Pathway to Veterinarian

Metropolitan State University of Denver
Department of Biology

What does a Veterinarian do? How's the job outlook?

Veterinarians care for the health of animals and work to protect public health. They diagnose, treat, and research medical conditions and diseases of pets, livestock, and other animals.

Employment of veterinarians is projected to grow 17 percent from 2020 to 2030, much faster than the average for all occupations. Increases in consumers' pet-related spending are expected to drive employment in the veterinary services industry, which employs most veterinarians. Veterinary medicine has advanced considerably. Today's veterinarians can offer many services that are comparable to healthcare for humans, including more complicated procedures such as cancer treatments and kidney transplants. The annual mean wage for veterinarians in the Denver Metro area is approximately $101,780. *

*U.S. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Veterinarians, at https://www.bls.gov/ooh/healthcare/veterinarians.htm

How do I become a veterinarian?

Veterinarians must complete a Doctor of Veterinary Medicine (DVM or VMD) degree at an accredited college of veterinary medicine. A veterinary medicine program generally takes 4 years to complete and includes classroom, laboratory, and clinical components. Admission to veterinary programs is competitive. Applicants to veterinary school typically have a bachelor's degree in any field and experience working with veterinarians and animals. Veterinary medical colleges typically require applicants to have taken many science classes, including biology, chemistry, and animal science. Most programs also require math, humanities, and social science courses. In veterinary medicine programs, students take courses on animal anatomy and physiology, as well as disease prevention, diagnosis, and treatment. Most programs include 3 years of classroom, laboratory, and clinical work. Students typically spend the final year of the 4-year program doing clinical rotations in a veterinary medical center or hospital.

Veterinarians must be licensed in order to practice in the United States. Licensing requirements vary by state, but prospective veterinarians in all states must complete an accredited veterinary program and pass the North American Veterinary Licensing Examination (NAVLE). In addition to passing the national exam, most states require that veterinarians pass a state licensing exam. However, veterinarians employed by state or federal government may not need a state license because government agencies differ in what they require.

The College of Veterinary Medicine at Colorado State University (CSU) is the only veterinary program in Colorado. For more information on the admissions process, please refer to the following website;

- The College of Veterinary Medicine at Colorado State University Admission Requirements https://vetmedbiosci.colostate.edu/dvm/admission-requirements/

Faculty Advisor who can guide you for this path are:

Dr. Clare Hays **haysc@msudenver.edu**

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The typical applicant completes a baccalaureate degree in order to become a competitive candidate. However, an absolute minimum of 60 semester hours is required when applying.

To check on prerequisites for veterinary schools other than CSU, you can consult the American Association of Veterinary Medical Colleges website; http://www.aavmc.org.

Prerequisites for CSU must include:

- General Biology I/II with lab – BIO 1080/1090 and BIO 1081/1091; 2 semesters

- General Genetics— BIO 3600; 1 semester
  OR
  Microbial Genetics*—BIO 4470; 1 semester
  *BIO 4470 is also acceptable, but has prerequisites of BIO 2400 and BIO 3600

- General Chemistry I/II with lab – CHE 1800/1801* and CHE 1810/1811; 2 semesters
  *Prereq includes College Algebra: MTH 1108-1109 or MTH 1110 or MTH 1111/1101 or MTH 1112

- Organic Chemistry I/II with lab – CHE 3100/3120 and CHE 3110/3130; 2 semesters

- Biochemistry I – CHE 4310, no lab required; 1 semester

- College Physics I/II with lab– PHY 2010/2030 or PHY 2020/2040; 1 semester
  OR
- General Physics I/II with lab —PHY 2311/2321 or PHY 2331/2341; 1 semester

- Introduction to Statistics—MTH 1210; 1 semester

- Freshman English Composition – ENG 1010; 1 semester

- Arts and Humanities/Behavioral and Social Sciences (12 Credit Hours)–Included are art, dance, English (excluding ENG 1010 listed above) foreign language, music, philosophy, speech, theater, anthropology, economics, geography, history, political science, psychology, and sociology.

Courses that are not required, but highly recommended include the following: Microbiology (BIO 2400), Human Anatomy & Physiology I and II (BIO 2310 or 2320), Cell Biology (BIO 3050), Histology (BIO 3210), Comparative Vertebrate Anatomy (BIO 3220), Animal Physiology (BIO 3360), Immunology (BIO 3350), and Introduction to Nutrition (NUT 2040).

New Prerequisites for 2024 CSU Application (submitted Fall 2023) must include:

In addition to the above prerequisites, the following are required:

- Cell Biology – BIO 3050
- A&P I and II - BIO 2310 and BIO 2320, or Advanced Human Physiology - BIO 3320, or Animal Physiology - BIO 3360

- 9 credits of Upper Division Biomedical Science Courses:
  Accepted courses include: BIO 3210 (Histology), BIO 3220 (Comparative Vertebrate Anatomy), BIO 3270 (Parasitology), BIO 3340 (Endocrinology), BIO 3350 (Immunology), BIO 3400 (Microbial Physiology), BIO 4070 (Biology of Cancer), BIO 4300 (Neurobiology), BIO 4440 (Virology), BIO 4450 (Pathogenic Microbiology), BIO 4820 (Developmental Biology)

Courses not accepted as upper division biomedical science courses include Animal Behavior, Issues in Conservation Biology, Ecology, Evolution, Mammalogy, Zoology, and Ornithology.

Evaluators carefully assess the quality of an applicant's academic history in terms of relative academic strengths and promise, including the number and quality of upper division science courses – especially if they have been taken recently. Evaluators try to determine if the academic history is stable, erratic, inconsistent, or improving over time. Short term declines can often be justified in the Special Circumstances section of the application (illness, injury). There is not a limit on the age of acceptable course work. However, of the majority of courses older than 10 years, some indication of current proficiency in genetics and biochemistry may be required.

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REQUIREMENTS FOR A MAJOR IN BIOLOGY
for 2020-2021 or future catalogs ONLY

A grade of "C-" or better is required for each BIO prefix course to count towards the major

Required Biology Courses for both the B.A. or the B.S. Degree

BIO 1080-3 General Biology I 3
BIO 1090-1 General Biology Lab I.....1
BIO 1081-3 General Biology II 3
BIO 1091-1 General Biology Lab II.....1

BIO 3520-3 General Ecology 3

Take ONE of these Genetics options:

___BIO 3600-4 General Genetics (no lab).....4
OR
___BIO 3610-4 Genetics: Principles & Analysis (has lab) 4

Pick ONE of these options:

___Option 1: BIO 2100-5 General Botany
OR
___Option 2: BIO 2400-5 General Microbiology
OR
___Option 3: Both BIO 2310-4 and BIO 2320-4 (Anatomy & Physiology I & II) (You must take both semesters to get credit for this option)
OR
___Option 4: Either BIO 3200-4 Invertebrate Zoology or BIO 3260-4 Vertebrate Zoology (If you wish to take both zoology courses, the other will count as an upper division elective)

Students are required to take a Senior Experience course:

Fulfills Senior Experience Requirement	
__BIO 4050-3 Advanced Cell & Molecular Biology	__BIO 4510-4 Microbial Ecology
__BIO 4230-3 Issues in Conservation Biology	__BIO 4540-4 Plant Ecology
__BIO 4300-3 Neurobiology	__BIO 4550-4 Animal Ecology
__BIO 4820-4 Developmental Biology	
__BIO 4850-3 Evolution	

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Elective Biology courses: Biology courses from 2000, 3000, and 4000 must be completed to bring the total of biology courses approved for the major to 40 credits. *At least 21 of these Biology credits must be from the 3000 or 4000 courses of the Department of Biology.*

Recommended Elective Courses from which to Choose:

- BIO 2310 – Anatomy & Physiology
- BIO 2320 – Anatomy & Physiology II
- BIO 3050 - Cell Biology
- BIO 3320 – Advanced Human Physiology
- BIO 3210 - Histology
- BIO 3350 - Immunology
- BIO 3351 – Immunology Lab

Total Credit Hours in Biology (minimum of 40) _____

Upper Division Biology Credit Hours (minimum of 21) _____

B.S. Non-Bio Course Requirements:
CHE 1800-4 Gen Chemistry I _____
CHE 1801-1 Gen Chemistry I Lab _____
CHE 1810-4 Gen Chemistry II _____
CHE 1811-1 Gen Chemistry II Lab _____

CHOOSE YOUR PATH:
CHE 3100-4 Organic Chemistry I_____
CHE 3120-1 Organic Chemistry I Lab ____
AND
CHE 3110- 3 Organic Chemistry II_____

~OR~

ºCHE 3090- 4 Survey of Organic Chem ____
CHE 3120-1 Organic Chemistry I Lab ____
AND
ºCHE 4310-4 Biochemistry _____

º Note on CHE 3090 – Survey of Organic Chemistry - this class is no longer being offered
º Note on CHE 4310 – Biochemistry – requires completion of both Organic Chemistry I and II

Math Requirement (2 semesters)

Two Semesters of Math: _____
_____

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Choose from the following math courses:

MTH 1108-1109 (Stretch College Algebra) *, MTH 1110 (College Algebra), MTH 1111 and MTH 1101 (College Algebra with lab), MTH 1112 (College Algebra through Modeling), MTH 1115/1116 (College Algebra through Modeling with Lab), MTH 1120 (Trigonometry), MTH 1210 (Intro to Statistics), MTH 1410 (Calculus I)**

MTH 1108-1109 is a Stretch Course and only counts as ONE of the required math courses for the BIO BS.

Students planning to take Calculus must take MTH 1108-1109, MTH 1110, or MTH 1111

Physics Requirement (Specific to Veterinary)
*** Students interested in a Veterinary program will also need to take: 2 semesters of Physics with Lab at numerous vet schools (CSU only requires 1 semester) ***

College Physics I/II with lab*– PHY 2010/2030 or PHY 2020/2040
OR
General Physics I/II with lab** —PHY 2311/2321 or PHY 2331/2341

*Prerequisites for PHY 2010/2030 includes MTH 1120- College Trigonometry
**Prerequisites for PHY 2311/2321 includes MTH 1410 – Calculus I

General Studies Requirements (33 cr. total), please visit
http://www.msudenver.edu/advising/facultystaff/generalstudiesrequirements/

Total Credits (Minimum 120) _____

Total Upper Division Credits (Minimum 40 TOTAL) _____

What is your Minor? (required) _____