MATHMATICS, RESEARCH EMPHASIS, COMPREHENSIVE MAJOR

Liberal Arts (Code 180-003)

University Requirements

GRADUATION REQUIREMENTS FOR BACCALAUREATE DEGREE

Credit Requirements

Minimum total for graduation
Upper division credits (courses numbered 300 and higher)
Liberal Education Core
Academic Concentrations
Graduate Degree Requirements

Total
Resident
Major
Minor
Certificate

2.00 average
2.00 average
2.00 average
2.00 average

25 percent of credits

University Residency Requirements

Minimum total
Senior year
Major, Standard, upper division in residence
Major, Comprehensive, upper division in residence

2.00 average

23
12
21

Procedures Required for Graduation

Obtain admission to the degree program and/or the College offering it.
Apply for graduation on CampS.

1. Certain programs exceed this minimum.
2. 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) 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.

APPLICATION OF CREDITS TOWARD GRADUATION

Credit Restrictions

Satisfactory/Unsatisfactory
Total degree credit
Major, Standard
Major, Comprehensive
Minor

Maximum 12
Maximum 1 course
Maximum 2 courses
Maximum 1 course

Credit by Examination
Total degree credit
Major or minor

Maximum ¼ of total
Maximum ½ of total

Two-Year College Credits
Total degree credit

Maximum 72 credits

Activity credit (band, chorus, drama, KINS 100-184)
Total KINS 100-184
Total Band, chorus, drama
Single course band, chorus, drama

Maximum 1 credit
Maximum 12 credits
Maximum 4 credits

Extension credits
UW-System
Other extension/correspondence
USAFI

No maximum
Maximum ¼ of total
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**

<table>
<thead>
<tr>
<th>Knowledge Goal</th>
<th><strong>Two (2) learning experiences</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Outcome 1 (K1): Natural Sciences (<a href="http://catalog.uwec.edu/undergraduate/attribute-k1/">http://catalog.uwec.edu/undergraduate/attribute-k1/</a>)</td>
<td></td>
</tr>
<tr>
<td>Knowledge Outcome 2 (K2): Social Sciences (<a href="http://catalog.uwec.edu/undergraduate/attribute-k2/">http://catalog.uwec.edu/undergraduate/attribute-k2/</a>)</td>
<td></td>
</tr>
<tr>
<td>Knowledge Outcome 3 (K3): Humanities (<a href="http://catalog.uwec.edu/undergraduate/attribute-k3/">http://catalog.uwec.edu/undergraduate/attribute-k3/</a>)</td>
<td></td>
</tr>
<tr>
<td>Knowledge Outcome 4 (K4): Fine Arts (<a href="http://catalog.uwec.edu/undergraduate/attribute-k4/">http://catalog.uwec.edu/undergraduate/attribute-k4/</a>)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills Goal</th>
<th><strong>Two (2) learning experiences</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>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>)</td>
<td></td>
</tr>
<tr>
<td>Skills Outcome 2 (S2): Mathematics (<a href="http://catalog.uwec.edu/undergraduate/attribute-s2/">http://catalog.uwec.edu/undergraduate/attribute-s2/</a>)</td>
<td></td>
</tr>
<tr>
<td>Skills Outcome 3 (S3): Creativity (<a href="http://catalog.uwec.edu/undergraduate/attribute-s3/">http://catalog.uwec.edu/undergraduate/attribute-s3/</a>)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responsibility Goal</th>
<th><strong>Two (2) learning experiences</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>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>)</td>
<td></td>
</tr>
<tr>
<td>Responsibility Outcome 2 (R2): Global Perspectives (<a href="http://catalog.uwec.edu/undergraduate/attribute-r2/">http://catalog.uwec.edu/undergraduate/attribute-r2/</a>)</td>
<td></td>
</tr>
<tr>
<td>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>)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integration Goal</th>
<th><strong>Two (2) learning experiences</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration Outcome 1 (I1): Integration (<a href="http://catalog.uwec.edu/undergraduate/attribute-i1/">http://catalog.uwec.edu/undergraduate/attribute-i1/</a>)</td>
<td></td>
</tr>
</tbody>
</table>

**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 all majors 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 / 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 5 in MATH 111, MATH 112, or MATH 113. (3) Achieve a satisfactory score on the MATH 120 competency test. This test may be attempted no more than two times.

**Major Requirements**

**Liberal Arts (Code 180-003)**

A minimum of sixty semester credits, including:

**Mathematics Core**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 114</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 216</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 316</td>
<td>Introduction to Real Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 317</td>
<td>Introduction to Real Analysis II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 324</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 425</td>
<td>Abstract Algebra I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Research requirement**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 380</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>MATH 480</td>
<td>Research Seminar (taken twice)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Depth requirement**

Choose one:

- MATH 426 Abstract Algebra II
- MATH 441 Linear Regression Analysis, with Time Series

**Elective mathematics courses**

Remaining credits to be chosen from:

- Math courses numbered above 305

**CS/logic requirement**

Choose one:

- CS 145 Programming for New Programmers
- CS 163 Introduction to Programming in C++
- PHIL 250 Symbolic Logic
- DS 150 Computing in Python: Fundamentals and Procedural Programming

**or another CS course with approval of the department**

**Speech requirement**

Choose one:

- CJ 202 Fundamentals of Speech

**Applications of mathematics requirement**

Minimum 6 credits in a sequence selected from:

- BIOL 221 Foundations of Biology I
- & BIOL 222 and Foundations of Biology II
- CHEM 115 Chemical Principles
- CHEM 105 General Chemistry I Lecture
- & CHEM 106 and General Chemistry I Laboratory
- & CHEM 109 and General Chemistry II with Lab
- CS 245 Advanced Programming and Data Structures and Algorithms
- CS 335 & ECON 103 Principles of Microeconomics
- & ECON 104 and Principles of Macroeconomics

**Sample Degree Plan**

**Mathematics, Research Emphasis, Comprehensive Major, B.S.**

The following is a sample degree plan, based on the 2022-2023 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 [here](https://catalog.uwec.edu/undergraduate/graduation-requirements/) 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**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 114 Calculus I (LE-S2)</td>
<td>4</td>
</tr>
</tbody>
</table>

**SECOND SEMESTER**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 215 Calculus II (prereq for MATH 324)</td>
<td>4</td>
</tr>
</tbody>
</table>

**SOME TIME IN THE FIRST YEAR**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRIT 114 Intensive Blugold Seminar in Critical Reading and Writing (LE-S1)</td>
<td>5</td>
</tr>
</tbody>
</table>

**Program Learning Outcomes**

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

- Apply a broad range of perspectives, including numerical, graphical, algebraic, analytical and verbal, to effectively connect and communicate mathematical ideas.
- Use mathematics to model and solve appropriate problems.
- Write mathematical proofs.
- Work independently and collaboratively on mathematical problems.
- Communicate mathematical concepts effectively with speech and writing skills.
- Identify and formulate open research problems and implement proper proof techniques to answer open problems.
4 | Mathematics, Research Emphasis, Comprehensive Major

University of Wisconsin-Eau Claire | 2022-2023 Catalog

OR

WRIT 116 Blugold Seminar in Critical Reading and Writing (LE-S1)

LE Option: Responsibility 2 (LE-R2) Global Perspectives with

LE Option: Knowledge 2 (LE-K2) Social Sciences or LE Option:
Knowledge 3 (LE-K3) Humanities or LE Option: Knowledge 4
(LE-K4) Fine Arts

Foreign Language 101 if BA student (or another LE course if BS) 3

CJ 202 Fundamentals of Speech (LE-S1) 3

LE Option: Responsibility 1 (LE-R1) Equity, Diversity, and
Inclusivity with LE Option: Knowledge 2 (LE-K2) Social Sciences
or LE Option: Knowledge 3 (LE-K3) Humanities

LE Option: Knowledge 2 (LE-K2) Social Sciences or LE Option:
Knowledge 3 (LE-K3) Humanities or LE Option: Knowledge 4
(LE-K4) Fine Arts

Foreign Language 102 if BA student (or another LE course if BS) 3

TOTAL FIRST YEAR 31

SECOND YEAR

FIRST SEMESTER

MATH 216 Calculus III (prereq for MATH 316) 4

MATH 324 Linear Algebra (prereq for MATH 380, 425) 4

SECOND SEMESTER

MATH 425 Abstract Algebra I (prereq for MATH 426) 3

SOME TIME IN THE SECOND YEAR

CS 145, CS 163, CS 170, PHIL 250 b 3

MATH APP (1st course) c, *** 4

MATH elective a 4

MATH APP (2nd course) c, *** 4

LE Option: Responsibility 1 (LE-R1), DDIV Equity, Diversity, and
Inclusivity with Design for Diversity 3

TOTAL SECOND YEAR 29

THIRD YEAR

FIRST SEMESTER

MATH 380 Research Methods (LE-S3) 3

MATH 316 Introduction to Real Analysis (prereq for MATH 317) 3

SECOND SEMESTER

MATH 480 Research Seminar 2

MATH 425 Abstract Algebra I 3

OR

MATH 441 Linear Regression Analysis, with Time Series d

SOME TIME IN THE THIRD YEAR

MATH elective a 3

LE Option: Knowledge 1 (LE-K1) Natural Sciences if needed c 4

LE Option: Knowledge 2 (LE-K2) Social Sciences or LE Option:
Knowledge 3 (LE-K3) Humanities or LE Option: Knowledge 4
(LE-K4) Fine Arts **

MATH elective a 3

LE Option: Knowledge 1 (LE-K1) Natural Sciences if needed c 4

LE Option: Integration (LE-I1) a 3

TOTAL THIRD YEAR 31-32

FOURTH YEAR

FIRST SEMESTER

MATH 317 Introduction to Real Analysis II 3

SECOND SEMESTER

MATH 480 Research Seminar 2

SOME TIME IN THE FOURTH YEAR

MATH elective a 3

LE Option: Knowledge 2 (LE-K2) Social Sciences or LE Option:
Knowledge 3 (LE-K3) Humanities or LE Option: Knowledge 4
(LE-K4) Fine Arts **

LE Option: Integration (LE-I1) a 3

Elective 3

MATH elective a 3

LE Option: Responsibility 3 (LE-R3) Civic and Environmental
Issues 3

Elective 3

Elective 3

TOTAL FOURTH YEAR 29

Minimum total for the baccalaureate degree = 120 credits

* One of the two experiences required for Integrative Learning (I1) may be
fulfilled with a math course with the I1 designation such as Math 307 or
Math 462.

** In this 4-year plan, the experiences for (K2), (K3), and (K4) are listed
together. The appropriate number of experiences from each learning
outcome will be required. See LE Core.

*** In the MATH APP sequence, many courses could fulfill (K1) and (K1+lab).

a Additional Math credits from courses numbered above 305; these courses
are 3 or 4 credits.

b Students must complete at least three credits to be selected from PHIL
250, CS 145, 163, 170, or another computer science course approved by
the math department.

c MATH APP: A minimum of 6 credits must be earned in a sequence
selected from BIOL 221/222, CHEM 105/106/109, CHEM 115, CHEM
103/104, CS 245/335, ECON 103/104, PHYS 231/232, or another sequence
approved by the math department. These sequences will vary on
credit load. If K1 is not satisfied by the courses used for the MATH APP
requirement, then K1 must be satisfied via other LE elective courses.

d Student can choose from MATH 426 or MATH 441 for the depth
requirement. Prereqs for MATH 441 are MATH 345 or MATH 347 or MATH
246 and 114 with the consent of the instructor.

Note: All students must complete the 30-hour Service-Learning Requirement
via a non-credit or credit option (see https://nextcatalog.uwec.edu/
undergraduate/graduation-requirements/) and/or Student/Faculty Collaborative Research into
your time at UW-Eau Claire.

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.
Student/Faculty Research—Students in the Research Emphasis are required to participate in student/faculty research. We recommended this during the semesters the student takes Math 480: Research Seminar. During Math 324, students will be introduced to the research interests of the faculty and are encouraged to contact the faculty member they are interested in working with. Recruitment for research projects also occurs during the year by email and announcements.

Study Abroad—Upper level math courses can be taken at the University of Glasgow and the University of Aberdeen. Math 312 and 324 can be taken during the summer at the University of Glasgow. Immersion programs offer at least R2 and LE requirements can be fulfilled in numerous programs.

**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.

- **R2** – 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.