

# Dual Degree Program in Computer Science: Cybersecurity and Master of Software Engineering

The dual degree program in Computer Science: Cybersecurity Emphasis and Master of Software Engineering is a great opportunity to those highly motivated students who would like to further their knowledge in software engineering. This program enables students to complete both degrees, a Bachelor of Science (BS) in computer science and a Master of Software Engineering (MSE) from UW-La Crosse, with less time in school, less tuition, and enter the workforce earlier than those receiving traditional degrees. This program can be completed in five years compared to what typically would take six years when completing both degrees separately.

Students may be accepted into the dual degree program anytime before they have completed seventy-five undergraduate credits hours. Applicants for undergraduate admission to UWL may request admission into the dual degree program. In order to remain in the program students must maintain a 3.00 GPA. Award of the BS degree will occur upon completion of 120 credits, the CS major requirements, the CSH college requirements, and the general university requirements. Students must have graduate student status prior to registering for their fourth graduate course (normally in the second semester of their 4th year.) Award of the MSE degree will occur after the completion of the BS and MSE requirements.

Refer to the sample degree plan (p. 2) for course sequencing. Students should consult with the CS Department Chair or their CS faculty advisor for specific course advising for this agreement.

## Major requirements

The Dual Degree Program in Computer Science: Cybersecurity Emphasis and Master of Software Engineering enables a UWL student to earn both a Bachelor of Science (B.S.) degree with a computer science major and a Master of Software Engineering (MSE) degree in five years. Students in this dual degree program should complete the following by the end of their junior year.

Code	Title	Credits
<b>Core</b>		
CS 120	Software Design I	4
CS 220	Software Design II	4
CS 225	Discrete Computational Structures <sup>1</sup>	3
CS 270	Introduction to Assembler Programming, C Programming and Computer Organization	3
CS 340	Software Design III: Abstract Data Types	4
CS 353	Analysis of Algorithm Complexity	3
or CS 453	Introduction to Theory of Computation	
CS 356	Software Exploitation	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
MTH 207	Calculus I	5
MTH 208	Calculus II	4
<b>Electives</b>		
Select three credits of CS electives. <sup>2,3</sup>		3

<sup>1</sup> May substitute MTH 225 for CS 225.

<sup>2</sup> Excluding CS 341.

<sup>3</sup> CPE courses may be used as alternatives to computer science electives, excluding CPE 321, CPE 395, CPE 446, CPE 481, CPE 483, and CPE 498.

During the senior year, students should complete:

Code	Title	Credits
CS 555	Fundamentals of Information Security	3
CS 556	Secure Software Development	3
CS 741	Software Engineering Principles	3
CS 743	Software Verification and Validation	3
CS 746	Software Modeling and Analysis	3
Select three or six graduate level MSE electives		3-6

In the fifth year, students should complete:

Code	Title	Credits
CS 744	Software Project Management	3
Graduate level MSE electives		3-6
CS 798	Software Development Project (two semesters of six credits)	12

CS 555, CS 556, and CS 741 will count toward the 51 credit hours of computer science courses required for the B.S. degree. In addition to the 51 credit hours of computer science courses required for the B.S. degree, two natural lab science courses must be taken 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>). CS 743, CS 744, CS 746, 12 credits of CS 798 (capstone project), and nine credits of MSE electives will fulfill the MSE requirements.

Students may be accepted into the dual degree program anytime before they have completed 75 undergraduate credit hours. Applicants for undergraduate admission to UWL may request admission into the dual degree program. In order to remain in the program students must maintain a 3.00 GPA. Award of the B.S. degree will occur upon completion of 120 credits, the CS major requirements, the CSH college core requirements, and the general university requirements. Students must have graduate student status before registering for their fourth graduate course (normally in the second semester of their senior year.) Award of the MSE degree will occur after the completion of the B.S. and MSE requirements.

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

Contact the Department of Computer Science & Computer Engineering (<http://www.cs.uwlax.edu/>) for application information. See the online graduate catalog for more information about the MSE program (<http://catalog.uwlax.edu/graduate/programrequirements/softwareengineering/>).

**Courses offered at both the undergraduate and graduate levels can only be taken for credit at one level.**

## 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. 2)
- Baccalaureate degree requirements (p. 2)
- Master of Software Engineering requirements (<http://catalog.uwlax.edu/graduate/programrequirements/softwareengineering/mse/>)

## 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 programs<sup>1</sup> 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 two certificates outside the major with at least 12 combined credits at the 300/400 level; or
4. 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.

<sup>1</sup> 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.<sup>1, 2</sup>
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<sup>1, 2</sup> 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.

<sup>1</sup> 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.

<sup>2</sup> 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 less than 12 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.*

#### 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
Gen Ed Arts	2-3 Gen Ed Health & Well Being	3
	<b>17</b>	<b>17</b>

#### Year 2

Fall	Credits Spring	Credits
CS 270	3 CS 364	3
CS 340	4 CS 370	3
Gen Ed Natural Lab Science	4 CS Elective	3
Gen Ed Minority Cultures	3 Gen Ed World History	3
CSH Core (300/400 not CS) or Minor <sup>1</sup>	3 Gen Ed Self & Society	3
	University Elective	3
	<b>17</b>	<b>18</b>

#### Year 3

Fall	Credits Spring	Credits
CS 353 or 441 <sup>2</sup>	3 CS 442	3
CS 356	3 CS 453 or 441 <sup>2</sup>	3
CS 421	3 CSH Core (300/400 not CS) or Minor <sup>1</sup>	3
Gen Ed Arts	2-3 CSH Core (300/400 not CS) or Minor <sup>1</sup>	3
Gen Ed Natural Lab Science	4 University Elective	3
	Gen Ed Minority Cultures	3
	Apply for "graduate special status" for Fall semester	
	<b>15</b>	<b>18</b>

#### Year 4

Fall	Credits Spring	Credits
CS 556	3 CS 555	3
CS 741	3 CS 746	3
CS 743	3 MSE Elective	3
University Elective	3 MSE Elective	3

CSH Core (300/400 not CS) or Minor <sup>1</sup>	3 Gen Ed Humanistic Studies	3
Apply for "full graduate status" for Spring semester	Complete CS major field test <sup>3</sup>	
	<b>15</b>	<b>15</b>
<b>Additional year</b>		
<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
CS 798	6 CS 744	3
MSE Elective	3 CS 798	6
	<b>9</b>	<b>9</b>

**Total Credits: 150**

- <sup>1</sup> 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.
- <sup>2</sup> Students must complete either CS 353 or CS 453 but not both.
- <sup>3</sup> Every student must complete the computer science major field test during their senior year. This test is used for program assessment, not individual assessment.

**Students also have the option of taking Gen Ed courses during Winter Intersession (January between Fall and Spring semesters) and Summer to reduce the load during regular semesters (Fall and Spring).**

**Additional UWL and College of Science and Health core courses may be required.**