

# Computer Science, M.S.

Computer Science encompasses both theoretical and practical aspects of design, analysis, and implementation of computer systems, as well as applications of computing to numerous other fields. Core research areas include: (1) artificial intelligence and machine learning, (2) bioinformatics, (3) computer architecture, (4) embedded systems, (5) graphics and computer vision, (6) database systems and information management, (7) multimedia and gaming, (8) networks and distributed systems, (9) programming languages and compilers, (10) security, privacy, and cryptography, (11) design and analysis of algorithms, and (12) scientific computing.

The M.S. degree in Computer Science (CS) is a broad and flexible program, offering students opportunities for in-depth graduate study and cutting-edge research, covering a broad range of topics in Computer Science.

The course requirements for the M.S. are identical to those of the Ph.D., although completion plans differ. M.S. students can choose a thesis option that allows them to undertake a research-based thesis in lieu of two elective courses, or the comprehensive plan option.

## Required Courses

Each student must complete at least 47 units of course work. In addition, students must receive at least a B in each course counted toward filling these requirements.

Students must complete three quarters of COMPSCI 200S, four core courses, and seven elective courses. The course requirements are as follows:

Students must select four areas from the list of seven areas given below. From each area, they must select at least one of the courses listed for that area.

<b>Data Structures and Algorithms</b>	
COMPSCI 260	Fundamentals of the Design and Analysis of Algorithms
COMPSCI 261	Data Structures
COMPSCI 263	Analysis of Algorithms
<b>Architecture/Embedded Systems</b>	
COMPSCI 250A	Computer Systems Architecture
COMPSCI 244	Introduction to Embedded and Ubiquitous Systems
<b>System Software</b>	
COMPSCI 205	Computer and Systems Security
COMPSCI 241	Advanced Compiler Construction
COMPSCI 230	Distributed Computer Systems
<b>Artificial Intelligence</b>	
COMPSCI 271	Introduction to Artificial Intelligence
COMPSCI 273A	Machine Learning
<b>Networks/Multimedia</b>	
COMPSCI 232	Computer and Communication Networks
COMPSCI 203	Network and Distributed Systems Security
<b>Database Systems</b>	
COMPSCI 222	Principles of Data Management
COMPSCI 223	Transaction Processing and Distributed Data Management
<b>Scientific and Visual Computing</b>	
COMPSCI 206	Principles of Scientific Computing
COMPSCI 211A	Visual Computing

Seven elective courses selected from any ICS graduate program, except COMPSCI 290, COMPSCI 296, COMPSCI 298, and COMPSCI 299, any course with a suffix of "S", "W", or "P" (e.g., 209S), and any non-COMPSCI course with a prefix of "29" (e.g., 295).

## Notes/Restrictions

- At most two COMPSCI 295 courses are allowed.
- At most two upper-division undergraduate courses are allowed from the list below:

COMPSCI 111	Digital Image Processing
COMPSCI 112	Computer Graphics

COMPSCI 122A	Introduction to Data Management
COMPSCI 132	Computer Networks
COMPSCI 142A	Compilers and Interpreters
COMPSCI 143A	Principles of Operating Systems
COMPSCI 152	Computer Systems Architecture
COMPSCI 161	Design and Analysis of Algorithms
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 177	Applications of Probability in Computer Science
COMPSCI 178	Machine Learning and Data-Mining
I&C SCI 161	Game Engine Lab
I&C SCI 162	Modeling and World Building
I&C SCI 163	Mobile and Ubiquitous Games
I&C SCI 166	Game Design

3. At most two courses from combined 1 and 2 above are allowed.
4. At most two courses are allowed from non-ICS UCI graduate programs, with written consent of the Vice Chair for Graduate Studies.
5. Any course that was used toward an undergraduate degree cannot be used toward graduate requirements.

#### **Plan I: Thesis Plan**

The thesis option is available for graduate students who may wish to continue on to a Ph.D. program or those who wish to concentrate on a specific problem. To qualify for this option, students must be in good academic standing with their Department. The student must enroll in at least two quarters of Thesis Supervision (COMPSCI 298) that will substitute for two required courses as specified under the concentration area or specialization of choice. All required courses must be completed with a grade of B or better, and the student must write a research or thesis project. A committee of three faculty members (voting members of the Academic Senate) will guide the student and give final approval of the thesis. The committee will consist of an advisor (faculty member from the student's department) who is willing to supervise the thesis project, and two other faculty members (one of which must be from the student's department) who are willing to serve on the committee as readers of the thesis. An oral presentation of the thesis to the committee will be required.

#### **Plan II: Comprehensive Examination Plan**

The student completes the required with a grade of B or better. The student must take a comprehensive examination given by the CS faculty. The examination covers the core requirements.