with:** AGRO 442, AGRO 842, NRES 842, NRES 442, GRAS 442  
**Prerequisites:** Junior standing.  
**Notes:** BIOS 101 and 101L, or equivalent, recommended.  
**Description:** Wildland plants that are important to grassland and shrubland ecosystem management and production. Distribution, utilization, classification, identification (including identification by vegetative parts), uses by Native Americans, and recognition of grasses, forbs, shrubs, exotic and wetland plants.  
**Credit Hours:** 3  
Max credits per semester: 3  
Max credits per degree: 3  
**Format:** LEC  
**Offered:** SPRING

RNGE 444 Ecosystem Monitoring and Assessment  
**Crosslisted with:** AGRO 444, AGRO 844, NRES 844, NRES 444, GRAS 444  
**Prerequisites:** Junior standing.  
**Notes:** NRES 220 or equivalent, recommended.  
**Description:** Measurement and monitoring of the important vegetation and environmental factors used to develop management guidelines in grasslands, savannas, woodlands, and wetlands. Emphasis on using ecosystem monitoring protocols for assessment of wildlife habitat, fuels management for wild-land fire, livestock production, and watershed function. Requires field sampling and travel to local field sites.  
**Credit Hours:** 3  
Max credits per semester: 3  
Max credits per degree: 3  
**Format:** LEC  
**Offered:** FALL

RNGE 445 Livestock Management on Range and Pasture  
**Crosslisted with:** AGRO 445, AGRO 845, ASCI 451, ASCI 851  
**Prerequisites:** Junior standing.  
**Notes:** AECN 201 recommended.  
**Description:** Analyzing the plant and animal resources and economic aspects of pasturage. Management of pasture and range for continued high production emphasized.  
**Credit Hours:** 3  
Max credits per semester: 3  
Max credits per degree: 3  
**Format:** LEC  
**ACE:** ACE 10 Integrated Product

RNGE 495 Grasslands Seminar  
**Crosslisted with:** AGRO 495, ENTO 495, GRAS 495, HORT 495, NRES 495, SOIL 495  
**Prerequisites:** Junior standing.  
**Description:** Topic varies and deals with different aspects of forage and/or range and/or livestock, turf and/or landscape grasses, natural habitats, and wetlands.  
**Credit Hours:** 1-2  
Min credits per semester: 1  
Max credits per semester: 2  
Max credits per degree: 4  
**Format:** LEC

RNGE 496 Independent Study  
**Crosslisted with:** AGRO 496, AGRO 896, SOIL 496  
**Credit Hours:** 1-6  
Min credits per semester: 1  
Max credits per semester: 6  
Max credits per degree: 12  
**Format:** IND
RNGE 499H Honors Thesis
Crosslisted with: AGRO 499H, SOIL 499H
Prerequisites: Admission to the University Honors Program and permission.
Notes: AGRI 299H recommended.
Description: Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.
Credit Hours: 3-6
Min credits per semester: 3
Max credits per semester: 6
Max credits per degree: 6
Format: IND

PLEASE NOTE
This document represents a sample 4-year plan for degree completion with this major. Actual course selection and sequence may vary and should be discussed individually with your college or department academic advisor. Advisors also can help you plan other experiences to enrich your undergraduate education such as internships, education abroad, undergraduate research, learning communities, and service learning and community-based learning.

Career Information
The following represents a sample of the internships, jobs and graduate school programs that current students and recent graduates have reported.

Jobs of Recent Graduates
• Environmental Restoration Technician II, AirLift Environmental LLC - Lincoln NE
• Range Management Specialist, USDA-NRCS - Burwell NE
• Advertising Account Executive, Nebraska Life Magazine - Norfolk NE
• Labourer, Johnson Land Management - Wausa NE