

MATHEMATICS, RESEARCH EMPHASIS, COMPREHENSIVE MAJOR

Liberal Arts (Code 180-003)

University Requirements

GRADUATION REQUIREMENTS FOR BACCALAUREATE DEGREE

Credit Requirements	
Minimum total for graduation ¹	120
Upper division credits (courses numbered 300 and higher)	39
Liberal Education Core (http://catalog.uwec.edu/undergraduate/graduation-requirements/#header1)	36
Academic Concentrations (http://catalog.uwec.edu/undergraduate/graduation-requirements/#header16)	
Grade Point Requirements (http://catalog.uwec.edu/undergraduate/graduation-requirements/#header14) ²	
Total	2.00 average
Resident	2.00 average
Major	2.00 average
Minor	2.00 average
Certificate	2.00 average
University Residency Requirements (http://catalog.uwec.edu/undergraduate/graduation-requirements/#header15)	
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.

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.

APPLICABILITY OF CREDITS TOWARD GRADUATION		Credit Restrictions
Satisfactory/Unsatisfactory		
Total degree credit		maximum 12
Major, Standard		maximum 1 course
Major, Comprehensive		maximum 2 courses
Minor		maximum 1 course
Credit by Examination		
Total degree credit		maximum ¼ of total
Major or minor		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		maximum 1 credit
Total Band, chorus, drama		maximum 12 credits
Single course band, chorus, drama		maximum 4 credits
Extension credits		
UW-System		no maximum
Other extension/correspondence		maximum ¼ of total
USAFI		
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 / 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

The research emphasis prepares students in mathematics both deeply and broadly, and is especially well-suited for students who plan to attend graduate school in math, applied math, or a related field. Students in this major participate in at least two math research experiences for credit. Because of the variety of research topics available, students are strongly encouraged to consult a mathematics advisor early and frequently while pursuing this emphasis.

Liberal Arts (Code 180-003)

Code	Title	Credits
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A minimum of sixty semester credits, including:

Mathematics Core		25
MATH 114	Calculus I	
MATH 215	Calculus II	
MATH 216	Calculus III	
MATH 316	Introduction to Real Analysis	
MATH 317	Introduction to Real Analysis II	
MATH 324	Linear Algebra	
MATH 425	Abstract Algebra I	

Code	Title	Credits
Research requirement		7

MATH 380	Research Methods	
MATH 480	Research Seminar (taken twice)	

Depth requirement		3-4
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Choose one:

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

Elective mathematics courses		12-13
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Remaining credits to be chosen from:

Math courses numbered above 305

CS/logic requirement		3
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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		3
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CJ 202	Fundamentals of Speech	
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Applications of mathematics requirement		6
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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 & CHEM 106 & CHEM 109	General Chemistry I Lecture and General Chemistry I Laboratory and General Chemistry II with Lab
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CS 245 & CS 335	Advanced Programming and Data Structures and Algorithms
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ECON 103 & ECON 104	Principles of Microeconomics and Principles of Macroeconomics
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PHYS 231 & PHYS 232	University Physics I and University Physics II
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or another sequence approved by the department

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.

Sample Degree Plan

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

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**

MATH 114	Calculus I (LE-S2)	4
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SECOND SEMESTER

MATH 215	Calculus II (prereq for MATH 324)	4
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SOME TIME IN THE FIRST YEAR

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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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	3
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Foreign Language 101 if BA student (or another LE course if BS)	3
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CJ 202	Fundamentals of Speech (LE-S1)	3
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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	3
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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	3
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Foreign Language 102 if BA student (or another LE course if BS)	3
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TOTAL FIRST YEAR	31
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SECOND YEAR**FIRST SEMESTER**

MATH 216	Calculus III (prereq for MATH 316)	4
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MATH 324	Linear Algebra (prereq for MATH 380, 425)	4
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SECOND SEMESTER

MATH 425	Abstract Algebra I (prereq for MATH 426)	3
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SOME TIME IN THE SECOND YEAR

CS 145, CS 163, DS 150, PHIL 250 ^b	3-4
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MATH APP (1st course) ^{c, ***}	4
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MATH elective ^a	4
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MATH APP (2nd course) ^{c, ***}	4
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LE Option: Responsibility 1 (LE-R1, DDIV) Equity, Diversity, and Inclusivity with Design for Diversity	3
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TOTAL SECOND YEAR	29-30
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THIRD YEAR**FIRST SEMESTER**

MATH 380	Research Methods (LE-S3)	3
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MATH 316	Introduction to Real Analysis (prereq for MATH 317)	3
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SECOND SEMESTER

MATH 480	Research Seminar	2
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MATH 425	Abstract Algebra I	3
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OR

MATH 441	Linear Regression Analysis, with Time Series ^d	
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SOME TIME IN THE THIRD YEAR

MATH elective ^a	3
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LE Option: Knowledge 1 (LE-K1) Natural Sciences if needed ^c	4
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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 ^{**}	3
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MATH elective ^a	3
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LE Option: Knowledge 1 (LE-K1) Natural Sciences if needed ^c	4
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LE Option: Integration (LE-I1) [*]	3
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TOTAL THIRD YEAR	31-32
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FOURTH YEAR**FIRST SEMESTER**

MATH 317	Introduction to Real Analysis II	3
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SECOND SEMESTER

MATH 480	Research Seminar	2
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SOME TIME IN THE FOURTH YEAR

MATH elective ^a	3
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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 ^{**}	3
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LE Option: Integration (LE-I1) [*]	3
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Elective	3
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MATH elective ^a	3
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LE Option: Responsibility 3 (LE-R3) Civic and Environmental Issues	3
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Elective	3
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Elective	3
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TOTAL FOURTH YEAR	29
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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 as least three credits to be selected from PHIL 250, CS 145, CS 163, DS 150, 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/BIOL 222, CHEM 105/CHEM 106/CHEM 109, CHEM 115, CS 245/CS 335, ECON 103/ECON 104, PHYS 231/PHYS 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 DS 140, MATH 345 or MATH 347 or MATH 246, and MATH 114 or consent of the instructor.

Note: All students must complete the 30-hour Service-Learning Requirement via a non-credit or credit option (see Undergraduate 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.

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 MATH 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
- 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.

Additional LE Core Information