

What is a Physician? What's the job outlook?

Physicians diagnose and treat injuries and illnesses; they take medical histories, prescribe medications, and order, perform, and interpret diagnostic tests. They also counsel on diet and preventative healthcare. There are two kinds of physicians; M.D. (Medical Doctor) and D.O. (Doctor of Osteopathic Medicine). Both use the same methods of treatment, but D.O.s place additional emphasis on holistic (whole-body) patient care.

Employment for physicians is expected to grow 3 percent from 2020 to 2030. Most job growth is expected to result from the need to replace those who transfer to different occupations and/or retire. The growing and aging population is also expected to drive overall growth. As rates of chronic illness rise, consumers will seek high levels of care that use the latest technologies and therapies. As new technologies become more widely used, however, physician assistants and nurse practitioners may be used to reduce cost at hospitals and doctor's offices. The annual mean wage for a physician depends on their specialty and where they practice, but for a general internal medicine physician in the Denver Metro area it is \$224,360.*



*U.S. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Pharmacists, on the Internet at <https://www.bls.gov/ooh/healthcare/physicians-and-surgeons.htm#tab-7>

How do I become a Physician?

Physicians must have either a Medical Doctor (M.D.) or Doctor of Osteopathic Medicine (D.O.). No specific undergraduate degree is required to apply for medical school, but a bachelor's degree is required. Medical schools are highly competitive. In Colorado there is one M.D. program, the University of Colorado School of Medicine (CUSOM).

Applicants to CUSOM must submit transcripts, scores from the Medical College Admission Test (MCAT), a personal statement, and letters of recommendation. Once the initial application has been received and verified, a link to a secondary application is sent which would include an additional essay and taking the CASPer Test, a standardized assessment on non-cognitive skills, interpersonal characteristics, and personal values and priorities. The admissions committee will then select which applicants they wish to interview.

Medical school is 4 years of study, after which graduates will enter a residency program based on their specialty of interest. Residencies can last anywhere from 3-9 years, depending on the specialty. Sub-specialization would include additional training in a fellowship of 1-3 years.

All states require that physicians be licensed; requirements vary by state. To qualify for a license, candidates must graduate from an accredited medical school and complete residency training in their specialty. Licensing requirements include passing standardized national exams. M.D.s take the U.S. Medical Licensing Examination (USMLE).

Biology Faculty Advisor who can guide you on this path:

Dr. Clare Hays - haysc@msudenver.edu

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Prerequisites for entry into medical school vary. Since medicine is a mixture of science and contact with people, courses in social and behavioral sciences, arts and humanities are of great value. Of course, you must demonstrate competence in the required science courses as well.

To check on the specific required courses for admission to medical schools around the country, you can consult Medical School Admission Requirements (MSAR), published by the Association of American Medical Colleges, www.aamc.org/students.

For further detail on admissions requirements at CUSOM, you can visit their website, <https://medschool.cuanschutz.edu/education/md-admissions>.

The following is a list of the minimum course requirements for admission to CUSOM.

- **General Biology with lab** – BIO 1080/1090 and BIO 1081/1091; 2 semesters
- **General Chemistry with lab** – CHE 1800/1801 and CHE 1810/1811; 2 semesters
- **Organic Chemistry with lab** – CHE 3100/3120 and CHE 3110/3130; 2 semesters
- **Math** – MTH 1110 and MTH 1120 (prerequisites for CHE & PHY); 2 semesters
- **College Physics** – PHY 2010/2030 and 2020/2040; 2 semesters
- **English Composition** – ENG 1010 and ENG 1020; 2 semesters

The following are highly recommended courses, although not required.

- **BIO 2310 & 2320** – Anatomy & Physiology I & II; 2 semesters
- **BIO 3050** – Cell Biology; 1 semester
- **BIO 3600** – Genetics; 1 semester
- **CHE 4310** – Biochemistry; 1 semester (many med schools now require this course)
- **MTH 1210** – Statistics
- **Psychology, Sociology, and Ethics**

**** Applicants should plan on completing the required courses by the end of junior year so that you will be prepared to take the MCAT in the spring of your junior year. The MCAT must be taken during or before September in the year of application. ****

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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"/>	
<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>	
<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?