

## BA (Bachelor of Arts) in Molecular Biology

Coursework in Biological Sciences: (44 qtr hrs total that include the following General Requirements, Lab/Research Requirement, and Category Electives)

### General Requirements: (30 hrs)

- BIOL 10xx Concepts series (with labs) (12 hrs)
- BIOL 2120 Cell Structure and Function (with lab) (5 hrs)
- BIOL 2510 General Genetics (with lab) (5 hrs)
- BIOL 3800 Human Molecular Biology (4 hrs)
- BIOL 3xxx any course in addition to lab and category requirements below (4 hrs) (with no more than 5 hrs of BIOL 3991 Independent Study and/or BIOL 3950 Undergraduate Research)

### Molec Biol Lab/Research Requirement: (min of 4 qtr hrs)

- **Either** BIOL 3560 Molec Biol Lab (4 hrs)
- **Or** BIOL 3655 Molec Neuroendocrinology (4 hrs)
- **Or** BIOL 3680 Adv Principles/Techniques in Cell Biology (4 hrs)

### Category Elective Courses: (minimum of 10 qtr hrs with at least one course from each category)

#### Molec Biology Electives

BIOL 3130 Molecular Evolution (4)  
BIOL 3570 Proteins in Biol Sys (3)  
BIOL 3610 Dev Biology (4)  
BIOL 3670 Molec Immunology (4)  
BIOL 3705 Adv Top:Forensic Gen (2)  
BIOL 3910 Virology & Inf Dis (3)  
BIOL 3160 Ion Channels & Disease (3)

#### Cell Biology Electives

BIOL 3120 Gen Microbiology (4)  
BIOL 3640 Intro to Neurobiol (4)  
BIOL 3642 Neuropharm (4)  
BIOL 3650 Endocrinology (4)  
BIOL 3150 Intracell Dynamics (4)

### Chemistry Minor is required: (minimum of 20 qtr hrs)

- CHEM 1010 General Chemistry (with lab) (4 hrs)
- CHEM 2451 Organic Chemistry I (with lab) (4 hrs)
- CHEM 2452 Organic Chemistry II (with lab) (4 hrs)
- CHEM 2xxx (at least 8 additional hrs)

**NOTE:** Many graduate programs (including medical schools) require at least 2 yrs of chemistry - one year of inorganic and one year of organic. Some graduate programs also require or recommend biochemistry. To satisfy a year-long requirement for inorganic chemistry, students should also take CHEM 2130 Chem of the Elements.

### Math: (8 qtr hrs of mathematics/statistics)

- **Either** MATC 1101 Analytical Inquiry I (4 hrs)
  - **or** MATC 1200 Calc for Business and Soc Sci (4 hrs)
  - **or** MATH 1951 Calculus I
- AND**
- **Either** PSYC 2300 Intro to Statistics (5 hrs)
  - **or** BIOL 2090 Biometry (4 hrs) or an approved business stats course

## BS (Bachelor of Science) in Molecular Biology

Coursework in Biological Sciences: (50 qtr hrs total that include the following General Requirements, Lab/Research Requirement, and Category Electives)

### General Requirements: (30 hrs)

- BIOL 101x Concepts series (with labs) (12 hrs)
- BIOL 2120 Cell Structure and Function (with lab) (5 hrs)
- BIOL 2510 General Genetics (with lab) (5 hrs)
- BIOL 3800 Human Molecular Biology (4 hrs)
- BIOL 3xxx any course in addition to lab and category requirements below (4 hrs) (with no more than 6 hrs of BIOL 3991 Independent Study and/or BIOL 3950 Undergraduate Research)

### Molec Biol Lab/Research Requirement: (min of 10 qtr hrs)

#### Thesis Research Option

##### ONE LAB COURSE:

BIOL 3560 Molec Bio Lab (4)  
**OR**  
BIOL 3655 Molec Neuroendo (4)  
**OR**  
BIOL 3680 Tech Cell Biol (4)  
**AND**  
BIOL 3991 Thesis Proposal (2)  
**or** BIOL 3118 IS-Thesis Prep (2)  
**AND**  
BIOL 3950 UG Res (min of 4)

#### Technical Coursework Option

**TWO LAB COURSES:** (Biochem lab can count for ONE lab course but does NOT reduce the required 50 BIOL hrs.)  
**BIOL 3560 Molec Bio Lab (4)**  
**OR**  
**BIOL 3655 Molec Neuroendo (4) OR**  
**BIOL 3680 Tech Cell Biol (4)**  
**AND**  
**BIOL 370x Adv Top Seminar (2)**

### Category Elective Courses: (minimum of 10 qtr hrs with at least one course from each category)

#### Molec Biology Electives

BIOL 3130 Molecular Evolution (4)  
BIOL 3570 Proteins in Biol Sys (3)  
BIOL 3610 Dev Biology (4)  
BIOL 3670 Molec Immunology (4)  
BIOL 3705 Forensic Genetics (2)  
BIOL 3910 Virology & Inf Dis (3)  
BIOL 3160 Ion Channels & Disease (3)

#### Cell Biology Electives

BIOL 3120 Gen Microbiology (4)  
BIOL 3640 Intro to Neurobiol (4)  
BIOL 3642 Neuropharm (4)  
BIOL 3650 Endocrinology (4)  
BIOL 3150 Intracell Dynamics (4)

**Minor coursework requirements: First minor in Chemistry is earned by taking the classes listed below. Second minor is required and can be selected from any other Department or program.**

### Chemistry Minor is required: (minimum of 20 qtr hrs)

- CHEM 1010 General Chemistry (with lab)
- CHEM 245x Organic Chemistry I, II, and III (with labs)
- CHEM 2011 Analysis Equilibrium Systems (with lab)

**NOTE:** Many graduate programs (including medical schools) require at least 2 yrs of chemistry - one year of inorganic and one year of organic. Some graduate programs also require or recommend biochemistry. To satisfy a year-long requirement for inorganic chemistry, students should also take CHEM 2130 Chem of the Elements.

(BS requirements are continued on pg. 2)

## **BS in Molecular Biology (continued from previous page)**

### **Math: (12 qtr hrs of calculus/statistics)**

- **Either** MATH 195x Calculus I, II & III (12 hrs)
- **or** Calc I & II plus stats (BIOL 2090 Biometry, PSYC 2300 Intro to Statistics or an approved business stats course)
- **or** Computer Sciences I-II-III by approval

### **Physics: (15 qtr hrs)**

- PHYS 111x Gen Physics (with labs) **or** PHYS 121x University Physics (with labs)

## **Additional requirements and notes for BA/BS in Molecular Biology**

All Biology majors must satisfy [University Undergraduate Requirements](#)

Advanced Placement (AP) credit for Calculus AB or Calculus BC may count toward the MATH 195x series for either the BA or the BS according to the University approval policy (see the [University of Denver Undergraduate Bulletin](#) for details). Approval through the Department of Mathematics is required.

ONE YEAR OF CALCULUS is recommended by many graduate medical programs and is required for a few.

ONE YEAR OF CALCULUS is required for many graduate research programs in the basic sciences. Check the requirements for the school(s) to which you hope to make application before you decide about math options.

- The **BA degree** requires the major plus **ONE minor**.
- The **BS degree** requires the major plus **TWO minors**. (Chem plus one additional minor).
- A **BA-BA double major** does not require a minor.
- A **BS-BS double major** requires **ONE minor**. (Chem minor is earned by satisfying the chemistry requirement).

To declare a major or minor fill out and submit a Declaration of Major/Minor form to the Registrar's Office. This form is available in the Registrar's office (University Hall) and online <http://www.du.edu/registrar/forms/index.html>