COMPUTER SCIENCE MAJOR (A)

The Computer Science program produces graduates highly skilled in creating, applying, and communicating complex technological solutions to organizational problems in the context of a Biblical worldview.

The BS degree program features 4 concentrations in Software Engineering, AI & Robotics, Cybersecurity, Virtual & Augmented Reality, and Information Systems. All 4 concentrations share a common technology core which ensures students share an understanding of computer programming, computer hardware, and fundamental topics in Computer Science. The only concentration currently offered face to face in Ann Arbor is Software Engineering, however for all other concentrations, some courses may have to be taken synchronously via zoom with the Mequon campus.

The concentrations allow a student to specialize in a specific area of Computer Science. Given the number of allowed free electives, students are invited to choose more than one concentration if that is of interest to them. Our students find high paying jobs in the technology sector of industry in areas involving software development, data science, artificial intelligence, robotics, cybersecurity, video game design, animation, as well as more hardware based vocations in the IT field. Students are often recruited by emerging technology firms looking for technology students capable of learning something new.

Our program emphasizes the idea that computer programming does not define Computer Science, but rather is the tool a Computer Scientist wields to solve problems. We also adopt the notion that the programming language is insignificant as programming is a skill, the language is how that skill is expressed. Programming is to the Computer Scientists as a tennis racket is to a tennis player. The grand ideas of Computer Science are then explored through the application of computer programming in the context of the various theoretical subjects offered by the department.

All students interested in problem solving in the world by leveraging technology should consider a major or minor in Computer Science!

Program Learning Outcomes

- Professional responsibility. Students will recognize and be guided by the professional, legal and worldview issues involved in the use of computer technology.
- Problem solving. Students will demonstrate how to solve problems in various user domains using the tools of computer science and information technology.
- Elements of computational thinking. Students will recognize the broad relevance of computational thinking in everyday life as well as its applicability within other domains, and apply it in appropriate circumstances.
- Modeling. Students will use such knowledge and understanding in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoff involved in design choices.
- Methods and tools. Students will deploy appropriate theory, practices, and tools for the specification, design, implementation, and maintenance as well as the evaluation of computer-based systems.
- Critical evaluation and testing. Students will analyze the extent to which a computer-based system meets the criteria defined for its current use and future development.
- Requirements and Specifications. Students will identify and analyze criteria and specifications appropriate to specific problems, and plan strategies for their solution.
- Knowledge and understanding. Students will exhibit knowledge and understanding of essential facts, concepts, principles, and theories relating to computer science and information technology (especially the nine grand ideas).

Curriculum

Code	Title	Hours
Core Requirements (https://catalog.cuw.edu/undergraduate/university/acad-prog/trad/core/)		45
Technical Core		36
Major or Concentration		16-18
Electives		21-23
Total Hours		*120*

Code	Title	Hours
Technical Core Courses		
MATH 205	Statistics I	3
CSC 175	Theory and Fundamentals of Computer Science	3
CSC 200	Coding I- Fundamentals	3
CSC 250	Coding II - Algorithms	3
CSC 325	Computer Architecture	3
CSC 350	Operating Systems	3
CSC 370	Software Engineering	3
CSC 410	Computational Dilemmas	3
CSC 420	User Experience and Interactive Systems	3
CSC 430	Database Fundamentals	3
CSC 460	Advanced Database and Web Development	3
CSC 491	Capstone Project	3
Total Hours		**36**

Select from the following 4 Concentrations:

Code	Title	Hours
Software Engineering		
CSC 300	Coding III- Data Structures	3
CSC 450	Systems Programming	3
CSC 470	Programming Language Theory	3
CSC 490	Theoretical Computer Science	3
CSC Elective		3
CSC 400	Internship	1-3
Total Hours		**16-18**

Code	Title	Hours
AI & Robotics		
CSC 300	Coding III- Data Structures	3
CSC 415	Artificial Intelligence	3
CSC 417	Advanced Artificial Intelligence	3
CSC 419	Machine Learning and Robotics	3
CSC Elective		3

Code	Title	Hours
CSC 400	Internship	1-3
Total Hours		**16-18**

Code	Title	Hours
Cyber Security		
CSC 180	Systems Integration	3
CSC 440	Networks & Security	3
CSC 426	Cybersecurity	3
CSC 428	Penetration Testing	3
CSC Elective		3
CSC 400	Internship	1-3
Total Hours		**16-18**

Code	Title	Hours
Virtual & Augmented Reality		
CSC 180	Systems Integration	3
CSC 210	Animation I	3
CSC 315	Animation II	3
CSC 435	Animation III	3
CSC Elective		3
CSC 400	Internship	1-3
Total Hours		**16-18**