



*COMPUTER SCIENCE
DEPARTMENT*

**Advisement Bulletin
Software Technology Major**



2018-2019

UNIVERSITY OF WISCONSIN OSHKOSH
Computer Science Department
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Admission & Graduation Requirements

- **To be eligible to declare a Software Technology Major**, students must have completed a Software Developer Associate in Applied Science (A.A.S.) degree from a Wisconsin technical college with which UW-Oshkosh has the appropriate articulation agreement to pursue their studies at UW-Oshkosh to complete a Bachelor of Science (B.S.) in Software Technology degree

To be eligible for graduation, students must meet all requirements for the degree being sought in addition to earning a minimum grade point average of 2.00 in all courses required for the Software Technology major.

In addition to University and College requirements, students must have a minimum grade point average of 2.00 in those computer science (CS) courses numbered 300 or above that are used to satisfy the requirements of the Software Technology major excluding CS 399.

Objectives

Three to five years after graduation, our typical alumni will:

1. Advance beyond initial entry-level positions as computing professionals or have made significant progress toward a graduate degree in computing.
2. Use the background they have acquired in Software Technology during their undergraduate study as a basis for continued growth of their professional knowledge and skills.
3. Use teamwork skills effectively in the development of software systems.
4. Use communication skills to advantage within the organizational structure of workplaces that are becoming increasingly diverse and interconnected among different groups including, but not necessarily limited to, those groups based on racial, gender, age, and religious backgrounds.
5. Demonstrate strong professional ethics in all of their computing endeavors.

Learning Outcomes

General outcomes that guide the specific learning outcomes for individual courses.

Students graduating with a degree in Software Technology will have:

- An ability to apply knowledge of computing to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- An ability to function effectively on teams to accomplish a common goal.
- An understanding of professional, ethical, legal, security, and social issues and responsibilities.
- An ability to communicate effectively with a range of audiences.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Recognition of the need for and an ability to engage in continuing professional development.
- An ability to use current techniques, skills, and tools necessary for computing practice.
- An ability to apply design and development principles in the construction of software systems of varying complexity

Prerequisites and Repeating Courses

Prerequisites

The computer science department has established prerequisites for each course so that students will be adequately prepared for the topics covered in the course. This allows the instructor to proceed with the course in a manner that ensures quality in the program.

The department strictly enforces the prerequisite policy. You should not take courses unless you satisfy the prerequisites. Otherwise, when the deficiency is detected, you will have to drop the course. All courses are checked. See Enrollment Policy Without Prerequisites on our website for additional details.

Repeating Courses

The College of Letters and Science and the computer science department permit students to repeat a given computer science course **one time only**. Note that this policy includes transfer courses. A very important consequence of this policy is that a student who does not earn a grade of C or better in certain courses that are prerequisites for a required course must withdraw from the Software Technology major. For example, suppose a student earns a D grade in CS 271 (Data Structures). Then s/he repeats it and earns a C- grade. Because CS 271 is a prerequisite for some required 300-level courses in Computer Science and Information Systems, he or she will not be permitted to major in Software Technology.

Software Technology Major Courses

<u>Course</u>	<u>Credits</u>
CS 221 Object Oriented Design and Programming I	3 cr.
CS 247 Introduction to Usability	3 cr.
CS 262 Object Oriented Design and Programming II	4 cr.
CS 271 Data Structures	4 cr.
CS 341 Software Engineering I	3 cr.
CS 344 Mobile Application Development	3 cr.
CS 346 Web Software Development	3 cr.
CS 399 Internship in Computer Science	3 cr.
PHIL 350 Computing Ethics	3 cr.
IS 208 Professional Career Skills in Math and Natural Science	1 cr.
INFO SYS 315 Database Systems in Business	3 cr.
INFO SYS 316 Networking and Data Communication	3 cr.
One of the following:	
INFO SYS 318 Agile Application Development	3 cr.
INFO SYS 432 Agile Web Design and Development	<u>3 cr.</u>

Total: 39 cr.

Course Rotation

This is the rotation schedule for Computer Science courses.

The computer science department will attempt to offer courses according to the following rotation. The schedule could be altered due to lack of resources or low enrollments.

The following courses will be offered every semester:

CS 221 Object Oriented Design and Programming I
CS 262 Object Oriented Design and Programming II
CS 271 Data Structures

The following courses will be offered once per year, in the Fall semester:

CS 247 Introduction to Usability
CS 341 Software Engineering I
CS 346 Web Software Development

The following course will be offered every third semester

Fall 2019, Spring 2021, Fall 2022

CS 344 Mobile Application Development

Computer Science Course Descriptions

CS 221 Object-Oriented Design and Programming I (3 units)

A first course in problem solving, software design, and computer programming using an object-oriented language. Problem solving/software design techniques include: flow charts, pseudo code, structure charts, structure charts, and UML class diagrams. Data structures and algorithms include: arrays, characters strings, linear search. Programming topics include; data types assignment statements, standard input/output, selection, repetition, functions/methods, parameters, scope of identifiers, debugging.

Prerequisite: A grade of C or better in Math 104 or Math 108 or Math 206 or CS 142, or qualifying for Math 171 via the Mathematics Placement Exam. (Fall, Spring)

CS 247 Introduction to Usability (3 units)

This course presents the basic theory and professional views on design and usability, with an emphasis on human-computer interaction in web-based environments. The nature of life in general requires an understanding of how people think and act. What makes a well-designed door versus a poorly designed door? Understanding the answer scientifically is based on understanding people and usability, not the mechanics of doors. This class will focus on several basic principles that range from defining usability, design, sketches and how to evaluate usability. A case study will be conducted using high-level psychology and visual perception concepts that often pertain to usability.

Prerequisites: A grade of C or better in Comp Sci 142 or Comp Sci 221 or Info Sys 318. (Fall)

CS 262 Object-Oriented Design and Programming II (4 units)

A second course in problem solving, software design, and computer programming using an object-oriented language. Problem solving/software design topics include: abstract data types, universal modeling language (UML), simple recursion, unit testing, event-handling, simple concurrency. Data structures and algorithms include: binary search, simple sorting algorithms, use of collection classes and their iteration protocols, sequential file processing. Additional topics include: inheritance, polymorphism, graphical user interfaces, simple use of threads.

Prerequisite: Mathematics 108 or equivalent with a grade of C or better, or qualifying for a higher level mathematics course via the Mathematics Placement exam, and CS 221 or equivalent with a grade of C or better. (Fall, Spring)

CS 271 Data Structures (4 units)

A course surveying the fundamental methods of representing data and the algorithms that implement and use those data representation techniques. Data structures and algorithms include; linked lists, stacks, queues, trees, heaps, priority queues, hashing, searching, sorting, data compression, graphs, recursion. Analysis topics include: elementary big-O analysis, empirical measurements of performance, time/space trade-offs, and identifying differences among best, average, and worst case behaviors.

Prerequisite: CS 262 with a grade of C or better AND, for Computer Science majors, either Completion (with a grade of C or better) of or concurrent enrollment in CS 251. (Fall, Spring)

CS 341 Software Engineering I (3 units)

This course will provide an in-depth study and analysis of at least one large scale software system. Students will analyze, design, and partially implement an extensive software project. Case studies will address major system concerns such as specification, classification, inter-relationships, validation, and evaluation. Other topics include the use of UML, prototyping, data flow diagrams and CASE tools.

Prerequisite: CS 271 with a grade of C or better OR Junior-level standing and CS 262 with a grade of C or better. (Fall)

CS 344 Mobile Application Development (3 units)

An introduction to the tools for developing mobile applications. Topics covered include: history of mobile development, using an appropriate IDE, emulating a mobile device, building a flexible user interface, understanding the application lifecycle, creating and managing multiple threads, creating and using web services and encrypting a completed project. A large mobile application will be created throughout the course.

Prerequisite: CS 262 with a grade of C or better. (Every 3rd semester)

CS 346 Web Software Development (3 units)

An introduction to the tools for developing internet applications. Topics covered include: Internet history, the HyperText Markup Language, graphic images and manipulation, multimedia, programming in the JavaScript and PERL languages.

Prerequisite: CS 262 with a grade of C or better. (Fall)

Internship

The course CS 399 Internship in Computer Science is designed to be the capstone course for the major. The course satisfies the Writing Emphasis requirement in the Computer Science Department. Each semester a faculty member in the Computer Science department is assigned the duties of being the " Internship Coordinator." The name of and the times to see the coordinator are posted in the departmental office each semester.

CS 399 Internship in Computer Science Credits (3 units)

An internship experience with a cooperating organization or corporation to provide on-the-job learning. This course satisfies the Writing Emphasis requirement for the Computer Science major.

[The internship guidelines and application form are online.](#)

Prerequisites: 75 credits toward graduation, at least six credits of 300 level CS courses, and completion of IS 208 (Professional Career Skills in Math and Natural Science, 1 credit) with a passing grade.

<u>Software Technology major</u>	
<p>Computer Science Required:</p> <ol style="list-style-type: none"> 1. CS 221 _____ 2. CS 247 _____ 3. CS 262 _____ 4. CS 271 _____ 5. CS 341 _____ 6. CS 344 _____ 7. CS 346 _____ 8. CS 399 _____ 	<p>INFO SYS Required:</p> <ol style="list-style-type: none"> 1. INFO SYS 315 _____ 2. INFO SYS 316 _____ <p>One of following INFO SYS Required:</p> <ol style="list-style-type: none"> 1. INFO SYS 318 _____ 2. INFO SYS 432 _____ <p>Philosophy Required:</p> <ol style="list-style-type: none"> 1. Phil 350 _____ <p>Interdisciplinary Studies Required:</p> <ol style="list-style-type: none"> 1. IS 208 _____

Student Notes