

# PLANT BIOLOGY (ASC)

## Description

**Website:** <http://agronomy.unl.edu/plantbiology>

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 the above 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/TLMT 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 UNL General Admission Requirements. Students who are admitted through the Admission by Review process may have certain conditions attached to their enrollment at UNL. 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 coursework 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 UNL, 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 UNL 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 UNL 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 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 UNL. All D grades may be transferred from UNO or UNK, but they are not applicable to a major or minor.

#### Readmitted Students

UNL students who choose not to take courses for more than 2 consecutive terms, must reapply to UNL. 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 UNL 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 to satisfy both an ACE outcome and a College distribution requirement. A student cannot use a course from their primary major to satisfy the Breadth Requirement (F), but may apply an ancillary requirement of the primary major or a 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).

Code	Title	Credit Hours
<b>College Distribution Requirements</b>		
CDR A - Written Communication		3
Select from courses approved for ACE outcome 1.		
CDR B and BL - Natural, Physical, and Mathematical Sciences with Lab		4
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.		
Some courses from geography and anthropology may also be used to satisfy the lab requirement above. <sup>1</sup>		
CDR C - Humanities		3
Select from classics, English, history, modern languages and literatures, philosophy, and religious studies. <sup>2</sup>		
CDR D - Social Science		3
Select from: anthropology, communication studies, geography, political science, psychology, or sociology. <sup>3</sup>		
CDR E - Language		0-16
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, Omaha, 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.		
CDR F - Additional Breadth		3
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.		
Credit Hours Subtotal:		16-32

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

<sup>2</sup> Language courses numbered 210 or below apply only for the foreign language requirement.

<sup>3</sup> See degree audit or College of Arts and Sciences advisor for list of natural/physical science courses in anthropology, geography, and psychology that do not apply as social science.

### Scientific Base Bachelor of Science Only (60 hours)

The bachelor of science degree requires students to complete 60 hours in mathematical, physical and natural sciences. Approved courses for scientific base credit come from the following College of Arts and Sciences disciplines: actuarial science, anthropology (selected courses), astronomy, biochemistry (excluding BIOC 101), biological sciences (excluding BIOS 203), chemistry (excluding CHEM 101), computer science (excluding CSCE 10), geography (selected courses), geology, life sciences, mathematics (excluding courses below MATH 104), meteorology, microbiology, physics and statistics.

See your degree audit or a College of Arts and Sciences advisor for a complete list including individual classes that fall outside of the disciplines listed above. Up to 12 hours of scientific and technical courses offered by other colleges may be accepted toward this requirement with approval of a college advisor.

### Foreign Languages/Language Requirement Languages Exemption Policy

UNL and the College of Arts and Sciences will exempt or waive students from the UNL entrance requirement of two years of the same foreign language or from the College's language distribution requirement based on documentation only. The following are the options and procedures for documentation:

#### High School Transcripts

**For the University entrance requirement,** students must show an official high school transcript with two or more years of the same foreign language.

**For the College of Arts and Sciences College Distribution Requirement E-Language,** students must show an official high school transcript with four or more years of the same foreign language in high school, or show evidence of graduation from a non-English-speaking foreign high school. Students whose native language is not English must show English as a Second Language study on an official high school transcript. Four years of ESL at the high school level (9th, 10th, 11th and 12th grades) will be the basis for a waiver of the CDR E Language requirement.

#### Proficiency Examination at UNL

**For the University entrance requirement,** students who do not have transcript documentation can request to take a proficiency exam in the language. (*This is not the same test as the Modern Languages Placement Exam.*) However, UNL will provide testing only in the languages it teaches. Currently, these languages are: Arabic, French, German, Spanish, Russian, Czech, Japanese, Chinese.

**For the College of Arts and Sciences College Distribution Requirement E-Language,** the Department of Modern Languages will oversee the test at the 202 level. If the student passes the test, the department will sign the College Request for Waiver form and indicate the level of proficiency. The form is then forwarded to the Arts and Sciences Advising Center for approval.

The Department of Modern Languages will oversee the test and provide written documentation to the Arts and Sciences Advising Center the level of proficiency passed.

### Distance Education

**For the University entrance requirement**, students without transcript documentation who claim proficiency in a language not taught at UNL, 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 UNL 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 were granted, the student would then be required to complete 101 and 102 in another, 3rd foreign language at UNL.

### 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 UNL C- and D grades can be applied toward requirements in a major or a minor.

#### 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 UNL 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 UNL. 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 UNL and participate in prior-approved education abroad

programs. UNL 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 UNL 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 UNL. 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 UNL 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

#### 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	
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

BIOS 109	General Botany	4
or AGRO 131 & AGRO 132	Plant Science and Agronomic Plant Science Laboratory	
or HORT 131 & HORT 133	Plant Science and Horticultural Plant Science Laboratory	
NRES 220 / BIOS 220 & NRES 222 / BIOS 222	Principles of Ecology and Ecology Laboratory	4
or BIOS 207	Ecology and Evolution	
AGRO 153 / HORT 153 / SOIL 153	Soil Resources	4
AGRO 215 / HORT 215 / TLMT 215	Genetics	4
or BIOS 206	General Genetics	



AGRO 325	Introductory Plant Physiology	4
AGRO 92 / HORT 92 / NRES 92	Plant Biology Portfolio and Assessment	0
Credit Hours Subtotal:		20
<b>Plant Biology Internship/Career Experience</b>		
Select one of the following:		1
BIOS 395	Internship	
HORT 395 / TLMT 395	Career Experience	
AGRO 295 / RNGE 295 / SOIL 295	Internship in Agronomy	
NRES 497	Career Experiences in Natural Resource Sciences	
Credit Hours Subtotal:		1
<b>Plant Biology Independent Study/Current Project</b>		
Select one of the following:		1-3
BIOS 498	Independent Research in Biological Sciences	
AGRO 496 / RNGE 496 / SOIL 496	Independent Study	
HORT 396 or HORT 399	Current Projects and Topics in Horticulture Independent Study	
NRES 496	Independent Study	
PLPT 496	Independent Study	
Credit Hours Subtotal:		1-3
Total Credit Hours		54-56

## Specific Major Requirements

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

### Ecology and Management Option

#### Required Courses

AGRO 245 / NRES 245 or NRES 310	Introduction to Grassland Ecology and Management Introduction to Forest Management	3-4
AGRO 444 / NRES 444 / RNGE 444	Ecosystem Monitoring and Assessment	3
Credit Hours Subtotal:		6-7

#### Additional Ecology and Management Option Courses

Select at least three (3) hours from each of the following five (5) areas:

##### Water/Climate

Select at least 3 hours from the following:		3-4
METR 100	Weather and Climate	
NRES 208	Applied Climate Sciences	
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	
<i>Geospatial Information Sciences</i>		
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 Sciences	
<i>Plant Identification</i>		
		3
AGRO 442 / NRES 442 / RNGE 442	Wildland Plants	
<i>Plant-Animal-Organismal Interactions</i>		
Select at least 3 hours from the following:		3-4
AGRO 340 / RNGE 340	Range Management and Improvement	
AGRO 460 / BIOS 447 / 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	Insect Biology and Insect Identification	
NRES 211	Introduction to Conservation Biology	
NRES 311	Wildlife Ecology and Management	
NRES 348	Wildlife Damage Management	
<i>Ecology and Management</i>		
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	
HORT 130	Introduction to Horticulture Science	
NRES 310	Introduction to Forest Management	
NRES 417 / HORT 418	Agroforestry Systems in Sustainable Agriculture	
NRES 424	Forest Ecology	
NRES 459 / BIOS 459 / WATS 459	Limnology	

NRES 468 / BIOS 458 / WATS 468	Wetlands	
Credit Hours Subtotal:		15
Total Credit Hours		21-22

## Biotechnology Option

### Required Courses

BIOS 312	Microbiology	3
BIOS 237	Basic Applications of Bioinformatics	3-4
or BIOC 442	Computational Biology	
or BIOS 427	Practical Bioinformatics Laboratory	
Credit Hours Subtotal:		6-7

### Additional Biotechnology Courses <sup>1</sup>

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

#### Biological Sciences

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

AGRO 460	Soil Microbiology	
AGRO 270	Biological Invaders	
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	Molecular Genetics	
BIOS 425	Plant Biotechnology	
BIOS 471	Plant Systematics	
BIOS 477	Bioinformatics and Molecular Evolution	

#### Applied Plant Biology

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

AGRO 131 & AGRO 132	Plant Science and Agronomic Plant Science Laboratory	
AGRO 131 & HORT 133	Plant Science and Horticultural Plant Science Laboratory	
AGRO 408	Microclimate: The Biological Environment	
AGRO 411	Crop Genetic Engineering	
AGRO 412	Crop and Weed Genetics	
HORT 221	Plant Propagation	
NRES 406 / AGRO 406	Plant Ecophysiology: Theory and Practice	
PLPT 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	Forage Crop and Pasture Management or AGRO 227Introductory Turfgrass Management	
AGRO 405	Crop Management Strategies or AGRO 435Agroecology	
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	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

<sup>1</sup> Students considering graduate school should also take BIOS 478 Plant Anatomy.

## 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.

### Requirements

AGRO 131 / HORT 131	Plant Science	3
AGRO 132 or HORT 133	Agronomic Plant Science Laboratory Horticultural Plant Science Laboratory	1
AGRO 325	Introductory Plant Physiology	4
BIOS 109	General Botany	4
Credit Hours Subtotal:		12

### Focus

Select either the Biotechnology Focus or Ecology and Management Focus 7-8

#### Biotechnology Focus

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

#### Ecology and Management Focus

BIOS 220 / NRES 220	Principles of Ecology	
BIOS 222 / NRES 222	Ecology Laboratory	

Any 300 or 400 level course listed under the Plant Biology  
Major Ecology and Management Option

Credit Hours Subtotal:	7-8
Total Credit Hours	19-20

## 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.

## Plant Biology (B.S.)

Icon Legend: Critical

### 16 HR TERM 1

#### Mathematics/Statistics

complete MATH 106

5hr

C

MATH 106 also fulfills the ACE 3 requirement.

#### Chemistry

complete CHEM 109

4hr

C

CHEM 109 also fulfills the ACE 4 requirement.

#### Life Science

complete LIFE 120, LIFE 120L

4hr

C

LIFE 120 and LIFE 120L also fulfill the CDR B and CDR BL requirements.

#### CDR E: Language

recommend 1 or more courses

3hr

If not complete, choose a language course according to your placement and proficiency. CDR E is met after 4th level (202) of most languages.

### 15 HR TERM 2

#### Plant Biology Core

complete 1 from BIOS 109, AGRO 131, AGRO 132, HORT 133

4hr

C

Complete either BIOS 109 or AGRO 131 and AGRO 132 or HORT 133.

#### Life Science

complete 2 from LIFE 121, LIFE 121L

4hr

C

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

#### Chemistry

complete CHEM 110

4hr

C

CHEM 110 fulfills the CDR F requirement.

#### CDR E: Language

recommend 1 or more courses

3hr

If not complete, choose a language course according to your placement and proficiency. CDR E is met after 4th level (202) of most languages.

### 14 HR TERM 3

#### Organic Chemistry and Lab

complete 2 from CHEM 251, CHEM 253, CHEM 255, CHEM 257

4hr

C

Complete one set course and lab.

#### Plant Biology Core

complete either BIOS 206 or AGRO 215

4hr

C

**ACE 1 Written Texts**

complete 1 from ACE1

3hr

complete 1 from ACE2

3hr

**ACE 5 Humanities**

complete 1 from ACE5

3hr

**Ecology Management**

complete AGRO 245

3hr

## 17 HR TERM 4

**Plant Biology Core**

complete 1 from BIOS 207, BIOS 220, BIOS 222

4hr

**Ecology Management**

complete 1 from AGRO 204, AGRO240, AGRO 440, BIOS 454, BIOS 457, BIOS 470, HORT 130, NRES 310, NRES 417, NRES 424, NRES 459, NRES 468

4hr

C

Choose an approved ecology management course.

**Plant Biology Core**

complete AGRO 153

4hr

**Ecology Management**

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

3hr

C

Choose an approved water/climate course.

**Mathematics/Statistics**

complete STAT 218

3hr

**Independent Study**

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

1hr

C

C

**CDR A: Writing**

complete 1 from ACE1

3hr

**Plant Biology Core**

complete AGRO 325

4hr

Complete an additional course approved as ACE 1.

C

**ACE 8 Ethical Principles**

complete 1 from ACE8

3hr

**Ecology Management**

complete 1 from GEOG 412, GEOG 418, NRES 312

3hr

Choose an approved geospatial info science course

## 14 HR TERM 5

**Biochemistry**

complete BIOC 321, BIOC 321L

4hr

**CDR C: Humanities**

complete 1 from Any Arabic Course at the 300 Level, Any Classics Course, Any Czech Course at the 300 Level, Any Czech Course at the 400 Level, Any English Course, FREN 282, Any French Course at the 300 Level, Any French Course at the 400 Level, GERM 282, Any German Course at the 300 Level, Any German Course at the 400 Level, Any Greek Course at the 300 Level, Any Greek Course at the 400 Level, Any Hebrew Course at the

C

**ACE 2 Communication Skill**



300 Level, Any History Course, Any Japanese Course at the 300 Level, Any Latin Course at the 300 Level, Any Latin Course at the 400 Level, Any Philosophy Course, Any Religious Studies Course at any Level, Any Russian Course at the 300 Level, Any Russian Course at the 400 Level, SPAN 264, SPAN 265, Any Spanish Course at the 300 Level, Any Spanish Course at the 400 Level

0hr

3hr

Complete an approved course from a Humanities discipline: ARAB, CLAS, CZEC, ENGL, FILM, FREN, GERM, GREK, HEBR, HIST, JAPN, LATN, PHIL, RELG, RUSS, SPAN.

1hr

C

## 16 HR TERM 7

### Ecology Management

complete AGRO 442

3hr

3hr

### Ecology Management

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

4hr

Choose an approved plant animal organismal course

7hr

### ACE 6 Social Sciences

complete 1 from ACE6

3hr

ECON course recommended.

### ACE 9 Global/Human Divers

complete 1 from ACE9

3hr

### CDR D: Social Sciences

complete 1 from Any Anthropology Course, Any Communications Course, Any Geography Course, Any National Securities Studies Course, Any Political Science Course, Any Psychology Course, Any Sociology Course

3hr

## 14 HR TERM 8

### ACE 10 Capstone

complete 1 from ACE10

3hr

### Plant Biology Core

complete AGRO92#

### Career Experience

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

### ACE 7 Arts

complete 1 from ACE7

### Electives

complete Any Course

### Graduation Requirements

1. A minimum 2.00 GPA required for graduation.
2. \*\*\*Total Credits Applying Toward 120 Total Hours\*\*\*
3. Complete 30 hours in residence at UNL.

## 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

- Comprehend and critically evaluate complex information
- Use quantitative analytical computational techniques
- Make predictions using mathematical, statistical, and scientific modeling methods
- Understand and use proper laboratory and technical skills and instruments
- Define problems and identifying causes
- Support and communicate claims using clear evidence
- Simplify complex information and present it to others
- Apply mathematical and scientific skills to solve real-world problems
- Document and replicate processes and procedures
- Design and implement research experiments