

Computer Science Major - Bachelor of Science (BS)

Computer science is a broad and very useful discipline that many other fields of study depend on. Computer science is the study of computing systems and the software processes that control them. Computer scientists have developed powerful algorithms in the areas of artificial intelligence, data mining, machine learning, computer vision, security, and a host of other areas. These algorithms are then used for medical imaging, stock market analysis, computer graphics, video processing, and many other fields. The emphasis within the computer science program is on software development and includes a strong variety of electives to allow students to study specific areas of personal interest.

Major requirements

(All colleges, excluding teacher certification programs)

51 credits (68 total credits including MTH and natural lab science requirements)

Code	Title	Credits
CS 120	Software Design I	4
CS 220	Software Design II	4
CS 225	Discrete Computational Structures ¹	3
CS 270	Introduction to Assembler Programming, C Programming and Computer Organization	3
CS 340	Software Design III: Abstract Data Types	4
CS 341	Software Design IV: Software Engineering	3
CS 353 or CS 453	Analysis of Algorithm Complexity Introduction to Theory of Computation	3
CS 364	Introduction to Database Management Systems	3
CS 370	Computer Architecture	3
CS 421	Programming Language Concepts	3
CS 441	Operating System Concepts	3
CS 442	Structures of Compilers	3
Electives ²		12
Total Credits		51

¹ May substitute MTH 225 for CS 225.

² The following courses may be used as alternatives to computer science electives: CPE 105, CPE 212, CPE 309, CPE 321, CPE 406, CPE 419, CPE 420, CPE 446, CPE 463, CPE 466, CPE 478, CPE 499, PHY 335, MTH 317, MTH 371.

The 51 credits must include no less than 31 credits of 300/400 level courses.

In addition to the 51 credits, the following courses must be taken: MTH 207; MTH 208; and two natural lab science courses chosen from the general education laboratory science category (GE 05) and/or from the courses listed in the College of Science and Health core requirements (<http://catalog.uwlax.edu/undergraduate/scienceandhealth/#Core>).

Every student must complete the computer science major field test. This test is used for program assessment not individual assessment.

Degree requirements

All students must complete the general education, college core, major/minor, and university degree requirements in order to qualify for a degree. The easiest way to track all of these requirements is to refer to the Advisement Report (AR) found in the Student Information System (WINGS) Student Center. All enrolled students have access to the AR.

- General education (<http://catalog.uwlax.edu/undergraduate/generaleducation/>)
- College core (p. 1)
- Baccalaureate degree requirements (p. 1)

College of Science and Health (CSH) Bachelor of Science core requirements

B.S. and B.A. students graduating from the College of Science and Health are required to take two natural laboratory science courses selected from the general education laboratory science category (GE 05) and/or from BIO 203, BIO 304, BIO 210, CHM 104, GEO 221, GEO 222, PHY 104 or PHY 204, and they either must take two mathematics courses or one math course and one computer science course from the math/logical systems category of the general education requirements (GE 02). One of the two science courses must be from a department outside of the student's major department.

Note: Math courses can be pairs, i.e. 150 and 151; MTH/CS majors can use two science courses from same department.

For the Bachelor of Science degree, in addition to all other College of Science and Health core requirements, students from non-exempted programs¹ must complete one of the following options. It is recommended that courses are selected in consultation with students' academic advisor.

1. Complete a second major; or
2. Complete a minor outside the major; or
3. Complete an individualized option, consisting of 18 credits
 - a. At least 12 credits must be earned at the 300/400 level outside the major department.
 - b. The remaining six credits should come from
 - i. 100 level or higher courses outside the major (General education courses may apply provided they are not being used to fulfill minimum general education requirements.); or
 - ii. 300/400 level courses inside major not being used to fulfill major requirements.
 - c. Internship credits may not count toward the individualized option.

¹ The list of exempted CSH programs is below.

Baccalaureate degree requirements

Candidates for the Bachelor of Arts or the Bachelor of Science degrees must accomplish the following:

1. Fulfill the general education requirements.
2. Complete at least one ethnic studies (diversity) course.
3. Complete the courses prescribed by the Undergraduate Curriculum Committee for the degree desired in the respective school or college.
4. Earn a minimum of 120 semester credits with at least a 2.00 cumulative GPA.^{1,2}
5. At least 40 credits must be earned in 300/400 level courses. Transfer courses earned or transferred at the 300/400 level apply to this requirement.
6. Complete major and minor requirements with at least a 2.00 GPA^{1, 2} in each major and minor (and concentration or emphasis, if selected).
7. A minimum of 30 semester credits in residence at UWL is required for graduation. (See undergraduate resident requirement (<http://catalog.uwlax.edu/undergraduate/academicpolicies/graduation/#undergraduate-residence-requirement>)).
8. Submit an application for graduation via the "Apply for Graduation" link in the WINGS Student Center as soon as the student has registered for his or her final semester or summer term in residence. December and winter intersession graduates should apply by May 1. May and summer graduates should apply by December 1.

¹ Grade point average requirements for some programs will be considerably higher than 2.00. Re-entering students may be required to earn credits in excess of the 120 needed for graduation in any curriculum in order to replace credits earned in courses in which the content has changed substantially in recent years. Each case will be judged on its own merit.

² The grade point average recorded at the time the degree is awarded will not be affected by future enrollment.

No degree will be awarded unless all requirements are fulfilled and recorded within 30 days after the official ending date of each term.

Sample degree plan

Below is a sample degree plan that can be used as a guide to identify courses required to fulfill the major and other requirements needed for degree completion. A student's actual degree plan may differ depending on the course of study selected (second major, minor, etc.). Also, this sample plan assumes readiness for each course and/or major plan, and some courses may not be offered every term. Review the course descriptions or the class timetable (<http://www.uwlax.edu/Records/registration/>) for course offering information.

The sample degree plans represented in this catalog are intended for first-year students entering UWL in the fall term. Students should use the Advisement Report (AR) in WINGS (<https://wings.uwlax.edu>) and work closely with their faculty advisor(s) and college dean's office to ensure declaration and completion of all requirements in a timely manner.

General Education Program

The general education curriculum (Gen Ed) is the common educational experience for all undergraduates at UWL. Sample degree plans include Gen Ed placeholders to ensure completion of the general education requirements. Courses may be rearranged to fit the needs or recommendations of the student's program of study. Gen Ed courses may be taken during winter term (January between the semesters) and summer to reduce the course load during regular terms (fall and spring). Students should consult with their advisor and/or the college academic services director in their college/school for assistance with course and schedule planning. Refer to the general education requirements (<http://>

catalog.uwlax.edu/undergraduate/generaleducation/) for more specific details.

At least 40 credits of the 120 credits required must be earned at the 300/400-level.

Note: New students and transfer students with 15 or fewer credits earned are required to take FYS 100 First-Year Seminar (3 cr.) during one of their first two semesters at UWL.

This sample degree plan does not establish a contractual agreement. It identifies the minimum requirements a student must successfully complete, to qualify for a degree, in a format intended to assist the student in planning their academic career. Actual degree plans may differ.

Two sample plans are provided below. The first is for students taking MTH 151 Precalculus in the first semester; the second is for students taking MTH 207 Calculus I in the first semester. Also, discuss the merits of adding a minor with your advisor, as you would likely be advised to spread courses for your minor throughout the plan.

Sample Plan 1 - students taking MTH 151 in first semester

Year 1		
Fall	Credits Spring	Credits
CS 120 (Gen Ed Lang/Logical Systems)	4 CS 220	4
MTH 151 (Gen Ed Math)	4 CS 225	3
ENG 110 or 112 (Gen Ed Literacy-Written)	3 CST 110 (Gen Ed Literacy-Oral)	3
FYS 100 (Gen Ed First-Year Seminar)	3 MTH 207 (Gen Ed Math)	5
Gen Ed Arts	2-3	
	16	15
Year 2		
Fall	Credits Spring	Credits
CS 270	3 CS 364	3
CS 340	4 CS 370	3
MTH 208	4 Gen Ed Health & Well-Being	3
Gen Ed Minority Cultures	3 Gen Ed World History	3
	Gen Ed Natural Lab Science	4
	14	16
Year 3		
Fall	Credits Spring	Credits
CS 353 or 441 ¹	3 CS 441 or 453	3
CS 300/400 Elective	3 CS 300/400 Elective ¹	3
2nd Lab Science (CSH Core)	4 Gen Ed Humanistic Studies	3
Gen Ed Global Studies	3 CSH Core (300/400 not CS) or Minor ²	3
CSH Core (300/400 not CS) or Minor ²	3 Gen Ed Self & Society	3
	16	15
Year 4		
Fall	Credits Spring	Credits
CS 421	3 CS 341	3
CS 300/400 Elective	3 CS 442	3
CSH Core (300/400 not CS) or Minor ²	3 CS 300/400 Elective	3
CSH Core or Minor ²	3 CSH Core (300/400 not CS) or Minor ²	3
Gen Ed Arts	2-3 University Elective	2

Complete CS major field test ³	
14	14
Total Credits: 120	

¹ Students must complete either CS 353 or CS 453 but not both.

² See CSH BS Core Requirements (<http://catalog.uwlax.edu/undergraduate/scienceandhealth/#Core>) for information on completing the individualized option. 300/400 requirements for graduation may be impacted.

³ Every student must complete the computer science major field test during their senior year. This test is used for program assessment, not individual assessment.

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Sample Plan 2 - students taking MTH 207 first semester

Year 1

Fall	Credits Spring	Credits
CS 120 (Gen Ed Lang/Logical Systems)	4 CS 220	4
MTH 207 (Gen Ed Math)	5 CS 225	3
ENG 110 or 112 (Gen Ed Literacy-Written)	3 MTH 208 (Gen Ed Math)	4
FYS 100 (Gen Ed First-Year Seminar)	3 CST 110 (Gen Ed Literacy-Oral)	3
	15	14

Year 2

Fall	Credits Spring	Credits
CS 270	3 CS 364	3
CS 340	4 CS 370	3
Gen Ed Global Studies	3 Gen Ed Health & Well-Being	3
Gen Ed Natural Lab Science	4 Gen Ed World History	3
Gen Ed Arts	2-3 Gen Ed Minority Cultures	3
	16	15

Year 3

Fall	Credits Spring	Credits
CS 370	3 CS 441 or 453 ¹	3
CS 353 or 441 ¹	3 CS 300/400 Elective	3
2nd Lab Science (CSH Core)	4 Gen Ed Humanistic Studies	3
CSH Core (300/400 not CS) or Minor ²	3 CSH Core (300/400 not CS) or Minor ²	3
University Elective	2 Gen Ed Self & Society	3
	15	15

Year 4

Fall	Credits Spring	Credits
CS 421	3 CS 341	3
CS Elective	3 CS 442	3
CS Elective	3 CSH Core (300/400 not CS) or Minor ²	3
CSH Core (300/400 not CS) or Minor ²	3 University Elective	3
University 300/400-level Elective	3 University Elective	1
	Gen Ed Arts	2-3
	Complete CS major field test ³	
	15	15

Total Credits: 120

¹ Students must complete either CS 353 or CS 453 but not both.

² See CSH BS Core Requirements (<http://catalog.uwlax.edu/undergraduate/scienceandhealth/#Core>) for information on