

# BIOCHEMISTRY/ MOLECULAR BIOLOGY, COMPREHENSIVE MAJOR

Liberal Arts (Code 090-001)

## University Requirements

### GRADUATION REQUIREMENTS FOR BACCALAUREATE DEGREE

Credit Requirements	
Minimum total for graduation <sup>1</sup>	120
Upper division credits (courses numbered 300 and higher)	39
Liberal Education Core ( <a href="http://catalog.uwec.edu/undergraduate/graduation-requirements/#header1">http://catalog.uwec.edu/undergraduate/graduation-requirements/#header1</a> )	36
Academic Concentrations ( <a href="http://catalog.uwec.edu/undergraduate/graduation-requirements/#header16">http://catalog.uwec.edu/undergraduate/graduation-requirements/#header16</a> )	
Grade Point Requirements ( <a href="http://catalog.uwec.edu/undergraduate/graduation-requirements/#header14">http://catalog.uwec.edu/undergraduate/graduation-requirements/#header14</a> ) <sup>2</sup>	
Total	2.00 average
Resident	2.00 average
Major	2.00 average
Minor	2.00 average
Certificate	2.00 average
University Residency Requirements ( <a href="http://catalog.uwec.edu/undergraduate/graduation-requirements/#header15">http://catalog.uwec.edu/undergraduate/graduation-requirements/#header15</a> )	
Minimum total	30
Senior year	23
Major, Standard, upper division in residence	12
Major, Comprehensive, upper division in residence	21
Certificate	25 percent of credits

### Procedures Required for Graduation

Obtain admission to the degree program and/or the College offering it.

Apply for graduation on CampS.

<sup>1</sup> Certain programs exceed this minimum.

<sup>2</sup> See special requirements in each College.

## Applicability of Credits Toward Graduation

**Junior College or Two-Year College Credits.** A maximum of 72 semester credits earned in a junior college or two-year college will be accepted as degree credits at UW-Eau Claire.

**Extension Credits.** Credits earned in credit outreach courses offered by UW-Eau Claire are treated as resident credits. Credits earned in extension courses offered by other units of the University of Wisconsin System are treated as transfer credits. All other (non-UW) extension and correspondence credits are normally limited to one-fourth of the total required for graduation from any curriculum.

**WTCS Credits.** A maximum of 72 semester credits earned in college parallel programs at Madison Area Technical College, Milwaukee Area Technical College, Nicolet Area Technical College, or Chippewa Valley Technical

College may be accepted as degree credits at UW-Eau Claire. A set number of general education courses will be accepted from other technical schools. Occupational and technical courses may also be considered for transfer if the quality and content of the course work from the technical college is judged to be comparable to course work at UW-Eau Claire. Refer to the Transfer Credit Wizard ([https://my.uwec.edu/psp/PUBLIC/EMPLOYEE/HRMS/c/EAU\\_SS\\_CUSTOM.EAU\\_TRNCRDZWZ.GBL](https://my.uwec.edu/psp/PUBLIC/EMPLOYEE/HRMS/c/EAU_SS_CUSTOM.EAU_TRNCRDZWZ.GBL)) or contact the UW-Eau Claire Admissions Office for information about the current transfer policy.

**USAFI Credit.** UW-Eau Claire will accept up to 32 semester credits for work done through the United States Armed Forces Institute, under the provision for non-UW correspondence credit (see Extension Credits above).

**Activity Credit (band, chorus, drama, KINS 100-184 courses)** Students may count toward graduation no more than one credit of KINS 110-184 courses. Students may count toward graduation no more than four credits earned in any single activity course and no more than 12 credits resulting from any combination of activity courses (excluding KINS 110-184 courses).

**Other Restricted Credits.** For other University restrictions, see the following: Cooperative Education; Credit by Examination; Satisfactory/Unsatisfactory Registration; Transfer of Credits. College or departmental restrictions may also be placed on Independent Study (399-499 courses), Directed Study (395-495), and other types of credits.

APPLICABILITY OF CREDITS TOWARD GRADUATION	Credit Restrictions
<b>Satisfactory/Unsatisfactory</b>	
Total degree credit	maximum 12
Major, Standard	maximum 1 course
Major, Comprehensive	maximum 2 courses
Minor	maximum 1 course
<b>Credit by Examination</b>	
Total degree credit	maximum ¼ of total
Major or minor	maximum ½ of total
<b>Two-Year College Credits</b>	
Total degree credit	maximum 72 credits
<b>Activity credit (band, chorus, drama, KINS 100-184)</b>	
Total KINS 100-184	maximum 1 credit
Total Band, chorus, drama	maximum 12 credits
Single course band, chorus, drama	maximum 4 credits
<b>Extension credits</b>	
UW-System	no maximum
Other extension/correspondence	maximum ¼ of total
<b>USAFI</b>	
USAFI	maximum 32 credits

## Liberal Education Core

The University of Wisconsin-Eau Claire measures learning outcomes to ensure that its graduates have achieved a liberal education and prepared themselves to contribute to a complex society. Upon graduation, each undergraduate will have met the five learning goals of our liberal education core and the 12 learning outcomes they comprise.

### LIBERAL EDUCATION CORE REQUIREMENTS

a minimum of  
36 credits

#### Knowledge Goal

Knowledge Outcome 1 (K1): Natural Sciences (<http://catalog.uwec.edu/undergraduate/attribute-k1/>) Two (2) learning experiences

One experience in laboratory science must be selected from either K1 or K2.

Knowledge Outcome 2 (K2): Social Sciences (<http://catalog.uwec.edu/undergraduate/attribute-k2/>) Two (2) learning experiences

One experience in laboratory science must be selected from either K1 or K2.

Knowledge Outcome 3 (K3): Humanities (<http://catalog.uwec.edu/undergraduate/attribute-k3/>) Two (2) learning experiences

Knowledge Outcome 4 (K4): Fine Arts (<http://catalog.uwec.edu/undergraduate/attribute-k4/>) One (1) learning experience

#### Skills Goal

Skills Outcome 1 (S1): Written and Oral Communication (<http://catalog.uwec.edu/undergraduate/attribute-S1/>) Two (2) learning experiences

One S1 must meet the University Writing Requirement (<http://catalog.uwec.edu/undergraduate/graduation-requirements/#header10>)

Skills Outcome 2 (S2): Mathematics (<http://catalog.uwec.edu/undergraduate/attribute-S2/>) One (1) learning experience

One S2 to meet the University Mathematics Requirement (<http://catalog.uwec.edu/undergraduate/graduation-requirements/#header11>)

Skills Outcome 3 (S3): Creativity (<http://catalog.uwec.edu/undergraduate/attribute-S3/>) One (1) learning experience

#### Responsibility Goal

Responsibility Outcome 1 (R1): Equity, Diversity, and Inclusivity (<http://catalog.uwec.edu/undergraduate/attribute-R1/>) Two (2) learning experiences

One R1 must satisfy Design for Diversity (<http://catalog.uwec.edu/undergraduate/attribute-DDIV/#header13>)

Responsibility Outcome 2 (R2): Global Perspectives (<http://catalog.uwec.edu/undergraduate/attribute-R2/>) One (1) learning experience

Responsibility Outcome 3 (R3): Civic and Environmental Issues (<http://catalog.uwec.edu/undergraduate/attribute-R3/>) One (1) learning experience

#### Integration Goal

Integration Outcome 1 (I1): Integration (<http://catalog.uwec.edu/undergraduate/attribute-I1/>) Two (2) learning experiences

#### Service-Learning Goal

Service-Learning (<http://catalog.uwec.edu/undergraduate/attribute-SL/#header13>) 30 hours

## College Degree Requirements

### Bachelor of Arts or Bachelor of Science Degree (B.A./B.S.)

**University Graduation Requirements.** All candidates for degrees must fulfill the requirements for credits, curriculum, GPA, and University residency as specified in the section of this catalog titled University Graduation Requirements (<http://catalog.uwec.edu/undergraduate/graduation-requirements/>).

**College Graduation Requirements: Grade Point Averages.** All candidates for degrees in the College of Arts and Sciences must earn minimum resident and total GPAs of 2.00 in the major, the minor, and the certificate. The resident and total GPAs for the major are computed using all attempted credits applicable to the major including those offered by departments other than the major department. The resident and total GPAs for the minor and the certificate are computed similarly.

**Major-Minor and Major-Certificate Requirements.** A standard major (a minimum of 36 credits) must be supplemented by a minor (a minimum of 24 credits) or by a certificate (12 to 18 credits) to meet graduation requirements for completing a first and second degree program. No minor or certificate is required with a Comprehensive Major (60 or more credits) or with two majors of 36 or more credits each.

Certain degree programs, which include Comprehensive Majors, may require more than the minimum of 120 credits for graduation.

Acceptable academic program combinations are determined at the college level. A major and a minor or a major and certificate or two majors (if available) may not be elected in the same department or program, except in the approved combinations listed here (<http://catalog.uwec.edu/undergraduate/arts-sciences/#academicprogramstext>).

**College Credits.** Earn at least 90 credits in courses offered by the College of Arts and Sciences.

### Bachelor of Arts Degree in the College of Arts and Sciences (B.A.)

Fulfillment of all University Graduation Requirements (which includes the Liberal Education Core); all College-level degree requirements (major and minor/certificate emphases, GPAs, earning at least 90 credits in Arts and Sciences course work); foreign language competency at the 102 level. Foreign language competency may be met in one of two ways: (1) Achieve a score on the foreign language placement test that qualifies the student to enter the 201-level course in a foreign language. (2) Earn a grade of at least C (not C-) or a mark of S in a 102-level foreign language course (or AIS 112 or AIS 122 or CSD 103).

### Bachelor of Science Degree in the College of Arts and Sciences (B.S.)

Fulfillment of all University Graduation Requirements (which includes the Liberal Education Core); all College-level degree requirements (major and minor/certificate emphases, GPAs, earning at least 90 credits in Arts and Sciences course work); mathematics competency at the MATH 111, MATH 112

or MATH 113 level. Mathematics competency can be met in one of three ways:

(1) Achieve a score on the mathematics placement test that qualifies the student to enter MATH 114. (2) Earn a grade of at least C (not C-) or a mark of 5 in MATH 111, MATH 112, or MATH 113. (3) Achieve a satisfactory score on the MATH 112 competency test. This test may be attempted no more than two times.

## Major Requirements

### Liberal Arts (Code 090-001)

Advisors: J. Anderson (Biology), T. Doyon (Chemistry and Biochemistry), D. Gingerich (Biology), S. Hati (Chemistry and Biochemistry), J. Lyman Gingerich (Biology), S. Showsh (Biology).

The Biochemistry/Molecular Biology major prepares students for entry-level employment opportunities in research and development in industrial and government laboratories as well as graduate programs in molecular biology, genetics, pharmacology, biochemistry and related fields (see NOTE 2 below). This program also provides effective preparation for admission to professional schools in medicine, osteopathy, pharmacy, and dentistry. Biochemistry/Molecular Biology majors are eligible to apply for Departmental Honors in Biology or Chemistry and Biochemistry (see each department page for criteria).

Biochemistry/Molecular Biology

Code	Title	Credits
A minimum of 69 semester credits, including:		
<b>I. Biology Course Requirements</b>		
(minimum of 26 credits)		
BIOL 221	Foundations of Biology I	4
BIOL 222	Foundations of Biology II	3
BIOL 223	Foundations of Biological Inquiry	2
BIOL 305	Molecular and Cell Biology	4
BIOL 323	Genetics	3
BIOL 324	Genetics Inquiry	2
BIOL 405	Advanced Cell and Molecular Lab	4
BIOL 409	Molecular Genetics	4
<b>II. Chemistry Course Requirements</b>		
(minimum of 30 credits)		
CHEM 115	Chemical Principles	6
CHEM 213	Quantitative Analysis	4
CHEM 325	Organic Chemistry I with Laboratory	4
CHEM 326	Organic Chemistry II with Laboratory	4
CHEM 406	Biophysical Chemistry	4
CHEM 452	Biochemistry I	3
CHEM 454	Biochemistry II	3
CHEM 453	Biochemistry Laboratory	2
<b>III. Other Course Requirements</b>		
(minimum of 13 credits)		
MATH 114	Calculus I	4
PHYS 211	General Physics	5
PHYS 212	General Physics	4

Note 1: CHEM 105, CHEM 106, and CHEM 109 may be substituted for CHEM 115, but only six of the credits count toward the major.

Note 2: CHEM 433 (CHEM 434 optional) may be substituted for CHEM 406 (MATH 215 and PHYS 231, PHYS 232 required if CHEM 433 (CHEM 434) is taken.) This substitution is strongly recommended for students considering doctoral study in biophysics or physical biochemistry.

Note 3: Students are also encouraged to seek out a collaborative research experience or do independent study (BIOL 399, BIOL 499, CHEM 399, CHEM 497, or CHEM 499) in addition to their formal course work.

## Program Learning Outcomes

Students completing this program will be expected to meet the following learning outcomes:

- Demonstrate an understanding of foundational biological principles in the areas of information flow, exchange, and storage, pathways and transformations of energy and matter, structure and function, and systems and evolution.
- Apply the process of science.
- Communicate and collaborate and to recognize the interdisciplinary nature of science.
- Use quantitative reasoning, models and/or simulation.
- Understand the relationship between science and society.