

# MASTER OF SCIENCE IN COMPUTER SCIENCE

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## DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

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## STATEMENT OF PURPOSE

The purpose of the Master of Science in Computer Science (MSCS) is to provide a high-quality, advanced education in computer science.

## PROGRAM OBJECTIVES

Graduates will:

1. demonstrate advanced knowledge and skills in computer science;
2. apply fundamental theory and practical methods to construct software systems;
3. interact affectively within international and diverse teams; and
4. engage in and recognize the importance of life-long learning.

## STUDENT LEARNING OUTCOMES

Graduates will achieve the following learning outcomes:

1. Foundation: Graduates will have a solid foundation in computer science with advanced knowledge in one or more areas.
2. Practice: Graduates will have demonstrated their ability to apply their knowledge to practical problems on projects.
3. Presentation: Graduates will be capable of effective written and oral communication particularly with respect to preparing, publishing, and presenting technical material to diverse audiences.
4. Growth: Graduates will exhibit skills for adapting to new environments and technologies, adapting to cultural differences, and embracing lifelong learning.

## INTRODUCTION

The Master of Science in Computer Science provides advanced study in computer science. The program offers various courses that cover both the fundamental theory and the fast advancing technologies in computing. The program is application oriented and students will be ready to go to industry after completing the program, although they can still proceed to Ph.D. programs if they chose so.

## PREREQUISITES

Those seeking admission to the program must have earned a bachelor's degree in computer science, software engineering, informatics or a closely related field from a regionally or nationally accredited institution. In particular, all students must have had courses in introductory programming and data structures and, in addition, coursework covering at least four of the following topics:

- Computer architecture
- Database design
- Discrete mathematics
- Programming languages
- Operating systems
- Networking
- Software engineering

Applicants from other fields may be required to take undergraduate courses to address deficiencies. Substantial industry experience may be accepted in lieu of coursework in the above areas on a case-by-case basis.

In addition, students must meet the other admission requirements for all master's programs at UW-Platteville.

## CURRICULUM

The program is designed to take three or four semesters of full-time study. All students will complete 30-36 credits, with at least 21 of those credits from courses at the 7000 level. Graduate students must maintain a minimum 3.00 grade point average. Students can take all classes on campus

with an option of one online class each semester. Students can also go to our partner university in Germany as exchange students for one or two semesters.

There are three options for the MSCS program depending upon whether the student writes a thesis or a seminar paper.

Option	Thesis	Seminar Paper	Courses Only
Total Credits	30	30	36
Foundations	18 to 24 credits, with at least 9 credits from Group A and 9 credits from Group B	21 to 27 credits, with at least 12 credits from Group A and 9 credits from Group B	30 to 36 credits, with at least 15 credits from Group A and 15 credits from Group B
Electives	0 to 6 credits	0 to 6 credits	0 to 6 credits
Additional	6 credits of COMPUTER 7990 Thesis Research	3 credits of COMPUTER 7920 Seminar Paper Research	Not applicable
Written Comprehensive Examination	No	Yes	Yes

## GROUP A

Courses with a significant mathematical component or which cover a traditional theoretical concept.

Code	Title	Credits
COMPUTER 5030	Artificial Intelligence	3
COMPUTER 5430	Object-Oriented Analysis and Design	3
COMPUTER 5520	Programming Language Structures	3
COMPUTER 5920	Computer Graphics	3
COMPUTER 7360	Advanced Operating Systems	3
COMPUTER 7380	Advanced Database Management Systems	3
COMPUTER 7460	Computer Security	3
COMPUTER 7630	Compiler Construction	3
COMPUTER 7820	Advanced Algorithms	3

## GROUP B

Applied courses.

Code	Title	Credits
COMPUTER 5730	Software Quality	3
COMPUTER 5860	Software Maintenance and Reengineering	3
COMPUTER 5870	Web Protocols, Technologies and Applications	3
COMPUTER 6130	Real-Time Embedded Systems Programming	3
COMPUTER 7640	Machine Learning	3
COMPUTER 7660	Computer Vision	3
COMPUTER 7720	Human-Computer Interaction	3

## INDEPENDENT STUDY AND SPECIAL TOPIC

COMPUTER 6830 Special Topics in Computer Science

COMPUTER 7830 Special Topics in Computer Science

COMPUTER 7980 Independent Study in Computer Science

## PROJECT COURSES

COMPUTER 7120 Software Project I

COMPUTER 7220 Software Project II

## SEMINAR PAPER AND THESIS

COMPUTER 7920 Seminar Paper Research

COMPUTER 7990 Thesis Research

## **FOUNDATION COURSES**

The foundation courses are divided into two groups with Group A including an element of theory and Group B being more applied. Students are required to take courses from both groups.

COMPUTER 6830, COMPUTER 7830, COMPUTER 7980 can also count towards the foundations requirement (with a designation in Group A or Group B) upon approval by the department chair or program coordinator.

## **WRITING**

For the thesis option, each student must organize a thesis committee containing at least three qualified individuals. At least one member of the thesis committee must be a member of the department and at least one must be outside of the department. For the seminar paper option, each student must have a seminar paper advisor from the department. For both the seminar and the courses only option, each student must pass a comprehensive written examination.