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.

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.

Experiential Learning

All undergraduates in the College of Agricultural Sciences and Natural Resources must take an Experiential Learning (EL) designated course. This may include 0-credit courses designed to document co-curricular activities recognized as Experiential Learning.

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 (withdrew), 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 (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 the 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
- Nebraska Indian Community College
- 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 are 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. 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 CASNR[1] (>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. The 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, 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 the 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. Students transferring from a community college, but without admission to a Joint Academic Transfer Program, may be eligible to fulfill the requirements as stated in the catalog for an academic year in which they were enrolled at the community college prior to attending the University of Nebraska-Lincoln. This decision should be made in consultation with academic advisors, provided the student a) was enrolled in a community college during the catalog year they are utilizing, b) maintained continuous enrollment at the previous institution for 1 academic year or more, and c) continued enrollment at the University of Nebraska-Lincoln within 1 calendar year from their last term at the previous institution. 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 the University of Nebraska–Lincoln 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.

College Integrative Course and ACE 8		
SCIL 101	Science and Decision-Making for a Complex World	3
Credit Hours Subtotal:		3
Veterinary Science		
PVET 101	Success in Veterinary Science	1
ACE 10/Capstone		
VBMS 403	Integrated Principles and Prevention of Livestock Diseases	4
Credit Hours Subtotal:		5
Natural Science Courses		
Life Sciences		
LIFE 120 & LIFE 120L	Fundamentals of Biology I and Fundamentals of Biology I laboratory (ACE 4)	4
LIFE 121 & LIFE 121L	Fundamentals of Biology II and Fundamentals of Biology II Laboratory (ACE 4)	4
BIOS 312	Microbiology	3
BIOS 314	Microbiology Laboratory	1
Genetics		
PLAS 215	Genetics	4
or BIOS 206	General Genetics	
Anatomy and Physiology		
Select from the following courses, one in either anatomy or physiology is required, but one course in each subject area is recommended:		4-9
ASCI 340	Animal Physiological Systems	
BIOS 213 & BIOS 213L	Human Physiology and Human Physiology Laboratory	
BIOS 214	Human Anatomy	
VBMS 407		
Cell Biology		
BIOS 302	Cell Biology	3
Immunology		
BIOS 443 / VBMS 443 / MBIO 443	Immunology	3
Physical Sciences		
CHEM 109A & CHEM 109L	General Chemistry I and General Chemistry I Laboratory	4
CHEM 110A & CHEM 110L	General Chemistry II and General Chemistry II Laboratory	4
CHEM 251	Organic Chemistry I	3
CHEM 253	Organic Chemistry I Laboratory	1
PHYS 141	Elementary General Physics I	5
Biological Chemistry		
Select one of the following:		4-5
BIOC 401 & BIOC 401L	Elements of Biochemistry and Laboratory for Elements of Biochemistry	
BIOC 431 / BIOS 431 / CHEM 431 & BIOC 433 / BIOS 433 / CHEM 433	Biochemistry I: Structure and Metabolism and Biochemistry Laboratory	
Credit Hours Subtotal:		47
Mathematics and Statistics		
Select 5-6 hours from the following:		5-6
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:		6
ENGL 150	Writing and Inquiry	
or ENGL 150H	Honors Writing: Writing and Inquiry	
ENGL 151	Writing and Argument	
or ENGL 151	Honors Writing: Writing and Argument	
ENGL 254	Writing and Communities	
or ENGL 254H	Honors: 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)	
Oral Communication (ACE 2)		
Select one of the following:		3
ALEC 102	Interpersonal Skills for Leadership	
COMM 101	Communication in the 21st Century	
or COMM 10	Honors: Communication in the 21st Century	
COMM 209	Public Speaking	
or COMM 209H	Honors: Public Speaking	
COMM 210	Communicating in Small Groups	
COMM 215	Visual Communication	
COMM 283	Interpersonal Communication	
COMM 286	Business and Professional Communication	
JGEN 300	Technical Communication II	
MRKT 257	Sales Communication	

NRES 301	Environmental Communication Skills	
TMFD 121	Visual Communication with Animation	
Credit Hours Subtotal:		9
Economics, Humanities and Social Sciences		
Economics (ACE 6)		
Select one of the following:		3
AECN 141	Introduction to the Economics of Agriculture	
ECON 200	Economic Essentials and Issues	
ECON 211	Principles of Macroeconomics	
or ECON 211H	Honors: Principles of Macroeconomics	
ECON 212	Principles of Microeconomics	
or ECON 212H	Honors: Principles of Microeconomics	
ACE Courses		
Select one course each from ACE outcomes 5, 7, and 9		9
Credit Hours Subtotal:		12
Total Credit Hours		**81**

Biomedical Science Option

Veterinary Science Courses		
Select a minimum of 10 hours from the following:		10
VBMS 406	Introduction to the Principles of Biosecurity and Disease Transmission	
VBMS 407		
VBMS 408 / BIOS 408	Functional Histology	
VBMS 410	General Pharmacology and Toxicology	
VBMS 424	Basic Molecular Infectious Diseases	
VBMS 425	Wildlife Health	
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 320	Animal Nutrition and Feeding	
ASCI 321	Companion Animal Nutrition	
ASCI 330	Animal Breeding and Genetics	
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 326	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 452	Field Epidemiology	
BIOS 487	Field Parasitology	
CLAS 116	Medical Greek and Latin	
CHEM 252	Organic Chemistry II	
CHEM 254	Organic Chemistry II Laboratory	
ENTO 300 / BIOS 300 / NRES 300	Toxins in the Environment	
FDST 405 / BIOS 445	Food Microbiology	
FDST 406 / BIOS 446	Food Microbiology Laboratory	
FDST 424	Food Safety Microbiology	
FDST 425	Food Toxicology	
FDST 455 / MBIO 455	Microbiology of Fermented Foods	
FDST 455L / MBIO 455L	Microbiology of Fermented Foods Laboratory	
NRES 482	Ecophysiology of Wildlife	
NUTR 372	Food Safety and Sanitation	
PHYS 142	Elementary General Physics II	
The following courses may also apply toward the 15-hour requirement if not taken for ACE 10/Capstone or Veterinary Science course requirements.		
VBMS 391	Advanced Special Topics in Veterinary Science	
VBMS 406	Introduction to the Principles of Biosecurity and Disease Transmission	
VBMS 407		
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:		15
Electives		
Select 1-17 hours		14
Credit Hours Subtotal:		14
Major Requirements		
Complete requirements		81-85
Credit Hours Subtotal:		81
Total Credit Hours		**120**

[1] *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 [1]	
Ethics & Jurisprudence (ACE 10 equivalent capstone course) [2]	4-5
Veterinary Anatomy I	6
Veterinary Anatomy II	4
Veterinary Histology	4
Animal Physiology I	4
General Veterinary Pathology	3
Systemic Veterinary Pathology	4
Credit Hours Subtotal:	29
Core Requirements	
Complete requirements [3]	77-81
Credit Hours Subtotal:	77
General Electives	
Complete electives	0-17
Credit Hours Subtotal:	14
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.*

3 *All Veterinary Science Core Requirements must be completed, except ACE 10.*

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:		12
VBMS 303	Principles and Prevention of Livestock Diseases	
VBMS 391	Advanced Special Topics in Veterinary Science	
VBMS 403	Integrated Principles and Prevention of Livestock Diseases	
VBMS 406	Introduction to the Principles of Biosecurity and Disease Transmission	
VBMS 407		
VBMS 408 / BIOS 408	Functional Histology	
VBMS 410	General Pharmacology and Toxicology	
VBMS 424	Basic Molecular Infectious Diseases	
VBMS 425	Wildlife Health	
VBMS 441 / BIOS 441	Pathogenic Microbiology	
BIOS 443 / VBMS 443	Immunology	
VBMS 496	Independent Study in Veterinary Science [1]	
VBMS 499H	Honors Thesis [2]	
Credit Hours Subtotal:		12
Total Credit Hours		**12**

1 *A total of no more than 3 hours of credit in* VBMS 496 Independent Study in Veterinary Science *can be applied to the minor.*

2 *A total of no more than 6 hours of credit of* VBMS 499H Honors Thesis *can be applied to the minor.*

VBMS 250 Breeds, Signalment, and Vitals of Domestic Animals
Crosslisted with: PVET 250
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 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 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 406 Introduction to the Principles of Biosecurity and Disease Transmission
Crosslisted with: VMED 506, VBMS 806
Prerequisites: VBMS 406: Open to juniors or seniors who have completed LIFE 120 & LIFE 121. VBMS 806: Open to graduate students enrolled in the UNL Graduate College. VMED 506: Open to veterinary professional students.
Description: An introduction into biosecurity and the principles of disease transmission. Covering the concepts of infectious disease transmission with practical applications for control and prevention.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
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; 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
Course and Laboratory Fee: $15

VBMS 410 General Pharmacology and Toxicology
Prerequisites: BIOS 213, ASCI 240, or ASCI 340; BIOC 401 or BIOC/BIOS/CHEM 431/831; or equivalent.
Notes: Recommended: CHEM 252 and 254; BIOC/BIOS/CHEM 432/832 and CHEM 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 425 Wildlife Health
Crosslisted with: NRES 425
Prerequisites: LIFE 120 and LIFE 121; Junior standing and above
Description: Introduction to ecological, social, and institutional issues. Engage in discussions of important zoonotic diseases, diseases of conservation concern, non-infectious threats, and strategies for assessing and managing wildlife health.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

VBMS 440 Microbial Physiology
Crosslisted with: BIOS 440, BIOS 840, VBMS 840, MBIO 440
Prerequisites: BIOS 312; BIOS 313 or BIOS 314.
Description: Molecular approaches to the study of prokaryotic cell structure and physiology, including growth, cell division, metabolism, and alternative microbial life styles.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Course and Laboratory Fee: $20

VBMS 441 Pathogenic Microbiology
Crosslisted with: BIOS 441, BIOS 841, VBMS 441H, VBMS 841
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
Course and Laboratory Fee: $25

VBMS 441H Pathogenic Microbiology
Crosslisted with: BIOS 441, BIOS 841, VBMS 441, VBMS 841
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
Course and Laboratory Fee: $25

VBMS 443 Immunology
Crosslisted with: BIOS 443, BIOS 843, VBMS 843, MBIO 443
Prerequisites: BIOS 206; CHEM 251 or CHEM 255 or CHEM 261.
Description: Fundamental consideration of cellular and humoral mechanisms of immunity, the structure and function of immunoglobulins, antigen-antibody interactions; hypersensitivity; transplantation and tumor immunity; immune and autoimmune disorders.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Prerequisite for: VBMS 852; VBMS 908; VBMS 910; VBMS 948; VBMS 949

VBMS 496 Independent Study in Veterinary Science
Prerequisites: 12 hrs veterinary science or closely related areas and permission.
Description: Individual or group projects in research, literature review, or extension of course work under supervision and evaluation of a departmental faculty member.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 12
Grading Option: Graded with Option

VBMS 499H Honors Thesis
Prerequisites: Admission to the University Honors Program and permission.
Notes: AGRI 299H recommended.
Description: Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.
Credit Hours: 3-6
Min credits per semester: 3
Max credits per semester: 6
Max credits per degree: 6
Grading Option: Graded

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.

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, 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, WY
- Client Care Specialist & Kennel Attendant, Belmont Veterinary Center - Lincoln, NE

Internships

- Intern, GPVEC/MARC, University of Nebraska-Lincoln - Clay Center, NE
- Intern, Kings Veterinary Services - Lemoore, CA
- Intern, Neurobiology Lab, University of Nebraska-Lincoln - Lincoln, NE
- Intern, Companion Animal Veterinary Clinic - Norfolk, NE
- Equine Clinic Intern, Veterinary Hospital at UFMG - Belo Horizonte, Brazil
- Food Safety, Quality, and Regulatory Intern, Cargill - Waco, TX
- Research Assistant, School of Marine and Animal Science, Univerisity of Miami - Miami, FL
- Reasearch Student, Michigan State University - 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 - Lincoln, NE/Ames, IA
- DVM program, Kansas State University - Manhattan, KS
- 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