

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

Pharmacists dispense prescription medications to patients and offer expertise in the safe use of prescriptions. They may also conduct health and wellness screenings and immunizations.

Employment for pharmacists is expected to decline by 2 percent from 2020 to 2030. Many pharmacists work in retail pharmacies and drug stores, which are expected to lose jobs as more people fulfill their prescriptions via mail order or online and as pharmacy chains reduce the number of their retail locations. Pharmacy technicians are also increasingly performing tasks previously done by pharmacists. That said, demand is projected to increase in healthcare settings such as hospitals and clinics to oversee medications given to patients and patient care. The annual mean wage for pharmacists in the Denver Metro area is \$116,030.*



*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/pharmacists.htm#tab-1>

How do I become a Pharmacist?

Pharmacists must have a Doctor of Pharmacy (Pharm.D.) as well as licensure in the state in which they practice. Most pharmacy programs require at least 3 years of undergraduate study, although some require a bachelor's degree. Some programs require applicants take the Pharmacy College Admissions Test (PCAT), however neither CU-Anschutz or Regis currently require this exam as part of their application process. Pharm.D. programs typically take 4 years to complete.

Upon completion of the program, prospective pharmacists must pass two exams to get a license. The North American Pharmacist Licensure Exam (NAPLEX) will test pharmacy skills and knowledge and the Multistate Pharmacy Jurisprudence Exam (MPJE), or an equivalent state-specific test, will cover pharmacy law.

Pharm.D. programs in Colorado can currently be found at two institutions: University of Colorado Anschutz Medical Campus and Regis University. For more information on the admissions process for each of these programs, please refer to the following websites.

- University of Colorado Anschutz Medical Campus - <https://pharmacy.cuanschutz.edu/academics/pharmd>
- Regis University - <https://www.regis.edu/academics/majors-and-programs/graduate/pharmacy-pharmd>

Biology Faculty Advisor who can guide you on this path:

Dr. Jeff Simpson - simpsonj@msudenver.edu

MSU Denver - Department of Biology

Course prerequisites required for those interested in pursuing pharmacy school include:

- **General Biology with lab** – BIO 1080/1090 and BIO 1081/1091; 2 semesters
- **Human Anatomy & Physiology I & II** – BIO 2310 and BIO 2320; 2 semesters
- **General Microbiology** – BIO 2400; 1 semester
- **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
- **Biochemistry I** – CHE 4310, no lab required; 1 semester
- **Math** – MTH 1110 and MTH 1120 (prerequisites for CHE & PHY); 2 semesters
- **Calculus** – MTH 1410; 1 semester
- **Physics** – PHY 2010 or 2311; 1 semester
- **English Composition** – ENG 1010 and ENG 1020; 2 semesters
- **Public Speaking** – COMM 1010; 1 semester
- **Macroeconomics OR Microeconomics** – ECO 2010 or ECO 2020; 1 semester
- **Social Sciences** – cultural anthropology, history, psychology or sociology; 9 semester credits
- **General Education** – does NOT include vocational, arts, crafts or PE courses

MSU Denver - Department of Biology

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?

MSU Denver - Department of Biology

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>	

MSU Denver - Department of Biology

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?