Animal Science (BS): Veterinary Bioscience Concentration

The degree of Bachelor of Science in Animal Science may be obtained by selecting one of three concentrations offered by the Department of Animal Science in the College of Agriculture and Life Sciences: Veterinary Bioscience, Science, and Industry.

The Veterinary Bioscience concentration is for students who are interested in advanced study in DVM programs and has all veterinary school prerequisite courses built into the concentration. Students in this concentration must maintain an overall GPA of 3.0 or higher. There are many opportunities to gain undergraduate research experience with an Animal Science faculty member, to participate in one of the animal-related clubs, and to engage globally by participating in one of our Animal Science Study Abroad experiences.

Accelerated Graduate Opportunities

Advanced undergraduates have the opportunity to complete the **Accelerated Bachelor's/Master's degrees**, which allows students to earn both the BS and the Master's of Animal Science degrees within five years. See listing of graduate degrees offered in the (https://grad.ncsu.edu/) Graduate School (https://grad.ncsu.edu/).

For more information about our program, visit our website (https://cals.ncsu.edu/animal-science/students/undergraduate/#bachelor-of-science).

Contact

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Plan Requirements

Use of animals and animal specimens is critical to our educational program. To obtain full credit for Animal Science courses, students are required to participate in laboratory procedures involving animals and animal specimens. All activities with live animals are IACUC (Institutional Animal Care and Use Committee) approved. Many lectures also incorporate animals or animal specimens into the course.

Code	Title	Hours	Counts towards
Orientation			
ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1	
or ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences		
Communication			
Select one of the following:		3	
COM 110	Public Speaking		
COM 112	Interpersonal Communication		
COM 211	Argumentation and Advocacy		
Mathematical & Natural Sciences			
MA 107	Precalculus I [1]	3	
ST 311	Introduction to Statistics	3	
or ST 350	Economics and Business Statistics		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4	
BIO 183	Introductory Biology: Cellular and Molecular Biology	4	
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory [1]	4	
GN 311	Principles of Genetics	4	
Major Requirements			
ANS 150 & ANS 151	Introduction to Animal Science and Introduction to Animal Science Lab [1]	4	
ANS 205 & ANS 206	Physiology of Domestic Animals and Anatomy of Domestic Animals Lab	4	
ANS 220 & ANS 221	Reproductive Physiology and Reproductive Physiology Lab	4	
ANS 230 & ANS 231	Animal Nutrition and Animal Nutrition Lab	4	

Select one of the following Animal Management courses:		3
ANS 400	Companion Animal Management	
ANS 403	Swine Management	
ANS 407	Livestock Grazing Management	
ANS 408	Small Ruminant Management	
ANS 410	Equine Breeding Farm Management	
ANS 411	Management of Growing and Performance Horses	
ANS 402	Beef Cattle Management	
ANS 404	Dairy Cattle Management	
Animal Science Discipline Courses (p. 3)		6
Animal Science Electives (p. 3)		5
Select one of the following Economics courses:		3
ARE 201	Introduction to Agricultural & Resource Economics	
ARE 201A	Introduction to Agricultural & Resource Economics	
EC 201	Principles of Microeconomics	
EC 202	Principles of Macroeconomics	
EC 205	Fundamentals of Economics	
Veterinary Bioscience Options		
Select one of the following Calculus I courses:		3
MA 121	Elements of Calculus	
MA 131	Calculus for Life and Management Sciences A	
MA 141	Calculus I	
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory	4
CH 221 & CH 222	Organic Chemistry I and Organic Chemistry I Lab	4
CH 223 & CH 224	Organic Chemistry II and Organic Chemistry II Lab	4
MB 351 & MB 352	General Microbiology and General Microbiology Laboratory	4
PY 211	College Physics I	4
PY 212	College Physics II	4
BCH 351	General Biochemistry	3-4
or BCH 451	Principles of Biochemistry	
GEP Courses		
ENG 101	Academic Writing and Research [1]	4
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		6
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		2
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) [3]		5
GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		
World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement)		
Free Electives		
Free Electives (12 Hr S/U Lmt) [2,3]		7-8
Total Hours		**120**

[1] A grade of C- or higher is required.

[2] Students should consult their academic advisors to determine which courses fill this requirement.

[3] Students are encouraged to take an Ethics course as part of their Humanities, Additional Breadth, Interdisciplinary Perspectives, or Free Electives.

Animal Science Discipline Courses

Code	Title	Hours	Counts towards
ANS 415/515/ NTR 415/515/ PO 415/515	Comparative Nutrition	3	
ANS 425/525/ FM 425/525/ NTR 425/525/ PO 425/525	Feed Manufacturing Technology	3	
ANS 435	Stress Physiology in Animals	3	
ANS 437	Precision Livestock Farming Systems	3	
ANS 439	Comparative Animal Exercise Physiology	3	
ANS 440/540	Animal Genetic Improvement	3	
ANS 452/552/ PHY 452/552	Comparative Reproductive Physiology and Biotechnology	3	
ANS 453/553	Physiology and Genetics of Growth and Development	3	
ANS 454/554/ NTR 454/554	Lactation, Milk and Nutrition	3	
ANS/NTR 550	Applied Ruminant Nutrition	3	
ANS/NTR 561	Equine Nutrition	3	
ANS/BCH 571	Regulation of Metabolism	3	
ANS 590	Topical Problems in Animal Science	1-3	
NTR 419	Human Nutrition and Chronic Disease	3	
VMP 420	Disease of Farm Animals	3	

Animal Science Electives

Code	Title	Hours	Counts towards
Animal Science Electives			
VMP 420	Disease of Farm Animals	3	
Any ANS Courses Not Planned			
AEE 208	Agricultural Biotechnology: Issues and Implications	3	
ANS 105	Introduction to Companion Animal Science	3	
ANS 110	Introduction to Equine Science	3	
ANS 150	Introduction to Animal Science	3	
ANS 151	Introduction to Animal Science Lab	1	
ANS 201	Techniques of Animal Care	2	
ANS 205	Physiology of Domestic Animals	3	
ANS 206	Anatomy of Domestic Animals Lab	1	
ANS/PB 208	Agricultural Biotechnology: Issues and Implications	3	
ANS/HS 215	Agricultural Genetics	3	
ANS 220	Reproductive Physiology	3	
ANS 221	Reproductive Physiology Lab	1	
ANS 230	Animal Nutrition	3	
ANS 231	Animal Nutrition Lab	1	
ANS 240/240A	Livestock Merchandising	3	
ANS 240A	Livestock Merchandising	3	
ANS 241	Introduction to Meat and Poultry Processing	3	
ANS 241A	Introduction to Meat and Poultry Processing	3	
ANS 242	Value Added Meat and Poultry Processing	3	
ANS 242A	Value Added Meat and Poultry Processing	3	
ANS 243	Meat Safety and Quality Systems	3	
ANS 243A	Meat Safety and Quality Systems	3	
ANS 260	Basic Swine Science	2	

ANS 261	Swine Health and Biosecurity	1
ANS 262	Swine Breeding and Gestation Management	1
ANS 263	Farrowing Management	1
ANS 264	Swine Nursery and Finishing Management	1
ANS 265	Contemporary Issues in the Swine Industry	1
ANS 266	Swine Environment Management	1
ANS 267	Swine Manure and Nutrient Management	1
ANS 268	Employee Management for the Swine Industry	1
ANS 269	Internship in the Swine Industry	1
ANS 270	Pork Export Markets from a Swine Production Perspective	1
ANS 271	Swine Nutrition	1
ANS 281	Professional Development of PreVeterinary Track Students	1
ANS 290	Professional Development for Animal Science Careers	2
ANS 303	Principles of Equine Evaluation	2
ANS 304	Dairy Cattle Evaluation	2
ANS 309	Livestock Evaluation	3
ANS/PO/FS 322	Muscle Foods and Eggs	3
ANS/FS 324	Milk and Dairy Products	3
ANS 330	Laboratory Animal Science	3
ANS 395	Animal Science Study Abroad	1-6
ANS 400	Companion Animal Management	3
ANS 402	Beef Cattle Management	3
ANS 403	Swine Management	3
ANS 404	Dairy Cattle Management	3
ANS 407	Livestock Grazing Management	3
ANS 408	Small Ruminant Management	3
ANS 410	Equine Breeding Farm Management	3
ANS 411	Management of Growing and Performance Horses	3
ANS 415/515/ NTR 415/515/ PO 415/515	Comparative Nutrition	3
ANS 425/525/ FM 425/525/ NTR 425/525/ PO 425/525	Feed Manufacturing Technology	3
ANS 435	Stress Physiology in Animals	3
ANS 437	Precision Livestock Farming Systems	3
ANS 439	Comparative Animal Exercise Physiology	3
ANS 440/540/	Animal Genetic Improvement	3
ANS 452/552/ PHY 452/552	Comparative Reproductive Physiology and Biotechnology	3
ANS 453/553	Physiology and Genetics of Growth and Development	3
ANS 454/554/ NTR 454/554	Lactation, Milk and Nutrition	3
ANS 495	Special Topics in Animal Science	1-3
ANS/NTR 550	Applied Ruminant Nutrition	3
ANS/NTR 561	Equine Nutrition	3
ANS/BCH 571	Regulation of Metabolism	3
ANS 590	Topical Problems in Animal Science	1-3
FS 435/535	Food Safety Management Systems	3

NTR 419	Human Nutrition and Chronic Disease	3

Semester Sequence

This is a sample.

First Year		
Fall Semester		**Hours**
ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1
ANS 150 & ANS 151	Introduction to Animal Science and Introduction to Animal Science Lab [1]	4
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
ENG 101	Academic Writing and Research [1]	4
MA 107	Precalculus I [1]	3
	Hours	**16**
Spring Semester		
Animal Science Course		2
BIO 183	Introductory Biology: Cellular and Molecular Biology	4
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory [1]	4
Select one of the following:		3
MA 121	Elements of Calculus	
MA 131	Calculus for Life and Management Sciences A	
MA 141	Calculus I	
	Hours	**13**
Second Year		
Fall Semester		
ANS 205 & ANS 206	Physiology of Domestic Animals and Anatomy of Domestic Animals Lab	4
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2
Select one of the following:		3
ARE 201	Introduction to Agricultural & Resource Economics	
EC 201	Principles of Microeconomics	
EC 202	Principles of Macroeconomics	
EC 205	Fundamentals of Economics	
CH 221 & CH 222	Organic Chemistry I and Organic Chemistry I Lab	4
Select one of the following:		3
COM 110	Public Speaking	
COM 112	Interpersonal Communication	
COM 211	Argumentation and Advocacy	
	Hours	**16**
Spring Semester		
ANS 220 & ANS 221	Reproductive Physiology and Reproductive Physiology Lab	4
CH 223 & CH 224	Organic Chemistry II and Organic Chemistry II Lab	4
ST 311 or ST 350	Introduction to Statistics or Economics and Business Statistics	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**15**
Third Year		
Fall Semester		
ANS 230 & ANS 231	Animal Nutrition and Animal Nutrition Lab	4
Animal Science Course (p. 3)		3
MB 351 & MB 352	General Microbiology and General Microbiology Laboratory	4
PY 211	College Physics I	4
	Hours	**15**
Spring Semester		
GN 311	Principles of Genetics	4
PY 212	College Physics II	4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
ANS Elective (p. 3) [2]		3
	Hours	**15**
Fourth Year		
Fall Semester		
ANS Discipline Course Elective (p. 3)		3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		3
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory	4
GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
Free Elective [2]		3
	Hours	**16**
Spring Semester		
ANS Discipline Course Elective (p. 3)		3
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) [2]		3
BCH 351 or BCH 451	General Biochemistry or Principles of Biochemistry	3
Free Elective [2]		5
	Hours	**14**
	Total Hours	**120**

[1] ANS 150 Introduction to Animal Science, MA 107 Precalculus I, ENG 101 Academic Writing and Research, and CH 101 Chemistry - A Molecular Science must be completed with a grade of C-minus or higher, and the student should repeat the course in the semester following the initial attempt if less than a C-minus is earned.

[2] Students are encouraged to take an Ethics course as part of their Humanities, Additional Breadth, Interdisciplinary Perspectives, or Free Electives.

Use of animals and animal specimens is critical to our educational program. To obtain full credit for Animal Science courses, students are required to participate in laboratory procedures involving animals and animal specimens. All activities with live animals are IACUC (Institutional Animal Care and Use Committee) approved. Many lectures also incorporate animals or animal specimens into the course.

Career Opportunities

Career Titles

- Agricultural Research Technician
- Animal Breeder
- Agricultural Inspector
- Agricultural/Farm Manager
- Sales Representative of Animal Health/Animal Products

Learn More About Careers

NCcareers.org (https://nccareers.org/)
Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (https://www.bls.gov/ooh/)
Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (https://www.careeronestop.org/)
View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (https://careers.dasa.ncsu.edu/explore-careers/career-assessments/) (NC State student email address required)
This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (https://careers.dasa.ncsu.edu/about/hours-appointments/) to discuss the results.

Focus 2 Apply Assessment (https://www.focus2career.com/Portal/Register.cfm?SID=1929) (Available to prospective students)
A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.