COMPUTER SCIENCE, COMPREHENSIVE MAJOR

Liberal Arts (Code 170-030)

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

Liberal Arts (Code 170-030)

This major is recommended for students who desire a strong foundation in software design and development, computer systems and networking, and mathematics.

Code	Title	Credits
A minimum of sixty semester credits, including:		
Computer Science core (39 crs)		
CS 145	Programming for New Programmers	4
or CS 148	Programming for Experienced Programmers	
CS 146	The Big Picture in Computer Science	1
CS 245	Advanced Programming and Data Structures	4
CS 252	Computer Systems	4
CS 260	Database Systems	4
CS 268	Web Systems	3
CS 330	Programming Languages	3
CS 335	Algorithms	3
CS 352	Computer Architecture	3
CS 355	Software Engineering I	3
CS 396	Junior Seminar	1
CS 452	Operating Systems	3
CS 462	Computer Networks (capstone course)	3
Mathematics Core (15 crs)		
MATH 114	Calculus I	4
MATH 215	Calculus II	4
MATH 314	Discrete Mathematics	3
MATH 246	Elementary Statistics	4
or MATH 345	Introduction to Probability and Mathematical Statistics	
A Computer Science elective, selected from one of the following options:		
Option 1		
Select a minimum of six credits of electives chosen from the following and not already included in the Computer Science core:		6
CS 370	Computer Security	
CS 376	Cryptography and Network Security	
CS 388	UNIX Systems Programming	
CS 399	Independent Study - Juniors	
CS 420	Artificial Intelligence	
CS 425	Machine Learning	
CS 426	Deep Learning	
CS 436	Mobile Software Development	
CS 450	Theory of Computation	
CS 455	Computer Graphics	
CS 485	Software Engineering II	
CS 491	Special Topics	
CS 498	Computer Science Internship	
Or other courses designated by the department (six-seven credits; recommended for students considering industry employment)		
Option 2		
Select six credits from the folllowing: [1]		
CS 482	Research in Computer Science I	
CS 492	Research in Computer Science II	

[1] Additional capstone and research experience; recommended for students considering graduate school

For a degree in Computer Science, a student must complete:

Code	Title	Credits
Required courses not counted toward credits in major:		
Complete one of the following:		3
CJ 202	Fundamentals of Speech	
ENGL 312	Science Writing	
ENGL 313	Technical Writing	
Required:		
PHIL 308	Ethics in Computing and Engineering	3
Complete one lab science sequence chosen from:		9-10
PHYS 211 & PHYS 212	General Physics and General Physics	
OR		
PHYS 231 & PHYS 232	University Physics I and University Physics II	

Program Learning Outcomes

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

- Apply the foundational elements of mathematics, logic, critical thinking and problem-solving skills to develop the algorithms and data structures necessary to solve a wide variety of computing problems.
- Analyze a problem, identify and define the computing requirements appropriate to its solution and demonstrate comprehension of the tradeoffs involved in design choices.
- Design, implement and evaluate a computing system or component to meet desired needs.
- Apply and use concepts from computer architecture and operating systems in computing system design, implementation and performance analysis.
- Use and evaluate a wide variety of modern tools and languages used in the practical construction of computing systems.
- Collaborate effectively in a team environment.
- Recognize social, ethical, and legal issues that surround the production and use of technology.
- Communicate effectively, both orally and in writing, to technical and non-technical audiences.

Sample Degree Plan

Computer Science, 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 (https://catalog.uwec.edu/undergraduate/graduation-requirements/#header1)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		
CS 145	Programming for New Programmers	4
CS 146	The Big Picture in Computer Science	1
MATH 112	Precalculus Mathematics	4
OR		
MATH 109	Algebra for Calculus (Winterim)	
AND		
MATH 113	Trigonometry (Prerequisite or concurrent enrollment for CS 245)	
LE Options		6
TOTAL		15
SECOND SEMESTER		
CS 245	Advanced Programming and Data Structures	4
WRIT 114	Intensive Blugold Seminar in Critical Reading and Writing	5
OR		
WRIT 116	Blugold Seminar in Critical Reading and Writing	
MATH 114	Calculus I	4
LE Option		3
TOTAL		16
SECOND YEAR		
FIRST SEMESTER		
CS 260	Database Systems (Prerequisite for CS 355)	4
MATH 215	Calculus II	4
PHYS 211	General Physics	5
OR		
PHYS 231	University Physics I	
MATH 246	Elementary Statistics	4
OR		
MATH 345	Introduction to Probability and Mathematical Statistics	
TOTAL		17
SECOND SEMESTER		
CS 252	Computer Systems (Prerequisite for CS 352, 452)	4
CS 268	Web Systems (Spring Only)	3
PHYS 212	General Physics	4
or PHYS 232	University Physics II	
LE Option		3
TOTAL		14-15
THIRD YEAR		
FIRST SEMESTER		
CS 335	Algorithms (Prerequisite for CS 452, Fall only)	3
CS 352	Computer Architecture (Fall Only)	3
CS 396	Junior Seminar (Fall Only)	1
MATH 314	Discrete Mathematics	3
ENGL 312	Science Writing	3
OR		
ENGL 313	Technical Writing	
OR		
CJ 202	Fundamentals of Speech	
LE Option		3
TOTAL		16
SECOND SEMESTER		
CS 355	Software Engineering I (Spring Only)	3
CS 330	Programming Languages (Spring Only)	3
CS Elective		3
LE Options		6
TOTAL		15
FOURTH YEAR		
FIRST SEMESTER		
CS 452	Operating Systems (Prerequisite for CS 452, Fall Only)	3
PHIL 308	Ethics in Computing and Engineering	3
CS Elective		3
LE Option		3
TOTAL		12
SECOND SEMESTER		
CS 462	Computer Networks (Spring Only)	3
LE Options		9
TOTAL		12

Minimum total for the baccalaureate degree = 120 credits

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 (https://studyabroad.apps.uwec.edu/), Intercultural Immersion (https://www.uwec.edu/immersion/), Internship (https://www.uwec.edu/career-services/info-students/internships/), and/or Student/Faculty Collaborative Research (https://www.uwec.edu/orsp/students/student-faculty-collaborative-research-guide/) into your time at UW-Eau Claire.

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.