FOOD TECHNOLOGY FOR COMPANION ANIMALS

Description
Food technology for companion animals is a cooperative program between the Department of Animal Science and the Department of Food Science and Technology. Students will be prepared for positions of responsibility in the pet food industry, one of the fastest growing industries in North America. Many pet foods are similar to human foods in how they are processed, but they are designed to meet the specific nutritional needs of different companion animals. Graduates of this program will be uniquely prepared to find employment with manufacturers and providers of pet foods and related products in areas such as research and new product development, processing technology, production management, and quality assurance.

Students build on a strong foundation in the basic sciences by completing extensive coursework in food chemistry and analysis, food microbiology and safety, food engineering and processing, and quality assurance. These courses are coupled with courses in companion animal nutrition and management. This curriculum also fits well for students in pre-professional programs, especially those considering a professional program in veterinary medicine.

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 UNL, 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 ensures 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 (withdrawn), 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 on transfer 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 students 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 provide transcripts and complete the Application for Degree form via MyRED. Students without MyRED access may apply for graduation in person at Husker Hub in the Canfield Administration Building, or by mail. 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 and a 3+1 program leading to a bachelor of science in Applied Science.

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 CASNR1 (>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, ENVIR, 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 food technology for companion animals will be able to:

1. Demonstrate ability to apply chemical, microbiological, and engineering principles to the processing and preservation of safe, nutritious and appealing companion animal food products.
2. Effectively communicate scientific, technical, and other information, both orally and in writing, to supervisors, colleagues, subordinates, and consumers.
3. Understand the role of government regulatory agencies and other groups responsible for making and enforcing rules, regulations, and guidelines related to companion animal food composition, processing, and safety.
4. Access and use technical and human resources, such as the World Wide Web, library systems, and consultants.
5. Represent their chosen field in a scientific and professional manner and participate in professional societies.
6. Recognize ethical responsibilities regarding scientific and professional conduct, as well as the responsibility to the consumer to produce safe and nutritious companion animal food products.
7. Develop analytical and creative thinking skills necessary to approach scientific and other issues, problems, and situations.
8. Demonstrate ability to work effectively in a team or group.
## Major Requirements

**College Integrative Course (ACE 8)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIL 101</td>
<td>Science and Decision-Making for a Complex World</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 3

**Natural Sciences (ACE 4)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC 401</td>
<td>Elements of Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>BIOC 401L</td>
<td>and Laboratory for Elements of Biochemistry</td>
<td></td>
</tr>
<tr>
<td>LIFE 120 &amp; LIFE 120L</td>
<td>Fundamentals of Biology I and Fundamentals of Biology I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>LIFE 121 &amp; LIFE 121L</td>
<td>Fundamentals of Biology II and Fundamentals of Biology II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>BIOS 312</td>
<td>Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 109</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 251</td>
<td>Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 253</td>
<td>and Organic Chemistry I Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

- MSYM 109 & MSYM 109L Physical Principles in Agriculture and Life Sciences and Physical Principles in Agriculture and Life Sciences Laboratory 5
- PHYS 151 & PHYS 153 Elements of Physics and Elements of Physics Laboratory 3
- PHYS 141 Elementary General Physics I 2

**Credit Hours Subtotal:** 32

**Mathematics and Statistics (ACE 3)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>STAT 218</td>
<td>Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 215</td>
<td>Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 102</td>
<td>Trigonometry</td>
<td>2</td>
</tr>
<tr>
<td>MATH 104</td>
<td>Applied Calculus</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 8

**Communications**

**ACE Outcome 1**

Select one of the following:

- ENGL 150 Writing and Inquiry 3
- ENGL 151 Writing and Argument 3
- ENGL 254 Writing and Communities 2
- JGEN 120 Basic Business Communication 3
- JGEN 200 Technical Communication I 3
- JGEN 300 Technical Communication II 3

**ACE Outcome 2**

Select one of the following:

- ALEC 102 Interpersonal Skills for Leadership 3
- COMM 101 Communication in the 21st Century 3
- COMM 209 Public Speaking 2
- COMM 210 Communicating in Small Groups 3
- COMM 286 Business and Professional Communication 3
- NRES 301 Environmental Communication Skills 3

**Credit Hours Subtotal:** 6

**Economics, Humanities and Social Sciences**

Select one of the following:

- ECON 211 Principles of Macroeconomics 3
- ECON 212 Principles of Microeconomics 3
- AECN 141 Introduction to the Economics of Agriculture (ACE 6) 3

Select one course each from ACE outcomes 5, 7, and 9 9

**Credit Hours Subtotal:** 12

**Technology Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDST 107 / ASCI 107</td>
<td>Introduction to the Companion Animal Food Industry</td>
<td>1</td>
</tr>
<tr>
<td>ASCI 100 &amp; ASCI 100L</td>
<td>Fundamentals of Animal Biology and Industry and Fundamentals of Animal Biology and Industry Laboratory</td>
<td>2-4</td>
</tr>
<tr>
<td>or FDST 101</td>
<td>Introductory Food Science</td>
<td></td>
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</tbody>
</table>

**Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDST 403</td>
<td>Food Quality Assurance</td>
<td>3</td>
</tr>
<tr>
<td>FDST 451</td>
<td>Food Science and Technology Seminar</td>
<td>1</td>
</tr>
<tr>
<td>or ASCI 491</td>
<td>Animal Science Seminar</td>
<td></td>
</tr>
<tr>
<td>FDST 460</td>
<td>Food Product Development Concepts I (ACE 10, Capstone courses)</td>
<td>3</td>
</tr>
<tr>
<td>or ASCI 486</td>
<td>Animal Biological Systems</td>
<td></td>
</tr>
</tbody>
</table>

**Process Technology**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>FDST 363 / MSYM 363</td>
<td>Heat and Mass Transfer</td>
<td>3</td>
</tr>
<tr>
<td>FDST 465 / MSYM 465</td>
<td>Food Engineering Unit Operations</td>
<td>3</td>
</tr>
<tr>
<td>ASCI 210</td>
<td>Animal Products</td>
<td>3</td>
</tr>
<tr>
<td>FDST 412</td>
<td>Cereal Technology</td>
<td>2-3</td>
</tr>
<tr>
<td>or AGRO 437</td>
<td>Animal, Food and Industrial Uses of Grain</td>
<td></td>
</tr>
</tbody>
</table>

**Food Chemistry**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>FDST 205</td>
<td>Food Composition and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FDST 448</td>
<td>Food Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>FDST 449</td>
<td>Food Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>FDST 458</td>
<td>Advanced Food Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Food Microbiology**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDST 405 / BIOS 445</td>
<td>Food Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>FDST 406 / BIOS 446</td>
<td>Food Microbiology Laboratory</td>
<td>2</td>
</tr>
</tbody>
</table>

**Animal Management and Nutrition**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCI 240</td>
<td>Anatomy and Physiology of Domestic Animals</td>
<td>4</td>
</tr>
<tr>
<td>ASCI 251</td>
<td>Introduction to Companion Animals</td>
<td>3</td>
</tr>
<tr>
<td>ASCI 320</td>
<td>Animal Nutrition and Feeding</td>
<td>3</td>
</tr>
<tr>
<td>ASCI 321</td>
<td>Companion Animal Nutrition</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 49-51

**Electives**

Select 7-10 hours 7-10

**Credit Hours Subtotal:** 10

**Total Credit Hours** 120-122

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1 Students interested in a career in research, medicine, or planning to seek an advanced degree should also take CHEM 252 and CHEM 254.
The one-semester comprehensive courses MSYM 109 (https://bulletin.unl.edu/undergraduate/courses/MSYM/109) and MSYM 109L (https://bulletin.unl.edu/undergraduate/courses/MSYM/109L), or PHYS 151 (https://bulletin.unl.edu/undergraduate/courses/PHYS/151) and PHYS 153 (https://bulletin.unl.edu/undergraduate/courses/PHYS/153), are recommended. Students applying to post-graduate professional programs that require a two-semester physics sequence may use PHYS 141 to fulfill the physics requirement for the degree.

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
- Quality Assurance, Sensory Effects
- Associate Food Scientist, ConAgra Foods

Internships
- Intern, Nestle/Purina - Crete NE
- Intern, Henry Doorly Zoo - Omaha NE
- Intern, Big Heart Pet Brands - Topeka KS

Graduate & Professional Schools
- Graduate School, Kansas State University - Manhattan KS
- Graduate School, University of Nebraska - Lincoln NE