

# Biology Major: Molecular Genetics and Cell Biology Concentration - Bachelor of Science (BS)

## Major requirements

(All colleges)

39 credits (71 total credits including CHM and MTH requirements)

*Each student must have a minimum of three 400 level BIO credits (excluding BIO 450, 479, 489, 491, 495, and 499) to fulfill requirements of the major.*

Code	Title	Credits
<b>Core</b>		
BIO 105	General Biology	4
BIO 203	Organismal Biology	4
BIO 306	Genetics	4
BIO 307	Ecology	3
BIO 315	Cell Biology	4
BIO 435	Molecular Biology	3
BIO 436	Molecular Biology Laboratory	1
or BIO 468	Human Molecular Genetics Lab	
BIO 440	Bioinformatics	2
BIO 491	Capstone Seminar in Biology	1
<b>Electives</b>		
Select 13 credits of electives from the following: <sup>1</sup>		13
BIO 202	Introduction to Biological Data Analysis and Interpretation	
BIO 303	Vertebrate Form and Function <sup>2</sup>	
BIO 312	Human Anatomy and Physiology I <sup>2</sup>	
BIO 313	Human Anatomy and Physiology II <sup>2</sup>	
BIO 333	Radiation Biology	
BIO 337	Plant Physiology	
BIO 406	Parasitology	
BIO 408	Developmental Biology	
BIO 410	Human Cadaver Dissection	
BIO 412	Mycology	
BIO 413	Medical Mycology	
BIO 424	Human Endocrinology	
BIO 428	Advanced Nutrition for the Health Professions	
BIO 429	Evolution	
BIO 432	Biology of Cancer	
BIO 436	Molecular Biology Laboratory	
BIO 443	Molecular Mechanism of Disease and Drug Action	
BIO 449	Advanced Microscopy and Biological Imaging	
BIO 466	Human Molecular Genetics	
BIO 468	Human Molecular Genetics Lab	

BIO 483	Cell Signaling
MIC 230	Fundamentals of Microbiology
MIC 310	Immunology
MIC 410	Immunology Laboratory
MIC 420	Introductory Virology
MIC 421	Virology Laboratory
MIC 427	Industrial and Fermentation Microbiology

### Chemistry requirement

Select a minimum of 24 chemistry credits including: 24

CHM 103	General Chemistry I
CHM 104	General Chemistry II
CHM 301	Analytical Chemistry

One of the following organic chemistry options:

Option A (5 credits) <sup>3</sup>

CHM 300	Fundamental Organic Chemistry
& CHM 302	and Fundamental Organic Chemistry Laboratory
Option B (7 credits)	

CHM 303	Organic Chemistry Theory I
& CHM 304	and Organic Chemistry Theory II
& CHM 302	and Fundamental Organic Chemistry Laboratory

Option C (8 credits)

CHM 303	Organic Chemistry Theory I
& CHM 304	and Organic Chemistry Theory II
& CHM 305	and Organic Chemistry Laboratory

And one of the following:

CHM 325	Fundamental Biochemistry
CHM 417	Biochemistry I: Macromolecules
& CHM 418	and Biochemistry II: Metabolism and Genetic Information

### Math requirement

Select a minimum of eight credits of mathematics, including the following: 8

STAT 145	Elementary Statistics
or MTH 265	Mathematical Models in Biology
MTH 175	Applied Calculus
or MTH 207	Calculus I

**Total Credits** 71

<sup>1</sup> Up to two credits from BIO 450, BIO 479, BIO 489, BIO 495, and BIO 499 may count toward the major.

<sup>2</sup> A maximum of eight credits of BIO 303, BIO 312, BIO 313 can be applied to the major.

<sup>3</sup> This is the recommended option for most biology majors, but students should consult with their biology advisor before enrolling.

## Degree requirements

All students must complete the general education, college core, major/minor, and university degree requirements in order to qualify for a degree. The easiest way to track all of these requirements is to refer to the Advisement Report (AR) found in the Student Information System (WINGS) Student Center. All enrolled students have access to the AR.

- General education (<http://catalog.uwlax.edu/undergraduate/generaleducation/>)
- College core (p. 2)
- Baccalaureate degree requirements (p. 2)

## College of Science and Health (CSH) Bachelor of Science core requirements

B.S. and B.A. students graduating from the College of Science and Health are required to take two natural laboratory science courses selected from the general education laboratory science category (GE 05) and/or from BIO 203, BIO 304, BIO 210, CHM 104, GEO 221, GEO 222, PHY 104 or PHY 204, and they either must take two mathematics courses or one math course and one computer science course from the math/logical systems category of the general education requirements (GE 02). One of the two science courses must be from a department outside of the student's major department.

**Note:** Math courses can be pairs, i.e. 150 and 151; MTH/CS majors can use two science courses from same department.

**For the Bachelor of Science degree**, in addition to all other College of Science and Health core requirements, students from non-exempted programs<sup>1</sup> must complete one of the following options. It is recommended that courses are selected in consultation with students' academic advisor.

1. Complete a second major; or
2. Complete a minor outside the major; or
3. Complete an individualized option, consisting of 18 credits
  - a. At least 12 credits must be earned at the 300/400 level outside the major department.
  - b. The remaining six credits should come from
    - i. 100 level or higher courses outside the major (General education courses may apply provided they are not being used to fulfill minimum general education requirements.); or
    - ii. 300/400 level courses inside major not being used to fulfill major requirements.
  - c. Internship credits may not count toward the individualized option.

<sup>1</sup> The list of exempted CSH programs is below.

## Baccalaureate degree requirements

Candidates for the Bachelor of Arts or the Bachelor of Science degrees must accomplish the following:

1. Fulfill the general education requirements.
2. Complete at least one ethnic studies (diversity) course.
3. Complete the courses prescribed by the Undergraduate Curriculum Committee for the degree desired in the respective school or college.
4. Earn a minimum of 120 semester credits with at least a 2.00 cumulative GPA.<sup>1, 2</sup>
5. At least 40 credits must be earned in 300/400 level courses. Transfer courses earned or transferred at the 300/400 level apply to this requirement.
6. Complete major and minor requirements with at least a 2.00 GPA<sup>1, 2</sup> in each major and minor (and concentration or emphasis, if selected).

7. A minimum of 30 semester credits in residence at UWL is required for graduation. (See undergraduate resident requirement (<http://catalog.uwlax.edu/undergraduate/academicpolicies/graduation/#undergraduate-residence-requirement>)).
8. Submit an application for graduation via the "Apply for Graduation" link in the WINGS Student Center as soon as the student has registered for his or her final semester or summer term in residence. December and winter intersession graduates should apply by May 1. May and summer graduates should apply by December 1.

- <sup>1</sup> Grade point average requirements for some programs will be considerably higher than 2.00. Re-entering students may be required to earn credits in excess of the 120 needed for graduation in any curriculum in order to replace credits earned in courses in which the content has changed substantially in recent years. Each case will be judged on its own merit.
- <sup>2</sup> The grade point average recorded at the time the degree is awarded will not be affected by future enrollment.

**No degree will be awarded unless all requirements are fulfilled and recorded within 30 days after the official ending date of each term.**

## Sample degree plan

Below is a sample degree plan that can be used as a guide to identify courses required to fulfill the major and other requirements needed for degree completion. A student's actual degree plan may differ depending on the course of study selected (second major, minor, etc.). Also, this sample plan assumes readiness for each course and/or major plan, and some courses may not be offered every term. Review the course descriptions or the class timetable (<http://www.uwlax.edu/Records/regISTRATION/>) for course offering information.

The sample degree plans represented in this catalog are intended for first-year students entering UWL in the fall term. Students should use the Advisement Report (AR) in WINGS (<https://wings.uwlax.edu>) and work closely with their faculty advisor(s) and college dean's office to ensure declaration and completion of all requirements in a timely manner.

### General Education Program

The general education curriculum (Gen Ed) is the common educational experience for all undergraduates at UWL. Sample degree plans include Gen Ed placeholders to ensure completion of the general education requirements. Courses may be rearranged to fit the needs or recommendations of the student's program of study. Gen Ed courses may be taken during winter term (January between the semesters) and summer to reduce the course load during regular terms (fall and spring). Students should consult with their advisor and/or the college academic services director in their college/school for assistance with course and schedule planning. Refer to the general education requirements (<http://catalog.uwlax.edu/undergraduate/generaleducation/>) for more specific details.

At least 40 credits of the 120 credits required must be earned at the 300/400-level.

**Note:** New students and transfer students with 15 or fewer credits earned are required to take FYS 100 First-Year Seminar (3 cr.) during one of their first two semesters at UWL.

*This sample degree plan does not establish a contractual agreement. It identifies the minimum requirements a student must successfully complete, to qualify for a degree, in a format intended to assist the student in planning their academic career. Actual degree plans may differ.*

**Year 1**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
BIO 105 (Gen Ed Natural Lab Science)	4 BIO 203	4
CST 110 (Gen Ed Literacy-Oral)	3 CHM 103 (Gen Ed Natural Lab Science)	5
MTH 207 or 175 (Gen Ed Math)	5 ENG 110 or 112 (Gen Ed Literacy-Written)	3
Gen Ed World History	3 FYS 100 (Gen Ed First-Year Seminar)	3
	<b>15</b>	<b>15</b>

**Year 2**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
STAT 145 (Gen Ed Lang/ Logical Systems)	4 CHM 300	4
BIO 307	3 CHM 302	1
CHM 104	5 BIO 306	4
Gen Ed Arts	2-3 Gen Ed Global Studies	3
	Gen Ed Minority Cultures	3
	Gen Ed Arts	2-3
	<b>14</b>	<b>17</b>

**Year 3**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
BIO Elective	3 BIO 315	4
BIO Elective	3 CHM 325	4
CHM 301	5 Gen Ed Health & Well-Being	3
Gen Ed Humanistic Studies	3 Gen Ed Self & Society	3
	University Elective	3
	<b>14</b>	<b>17</b>

**Year 4**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
BIO 435	3 BIO 440	2
BIO 436 or 468	1 BIO 491	1
BIO Elective	3 BIO Elective (400 level)	4
CSH Core or Minor <sup>1</sup>	3 CSH Core or Minor <sup>1</sup>	3
University Elective	3 University Elective	2
	University Elective	3
	<b>13</b>	<b>15</b>

**Total Credits: 120**

<sup>1</sup> See CSH BS Core Requirements (<http://catalog.uwlax.edu/undergraduate/scienceandhealth/#bs-core>) for information on completing the individualized option. 300/400 requirements for graduation may be impacted.