

MOLECULAR AND BIOMEDICAL BIOLOGY, BACHELOR OF SCIENCE

To obtain a BS in Molecular and Biomedical Biology (MBB), a student must fulfill university, college, and department requirements. Minimum hour requirements follow:

- 46 hours of University General Education courses—most commonly, Biology majors do not complete 46 hours of coursework exclusively to meet university General Education requirements, but may reduce this number, possibly to 30 hours or fewer, in following ways:
 - Test out of at least three hours of fundamental academic skills,
 - Take six hours of coursework that meets both the six hours of diversity requirements and six hours of distribution requirements,
 - Meet the seven-hour University General Education natural sciences distribution requirement through completing major courses.
- 12 hours college breadth requirement
- 51 hours of major courses
- Elective hours as required to total of 120 hours

TOTAL HOURS: 120

Requirements

The Bachelor of Science in Molecular and Biomedical Biology degree requires 36-45 credits of biology courses of which 18 credits must be 3000-4000 level courses. The course requirements are below.

Code	Title	Credits
Required Courses		
BIOL 1450	BIOLOGY I	5
BIOL 1750	BIOLOGY II	5
BIOL 2140	GENETICS	4
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL	3
BIOL 3240	INTRODUCTION TO IMMUNOLOGY	3
Biochemistry Lecture and Lab		
Select one of the following:		4
BIOL/CHEM 4650	BIOCHEMISTRY I (with the following lab)	
BIOL/CHEM 4654	BIOCHEMISTRY I LABORATORY	
or		
CHEM 4610	BIOCHEMISTRY OF METABOLISM	
Additional Courses		
Select three of the following, at least two must be lab-based:		10-13
BIOL 4130	MOLECULAR GENETICS	
BIOL 4140	CELLULAR BIOLOGY	
BIOL 4450 & BIOL 4454	VIROLOGY and VIROLOGY LABORATORY	
BIOL 4460	COMPARATIVE IMMUNOLOGY	
BIOL 4640	MOLECULAR MICROBIOLOGY	
BIOL 4810	BEHAVIORAL GENETICS	
BIOL 4850 & BIOL 4830	DEVELOPMENTAL BIOLOGY and DEVELOPMENTAL GENETICS	
BIOL 4860	COMPARATIVE GENOMICS	
BIOL/CHEM 4660	BIOCHEMISTRY II	
BIOL/CHEM 4664	BIOCHEMISTRY II LABORATORY	
BIOL 4760	GENOME TECHNOLOGY AND ANALYSIS	
BIOL/NEUR 4870	MOLECULAR AND CELLULAR NEUROBIOLOGY	

Required Chemistry Sequence

CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY	4
CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY	4
CHEM 2250	ORGANIC CHEMISTRY I	3
CHEM 2260	ORGANIC CHEMISTRY II	3
CHEM 2274	ORGANIC CHEMISTRY LABORATORY	2

Physics

PHYS 1110 or PHYS 2110	GENERAL PHYSICS I	4
PHYS 1154	GENERAL PHYSICS I - CALCULUS LEVEL	1

Mathematics

Two courses in mathematics or statistics are required and must include one of the following calculus courses:

MATH 1930	CALCULUS FOR THE MANAGERIAL, LIFE, AND SOCIAL SCIENCES (3 cr)	6
MATH 1940	CALCULUS FOR BIOMEDICINE (5 cr)	
MATH 1950	CALCULUS I (5 cr)	

To complete the degree, students choose one of the following two tracks:

Track 1: Molecular Biotechnology

This track will position students to excel in graduate, medical, business, or law schools, as well as industry careers. Students will have about 10 hours of free electives with this track.

Code	Title	Credits
Internship		3
BIOL 4550	MOLECULAR AND BIOMEDICAL BIOLOGY INTERNSHIP	
Six hours in Information, Innovation, and Development		6
BIOI 2000	FOUNDATIONS OF BIOINFORMATICS	
BIOI 3000	APPLIED BIOINFORMATICS	
ITIN 1110	INTRODUCTION TO IT INNOVATION	
ITIN 2220	APPLIED I.T. INNOVATION	
ENTR 3710	ENTREPRENEURIAL FOUNDATIONS	
ENTR 4740	TECHNOLOGY AND INNOVATION MANAGEMENT	
ACCT 2010	PRINCIPLES OF ACCOUNTING I	
MGMT 3490	MANAGING PEOPLE AND ORGANIZATIONS	
STAT 4410	INTRODUCTION TO DATA SCIENCE	
Track 1 Total Credits		70-73

Track 2: Biomedical Humanities

This is a path to prepare students for success in healthcare and affiliated training programs. Students will have approximately 4 hours of free electives with this track. Requires completion of minor in Medical Humanities (<http://catalog.unomaha.edu/undergraduate/college-arts-sciences/medical-humanities/>). BIOL 1060 Intro to Health Careers and Ethics must be taken as part of the minor and nine credits must be in upper division (3000 or higher) courses.

Code	Title	Credits
Track 2 Total Credits		76-79

Writing in the Discipline

All students are required to take a writing in the discipline course within their major. For the Molecular and Biomedical Biology major, the writing in the discipline requirement can be fulfilled by completing a sequence of approved biology courses at UNO that incorporate discipline specific writing as part of their requirements. To satisfy the requirement for the writing in the discipline course students must complete BIOL 1450 AND BIOL 1750, two courses from BIOL 2140, BIOL 3020 and BIOL 3340 and two additional 3000/4000 level courses that are approved as meeting the writing requirement by the Department of Biology. Only courses taken at UNO and after January 1, 2010 can be applied to this requirement. Students not meeting the writing requirement through this sequence of courses will fulfill the writing requirement by completing BIOL 3150, ENGL 3980, or another college-approved advanced writing course.

Track 1: Molecular Biotechnology Track

Freshman

Fall		Credits
ENGL 1150	ENGLISH COMPOSITION I	3
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS or ARGUMENTATION AND DEBATE	3
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY	4
BIOL 1450	BIOLOGY I	5
Credits		15

Spring

ENGL 1160	ENGLISH COMPOSITION II	3
CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY	4
BIOL 1750	BIOLOGY II	5
Humanities/Fine Arts Course		3
Credits		15

Sophomore

Fall		Credits
Calculus Course*		3-5
CHEM 2250	ORGANIC CHEMISTRY I	3
BIOL 2140	GENETICS	4
Social Sciences		3
US Diversity if 3 credit Calculus course was taken.		3
*Calculus options include MATH 1930, MATH 1940, or MATH 1950. Prerequisites vary.		
Credits		16-18

Spring

CHEM 2260 & CHEM 2274	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LABORATORY	5
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL	3
Math or Statistics		3
Humanities/Fine Arts		3
Credits		14

Junior

Fall		Credits
CHEM 4650 & CHEM 4654	BIOCHEMISTRY I and BIOCHEMISTRY I LABORATORY	4
BIOL 3240	INTRODUCTION TO IMMUNOLOGY	3
Humanities/Fine Arts***		3
Social Sciences		3
Course towards Minor/2nd Major or Elective^		3

***HFA course must be in a 2nd field.

^Students must have a minimum of 120 credits, with 27 upper-level credits (3000-4000 level) throughout the degree, 18 of which must come from the major. Biology and Chemistry classes required for the major will include at least 24 credits at the 3000-4000 level so 3 additional credit hours will need to be at 3000-4000 level somewhere in the degree program.

Credits		16
Spring		
Upper Level BIOL course with Lab*		4
PHYS 1110 & PHYS 1154	GENERAL PHYSICS I and GENERAL PHYSICS LABORATORY I	5
Course in Information, Innovation, and Development***		3
Course towards Minor/2nd Major or Elective^		3
*Approved Upper Level BIOL courses include: BIOL 4130, BIOL 4140, BIOL 4450/ BIOL 4454, BIOL 4460, BIOL 4640, BIOL 4760, BIOL 4810, BIOL 4850, BIOL 4830, BIOL 4860, NEUR 4870, or CHEM 4660/ CHEM 4664. At least two of the three required upper level BIOL courses must have a lab.		
***Approved IDD courses include: BIOI 2000, 3000, ITIN 1110, 2220, ENTR 3710, 4740, ACCT 2010, MGMT 3490, STAT 4410. BIOI 3000 requires BIOI 2000, ITIN 2220 requires ITIN 1110, ENTR 4740 requires ENTR 3710, and MGMT 3490 requires ACCT 2010.		

Credits		15
Senior		
Fall		
Upper Level BIOL Course with lab*		4
Social Sciences**		3
Global Diversity		3
Course in Information, Innovation, and Development***		3
Course towards Minor/2nd Major or Elective^		2-3
*Approved Upper Level BIOL courses include: BIOL 4130, BIOL 4140, BIOL 4450/BIOL 4454, BIOL 4460, BIOL 4640, BIOL 4760, BIOL 4810, BIOL 4850, BIOL 4830, BIOL 4860, NEUR 4870, or CHEM 4660/4664. At least two of the three required upper level BIOL courses must have a lab.		
**Social Sciences course must be in a 2nd field.		
***Approved IDD courses include: BIOI 2000, 3000, ITIN 1110, 2220, ENTR 3710, 4740, ACCT 2010, MGMT 3490, STAT 4410. BIOI 3000 requires BIOI 2000, ITIN 2220 requires ITIN 1110, ENTR 4740 requires ENTR 3710, and MGMT 3490 requires ACCT 2010.		

^Students must have a minimum of 120 credits, with 27 upper-level credits (3000-4000 level) throughout the degree, 18 of which must come from the major. Biology and Chemistry classes required for the major will include at least 24 credits at the 3000-4000 level so 3 additional credit hours will need to be at 3000-4000 level somewhere in the degree program.

Credits		15-16
Spring		
Upper Level BIOL Course*		3-4
BIOL 4550	MOLECULAR AND BIOMEDICAL BIOLOGY INTERNSHIP (**)	3
US Diversity if 3-credit Calculus was taken; or if 5-credit Calculus was taken, course towards Minor/2nd Major or Elective^		3
Course towards Minor/2nd Major or Elective^		3
Course towards Minor/2nd Major or Elective^		2-3

*Approved Upper Level BIOL courses include: BIOL 4130, BIOL 4140, BIOL 4450/BIOL 4454, BIOL 4460, BIOL 4640, BIOL 4760, BIOL 4810, BIOL 4850, BIOL 4830, BIOL 4860, NEUR 4870, or CHEM 4660/4664. At least two of the three required upper level BIOL courses must have a lab.

**Requires a 4000-level upper level MBB course as a co- or prerequisite.

^Students must have a minimum of 120 credits, with 27 upper-level credits (3000-4000 level) throughout the degree, 18 of which must come from the major. Biology and Chemistry classes required for the major will include at least 24 credits at the 3000-4000 level so 3 additional credit hours will need to be at 3000-4000 level somewhere in the degree program.

Credits	14-16
Total Credits	120-125

Track 2: Biomedical Humanities Track

Freshman

	Credits
Fall	
ENGL 1150	ENGLISH COMPOSITION I 3
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS or ARGUMENTATION AND DEBATE 3
MATH 1320/ or MATH 1300	PRE-CALCULUS ALGEBRA (**) or COLLEGE ALGEBRA WITH SUPPORT 3-4
BIOL 1450	BIOLOGY I 5
BIOL 1060	INTRODUCTION TO MEDICAL CAREERS & ETHICS (^) 2

**MATH 1300 or 1320: See the catalog for the most up-to-date prerequisites.

^BIOL 1060 is required within the Medical Humanities minor/
Biomedical Humanities Track.

Credits	16-17
Spring	
ENGL 1160	ENGLISH COMPOSITION II 3
Humanities/Fine Arts Course + Global Diversity course	3
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY 4
BIOL 1750	BIOLOGY II 5

Credits	15
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Sophomore

	Credits
Fall	
CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY 4
Medical Humanities Minor Course – Lower Level	3
Humanities/Fine Arts	3
Social Science + US Diversity Course	3
Calculus Course**	3-5

**Calculus options include: MATH 1930, 1940, 1950.

Credits	16-18
Spring	
CHEM 2250	ORGANIC CHEMISTRY I 3
BIOL 2140	GENETICS 4
Social Science	3
Humanities/Fine Arts***	3
Elective	2-3

***HFA course must come from a 2nd discipline.

Credits	15-16
Junior	
Fall	
CHEM 2260 & CHEM 2274	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LABORATORY 5
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL 3
Elective	3
Ethical/Religious/Cross-cultural course for minor^	3
^The Medical Humanities minor requires 15 credits, of which 9 must be 3000-4000 level. Take an upper or lower level course, accordingly.	

Credits	14
Spring	
CHEM 4610	BIOCHEMISTRY OF METABOLISM 4
BIOL 3240	INTRODUCTION TO IMMUNOLOGY 3
Upper Level BIOL course with Lab***	4
Race/Ethnicity/Gender/Sex/Age course for minor^	3
Elective	1
*** Approved Upper Level BIOL courses include: BIOL 4130, BIOL 4140, BIOL 4450/BIOL 4454, BIOL 4460, BIOL 4640, BIOL 4760, BIOL 4810, BIOL 4850, BIOL 4830, BIOL 4860, NEUR 4870, or CHEM 4660/4664. At least two of the three required upper level BIOL courses must have a lab.	

Credits	15
Senior	
Fall	
Upper Level BIOL Course*	3
PHYS 1110 & PHYS 1154	GENERAL PHYSICS I and GENERAL PHYSICS LABORATORY I 5
Medical humanities minor course^	3
Elective or Medical humanities minor course	1-3
Elective***	3

*Approved Upper Level BIOL courses include: BIOL 4130, BIOL 4140, BIOL 4450/BIOL 4454, BIOL 4460, BIOL 4640, BIOL 4760, BIOL 4810, BIOL 4850, BIOL 4830, BIOL 4860, NEUR 4870, or CHEM 4660/4664. At least two of the three required upper level BIOL courses must have a lab.

***Students must have a minimum of 120 credits, with 27 upper-level credits throughout the degree and 18 of those upper level credits must be concentrated in the major. Electives may need to be selected at the 3000-4000 level to reach these minimums.

^The Medical Humanities minor requires 15 credits, of which 9 must be 3000-4000 level. Take an upper or lower level course, accordingly.

Credits	15-17
Spring	
Upper Level BIOL Course with Lab^ w	4
Narrative medicine/Communication course for minor^	3
Elective**	3
Elective**	1
Social Science***	3

*Approved Upper Level BIOL courses include: BIOL 4130, BIOL 4140, BIOL 4450/BIOL 4454, BIOL 4460, BIOL 4640, BIOL 4760, BIOL 4810, BIOL 4850, BIOL 4830, BIOL 4860, NEUR 4870, or CHEM 4660/4664. At least two of the three required upper level BIOL courses must have a lab.

w Meets Advanced Writing requirement: BIOL 4130, BIOL 4140, BIOL 4450/BIOL 4454, BIOL 4640, BIOL 4850, BIOL 4830, CHEM 4660/4664. Alternatively, students may meet the writing requirement by completing BIOL 3150 Writing in Biology or ENGL 3980 Technical Writing Across the Disciplines.

^The Medical Humanities minor requires 15 credits, of which 9 must be 3000-4000 level. Take an upper or lower level course, accordingly.

**Students must have a minimum of 120 credits, with 27 upper-level credits throughout the degree and 18 of those upper level credits must be concentrated in the major. Electives may need to be selected at the 3000-4000 level to reach these minimums.

***SS must come from a 2nd discipline.

Credits	14
Total Credits	120-126

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

This plan is not a contract and curriculum is subject to change.

Additional Information About this Plan:

University Degree Requirements: The minimum number of hours for a UNO undergraduate degree is 120 credit hours. Please review the requirements for your specific program to determine all requirements for the program. In order to graduate on-time (four years for an undergraduate degree), you need to take 30 hours each year.

Placement Exams: For Math, English, Foreign Language, a placement exam may be required. More information on these exams can be found at <https://www.unomaha.edu/enrollment-management/testing-center/placement-exams/information.php>

**Transfer credit or placement exam scores may change suggested plan of study

GPA Requirements: 2.0