PLANT BIOLOGY (CAS)

Description
Website: http://agronomy.unl.edu/plant-biology

The plant biology major is designed to provide a flexible entry for undergraduate students that have an interest in the plant sciences. Once enrolled in the program, students will take a core of classes that will allow them to continue in the plant biology major or would also allow them to easily transfer to other Life Sciences programs. Students will have the opportunity to interact with the faculty of the Center for Plant Science Innovation as well as other departments and schools for advising and research opportunities.

The goal of the plant biology program is to offer a field of study to students who are interested and talented in the basic sciences and mathematics and who:

1. may never have considered applying this knowledge to plants,
2. have always dreamed of this field of study, and/or
3. have always had an interest in plants but are uncertain that this field of study is right for them.

Studying plant biology will allow students to explore and understand plants at molecular, cellular, physiological, organismal, population, and community levels and by taking ecological, evolutionary, agricultural, and horticultural perspectives. This is accomplished through required courses in different scientific fields (e.g., biology, biochemistry, chemistry, agronomy, horticulture) and through different options in the major (ecology and management option and biotechnology option).

The plant biology program includes a career experience/internship course (AGRO 295/RNGE 295/SOIL 295, BIOS 395, HORT 395, NRES 497) which provides the opportunity to gain work experience in an off-campus setting related to a student’s academic and career objectives.

A research project initiated by the beginning of the junior year is required.

College Requirements

College Admission

College Admission

The entrance requirements for the College of Arts and Sciences are the same as the University of Nebraska–Lincoln General Admission Requirements. Students who are admitted through the Admission Review process may have certain conditions attached to their enrollment at Nebraska. These conditions are explained under “Removal of Deficiencies.”

In addition to these requirements, the College of Arts and Sciences strongly recommends a third and fourth year of one foreign language. Four years of high school course work in the same language will fulfill the College of Arts and Sciences’ language requirement. It will also allow students to continue language study at a more advanced level at the University of Nebraska–Lincoln, and provide more opportunity to study abroad.

Transfer Students

To be considered for admission as a transfer student, Nebraska resident or nonresident, students 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 graduated from high school January 1997 and after must also meet the University of Nebraska–Lincoln General Admission Requirements. Those transfer students who graduated before January 1997 must have completed in high school, 3 years of English, 2 years of the same foreign language, 2 years of algebra, and 1 year of geometry. Transfer students who have completed less than 12 credit hours of college study must also submit either their ACT or SAT scores.

Ordinarily, hours earned at a similarly accredited college or university are applicable to the University of Nebraska–Lincoln degree. The College, however, will evaluate all hours submitted on an application for transfer, and reserves the right to accept or reject any of them, based upon its exclusion and restriction policies. Sixty (60) is the maximum number of hours the University will accept on transfer from a two-year college or international institution. Transfer credit in the major or minor must be approved by the departmental advisor on a Request for Substitution Form to meet specific course requirements, group requirements, or course level requirements in the major or minor. At least half of the hours in the major field must be completed at the University regardless of the number of hours transferred.

The College of Arts and Sciences will accept no more than 15 semester hours of C- and D grades from other schools. The C- and D grades cannot be applied toward requirements for a major or minor. This policy does not apply to the transfer of grades from UNO or UNK to the University of Nebraska–Lincoln. All D grades may be transferred from UNO or UNK, but they are not applicable to a major or minor.

Readmitted Students

University of Nebraska–Lincoln students who choose not to take courses for more than two consecutive terms, must reapply to the University of Nebraska–Lincoln. Students readmitted to the College of Arts and Sciences will follow the requirements stated in the catalog for the academic year of readmission and re-enrollment as a degree-seeking student in Arts and Sciences. In consultation with advisors, a student may choose to follow a catalog for any academic year in which they are admitted to and enrolled as a degree-seeking student at Nebraska in the College of Arts and Sciences. Students must complete all degree requirements from a single catalog year. Beginning in 1990-1991, the catalog which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

Admission Deficiencies/Removal of Deficiencies

Students must remove entrance deficiencies in geometry and foreign language as soon as possible, and before graduating from the College of Arts and Sciences. For questions and more information, students should consult a college advisor in the Academic and Career Advising Center in 107 Oldfather Hall.

Removing Foreign Language Deficiencies

Students must complete the second semester of a first year language sequence to clear the deficiency and the second semester of the second year language sequence to complete the college graduation requirement in language.

Removing Geometry Deficiencies

A deficiency of one year of geometry can be removed by taking high school geometry courses through an approved independent study program, or by completing a geometry course from an accredited community college or a four-year institution. Neither of these options will count for college credit.
College Degree Requirements

College Distribution Requirements

Bachelor of Arts or Bachelor of Science (16 hours + Language)

The College of Arts and Sciences distribution requirements are designed to further the purposes of liberal education by encouraging study in several different areas within the College. All requirements are in addition to University ACE requirements. A student may not use a single course to satisfy more than one of the following five distribution requirements. A student cannot use a single course from their second major toward this requirement. Independent study or reading courses and internships cannot be used to satisfy distribution requirements. To see a complete list of excluded courses, run a degree audit through MyRED.

Courses from interdisciplinary programs will count in the same area as courses from the home/cross-listed department(s).

College Distribution Requirements

<table>
<thead>
<tr>
<th>CDR A - Written Communication</th>
<th>3</th>
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<tbody>
<tr>
<td>Select from courses approved for ACE outcome 1.</td>
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<table>
<thead>
<tr>
<th>CDR B and BL - Natural, Physical, and Mathematical Sciences with Lab</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select from biochemistry, biological sciences, chemistry, computer science, geology, meteorology, mathematics, physics and statistics. Must include one lab in the natural or physical sciences. Lab courses may be selected from biochemistry, biological sciences, chemistry, geology, meteorology and physics.</td>
<td></td>
</tr>
</tbody>
</table>

Some courses from geography and anthropology may also be used to satisfy the lab requirement above.  

<table>
<thead>
<tr>
<th>CDR C - Humanities</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Select from classics, English, history, modern languages and literatures, philosophy, and religious studies.</td>
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</table>

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<thead>
<tr>
<th>CDR D - Social Science</th>
<th>3</th>
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<tbody>
<tr>
<td>Select from: anthropology, communication studies, geography, political science, psychology, or sociology.</td>
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<thead>
<tr>
<th>CDR E - Language</th>
<th>0-16</th>
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<tbody>
<tr>
<td>Fulfilled by the completion of the 6-credit-hour second-year sequence in a single foreign language in one of the following departments: Classics and religious studies, modern languages and literatures, or anthropology. Instruction is currently available in Arabic, Chinese, Czech, French, German, Greek, Japanese, Latin, Omega, Russian, and Spanish. A student who has completed the fourth-year level of one foreign language in high school is exempt from the languages requirement.</td>
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</table>

<table>
<thead>
<tr>
<th>CDR F - Additional Breadth</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Select from: natural, physical and mathematical sciences (Area B), humanities (Area C), or social sciences (Area D). Cannot be a course from the primary major.</td>
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</tbody>
</table>

Credit Hours Subtotal: 16-32

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1 See degree audit or College of Arts and Sciences advisor for approved geography and anthropology courses that apply as natural science.

2 Language courses numbered 210 or below apply only for the foreign language requirement.
**Distance Education**

For the **University entrance requirement**, students without transcript documentation who claim proficiency in a language not taught at the University of Nebraska–Lincoln, have the option of seeking out a distance education program in languages. If the student completes the equivalent of 102 from an approved distance education program, the student will meet the University’s entrance requirement. The student must have the course work approved before he/she takes/completes the course as equivalent to 102 by a College advisor. The student then completes the course and has the distance education program send the transcript to the Admissions Office.

For the **College of Arts and Sciences College Distribution Requirement E-Language**, the student can seek out a distance education program and complete the equivalent of the 202-level course. The student must submit the request on the College Request for Substitution form and have the course work approved by a College advisor. The student then completes the course and has the distance education program send the transcript to the Admissions Office.

**Third Language Option**

If a student demonstrates knowledge of two foreign languages at the 102 level, the College of Arts and Sciences may consider waiving two semesters of the four semester College Distribution Requirement E-Languages requirement. If this waiver was granted, the student would then be required to complete 101 and 102 in another, 3rd foreign language at Nebraska.

**Minimum Hours Required for Graduation**

A minimum of 120 semester hours of credit is required for graduation from the College of Arts and Sciences. A total grade point average of at least 2.0 is required.

**Grade Rules**

**Restrictions on C- and D Grades**

The College will accept no more than 15 semester hours of C- and D grades from other schools except for UNO and UNK. No transfer C- and D grades can be applied toward requirements in a major or a minor. No University of Nebraska–Lincoln C- or D or F grades.

**Pass/No Pass Privilege**

**University regulations for the Pass/No Pass (P/N) privilege state:**

- **The Pass/No Pass option is designed for your use by seeking to expand your intellectual horizons by taking courses in areas where you may have had minimal preparation.**
- **Neither the P nor the N grade contribute to your GPA.**
- **P is interpreted to mean C or above.**
- **A change to or from a Pass/No Pass may be made until mid-term (see academic calendar for specific dates per term).**
- **The Pass/No Pass or grade registration cannot conflict with the policy of the professor, department, college, or University governing the grading option.**
- **Changing to or from Pass/No Pass requires using the MyRED system to change the grading option or filing a Drop/Add form with the Office of the University Registrar, 107 Canfield Administration Building. After mid-term of the course, a student registered for Pass/No Pass cannot change to a grade registration unless the Pass/No Pass registration is in conflict with the policy of the professor, department, college, or University governing Pass/No Pass.**

- **The Pass/No Pass grading option cannot be used for the removal of C- or D or F grades.**

**Pass/No Pass privileges in the College of Arts and Sciences are extended to students according to the following additional regulations:**

- **Pass/No Pass hours can count toward fulfillment of University ACE requirements and college distribution requirements up to the 24-hour maximum.**
- **Most Arts and Sciences departments and programs do not allow courses graded Pass/No Pass to apply to the major or minor. Students should refer to the department’s or program’s section of the catalog for clarification. By college rule, departments can allow up to 6 hours of Pass/No Pass in the major or minor.**
- **Departments may specify that certain courses of theirs can be taken only on a P/N basis.**
- **The college will permit no more than a total of 24 semester hours of P/N grades to be applied toward degree requirements. This total includes all Pass grades earned at the University and other U.S. schools. NOTE: This 24-hour limit is more restrictive than the University regulation.**

**Grading Appeals**

A student who feels that he/she has been unfairly graded must ordinarily take the following sequential steps in a timely manner, usually by initiating the appeal in the semester following the awarding of the grade:

1. Talk with the instructor concerned. Most problems are resolved at this point.
2. Talk to the instructor’s department chairperson.
3. Take the case to the Grading Appeal Committee of the department concerned. The Committee should be contacted through the department chairperson.
4. Take the case to the College Grading Appeals Committee by contacting the Dean’s Office, 1223 Oldfather Hall.

**Course Level Requirements**

**Courses Numbered above 299**

Thirty of the 120 semester hours of credit must be in courses numbered above 299. Of the 30 hours above 299, 15 hours (1/2) must be completed in residence at UNL.

**Graduate Courses**

Seniors in the University who have obtained in advance the approval of the dean for Graduate Studies may receive up to 12 hours credit for graduate courses taken in addition to the courses necessary to complete their undergraduate work, provided that such credits are earned within the calendar year prior to receipt of the baccalaureate. For procedures, inquire at the Office of Graduate Studies.

Course work taken prior to receipt of the baccalaureate may not always be accepted for transfer to other institutions as graduate work.

**Residency**

**Residency Requirement and Open Enrollment and Summer Independent Study Courses**

Students must complete at least 30 of the 120 total hours for their degree at the University of Nebraska–Lincoln. Students must complete at least 1/2 of their major course work including 6 hours above 299 in their major, and 15 of the 30 hours required above 299 in residence. Credit earned during education abroad may be used toward the residency requirement if students register through the University and participate in
prior-approved education abroad programs. The University of Nebraska–Lincoln open enrollment and summer independent study courses count toward residence.

ACE Requirements
Consistent with the mission and values of the University, ACE is based on a shared set of four institutional objectives and ten student learning outcomes. The ACE program was approved by faculty in all eight undergraduate colleges and endorsed by the Faculty Senate, the student government, and the Academic Planning Committee in January 2008 for implementation in the fall 2009. ACE aligns with current national initiatives in general education.

Key characteristics of ACE demonstrate the benefits of the program to students:

• Students receive a broad education with exposure to multiple disciplines, critical life skills and important reasoning, inquiry, and civic capacities.
• ACE is simple and transparent for students, faculty and advisors. Students complete the equivalent of 3 credit hours for each of the ten student learning outcomes.
• Students connect and integrate their ACE experiences with their selected major.
• Students can transfer all ACE certified courses across colleges within the institution to meet the ACE requirement and any course from outside the institution that is directly equivalent to a University of Nebraska–Lincoln ACE-certified course. Courses from outside institutions without direct equivalents may be considered with appropriate documentation for ACE credit (see academic advisor).

ACE allows faculty to assess and improve their effectiveness and facilitate students’ learning.

ACE Institutional Objectives and Student Learning Outcomes
To meet the ACE Program requirement, a student will complete a minimum of 3 credit hours for each of the ten ACE Student Learning Outcomes (a total of 30 ACE credit hours). See the ACE website at: http://ace.unl.edu for the most current information and the most recently certified courses.

Catalog Rule
Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted to and enrolled as a degree-seeking student at the University of Nebraska–Lincoln. 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 Arts and Sciences. Students must complete all degree requirements from a single catalog year. Beginning in 1990-1991 the catalog which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

Learning Outcomes
Majors in plant biology will be able to:

1. Be confident in explaining how various plants grow and reproduce and predict how they will respond to their growing environment.
2. Plan and conduct experiments that are designed to test hypotheses and then communicate their discoveries in formats designed for other scientists or for the public.

3. Use the principles of ecology to analyze and interpret the interactions of the plant, animal, environmental, and economic aspects of grassland ecosystems. (Ecology and Management Option)
4. Identify management strategies for grasslands that ensure sustained productivity and resilience. (Ecology and Management Option)
5. Envision and design genetic and production improvements in plants to better meet the needs of people or changes in plant production environments (Biotechnology Option)
6. Be competitive applicants for graduate programs world wide in plant biology.

Major Requirements
Core Requirements

Mathematics and Statistics
MATH 106 Calculus I 5
STAT 218 Introduction to Statistics 3
Credit Hours Subtotal: 8

Life Sciences
LIFE 120 & LIFE 120L Fundamentals of Biology I and Fundamentals of Biology I laboratory 4
LIFE 121 & LIFE 121L Fundamentals of Biology II and Fundamentals of Biology II Laboratory 4
Credit Hours Subtotal: 8

Physics
PHYS 141 Elementary General Physics I 5
Credit Hours Subtotal: 5

Chemistry
CHEM 109 General Chemistry I 4
CHEM 110 General Chemistry II 4
CHEM 255 & CHEM 257 Biological Organic Chemistry and Biological Organic Chemistry Laboratory 4
or CHEM 251 & CHEM 253 Organic Chemistry I and Organic Chemistry I Laboratory 4
Credit Hours Subtotal: 12

Biochemistry
BIOC 321 & BIOC 321L Elements of Biochemistry and Laboratory for Elements of Biochemistry 4
Credit Hours Subtotal: 4

Plant Biology Core
Select one of the following: 4

AGRO 131 / HORT 131 and Agrominic Plant Science Laboratory
AGRO 132

HORT 131 / AGRO 131 and Horticultural Plant Science Laboratory
HORT 133

NRES 220 & NRES 222 Principles of Ecology and Ecology Laboratory 4
or BIOS 207 Ecology and Evolution 4
AGRO 153 / HORT 153 / SOIL 153 Soil Resources 4
### Plant Biology (CAS)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRO 215 / HORT 215 / TLMT 215 or BIOS 206</td>
<td>Genetics / General Genetics</td>
<td>4</td>
</tr>
<tr>
<td>AGRO 325</td>
<td>Introductory Plant Physiology</td>
<td>4</td>
</tr>
<tr>
<td>AGRO 92 / HORT 92 / NRES 92</td>
<td>Plant Biology Portfolio and Assessment</td>
<td>0</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 20

### Plant Biology Internship/Career Experience

Select one of the following: 1
- BIOS 395  Internship
- HORT 395  Career Experience
- AGRO 295 / RNGE 295 / SOIL 295  Internship in Agronomy
- NRES 497  Career Experiences in Natural Resource Sciences

**Credit Hours Subtotal:** 1

### Plant Biology Independent Study/Current Project

Select one of the following: 1-3
- BIOS 498  Independent Research in Biological Sciences
- AGRO 496 / RNGE 496 / SOIL 496  Independent Study
- HORT 396  Current Projects and Topics in Horticulture
  or HORT 399  Independent Study
- NRES 496  Independent Study
- PLPT 496  Independent Study

**Credit Hours Subtotal:** 1-3

**Total Credit Hours:** 59-61

### Specific Major Requirements

Select either the Ecology and Management Option or the Biotechnology Option as described below.

#### Ecology and Management Option

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>AGRO 245 / NRES 245 or NRES 310</td>
<td>Introduction to Grassland Ecology and Management / Introduction to Forest Management</td>
<td>3-4</td>
</tr>
<tr>
<td>AGRO 444 / NRES 444 / RNGE 444</td>
<td>Ecosystem Monitoring and Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 6-7

**Additional Ecology and Management Option Courses**

Select at least 3 hours from each of the following five areas:

- **Water/Climate**
  - METR 100  Weather and Climate
  - NRES 208  Applied Climate Sciences

Select at least 3 hours from the following: 3-4
- AGRO 204  Resource-Efficient Crop Management
- AGRO 240 / RNGE 240  Forage Crop and Pasture Management
- AGRO 440 / NRES 440 / RNGE 440  Great Plains Ecosystem
- BIOS 454 / NRES 454  Ecological Interactions
- BIOS 457 / GEOL 457  Ecosystem Ecology
- BIOS 470  Prairie Ecology
- NRES 310  Introduction to Forest Management
- NRES 417 / HORT 418  Agroforestry Systems in Sustainable Agriculture
- NRES 408 / AGRO 408 / GEOG 408 / HORT 408 / METR 408 / WATS 408  Microclimate: The Biological Environment
- WATS 281 / GEOG 281 / NRES 281  Introduction to Water Science

#### Geospatial Information Sciences

Select at least 3 hours from the following: 3-4
- GEOG 412 / NRES 412  Introduction to Geographic Information Systems
- GEOG 418 / NRES 418  Introduction to Remote Sensing
- NRES 312 / GEOG 312  Introduction to Geospatial Information Scieces

#### Plant Identification

- AGRO 442 / NRES 442 / RNGE 442  Wildland Plants

#### Plant-Animal-Organismal Interactions

Select at least 3 hours from the following: 3-4
- AGRO 340 / RNGE 340  Range Management and Improvement
- AGRO 460 / BIOS 460 / SOIL 460 / NRES 460  Soil Microbiology
- BIOS 317  The Biology of Plants
- BIOS 475  Avian Biology
- BIOS 476 / NRES 476  Mammalogy
- ENTO 115 / BIOS 115 & ENTO 116 / BIOS 116  Insect Biology and Insect Identification
- NRES 211  Introduction to Conservation Biology
- NRES 311  Wildlife Ecology and Management
- NRES 348  Wildlife Damage Management

#### Ecology and Management

Select at least 3 hours from the following: 3-4
- AGRO 204  Resource-Efficient Crop Management
- AGRO 240 / RNGE 240  Forage Crop and Pasture Management
- AGRO 440 / NRES 440 / RNGE 440  Great Plains Ecosystem
- BIOS 454 / NRES 454  Ecological Interactions
- BIOS 457 / GEOL 457  Ecosystem Ecology
- BIOS 470  Prairie Ecology
- NRES 310  Introduction to Forest Management
- NRES 417 / HORT 418  Agroforestry Systems in Sustainable Agriculture
- NRES 408 / AGRO 408 / GEOG 408 / HORT 408 / METR 408 / WATS 408  Microclimate: The Biological Environment
- WATS 281 / GEOG 281 / NRES 281  Introduction to Water Science
Biotechnology Option

Required Courses

BIOS 312  Microbiology  3

Select one of the following:  3-4

BIOS 337  Applications of Bioinformatics

BIOC 442 / STAT 442  Computational Biology

BIOS 427  Practical Bioinformatics Laboratory

Credit Hours Subtotal:  6-7

Additional Biotechnology Courses  

Select at least 17 hours from the following three areas with at least 3 hours in each area:

Biological Sciences

Select at least 3 hours from the following:  3-6

AGRO 270 / HORT 270 / NRES 270 / PLPT 270  Biological Invaders

AGRO 460 / BIOS 460 / NRES 460 / SOIL 460  Soil Microbiology

BIOS 205  Genetics, Molecular and Cellular Biology Laboratory

BIOS 302  Cell Biology

BIOS 317  The Biology of Plants

BIOS 407  Biology of Cells and Organelles

BIOS 418  Advanced Genetics

BIOS 420 / MBIO 420  Molecular Genetics

BIOS 425  Plant Biotechnology

BIOS 471  Plant Systematics

or BIOS 429 Phylogenetic Biology

BIOS 477  Bioinformatics and Molecular Evolution

Applied Plant Biology

Select at least 3 hours from the following:  3-6

AGRO 131 / HORT 131 / & AGRO 132  Plant Science and Agronomic Plant Science Laboratory

or HORT 131 Plant Science

& HORT 133 and Horticultural Plant Science Laboratory

AGRO 408 / GEOG 408 / HORT 408 / METR 408 / NRES 408 / WATS 408  Microclimate: The Biological Environment

AGRO 411  Crop Genetic Engineering

AGRO 412  Crop and Weed Genetics

HORT 221  Plant Propagation

NRES 406 / AGRO 406 / HORT 406  Plant Ecophysiology: Theory and Practice

PLPT 369 / BIOS 369  Introductory Plant Pathology

Plant and Food System Management

Select at least 3 hours from the following:  3-6

AGRO 204  Resource-Efficient Crop Management

AGRO 240 / RNGE 240  Forage Crop and Pasture Management

or AGRO 227 Introductory Turfgrass Management

HORT 227 / PGAM 227 / TLMT 227

AGRO 405  Crop Management Strategies

or AGRO 435 Agroecology

HORT 435 / NRES 435

AGRO 426  Invasive Plants

AGRO 437  Animal, Food and Industrial Uses of Grain

AGRO 438  Producing Grain for Animal, Food and Industrial Uses

ENTO 115 / BIOS 115 & ENTO 116 / BIOS 116  Insect Biology and Insect Identification

FDST 205  Food Composition and Analysis

HORT 325  Greenhouse Practices and Management

HORT 352  Production and Physiology of Horticultural Crops

HORT 355  Perennial, Pot and Bedding Plant Production Laboratory

HORT 462  Nursery Management and Crop Production

Credit Hours Subtotal:  17

Total Credit Hours  23-24

1 Students considering graduate school should also take BIOS 478.

Additional Major Requirements

Grade Rules

C- and D Grades

A grade of C or better is required in all courses in the major or minor.
**Pass/No Pass**
No course taken Pass/No Pass will count toward the major or minor, except for the Career Experience courses.

**Requirements for the minor Offered by Department**
Requirements for the minor include 19 hours of course work, with a minimum of 7 hours at the 300 level or above.

<table>
<thead>
<tr>
<th>Requirements</th>
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<tbody>
<tr>
<td>Select one of the following:</td>
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<tr>
<td>AGRO 131 / HORT 131 &amp; AGRO 132</td>
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<tr>
<td>HORT 131 / AGRO 131 &amp; HORT 133</td>
</tr>
<tr>
<td>AGRO 278</td>
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<tr>
<td>AGRO 325</td>
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<tr>
<td><strong>Credit Hours Subtotal:</strong></td>
</tr>
</tbody>
</table>

**Focus**
Select either the Biotechnology Focus or Ecology and Management Focus

**Biotechnology Focus**
AGRO 215 / HORT 215 / TLMT 215
or BIOS 206 General Genetics
Any 300- or 400-level course listed under the Plant Biology Major–Biotechnology Option

<table>
<thead>
<tr>
<th><strong>Ecology and Management Focus</strong></th>
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<tbody>
<tr>
<td>NRES 220 Principles of Ecology</td>
</tr>
<tr>
<td>NRES 222 Ecology Laboratory</td>
</tr>
<tr>
<td>Any 300- or 400-level course listed under the Plant Biology Major–Ecology and Management Option</td>
</tr>
<tr>
<td><strong>Credit Hours Subtotal:</strong></td>
</tr>
<tr>
<td><strong>Total Credit Hours:</strong></td>
</tr>
</tbody>
</table>

**Grade Rules**

**C- and D Grades**
A grade of C or better is required in all courses in the major or minor.

**Pass/No Pass**
No course taken Pass/No Pass will count toward the major or minor, except for the Career Experience courses.

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.

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**Plant Biology - Ecology and Management (B.S.)**

**16 HR TERM 1**

**ACE 3 Math/Statistics**
complete MATH 106

**5hr**

**Biological Sciences**
complete LIFE 120, LIFE 120L

**4hr**

**ACE 1 Written Comm**
complete 1 from ENGL 150, ENGL 151, ENGL 254, JGEN 120, JGEN 200, JGEN 300

**3hr**

**ACE 4 Chemistry**
complete CHEM 109

**4hr**

**16 HR TERM 2**

**Gen Botany or Plant Sci**
complete AGRO 278
Life Science

complete LIFE 121, LIFE 121L

4hr

College Course

complete SCIL 101

4hr

C

LIFE 121 and 121L are ideally completed in the second term of enrollment. They become critical to your success in the major if not completed by the third term of enrollment.

Soil Resources

complete AGRO 153

4hr

Ecology

complete BIOS 207

4hr

14 HR TERM 3

Organic Chem/Lab

complete CHEM 251, CHEM 253

4hr

14 HR TERM 4

ACE 4 Chemistry

complete CHEM 110

4hr

ACE 4 Physics

complete 1 from PHYS 141, PHYS 151, PHYS 153, PHYS 211, PHYS 221, PHYS 212, PHYS 222

5hr

Ecology/Mngt Option Core

complete 1 from AGRO 245, AGRO 444, NRES 310

3hr

ACE 2 Oral Comm

complete COMM 209

3hr

ACE 3 Math/Statistics

complete STAT 218

3hr
ACE 9 Global/Human Divers

complete 1 from ACE 9

Ecology/Management

complete 1 from AGRO 204, AGRO 240, AGRO 440, BIOS 454, BIOS 457, BIOS 470, NRES 310, NRES 417, NRES 424, NRES 459, NRES 468

16 HR TERM 5

Biological Chemistry

complete BIOC 321, BIOC 321L

3hr

15 HR TERM 6

Ecology/Mngt Option Core

complete 1 from AGRO 245, AGRO 444, NRES 310

4hr

Biological Sciences

complete AGRO 215

4hr

Plnt Bio Portfolio/Assess

complete 1 from AGRO 92, HORT 92, NRES 92

0hr

Biological Sciences

complete AGRO 325

4hr

Water/Climate

complete 1 from METR 100, NRES 208, NRES 408, WATS 281

3hr

Independent Study/Project

complete 1 from AGRO 496, BIOS 498, HORT 396, HORT 399, NRES 496, RNGE 496, PLPT 496, SOIL 496

C 1hr

ACE 5 Humanities

complete 1 from ACE 5

3hr

BIOC 321 or 321L becomes critical to your success in the major if not completed by the fifth term of enrollment.
Electives

Complete an Elective, Minor, or Secondary Major this term.

15 HR TERM 7

ACE 6 Economics

complete either ECON 211 or ECON 212

3hr

Geospatial Inform Science

complete 1 from GEOG 412, GEOG 418, NRES 312

3hr

Plant Identification

complete AGRO 442

3hr

ACE 7 Arts

complete 1 from ACE7

3hr

Electives

complete Any Course

4hr

Complete an Elective, Minor, or Secondary Major this term.

13 HR TERM 8

Plant/Animal/Organismal

complete 1 from AGRO 340, AGRO 460, BIOS 317, BIOS 475, BIOS 476, ENTO 115, ENTO 116, NRES 211, NRES 311, NRES 348

3hr

Ecology/Management

complete 1 from AGRO 204, AGRO240, AGRO 440, BIOS 454, BIOS 457, BIOS 470, NRES 310, NRES 417, NRES 424, NRES 459, NRES 468

3hr

Career Experience

complete 1 from AGRO 295, BIOS 395, HORT 395, NRES 497, RNGE 295, SOIL 295, TLMT 395

1hr

ACE 8 Ethical Principles

complete 1 from ACE8

3hr
**ACE 10 Capstone Reqt**

complete 1 from ANR-ACE10

---

**16 HR TERM 1**

**ACE 3 Math/Statistics**

complete MATH 106

---

**Biological Sciences**

complete LIFE 120, LIFE 120L

---

**ACE 1 Written Comm**

complete 1 from ENGL 150, ENGL 151, ENGL 254, JGEN 120, JGEN 200, JGEN 300

---

**ACE 4 Chemistry**

complete CHEM 109

---

**16 HR TERM 2**

**Gen Botany or Plant Sci**

complete AGRO 278

---

**Life Science**

complete LIFE 121, LIFE 121L

---

**Soil Resouces**

complete AGRO 153

---

**14 HR TERM 3**

**Organic Chem/Lab**

complete CHEM 110
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Notes</th>
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<tr>
<td>Plant Biology (CAS)</td>
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<tr>
<td>complete CHEM 251, CHEM 253</td>
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<td>BIOS 477, ENTO 115, ENTO 116, FDST 205, HORT 221, HORT 325, HORT 352, HORT 355, HORT 462, NRES 406, PLPT369</td>
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<td>ACE 2 Oral Comm</td>
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<td>complete COMM 209</td>
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<td>College Course</td>
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<td>complete SCIL 101</td>
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<td>Ecology</td>
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<td>complete BIOS 207</td>
<td>3hr</td>
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<td>14 HR TERM 4</td>
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<td>16 HR TERM 5</td>
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<tr>
<td>Biological Chemistry</td>
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<tr>
<td>complete BIOC 321, BIOC 321L</td>
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<td>Bioc 321 and 321L become critical to your success in the major if not completed by the fifth term of enrollment.</td>
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<td>Biological Sciences</td>
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<td>complete AGRO 215</td>
<td>4hr</td>
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<tr>
<td>Biotechnology Option Elec</td>
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<tr>
<td>complete 1 from AGRO 131, AGRO 132, HORT 133, AGRO 204, AGRO0240, HORT 227, AGRO 270, AGRO 405, AGRO 435, AGRO 408, AGRO 411, AGRO 412, AGRO 426, AGRO 437, AGRO 438, AGRO 460, BIOS 205, BIOS 302, BIOS 317, BIOS 407, BIOS 418, BIOS 420, BIOS 425, BIOS 471, BIOS 429,</td>
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<td>Plnt Bio Portfolio/Assess</td>
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</table>
Biotechnology Option Elec


Biotechnology Option Core

0hr

complete 1 from BIOS 312, BIOS 478, BIOS 237, BIOC 442, BIOS 427

3hr

ACE 5 Humanities

complete 1 from ACE5

3hr

15 HR TERM 6

Independent Study/Project

complete 1 from AGRO 496, BIOS 498, HORT 396, HORT 399, NRES 496, RNGE 496, PLPT 496, SOIL 496

1hr

Biological Sciences

complete BIOS 471

4hr

15 HR TERM 7

ACE 6 Economics

complete either ECON 211 or ECON 212

3hr

Applied Plant Biology

complete 1 from AGRO 408, AGRO 411, AGRO 412, HORT 221, NRES 406, PLPT369#, HORT 133

3hr

Biological Sciences

complete AGRO 325

4hr

Plant/Food System Mngt

complete 1 from AGRO 204, AGRO240, AGRO 227, AGRO 405, AGRO 435, AGRO 426, AGRO 437, AGRO 438, ENTO 115, ENTO 116, FDST 205, HORT 325, HORT 352, HORT 355, HORT 462

3hr
ACE 7 Arts

complete 1 from ACE7

3hr

Electives

complete Any Course

3hr

17 HR TERM 8

Biotechnology Option Core

complete 2 from BIOS 312, BIOS 478, BIOS 237, BIOC 442, BIOS 427

7hr

Career Experience

complete 1 from AGRO 295, BIOS 395, HORT 395, NRES 497, RNGE 295, SOIL 295, TLMT 395

1hr

ACE 8 Ethical Principles

complete 1 from ACE8

3hr

Career Information

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

Transferable Skills

• Communicate results of scientific experiments to scientific and non-scientific audiences
• Apply mathematical and scientific skills to solve real-world problems
• Make predictions using mathematical, statistical, and scientific modeling methods
• Define problems and identifying causes
• Understand and use proper laboratory and technical skills and instruments
• Collaborate with a team to develop solutions
• Confidently navigate complex, ambiguous projects and environments
• Design and implement research experiments
• Document and replicate processes and procedures

Jobs of Recent Graduates

• North American Trait Integration Breeder, Monsanto - Chesterfield MO
• Plant Protection Technician, USDA - Lincoln NE
• Data Analyst, Zoex Corporation - Houston TX
• Associate Sales Manager, Theisen Seed LLC - Atkinson NE
• Distance Education Instructor, University of Nebraska-Lincoln - Lincoln NE
• Site Manager, Sustainable Agriculture Education - Berkeley CA
• Groundskeeper, Burr Oak Lodge - Eagle NE
• Graduate Research Assistant, University of Nebraska-Lincoln - Lincoln NE
• Student of Doctor of Health Program, University of Nebraska-Lincoln - Lincoln NE

Graduation Requirements

1. Performance Measure: 2.00 GPA required for graduation.
2. ***Total Credits Applying Toward 120 Total Hours***
**Internships**

- Intern, DuPont Pioneer - Johnston IA
- Research Assistant, University of Nebraska-Lincoln Plant Pathology - Lincoln NE
- Cover Crop Research Intern, University of Nebraska-Lincoln Agronomy and Horticulture - Lincoln NE
- Research Intern, Nebraska Forest Service - Lincoln NE
- Intern, Grassland Ecology - Wood River NE
- Pioneer Sales Associate Intern, Theisen Seed LLC - Atkinson NE
- Crop Production Intern, University of Nebraska-Lincoln Agronomy and Horticulture - Lincoln NE
- Research Intern, University of Nebraska-Lincoln Molecular Plant Physiology - Lincoln NE

**Graduate & Professional Schools**

- Ph.D., Genetics, Iowa State University - Ames IA
- Ph.D., Evolutionary Ecology, Colorado State University - Fort Collins CO
- Ph.D., Plant Breeding and Genetics, Purdue University - Lafayette IN
- Ph.D., Entomology, University of Arkansas - Fayetteville AR
- Ph.D., Agronomy and Horticulture, University of Nebraska-Lincoln - Lincoln NE
- Master’s Degree, Agronomy, University of Nebraska-Lincoln - Lincoln NE
- Master’s Degree, Plant Breeding and Genetics, University of Nebraska-Lincoln - Lincoln NE
- Master’s Degree, Biological Sciences, University of Nebraska-Lincoln - Lincoln NE
- Master’s Degree, Entomology and Plant Pathology, Colorado State University - Fort Collins CO
- Master’s Degree, Horticulture, University of Nebraska-Lincoln - Lincoln NE
- Ph.D., Horticulture, University of Nebraska-Lincoln - Lincoln NE