Dual Degree Program in Computer Science: Embedded Systems and Master of Software Engineering

The dual degree program in Computer Science: Embedded Systems 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 credit hours. Applicants for undergraduate admission to UW-La Crosse 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 core requirements, and the general university requirements. Students must have graduate student status prior to registering for their fourth quarter of study (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: Embedded Systems 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 120</td>
<td>Software Design I</td>
<td>4</td>
</tr>
<tr>
<td>CS 220</td>
<td>Software Design II</td>
<td>4</td>
</tr>
<tr>
<td>CS 225</td>
<td>Discrete Computational Structures</td>
<td>3</td>
</tr>
<tr>
<td>CS 270</td>
<td>Introduction to Assembler Programming, C Programming and Computer Organization</td>
<td>3</td>
</tr>
<tr>
<td>CS 272</td>
<td>Digital Circuit Design for Microcontrollers I</td>
<td>3</td>
</tr>
<tr>
<td>CS 340</td>
<td>Software Design III: Abstract Data Types</td>
<td>4</td>
</tr>
<tr>
<td>CS 370</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>CS 372</td>
<td>Hardware/Software Integration</td>
<td>3</td>
</tr>
<tr>
<td>CS 421</td>
<td>Programming Language Concepts</td>
<td>3</td>
</tr>
<tr>
<td>CS 441</td>
<td>Operating System Concepts</td>
<td>3</td>
</tr>
<tr>
<td>CS 442</td>
<td>Structures of Compilers</td>
<td>3</td>
</tr>
</tbody>
</table>

In the fifth year, students should complete:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 555</td>
<td>Fundamentals of Information Security</td>
<td>3</td>
</tr>
<tr>
<td>CS 741</td>
<td>Software Engineering Principles</td>
<td>3</td>
</tr>
<tr>
<td>CS 743</td>
<td>Software Verification and Validation</td>
<td>3</td>
</tr>
<tr>
<td>CS 746</td>
<td>Software Modeling and Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three or six graduate level MSE electives

During the senior year, students should complete:

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/gernealeducation/)
- College core (p. 2)
- Baccalaureate degree requirements (p. 2)
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, ESC 221, ESC 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 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 an 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.

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. (No substitutions for graduation may be made in course requirements for a major or minor after the fourth week of the last semester of the senior year.)
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 GPA¹ 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/class timetable) 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/psp/csped/7cmd=login&amp;languageCd=ENG&amp;) 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.

### Year 1
#### Fall
- CS 120 (Gen Ed Lang/Logical Systems) 4
- MTH 207 (Gen Ed Math) 5
- ENG 110 or 112 (Gen Ed Literacy-Written) 3
- FYS 100 3
- Gen Ed Arts 2-3

#### Spring
- CS 220 4
- CS 225 3
- MTH 208 (Gen Ed Math) 4
- Gen Ed Natural Lab Science 4

**Total Credits: 17**

### Year 2
#### Fall
- CS 270 3
- CS 272 3
- CS 340 4
- CST 110 (Gen Ed Literacy-Oral) 3
- Gen Ed Arts 2-3
- University Elective 3

#### Spring
- CS 370 3
- CS 372 3
- Gen Ed Science Elective (CSH Core) 4
- Gen Ed Minority Cultures 3
- Gen Ed Self & Society 3

**Total Credits: 18**

### Year 3
#### Fall
- CS 441 3
- CS 472 3
- Gen Ed Global Studies 3
- Gen Ed Humanistic Studies 3
- University Elective (300/400-level) 3
- CSH Core (300/400 not CS) or Minor 3

#### Spring
- CS 421 3
- CS 442 3
- Gen Ed Health & Well-Being 3
- Gen Ed Core (300/400 not CS) or Minor 3
- CSH Core or Minor 3
- Apply for "graduate special status" for Fall semester

**Total Credits: 18**

### Year 4
#### Fall
- CS 741 3
- CS 743 3
- MSE Elective 3
- MSE Elective 3
- CSH Core or Minor 3
- University Elective 3
- University Elective 3

#### Spring
- CS 745 3
- CS 746 3
- MSE Elective 3
- Gen Ed World History 3
- CSH Core or Minor 3
- Complete CS major field test 3

**Total Credits: 18**

---

1. 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.

2. 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.