VETERINARY SCIENCE

Description
The bachelor of science in veterinary science degree allows students to enter into the biomedical science or animal health career fields as a veterinary scientist. It also helps qualify students for admission to a veterinary medical school.

Courses in veterinary science are designed to broaden students’ knowledge of anatomy, biochemistry, histology, immunology, microbiology, molecular biology, pathology, pharmacology, toxicology, and virology as they relate to diverse mammalian species.

Biomedical Sciences Option
This option is intended for students who wish to qualify academically for admission to a veterinary school or enter the biomedical science career field. Its graduates can also qualify for admission to graduate school to further their education in a specialized biomedical science area. It incorporates all of the pre-veterinary medicine course requirements for the Professional Program in Veterinary Medicine (PPVM) and can be modified so that it can meet the admission requirements for any AVMA-COE accredited veterinary school.

It also allows students to study biomedical science areas by selecting biomedical sciences elective courses.

Veterinary Medicine Option
This option, commonly called a 3+2 Program, allows a veterinary science major, who is admitted to an AVMA-COE accredited professional veterinary medical program before earning the bachelor of science in veterinary science, the opportunity of earning that baccalaureate degree after completing the first two years of the professional program. The applicant under this option must have successfully completed all of the university ACE program requirements, except ACE 10. Credits earned for courses taken as part of the professional program are transferred and applied toward the baccalaureate degree requirements.

This degree may be earned in four years, but if the student is not prepared to start the science-intensive veterinary science program, its completion will take longer. Adequate preparation includes math proficiency, as indicated by the Nebraska Math Proficiency Examination (MPE). Students who do not place into at least MATH 102 Trigonometry may take longer to complete the baccalaureate degree.

Graduates may obtain employment in veterinary product sales, research and development; biotech and pharmaceutical industries; biomedical science laboratories; federal, state, and local health-related agencies; and in animal care.

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 sciences, and 2 units of world language. Students must also meet performance requirements: a 3.0 cumulative high school grade point average OR an ACT composite of 20 or higher, writing portion not required OR a score of 1040 or higher on the SAT Critical Reading and Math sections OR rank in the top one-half of graduating class; transfer students must have a 2.0 (on a 4.0 scale) cumulative grade point average and 2.0 on the most recent term of attendance. For students entering the PGA Golf Management degree program, a certified golf handicap of 12 or better (e.g., USGA handicap card) or written ability (MS Word file) equivalent to a 12 or better handicap by a PGA professional or high school golf coach is required. For more information, please visit http://pgm.unl.edu/requirements.

Admission Deficiencies/Removal of Deficiencies
Students who are admitted to CASNR with core course deficiencies must remove these deficiencies within the first 30 credit hours at the University of Nebraska–Lincoln, or within the first calendar year at Nebraska, whichever takes longer, excluding foreign languages. Students have up to 60 credit hours to remove world 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 the 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.

World Languages/Language Requirement
Two units of a world 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
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. Transfer programs are available for students pursuing degree programs leading to a bachelor of science degree.

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 the University of Nebraska–Lincoln 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, MBIQ, ENVR, SCIL, EAEP, HRTM, ENSC) and CASNR crosslisted courses taught by non-CASNR faculty.

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

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

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

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

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

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

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

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

Catalog Rule
Students must fulfill the catalog 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 veterinary science will be able to:

1. Take requisite courses for application to veterinary school of the student's choice. Converse in a knowledgeable and professional manner with employers and colleagues.
2. Demonstrate knowledge of the scientific method and impact of research in health and disease.
3. Demonstrate general understanding of the impact of veterinary science on the diagnosis, treatment, and prevention of diseases in animals.

Major Requirements
Core Requirements
The following basic courses are required for all students majoring in veterinary science. Additionally, students must select and meet the requirements of one of the veterinary science options.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</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>
<tr>
<td>PVET 101</td>
<td>Success in Veterinary Science</td>
<td>1</td>
</tr>
<tr>
<td>VBMS 403</td>
<td>Integrated Principles and Prevention of Livestock Diseases</td>
<td>4</td>
</tr>
<tr>
<td>LIFE 120 &amp; LIFE 120L</td>
<td>Fundamentals of Biology I and Fundamentals of Biology I laboratory (ACE 4)</td>
<td>4</td>
</tr>
<tr>
<td>LIFE 121 &amp; LIFE 121L</td>
<td>Fundamentals of Biology II and Fundamentals of Biology II Laboratory (ACE 4)</td>
<td>4</td>
</tr>
<tr>
<td>BIOS 312</td>
<td>Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIOS 313</td>
<td>Molecular Microbiology Laboratory</td>
<td>1-2</td>
</tr>
<tr>
<td>AGRO 215 / HORT 215 / TLMT 215</td>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BIOS 213</td>
<td>Human Physiology</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 109A &amp; CHEM 109L</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 110A &amp; CHEM 110L</td>
<td>General Chemistry II and General Chemistry II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 251</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 253</td>
<td>Organic Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 141</td>
<td>Elementary General Physics I</td>
<td>5</td>
</tr>
<tr>
<td>BIO 401 &amp; BIO 401L</td>
<td>Elements of Biochemistry and Laboratory for Elements of Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>BIO 431 / BIO 431L / CHEM 431</td>
<td>Biochemistry I: Structure and Metabolism and Biochemistry Laboratory</td>
<td>4</td>
</tr>
</tbody>
</table>

**Mathematics and Statistics**

Select 5-6 hours from the following:

- MATH 102: Trigonometry
- MATH 103: College Algebra and Trigonometry (only 2 credits apply)
- MATH 104: Applied Calculus (ACE 3)
- MATH 106: Calculus I (ACE 3)
- STAT 218: Introduction to Statistics (ACE 3)

*Credit Hours Subtotal: 5*

**Communications**

Written Communication (ACE 1)

Select two 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 (if not taken as ACE 2 course)

*Credit Hours Subtotal: 6*

**Economics, Humanities and Social Sciences**

Economics (ACE 6)

Select one of the following:

- AECN 141: Introduction to the Economics of Agriculture
- ECON 200: Economic Essentials and Issues
- ECON 211: Principles of Macroeconomics
- ECON 212: Principles of Microeconomics

*Credit Hours Subtotal: 3*
Credit Hours Subtotal: 15
Total Credit Hours 78

1 One course in either anatomy or physiology is required, but one course in each subject area is recommended.

Biomedical Science Option

Veterinary Science Courses

Select a minimum of 10 hours from the following: 10
- VBMS 407 Introduction to Veterinary Anatomy
- VBMS 408 / BIOS 408 Functional Histology
- VBMS 410 General Pharmacology and Toxicology
- VBMS 424 Basic Molecular Infectious Diseases
- VBMS 441 / BIOS 441 Pathogenic Microbiology
- VBMS 496 Independent Study in Veterinary Science
- VBMS 499H Honors Thesis

Credit Hours Subtotal: 10

Biomedical Science Courses

Select a minimum of 15 hours from the following: 15
- ASCI 315 Animal Growth and Development
- ASCI 320 Animal Nutrition and Feeding
- ASCI 321 Companion Animal Nutrition
- ASCI 330 Animal Breeding and Genetics
- ASCI 340 Animal Physiological Systems
- ASCI 341 Physiology and Management of Reproduction
- ASCI 421 Advanced Animal Nutrition
- ASCI 441 New Techniques in Reproductive Biology
- ASCI 442 / BIOS 442 Endocrinology
- ASCI 443 Physiology of Animal Cells and Tissues
- BIOS 213 Human Physiology
- BIOS 213L Human Physiology Laboratory
- BIOS 214 Human Anatomy
- BIOS 313 Molecular Microbiology Laboratory
- BIOS 325 Biology of Viruses
- BIOS 385 Parasitology
- BIOS 386 / NRES 386 Vertebrate Zoology
- BIOS 402 Cancer Biology
- BIOS 420 / MBIO 420 Molecular Genetics
- BIOS 422 Comparative Physiology
- BIOS 422L Comparative Physiology Laboratory
- BIOS 427 Practical Bioinformatics Laboratory
- BIOS 435 Evolutionary Medicine
- BIOS 440 / MBIO 440 Microbial Physiology
- BIOS 443 / MBIO 443 Immunology
- BIOS 452 Field Epidemiology
- BIOS 487 Field Parasitology

Credit Hours Subtotal: 15

Electives

Select 1-17 hours 13
Credit Hours Subtotal: 13

Major Requirements

Complete requirements 78-86
Credit Hours Subtotal: 82
Total Credit Hours 120

1 If not taken for anatomy and physiology requirement.
2 If not taken for microbiology requirement.

Veterinary Medicine Option

This option is for University of Nebraska–Lincoln students who enter a veterinary professional program before earning their University BS in veterinary medicine and biomedical sciences degree and who have completed all of the Veterinary Science Core Requirements, except ACE 10. This option allows them to transfer credits from an AVMA-COE-accredited professional veterinary medical program to fulfill the rest of the degree requirements.

Equivalent Courses

Select equivalent courses from college/school of veterinary medicine

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 116</td>
<td>Medical Greek and Latin</td>
</tr>
<tr>
<td>CHEM 252</td>
<td>Organic Chemistry II</td>
</tr>
<tr>
<td>CHEM 254</td>
<td>Organic Chemistry II Laboratory</td>
</tr>
<tr>
<td>ENTO 300 / BIOS 300 / NRES 300</td>
<td>Toxins in the Environment</td>
</tr>
<tr>
<td>FDST 372 / NUTR 372</td>
<td>Food Microbiology</td>
</tr>
<tr>
<td>FDST 405 / BIOS 440</td>
<td>Food Microbiology Laboratory</td>
</tr>
<tr>
<td>FDST 406 / BIOS 440</td>
<td>Food Microbiology Laboratory</td>
</tr>
<tr>
<td>FDST 425</td>
<td>Food Toxicology</td>
</tr>
<tr>
<td>FDST 455 / MBIO 455</td>
<td>Microbiology of Fermented Foods</td>
</tr>
<tr>
<td>FDST 455L / MBIO 455L</td>
<td>Microbiology of Fermented Foods Laboratory</td>
</tr>
<tr>
<td>NRES 482</td>
<td>Ecophysiology of Wildlife</td>
</tr>
<tr>
<td>PHYS 142</td>
<td>Elementary General Physics II</td>
</tr>
</tbody>
</table>

1 | Ethics & Jurisprudence (ACE 10 equivalent capstone course) 2 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Veterinary Anatomy I</td>
<td></td>
</tr>
<tr>
<td>Veterinary Anatomy II</td>
<td></td>
</tr>
</tbody>
</table>
Veterinary Histology  4
Animal Physiology I  4
General Veterinary Pathology  3
Systemic Veterinary Pathology  4
Credit Hours Subtotal:  29

General Electives
Complete electives  0-17
Credit Hours Subtotal:  9

Core Requirements
Complete requirements  78-86
Credit Hours Subtotal:  82
Total Credit Hours  120

1 These credits will be transferred from an accredited college or school of veterinary medicine. The student must have successfully completed two years of study toward a DVM/VMD degree.

2 This course must include ethics, animal welfare, and jurisprudence to qualify as the capstone for the major and also must be certified as ACE 10 equivalent. For students enrolled in the Professional Program in Veterinary Medicine at Nebraska and the Iowa State University College of Veterinary Medicine, the capstone equivalent is the two-course sequence, VMED 511 and VMED 512 (3 hr) and II (2 hr) respectively.

Additional Major Requirements

Grade Rules

C- and D Grades
Most veterinary schools require a grade of at least a C in courses required for admission. Exact course grade requirements for admission should be determined for each veterinary school to which an application is to be made.

Pass/No Pass Policy
Courses intended to satisfy veterinary school requirements must be taken on a graded A-F basis to satisfy entry requirements. Veterinary school required courses taken for Pass/No Pass will not be accepted. Please consult with your advisor and each veterinary school to which an application is to be made.

GPA Requirements
A minimum cumulative GPA of 2.00 is required for graduation.

A minimum cumulative GPA of 2.50 is generally required for application to a veterinary school. Exact GPA requirement for admission should be obtained for each veterinary school to which application is to be made.

Requirements for Minor Offered by Department

The veterinary science minor is designed for students from across the University with interests in animal health, biotechnology, and biomedical sciences. Students completing a minor in veterinary science will be better prepared to apply to professional schools and will also be candidates for graduate research positions after they complete their baccalaureate degree. The course of study leading to the minor should be developed in consultation with the chief pre-veterinary advisor in the School of Veterinary and Biomedical Sciences. A total of no more than 3 hours of credit in VBMS 496 Independent Study in Veterinary Science and no more than 6 hours of credit of VBMS 499H Honors Thesis can be applied to the minor. The veterinary science minor will consist of completion of at least 12 credit hours of formal coursework in veterinary and biomedical sciences with grades of at least a C in each VBMS course, which are selected from the following upper division courses:

Requirements for the Minor
Select 12 hours of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBMS 303</td>
<td>Principles and Prevention of Livestock Diseases</td>
<td>3</td>
</tr>
<tr>
<td>VBMS 403</td>
<td>Integrated Principles and Prevention of Livestock Diseases</td>
<td>2</td>
</tr>
<tr>
<td>VBMS 407</td>
<td>Introduction to Veterinary Anatomy</td>
<td>1</td>
</tr>
<tr>
<td>VBMS 408</td>
<td>Functional Histology</td>
<td>1</td>
</tr>
<tr>
<td>BIOS 408</td>
<td>Basic Molecular Infectious Diseases</td>
<td>1</td>
</tr>
<tr>
<td>VBMS 410</td>
<td>General Pharmacology and Toxicology</td>
<td>1</td>
</tr>
<tr>
<td>VBMS 441</td>
<td>Pathogenic Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>BIOS 441</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>VBMS 496</td>
<td>Independent Study in Veterinary Science</td>
<td>1</td>
</tr>
<tr>
<td>VBMS 499H</td>
<td>Honors Thesis</td>
<td>1</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 12
Total Credit Hours 12

VBMS 250 Breeds, Signalment, and Vitals of Domestic Animals
Description: Fundamentals of signalment assessment including identification of domestic animal breeds, description of coat, color and markings, terms used when describing species, age, gender, reproductive status, and collections of animals, and introduction to species-specific life history and vital signs.

Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded

VBMS 291 Special Topics in Veterinary Science
Notes: Six (6) hours maximum VBMS 291 special topics hours total. May be repeated up to three times so long as the topics are different.

Description: Special topics in veterinary medicine and biomedical sciences. Topics vary each term.

Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Graded with Option

VBMS 303 Principles and Prevention of Livestock Diseases
Prerequisites: Juniors and seniors; ASCI 240 or ASCI 340 or BIOS 213 and BIOS 213L.
Notes: BIOS 300 or BIOS 312 recommended.

Description: Management techniques in the control of metabolic, infectious, and parasitic diseases of domestic animals and understanding of basic concepts of the important diseases of livestock.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
VBMS 391 Advanced Special Topics in Veterinary Science
Prerequisites: Junior or Senior standing
Notes: Eight (8) hours maximum VBMS 391 special topics hours total. May be repeated up to three times so long as the topics are different.
Description: Advanced topics in veterinary medicine and biomedical sciences. Topics vary each term.
Credit Hours: 1-4
Min credits per semester: 1
Max credits per semester: 4
Max credits per degree: 8
Grading Option: Graded with Option

VBMS 403 Integrated Principles and Prevention of Livestock Diseases
Prerequisites: ASCI 340 or BIOS 213 and BIOS 213L, BIOS 312, CHEM 251.
Notes: Capstone course.
Description: Emphasizes integrated management techniques of livestock, and understanding the basic integrated concepts of the important diseases of domestic animals. Biotechnology in animal health and current issues in management practices to control diseases.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
ACE: ACE 10 Integrated Product

VBMS 407 Introduction to Veterinary Anatomy
Prerequisites: LIFE 120 & LIFE 120L and LIFE 121 & LIFE 121L or equivalent.
Description: Gross anatomy of the mammalian body, using domestic dog as the model. Macroscopic anatomy of organs and organ systems emphasizing structural and functional relationships, and their contribution to homeostasis of domestic animals. Incorporates detailed study of prospected cadavers and skeletal preparations.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: SPRING

VBMS 408 Functional Histology
Crosslisted with: BIOS 408, BIOS 808, VBMS 808
Prerequisites: BIOS 101 and 101L or LIFE 120 and 120L or BIOS 112; BIOS 213 or ASCI 240 or ASCI 340.
Description: Microscopic anatomy of the tissues and organs of major vertebrate species, including humans. Normal cellular arrangements of tissues and organs as related to their macroscopic anatomy and function, with reference to sub-cellular characteristics and biochemical processes. Functional relationships among cells, tissues, organs and organ systems, contributory to organismal well being. General introduction to pathological processes and principles underlying some diseases.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option

VBMS 410 General Pharmacology and Toxicology
Prerequisites: BIOS 213, ASCI 240, or ASCI 340, or BIOC 401 or BIOC/BIOS/CHEM 431/831, or equivalent.
Notes: Recommended: CHEM 252 and 254; BIOC/BIOS/CHEM 432/832 and 433/833.
Description: Basic principles and sciences of drug action (as therapeutic agents) and of adverse (toxic) effects of harmful chemical substances. Discussion of these concepts as they relate to animal production and care, regulatory concerns, legal and ethical decisions, human and animal health hazards, food safety, and environmental contamination.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL

VBMS 424 Basic Molecular Infectious Diseases
Crosslisted with: VBMS 824
Prerequisites: BIOS 312.
Notes: Offered spring semester of odd-numbered calendar years.
Description: Introduction to the molecular, genetic and cellular aspects of microbial pathogenesis in humans and animals. Critical reviews of original scientific literature and development of manuscript and proposal writing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

VBMS 441H Pathogenic Microbiology
Prerequisites: BIOS 441, BIOS 841, VBMS 441, VBMS 841
Description: Fundamental principles involved in host-microorganism interrelationships. Identification of pathogens, isolation, propagation, mode of transmission, pathogenicity, symptoms, treatment, prevention of disease, epidemiology, and methods of control.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Prerequisite for: VBMS 805; VBMS 949

VBMS 441 Pathogenic Microbiology
Prerequisites: BIOS 312
Description: Fundamental principles involved in host-microorganism interrelationships. Identification of pathogens, isolation, propagation, mode of transmission, pathogenicity, symptoms, treatment, prevention of disease, epidemiology, and methods of control.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Prerequisite for: VBMS 805; VBMS 949
to enrich your undergraduate education such as internships, education 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.

**Veterinary Science - Biomedical Science**

**Veterinary Science - Veterinary Medicine**

**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**

- Veterinarian Practicing Partner (professional school needed), The Animal Center · Alliance NE
- Laboratory Technician, Zoetis · Lincoln NE
- Vet Assistant, Veterinary Clinic · Laurel NE
- Animal Rehabilitation intern, Mote Aquarium · Sarasota FL
- Scientist, CEVA Biomune · Kansas City KS
- Chemical Analyst, Midwest Laboratories · Omaha NE
- Vet Assistant, Stolley Park Vet Clinic · Grand Island NE
- Receptionist/Kennel Staff, Pitts Veterinary Hospital · Lincoln NE
- Wrangler, Yellowstone National Park ·
- Client Care Specialist & Kennel Attendant, Belmont Veterinary Center · Lincoln NE

**Internships**

- Intern, UNL GPVEC/MARC · Clay Center NE
- Intern, Kings Veterinary Services · Lemoore CA
- Intern, UNL Neurobiology Lab · Lincoln NE
- Intern, Companion Animal Veterinary Clinic · Norfolk NE
- Equine Clinic Intern, Veterinary Hospital at UFMG · Brazil ZZ
- Food Safety, Quality, and Regulatory Intern, Cargill · Waco TX
- Research Assistant, University of Miami School of Marine and Atm. Sci. · Miami FL
- Research Student, MSU · East Lansing MI
- Animal Agriculture Food, Safety, & Quality Intern, Cargill Turkey and Cooked Meats · Waco TX
- Marketing Assistant, Nebraska Game and Parks Commission · Lincoln NE

**Graduate & Professional Schools**

- DVM program, University of Nebraska-Lincoln/Iowa State ·
- DVM program, Kansas State University · Manhattan KS
- Masters, University of Nebraska-Lincoln ·
- Doctor of Pharmacy Program, University of Nebraska Medical Center · Omaha NE
- Diagnostic Medical Sonography, Bryan College of Health Science · Lincoln NE
- Ph.D. Program, Montana State University · Bozeman MT