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 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 course work 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 UNL, whichever takes longer, excluding foreign languages. Students have up to 60 credit hours to remove foreign language deficiencies. College-level course work taken to remove deficiencies may be used to meet degree requirements in CASNR.

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

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

College Degree Requirements

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

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

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

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.

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 is the maximum number of hours UNL will accept on transfer from a two-year college. Ninety is the maximum number of hours UNL 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 UNL 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 UNL.

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 UNL 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 course work. 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 UNL, 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 UNL with a degree in animal science or veterinary science after successfully completing two years of the professional curriculum in veterinary medicine at an accredited veterinary school. Students who successfully complete the 3+2 Program, must complete the “Application for Degree” form and provide transcripts to the Credentials Clerk, Office of the University Registrar, 107 Canfield Administration Building, UNL. Students should discuss these degree programs with their academic advisor.

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

UNL Degree-Granting Programs
A UNL degree-granting program is designed to provide students the opportunity to complete a two-year program of study at one of the four-year institutions listed below, transfer to CASNR and complete the requirements for a bachelor of science degree.

Chadron State College. Chadron State College offers a 2+2 program leading to a grassland ecology and management degree program and a transfer program leading to a Bachelor of Science in Agricultural Education in the teaching option.

Wayne State College. Wayne State College offers a 3+1 program leading to a Bachelor of Science in Plant Biology in the ecology and management option.

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

University of Nebraska at Omaha. The University of Nebraska at Omaha (UNO) cooperates with CASNR in providing four-quarter 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).

UNL 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 UNL Degree-Granting Programs
The CASNR cooperates with other institutions to provide course work 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 UNL 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 course work at Chadron State College and one year of specialized range science course work (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 UNL credits. At least 18 of the 30 credit hours must be in courses offered through CASNR under interdisciplinary prefixes (e.g., LIFE, M BIO, ENV R, SCI L, EA EP, HRT M, ENS C) and CASNR crosslisted courses taught by non-CASN R 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 course work 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 www.ace.unl.

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 UNL 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 and enrolled as a degree-seeking student at UNL 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**

Majors in 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</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>
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</tbody>
</table>

Credit Hours Subtotal: 3

**Natural Sciences (ACE 4)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC 321</td>
<td>Elements of Biochemistry and Laboratory for Elements of Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>&amp; BIOC 321L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIFE 120</td>
<td>Fundamentals of Biology I and Fundamentals of Biology I laboratory</td>
<td>4</td>
</tr>
<tr>
<td>&amp; LIFE 120L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIFE 121</td>
<td>Fundamentals of Biology II and Fundamentals of Biology II laboratory</td>
<td>4</td>
</tr>
<tr>
<td>&amp; LIFE 121L</td>
<td></td>
<td></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>
</tbody>
</table>
CHEM 251 & CHEM 253: Organic Chemistry I and Organic Chemistry I Laboratory

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
- PHYS 151 & PHYS 153: Elements of Physics and Elements of Physics Laboratory
- PHYS 141: Elementary General Physics I

Credit Hours Subtotal: 32

Mathematics and Statistics (ACE 3)

STAT 218: Introduction to Statistics or ECON 215: Statistics
MATH 102: Trigonometry
MATH 104: Applied Calculus

Credit Hours Subtotal: 8

Communications

ACE Outcome 1

Select one of the following:
- ENGL 150: Writing and Inquiry
- ENGL 151: Writing and Argument
- ENGL 254: Writing and Communities
- JGEN 120: Basic Business Communication
- JGEN 200: Technical Communication I
- JGEN 300: Technical Communication II

Credit Hours Subtotal: 3

Economics, Humanities and Social Sciences

Select one of the following:
- ECON 211: Principles of Macroeconomics
- ECON 212: Principles of Microeconomics
- AECN 141: Introduction to the Economics of Agriculture (ACE 6)

Select one course each from ACE outcomes 5, 7, 8, and 9

Credit Hours Subtotal: 12

Technology Requirements

FDST 107 / ASCI 107: Introduction to the Companion Animal Food Industry
ASCI 100 & ASCI 100L: Fundamentals of Animal Biology and Industry and Fundamentals of Animal Biology and Industry Laboratory
or FDST 101: Introductory Food Science

Core Courses

FDST 403: Food Quality Assurance
FDST 451: Food Science and Technology Seminar

or ASCI 491: Animal Science Seminar
FDST 460: Food Product Development Concepts I
(or ASCI 486: Animal Biological Systems)

Process Technology

FDST 363 / MSYM 363: Heat and Mass Transfer
FDST 465 / MSYM 465: Food Engineering Unit Operations

ASC1 210: Animal Products
FDST 412: Cereal Technology or AGRO 437: Animal, Food and Industrial Uses of Grain

Food Chemistry

FDST 205: Food Composition and Analysis
FDST 448: Food Chemistry
FDST 449: Food Chemistry Laboratory
FDST 458: Advanced Food Analysis

Food Microbiology

FDST 405 / BIOS 445: Food Microbiology
FDST 406 / BIOS 446: Food Microbiology Laboratory

Animal Management and Nutrition

ASCI 240: Anatomy and Physiology of Domestic Animals
ASCI 251: Introduction to Companion Animals
ASCI 320: Animal Nutrition and Feeding
ASCI 321: Companion Animal Nutrition

Credit Hours Subtotal: 49-51

Electives

Select 4-7 credits

Credit Hours Subtotal: 7

Total Credit Hours: 120-122

1. Students interested in a career in research, medicine, or planning to seek an advanced degree should also take CHEM 252 Organic Chemistry II and CHEM 254 Organic Chemistry II Laboratory.

2. 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 postgraduate professional programs that require a two-semester physics sequence may use PHYS 141 Elementary General Physics I 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.
**17 HR TERM 1**

**Introductory Course**
complete either ASCI 100 or FDST 101

**ACE 3 Math/Statistics**
complete MATH 102

**ACE 4 Chemistry**
complete CHEM 109

**College Course**
complete SCIL 101

**Intro Comp Animal Food Ind**
complete either FDST 107 or ASCI 107

FDST 107 or ASCI 107 becomes critical to your success in the major if not completed by the second term of enrollment.

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

**18 HR TERM 2**

**ACE 5 Humanities**
complete 1 from ACES5

Complete a ACE 5, 7, 8, or 9 requirement this term.

**ACE 4 Chemistry**
complete CHEM 110

**College Algebra Reqt**
complete either MATH 104 or MATH 106

MATH 104 or 106 becomes critical to your success in the major if not completed by the fourth term of enrollment.

**ACE 2 Oral Comm**
complete 1 from ALEC 102, COMM 101, COMM 209, COMM 210H, COMM 286, NRES 301

**ACE 6 Economics**
complete 1 from AECN 141, ECON 211, ECON 212, ECON 200

**14 HR TERM 3**

**Intro to Companion Animal**
complete ASCI 251

ASCI 251 becomes critical to your success in the major if not completed by the fourth term of enrollment.

**ACE 4 Organic Chemistry**
complete CHEM 251, CHEM 253

CHEM 251 and 253 become critical to your success in the major if not completed by the fourth term of enrollment.

**ACE 4 Life Science**
complete either LIFE 120 or LIFE 120L

**16 HR TERM 4**

**Food Chemistry**
complete FDST 205

FDST 205 becomes critical to your success in the major if not completed by the fourth term of enrollment.
<table>
<thead>
<tr>
<th>Course Category</th>
<th>Course Code(s)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE 4 Life Science</td>
<td>LIFE 121, LIFE 121L</td>
<td>3hr</td>
</tr>
<tr>
<td>ACE 4 Physics</td>
<td></td>
<td>4hr</td>
</tr>
<tr>
<td>Animal Mngt/Nutrition</td>
<td>ASCI 240</td>
<td>4hr</td>
</tr>
<tr>
<td>Process Technology</td>
<td>FDST 363, ASCI 210</td>
<td>6hr</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>BIOC 321, BIOC 321L</td>
<td>4hr</td>
</tr>
<tr>
<td>Animal Mngt/Nutrition</td>
<td>ASCI 320</td>
<td>3hr</td>
</tr>
<tr>
<td>ACE 8 Ethical Principles</td>
<td></td>
<td>3hr</td>
</tr>
<tr>
<td>ACE 9 Global/Human Divers</td>
<td></td>
<td>3hr</td>
</tr>
<tr>
<td>Food Microbiology</td>
<td>FDST 405, FDST 406</td>
<td>5hr</td>
</tr>
<tr>
<td>Food Chemistry</td>
<td>FDST 448, FDST 449</td>
<td>4hr</td>
</tr>
<tr>
<td>Process Technology</td>
<td>FDST 412</td>
<td>3hr</td>
</tr>
<tr>
<td>ACE 10 Capstone Course</td>
<td></td>
<td>3hr</td>
</tr>
</tbody>
</table>

Completion of PHYS course and lab becomes critical to your success in the major if not completed by the fourth term of enrollment.

BIOC 321 and 321L become critical to your success in the major if not completed by the sixth term of enrollment.

Complete an ACE 5, 7, 8, or 9 requirement this term.
complete either FDST 460 or ASCI 486

3hr

FDST 460 or ASCI 486 becomes critical to your success in the major if not completed by the eighth term of enrollment.

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**Core Courses**

complete 2 from FDST 403, FDST 451, ASCI 491

4hr

Complete FDST 403 and either FDST 451 or ASCI 491.

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**Electives**

complete Any Course

4hr

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**Graduation Requirements**

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

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**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 -

**Internships**

- Intern, Nestle/Purina - Crete NE
- Intern, Henry Doorly Zoo - Omaha NE
- Intern, Oceans Research - George, South Africa ZZ

**Grad Schools**

- Graduate School, Kansas State University - Manhattan KS