

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 \$110,510.*



*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/>

Biology Faculty Advisor who can guide you on this path:

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 Biology II is not required for vet school but is one of the prerequisites for Genetics which is required.
- **A&P I and II** - BIO 2310 and BIO 2320, or **Advanced Human Physiology** - BIO 3320, or **Animal Physiology** - BIO 3360
- **Cell Biology** - BIO 3050
- **General Genetics** - BIO 3600; 1 semester
OR
Genetics: Principles and Analysis - BIO 3610; 1 semester
- **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.*
- **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** – CHE 3100 and CHE 3110; no labs required; 2 semesters
 - These classes are not required, but they are prerequisites for Biochemistry which is required.
- **Biochemistry I** – CHE 4310, no lab required; 1 semester
- **One semester of physics with lab.**
 - **College Physics I with lab** - PHY 2010/2030; 1 semester
OR
 - **General Physics I with lab** - PHY 2311/2321; 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), foreign language, music, philosophy, speech, theater, anthropology, economics, geography, history, political science, psychology, and sociology.

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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 B.S. IN BIOLOGY

(2024-2025 or future catalogs ONLY)

Major Requirements:

- Total of 46 total credit hours approved by the Biology Faculty must be completed in the BIO prefix
- C- or better must be earned for any BIO course to apply to your major requirements.
- 27 upper division credit hours in BIO courses must be completed
- Non-biology courses in math, chemistry and other STEM disciplines are required

Start Smart! Have you met with a Biology Academic Advisor at least once a semester to ensure timely progression toward your degree and to avoid taking unnecessary courses.

Required Introductory Courses:

- BIO 1080 & 1090: General Biology I w/ Lab
- BIO 1081 & 1091: General Biology II w/ Lab

Choose one of the following chemistry sequences:

- CHE 1800 & 1801: General Chemistry I w/ Lab
- CHE 1810 & 1811: General Chemistry II w/ Lab

*** **OR** ***

Two semesters of math:

- MTH 1109/ 1110: College Algebra, or higher
- Another semester of Math > MTH 1110

- CHE 1110 & 1150: Principles of Chemistry w/ Lab
- CHE 2100 & 2150: Into to Organic & Biol Chem w/ Lab

Pro Tip! Biology students do not need additional General Studies coursework for Natural & Physical Sciences or Quantitative Literacy. Your required Biology, Chemistry, and Math courses will fulfill these.

Additional Required Biology courses:

Choose one of the following:

- BIO 2100: General Botany (5cr.)
- BIO 2310: Human Anatomy & Physiology I (4cr.)
- BIO 2400: General Microbiology (5cr.)
- BIO 3200: Invertebrate Zoology (4cr.)
- BIO 3260: Vertebrate Zoology (4cr.)

Take General Ecology and a Genetics course:

- BIO 3520: General Ecology (3cr.)

Choose one of the following:

- BIO 3600: General Genetics (4cr.)
- BIO 3610: Genetics: Principles & Analysis (4cr.)

Professionalize! Have you met with a Faculty Advisor to personalize your path and ensure you select courses and extracurricular experiences that will best serve you?

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Biology Elective Course Requirement:

- At least 46 total credit hours must be completed in BIO courses.
- At least 27 total credit hours must be upper division BIO courses (3000/4000 level).
 - Includes any upper division Zoology, General Ecology, Genetics, and BIO Senior Experience

| Lower Division BIO Courses (1000/2000 level) | Credit Hours | Upper Division BIO Courses (3000/4000 level) | Credit Hours |
|---|-----------------|--|-----------------|
| <input type="checkbox"/> BIO 1080/1090 – General Biology I w/Lab | 4 | <input type="checkbox"/> BIO 3520: General Ecology | 3 |
| <input type="checkbox"/> BIO 1081/1091 – General Biology II w/Lab | 4 | <input type="checkbox"/> BIO 36XX: Genetics | 4 |
| <input type="checkbox"/> | | <input type="checkbox"/> | |
| <input type="checkbox"/> | | <input type="checkbox"/> | |
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| <input type="checkbox"/> | | <input type="checkbox"/> | |
| <input type="checkbox"/> | | <input type="checkbox"/> BIO Senior Experience (recommended) | |
| Total lower division BIO credit hours: | | Total upper division BIO credit hours: <i>AT LEAST 27 UPPER DIVISION BIO CREDIT HOURS REQUIRED</i> | |
| Total BIO prefix credit hours: <i>LOWER DIVISION + UPPER DIVISION (AT LEAST 46 TOTAL BIO CREDIT HOURS REQUIRED)</i> | | | |

Required Non-Biology Science Electives:

- 9 credits total, at least 6 of which must be upper division (3000 /4000 level).
- Any Math course selected would be in addition to the two semesters required above.

| Non-Biology Science Elective Courses | Credit Hours |
|--|------------------|
| <input type="checkbox"/> | |
| <input type="checkbox"/> | (upper division) |
| <input type="checkbox"/> | (upper division) |
| Total Non-Biology Science Elective credit hours: <i>At least 6 credit hours must be upper division (3000/4000 level)</i> | |

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Senior Experience Requirement:

- A capstone course is required to graduate.
- A Biology Senior Experience is recommended.
- Courses outside Biology marked (SE) fulfill the Senior Experience requirement but would **not** count toward your BIO hours.

BIO 4050: Advanced Cell & Molecular Biology

BIO 4230: Issues in Conservation Biology

BIO 4271: Parasitology

BIO 4300: Neurobiology

BIO 4510: Microbial Ecology

BIO 4540: Animal Ecology

BIO 4820: Developmental Biology

BIO 4850: Evolution

Are you ready for graduation?

→ Please see your Degree Progress Report for General Studies and MSU Denver graduation requirements. ←

- Have you completed a total of 46 credit hours of BIO courses approved by the Biology Department?
- Have you completed at least 27 upper division BIO coursework (3000/ 4000 level)?
- Have you completed at least 39 total upper division credit hours?
- Have you completed a Senior Experience course?
- Have you had a final advising appointment?
- Have you submitted an application for graduation?