

# CHEMISTRY, MAJOR - LIBERAL ARTS

Liberal Arts (Code 100-201)

## 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\\_TRNCRDWZ.GBL](https://my.uwec.edu/psp/PUBLIC/EMPLOYEE/HRMS/c/EAU_SS_CUSTOM.EAU_TRNCRDWZ.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
<b>Knowledge Goal</b>	
Knowledge Outcome 1 (K1): Natural Sciences ( <a href="http://catalog.uwec.edu/undergraduate/attribute-k1/">http://catalog.uwec.edu/undergraduate/attribute-k1/</a> )	Two (2) learning experiences
One experience in laboratory science must be selected from either K1 or K2.	
Knowledge Outcome 2 (K2): Social Sciences ( <a href="http://catalog.uwec.edu/undergraduate/attribute-k2/">http://catalog.uwec.edu/undergraduate/attribute-k2/</a> )	Two (2) learning experiences
One experience in laboratory science must be selected from either K1 or K2.	
Knowledge Outcome 3 (K3): Humanities ( <a href="http://catalog.uwec.edu/undergraduate/attribute-k3/">http://catalog.uwec.edu/undergraduate/attribute-k3/</a> )	Two (2) learning experiences
Knowledge Outcome 4 (K4): Fine Arts ( <a href="http://catalog.uwec.edu/undergraduate/attribute-k4/">http://catalog.uwec.edu/undergraduate/attribute-k4/</a> )	One (1) learning experience
<b>Skills Goal</b>	
Skills Outcome 1 (S1): Written and Oral Communication ( <a href="http://catalog.uwec.edu/undergraduate/attribute-S1/">http://catalog.uwec.edu/undergraduate/attribute-S1/</a> )	Two (2) learning experiences
One S1 must meet the University Writing Requirement ( <a href="http://catalog.uwec.edu/undergraduate/graduation-requirements/#header10">http://catalog.uwec.edu/undergraduate/graduation-requirements/#header10</a> )	
Skills Outcome 2 (S2): Mathematics ( <a href="http://catalog.uwec.edu/undergraduate/attribute-S2/">http://catalog.uwec.edu/undergraduate/attribute-S2/</a> )	One (1) learning experience
One S2 to meet the University Mathematics Requirement ( <a href="http://catalog.uwec.edu/undergraduate/graduation-requirements/#header11">http://catalog.uwec.edu/undergraduate/graduation-requirements/#header11</a> )	
Skills Outcome 3 (S3): Creativity ( <a href="http://catalog.uwec.edu/undergraduate/attribute-S3/">http://catalog.uwec.edu/undergraduate/attribute-S3/</a> )	One (1) learning experience
<b>Responsibility Goal</b>	
Responsibility Outcome 1 (R1): Equity, Diversity, and Inclusivity ( <a href="http://catalog.uwec.edu/undergraduate/attribute-R1/">http://catalog.uwec.edu/undergraduate/attribute-R1/</a> )	Two (2) learning experiences
One R1 must satisfy Design for Diversity ( <a href="http://catalog.uwec.edu/undergraduate/attribute-DDIV/#header13">http://catalog.uwec.edu/undergraduate/attribute-DDIV/#header13</a> )	
Responsibility Outcome 2 (R2): Global Perspectives ( <a href="http://catalog.uwec.edu/undergraduate/attribute-R2/">http://catalog.uwec.edu/undergraduate/attribute-R2/</a> )	One (1) learning experience
Responsibility Outcome 3 (R3): Civic and Environmental Issues ( <a href="http://catalog.uwec.edu/undergraduate/attribute-R3/">http://catalog.uwec.edu/undergraduate/attribute-R3/</a> )	One (1) learning experience
<b>Integration Goal</b>	
Integration Outcome 1 (I1): Integration ( <a href="http://catalog.uwec.edu/undergraduate/attribute-I1/">http://catalog.uwec.edu/undergraduate/attribute-I1/</a> )	Two (2) learning experiences
<b>Service-Learning Goal</b>	

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/#academicprogramtext>).

**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 / LANG 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 S 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 100-201)

The Liberal Arts Chemistry Major is designed to provide students with a solid foundation in the field, while offering the opportunity to pursue a parallel specialization, thus effectively preparing students for graduate or professional school, and/or a variety of career paths in chemistry, the health sciences, and related fields. This major is ideal for pre-medicine or pre-pharmacy students who are interested in a chemistry major, and any others who are seeking a minor in another field.

### Core Requirements for A.C.S. and Liberal Arts Chemistry Majors

A minimum of 55-semester credits, including:

Code	Title	Credits
<b>Chemistry Core</b>		
Select one of the following: <sup>1</sup>		6
CHEM 115	Chemical Principles	
CHEM 105 & CHEM 106 & CHEM 109	General Chemistry I Lecture and General Chemistry I Laboratory and General Chemistry II with Lab	
Required:		
CHEM 213	Quantitative Analysis	4
CHEM 218	Introduction to Inorganic Chemistry	3
CHEM 325	Organic Chemistry I with Laboratory	4
CHEM 326	Organic Chemistry II with Laboratory	4
<b>Additional Required Courses</b>		
PHYS 231 & PHYS 232	University Physics I and University Physics II	10
MATH 114 & MATH 215	Calculus I and Calculus II	8
<b>Total Credits</b>		<b>39</b>

<sup>1</sup> Only six credits of the CHEM 105/CHEM 106/CHEM 109 sequence are credited to the major.

### Capstone Experience for Chemistry Majors

The capstone experience is met by completing CHEM 411 for chemistry with business emphasis majors, and by CHEM 420, CHEM 438, CHEM 453 or CHEM 497 for other chemistry majors.

### Chemistry, Major - Liberal Arts Requirements

In addition to the chemistry core and required mathematics/physics courses, students must complete the following course work:

Code	Title	Credits
CHEM 433 & CHEM 434	Physical Chemistry I and Physical Chemistry II	8
One of the following:		2-3
CHEM 420	Advanced Synthesis Laboratory	
CHEM 438	Physical Analysis Laboratory	
CHEM 453	Biochemistry Laboratory	

Electives	
Select 6 credits of the following:	
CHEM 304	Environmental Chemistry
CHEM 318	Bioinorganic Chemistry
CHEM 344	Modern Applied Separations and Spectrometry
CHEM 352	Fundamentals of Biochemistry
CHEM 361	Molecules and Medicine
CHEM 399	Independent Study - Juniors
CHEM 401	Inorganic Chemistry
CHEM 411	Survey of Industrial Chemistry
CHEM 426	Modern Organic Chemistry
CHEM 460	Polymer Chemistry
CHEM 491	Special Topics
CHEM 495	Directed Studies
CHEM 497	Independent Study - Research Manuscript
CHEM 499	Independent Study - Seniors

**Total Credits** **16-17**

## Program Learning Outcomes

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

- Knowledge and Understanding: Students will develop a rigorous understanding of chemical principles, and apply them to predict and rationalize chemical properties.
  - Structure and Bonding: Students can describe the structural properties of matter, as well as rationalize and predict chemical stability or physical properties on the basis of structure.
  - Reactivity and Stability: Students can classify and rationalize chemical transformations, and predict and quantify products.
  - Instrumentation Theory: Students can describe the underlying physical principles of various instruments and measurement techniques.
- Skills: Students will develop the skills need to be effective practitioners of the field by devolving laboratory proficiency, the capacity to think critically and creatively, and the ability to communicate effectively.
  - Laboratory Skills: Students will develop proficient laboratory technique.
  - Chemical Reasoning: Students will develop critical and creative thinking skills, use them within the context of the field.
  - Communication Skills: Students will develop effective oral and written.
  - Literature Skills: Students will become proficient with the chemical literature.
- Responsibility: Students will become responsible practitioners of the field, by practicing laboratory safety, recognizing the societal impacts of chemistry, and identifying contributions made by individuals with a variety of social identities.
  - Chemical Safety: Students will function safely in a chemical laboratory, and will manage waste effectively.
  - Ethical and Professional Conduct: Students will conduct themselves ethically and professionally, cultivate awareness of the impact of chemistry on society, and recognize contributions from a diverse population.
- Distinction—Chemistry, Liberal Arts: Students in the Chemistry, Liberal Arts major will develop some degree of specialization in an adjacent and/or complimentary field of study.

## Sample Degree Plans

### Chemistry, Major - Liberal Arts, B.S. (Starting with CHEM 115 and MATH 114)

The following is a sample degree plan, based on the 2023-2024 catalog. It is based on the 120-credit graduation requirement and assumes no transferred credits, no requirements waived by placement tests, no courses taken in the summer or winter, no repeated courses, and no remedial courses that may be required. This sample degree plan is intended for first-year students entering UW-Eau Claire in the fall semester. Your own degree plan may differ depending on the course of study selected (second major, minor, etc.). UW-Eau Claire cannot guarantee all courses will be offered as shown, but will provide a range of courses that may enable prepared students to fulfill their requirements in a timely period. This sample degree plan is just a guide. Please consult your advisor, your degree audit, and the catalog to create your own degree plan. Note: In order to earn the required minimum of 120 credits for the degree in four years, you should plan to take 15 credits each semester or 30 credits each year.

To earn a degree, students must fulfill all University Graduation Requirements, including the Liberal Education (LE) Core. LE Core course work in the following sample degree plan uses abbreviations such as LE-K1, LE-S2, LE-R3, and LE-I1 to represent the learning outcomes students will meet via completion of their liberal education course work. Please click (<https://catalog.uwec.edu/undergraduate/graduation-requirements/>) here for a description of the Liberal Education Core outcomes and requirements. Note that the LE Core may be completed through both course and non-course experiences.

Students in this major have the option to pursue either a Bachelor of Arts (B.A.) or a Bachelor of Science (B.S.) degree. The degrees are distinguished by foreign language competency for the B.A. and a higher level of mathematics competency for the B.S.

#### FIRST YEAR

##### FIRST SEMESTER

CHEM 115	Chemical Principles (LE-K1L, Fall Only) <sup>a</sup>	6
MATH 114	Calculus I (LE-S2) <sup>b</sup>	4
WRIT 114	Intensive Blugold Seminar in Critical Reading and Writing (LE-S1)	5
OR		
WRIT 116	Blugold Seminar in Critical Reading and Writing (LE-S1)	

##### SECOND SEMESTER

CHEM 213	Quantitative Analysis (LE-S3)	4
CHEM 218	Introduction to Inorganic Chemistry (Spring Only)	3
MATH 215	Calculus II <sup>b</sup>	4
LE Option: Knowledge 2 (LE-K2) Social Sciences		3

**TOTAL FIRST YEAR** 29

#### SECOND YEAR

##### FIRST SEMESTER

CHEM 325	Organic Chemistry I with Laboratory	4
PHYS 231	University Physics I (LE-K1L)	5
LE Option: Knowledge 3 (LE-K3) Humanities		3
LE Option: Knowledge 4 (LE-K4) Fine Arts		3

##### SECOND SEMESTER

CHEM 326	Organic Chemistry II with Laboratory	4
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PHYS 232	University Physics II (LE-K1L)	5
LE Option: Knowledge 2 (LE-K2) Social Sciences		3
LE Option: Responsibility 3 (LE-R3) Civic and Environmental Issues		3

**TOTAL SECOND YEAR** 30

#### THIRD YEAR

##### FIRST SEMESTER

CHEM 433	Physical Chemistry I (Fall Only)	4
Second Program/minor, e.g. course with lab		5
CHEM Elective <sup>d</sup>		3
LE Option: Skills 1 (LE-S1) Written and Oral Communication		3

##### SECOND SEMESTER

CHEM 434	Physical Chemistry II (Spring Only)	4
Two courses in Second Program/minor		6
LE Option: Responsibility 1 (LE-R1) Equity, Diversity, and Inclusivity		3
LE Option: Knowledge 3 (LE-K3) Humanities		3

**TOTAL THIRD YEAR** 31

#### FOURTH YEAR

##### FIRST SEMESTER

CHEM 420	Advanced Synthesis Laboratory (Fall Only) <sup>c</sup>	3
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OR

CHEM 453	Biochemistry Laboratory (2 Credits) <sup>c</sup>	
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OR

CHEM Elective (3 credits) <sup>d</sup>		
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Two courses in Second Program/minor		6
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LE Option: Integration (LE-I1)		3
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LE Option: Responsibility 1 (LE-R1, DDIV) Equity, Diversity, and Inclusivity with Design for Diversity		3
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##### SECOND SEMESTER

CHEM 438	Physical Analysis Laboratory (Spring Only) <sup>c</sup>	2
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OR

CHEM Elective (3 credits) <sup>d</sup>		
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Two courses in Second Program/minor		7
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LE Option: Integration (LE-I1)		3
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LE Option: Knowledge 3 (LE-K3) Humanities		3
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**TOTAL FOURTH YEAR** 29-31

#### Minimum total for the baccalaureate degree = 120 credits

- a CHEM 105, CHEM 106 (K1) and CHEM 109 may be taken in place of CHEM 115, but only 6 of the 9 credits will count towards the major.
- b Students planning for graduate studies in chemistry (especially those interested in physical chemistry) are encouraged to take additional courses in mathematics (MATH 216, MATH 311, and/or MATH 324) and physics.
- c One of the three upper-level labs need to be taken, including CHEM 420, CHEM 438, and CHEM 453. The CHEM 453 (Biochemistry Lab) option has a prerequisite of CHEM 352 (Fundamentals of Biochemistry), which can be taken as the Chemistry elective.
- d Select at least 6 credits from the following: CHEM 304, CHEM 344, CHEM 352, CHEM 361, CHEM 399, CHEM 401, CHEM 411, CHEM 426, CHEM 460, CHEM 491, CHEM 495, CHEM 497, and CHEM 499.

e Electives need to be carefully selected to ensure that a student's degree comprises at least 39 credits of upper division courses (300-400 level) and that the student complete a minor in addition to the Chemistry major.

**Note:** All students must complete the 30-hour Service-Learning Requirement via a non-credit or credit option (see University Graduation Requirements (<http://catalog.uwec.edu/undergraduate/graduation-requirements/>)).

### RECOMMENDATIONS FOR HIGH IMPACT PRACTICES (HIPs)

The University of Wisconsin-Eau Claire encourages all students to participate in High Impact Practices. The following information identifies any specific recommendations that faculty in this major have concerning which HIPs might be most beneficial to students, and any recommendations about when those HIPs best fit into the degree plan. Students should also consult their faculty advisor for information on HIPs. There are many additional high impact opportunities available. Talk to your academic advisor for more information about incorporating HIPs like Study Abroad, Intercultural Immersion, Internship, and/or Student/Faculty Collaborative Research into your time at UW-Eau Claire.

## Chemistry, Major - Liberal Arts, B.S. (Starting with CHEM 105/106 and MATH 109)

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To earn a degree, students must fulfill all University Graduation Requirements, including the Liberal Education (LE) Core. LE Core course work in the following sample degree plan uses abbreviations such as LE-K1, LE-S2, LE-R3, and LE-I1 to represent the learning outcomes students will meet via completion of their liberal education course work. Please click (<https://catalog.uwec.edu/undergraduate/graduation-requirements/>) here for a description of the Liberal Education Core outcomes and requirements. Note that the LE Core may be completed through both course and non-course experiences.

Students in this major have the option to pursue either a Bachelor of Arts (B.A.) or a Bachelor of Science (B.S.) degree. The degrees are distinguished by foreign language competency for the B.A. and a higher level of mathematics competency for the B.S.

### FIRST YEAR

CHEM 105	General Chemistry I Lecture <sup>a</sup>	3
CHEM 106	General Chemistry I Laboratory (LE-K1L) <sup>a</sup>	2
MATH 109	Algebra for Calculus (LE-S2)	4
LE Option: Knowledge 2 (LE-K2) Social Sciences		3
LE Option: Knowledge 3 (LE-K3) Humanities		3

### SECOND SEMESTER

CHEM 109	General Chemistry II with Lab <sup>a</sup>	4
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WRIT 114	Intensive Blugold Seminar in Critical Reading and Writing (LE-S1)	5
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### OR

WRIT 116	Blugold Seminar in Critical Reading and Writing (LE-S1)	
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MATH 113	Trigonometry	2
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LE Option: Knowledge 4 (LE-K4) Fine Arts		3
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LE Option: Responsibility 1 (LE-R1, DDIV) Equity, Diversity, and Inclusivity with Design for Diversity		3
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<b>TOTAL FIRST YEAR</b>		<b>32</b>
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### SECOND YEAR

#### FIRST SEMESTER

CHEM 213	Quantitative Analysis (LE-S3)	4
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MATH 114	Calculus I (LE-S2) <sup>b</sup>	4
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Second Program/minor		4
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LE Option: Knowledge 3 (LE-K3) Humanities and LE Option: Responsibility 2 (LE-R2) Global Perspectives		3
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#### SECOND SEMESTER

CHEM 218	Introduction to Inorganic Chemistry (Spring Only)	3
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CHEM 325	Organic Chemistry I with Laboratory	4
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MATH 215	Calculus II <sup>b</sup>	4
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Second Program/minor		4
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<b>TOTAL SECOND YEAR</b>		<b>30</b>
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### THIRD YEAR

#### FIRST SEMESTER

CHEM 326	Organic Chemistry II with Laboratory	4
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PHYS 231	University Physics I (LE-K1L)	5
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Second Program/minor		3
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LE Option: Skills 1 (LE-S1) Written and Oral Communication		3
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#### SECOND SEMESTER

CHEM Elective (3 credits) <sup>d</sup>		
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PHYS 232	University Physics II (LE-K1L)	5
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Second Program/minor		4
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LE Option: Integration (LE-I1)		3
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<b>TOTAL THIRD YEAR</b>		<b>30</b>
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### FOURTH YEAR

#### FIRST SEMESTER

CHEM 433	Physical Chemistry I (Fall Only)	4
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CHEM 420	Advanced Synthesis Laboratory (Fall Only) <sup>c</sup>	3
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### OR

CHEM 453	Biochemistry Laboratory (2 Credits) <sup>c</sup>	
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CHEM Elective <sup>d</sup>		3
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Second Program/minor		3
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LE Option: Knowledge 2 (LE-K2) Social Sciences and LE Option: Integration (LE-I1)		3
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#### SECOND SEMESTER

CHEM 434	Physical Chemistry II (Spring Only)	4
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CHEM 438	Physical Analysis Laboratory (Spring Only) <sup>c</sup>	2
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### OR

CHEM 453	Biochemistry Laboratory <sup>c</sup>	
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Second Program/minor	6
LE Option: Responsibility 3 (LE-R3) Civic and Environmental Issues	3
<b>TOTAL FOURTH YEAR</b>	<b>30-31</b>

#### Minimum total for the baccalaureate degree = 120 credits

- a CHEM 105, CHEM 106 (K1) and CHEM 109 may be taken in place of CHEM 115, but only 6 of the 9 credits will count towards the major.
- b Students planning for graduate studies in chemistry (especially those interested in physical chemistry) are encouraged to take additional courses in mathematics (MATH 216, MATH 311, and/or MATH 324) and physics.
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## Liberal Education (LE) Core Guidance

### Liberal Education Core (LE Core)

The LE Core comprises 17 learning experiences across 11 learning outcomes. Students must complete a minimum of 36 credits in courses approved for the LE Core.

- K1 – Natural Sciences; two experiences (one lab science experience is required in K1 or K2).
- K2 – Social Sciences; two experiences (one lab science experience is required in K1 or K2).
- K3 – Humanities; two experiences.
- K4 – Fine Arts; one experience.
- S1 – Written and Oral Communication; two experiences (one experience must satisfy the University writing requirement).
- S2 – Mathematics; one experience (must satisfy the University math competency requirement).

- S3 – Creativity; one experience (can be fulfilled in a student's major).
- R1 – Equity, Diversity, and Inclusivity; two experiences (one experience must meet the UW System Design for Diversity (DD) requirement).
- R2 – Global Perspectives; one experience.
- R3 – Civic and Environmental Issues; one experience.
- I1 – Integration; two experiences (one experience can be fulfilled in a student's major).
- SL—Service Learning; 30 hours

### Additional LE Core Information

- Most LE Core learning experiences are course based, and many courses meet more than one learning outcome (e.g., K3 and R2 or K1 and R3).
- Some learning experiences can also be met outside of a traditional course (e.g., undergraduate research (S3), study abroad (I1)).
- S1 – An English placement score that fulfills the University writing requirement fulfills one S1 experience.
- S1 – A foreign Language placement score that qualifies the student to enter the 102 level satisfies one S1 experience.
- S1, R2 – A foreign language placement score that qualifies the student to enter the 202 level satisfies one experience in S1 and the R2 experience.
- S2 – A math placement score that qualifies the student to enter Math 111, 112, 113 or 114 fulfills the S2 experience.
- S3 – Completion of two credits from any approved music ensemble fulfills the S3 experience.
- I1 – Any semester long study abroad program can fulfill one I1 experience.