Computer Science M.S.

Graduate Arts and Sciences

Director: Babak Forouraghi, Ph.D.

The equivalent of the following courses currently required in the undergraduate Computer Science program:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CSC 120</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSC 121</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
</tbody>
</table>

These courses use the Java programming language.

Mathematics

The equivalent of the following courses in an undergraduate Mathematics or Computer Science program.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 240</td>
<td>Discrete Structures</td>
<td>3</td>
</tr>
</tbody>
</table>

1 New students will be required to take a placement examination in these subjects. Students who are deficient in these requirements must take and earn (without graduate credit) a grade of B in the appropriate courses.

Program Options

Students may choose to graduate with an:

- M.S. degree in Computer Science: General Option, or
- M.S. degree in Computer Science: Concentration Option, or
- M.S. degree in Cybersecurity

Learning Goals and Objectives

Goal 1: Graduates succeed as practicing computer scientists.

Students will be able to:

Objective 1.1: Solve problems and implement their solutions in an appropriate computational environment.

Objective 1.2: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 1.3: Design systems, components, or processes to meet specified requirements.

Objective 1.4: Work in teams to create various software systems, both large and small.

Objective 1.5: Communicate effectively, orally and in written form, individually and/or in teams.

Goal 2: Graduates adapt and evolve in complex technological environments such as those found in the workplace.

Students will be able to:

Objective 2.1: Solve problems and implement their solutions in an appropriate computational environment.

Objective 2.2: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 2.3: Design systems, components, or processes to meet specified requirements.

Objective 2.4: Work in teams to create various software systems, both large and small.

Objective 2.5: Analyze contemporary issues related to the evolving discipline of computer science.

Objective 2.6: Communicate effectively, orally and in written form, individually and/or in teams.

Goal 3: Graduates are careful, precise, mature thinkers, and take with them the intellectual preparation they need to apply what they have learned, communicate it to others, and continue their education for the rest of their lives.

Students will be able to:

Objective 3.1: Enter and successfully complete Ph.D. programs in computing.

Objective 3.2: Solve problems and implement their solutions in an appropriate computational environment.

Objective 3.3: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 3.4: Design systems, components, or processes to meet specified requirements.

Objective 3.5: Articulate the social, professional, ethical and legal aspects of a computing environment.

Objective 3.6: Analyze contemporary issues related to the evolving discipline of computer science.

Objective 3.7: Communicate effectively, orally and in written form, individually and/or in teams.

Degree Requirements for M.S. in Computer Science: General Option

A total of ten (six core and four elective) courses is the minimum required for the M.S. in Computer Science with General Option. Of these, a maximum of two courses may be for an approved research project.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select six of the following:</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>CSC 550</td>
<td>Object Orient Design &amp; Data Structure</td>
<td></td>
</tr>
<tr>
<td>CSC 551</td>
<td>Design and Analysis</td>
<td></td>
</tr>
<tr>
<td>CSC 552</td>
<td>Computer Architecture</td>
<td></td>
</tr>
<tr>
<td>CSC 553</td>
<td>Computer Systems</td>
<td></td>
</tr>
<tr>
<td>CSC 554</td>
<td>Theory of Computation</td>
<td></td>
</tr>
<tr>
<td>CSC 610</td>
<td>Software Engineering</td>
<td></td>
</tr>
<tr>
<td>CSC 621</td>
<td>Database Systems</td>
<td></td>
</tr>
</tbody>
</table>

Elective Courses

Select any four CSC courses numbered 600 and more 12
A student who receives a grade lower than a B in a core course must retake the course.

**Degree Requirements for M.S. in Computer Science: Concentration Option**

A total of ten (four core and six elective) courses is the minimum for obtaining an M.S. degree in Computer Science in any of the following concentrations:

- Web and Database Technologies
- Cybersecurity
- Artificial Intelligence

Students who do not need prerequisite courses take the following two required core courses during their first and second semesters, respectively:

<table>
<thead>
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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 550</td>
<td>Object Orint Dsgn &amp; Data Struct</td>
<td>3</td>
</tr>
<tr>
<td>CSC 551</td>
<td>Design and Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Elective Courses**

Select two of the following: 6

- CSC 552 Computer Architecture
- CSC 553 Computer Systems
- CSC 554 Theory of Computation
- CSC 610 Software Engineering
- CSC 621 Database Systems
- CSC 627 Introduction to Security
- CSC 680 Artificial Intelligence
- CSC 681 Programming Paradigms

A student who receives a grade lower than a B in any core course must retake the course.

**Requirements for Six Elective (Concentration) Courses**

Students take four courses from the same concentration plus any other two CSC courses numbered 600 and above to receive a specialized M.S. degree from that concentration:

**Web and Database Technologies Concentration**

Select four of the following plus any two CSC courses numbered 600 and above:

- CSC 620 Internet App. Development
- CSC 621 Database Systems
- CSC 622 Advanced Database Concepts
- CSC 623 Data Comm and Networking
- CSC 643 Big Data and Web Intelligence
- CSC 647 Internet of Things

**Cybersecurity Concentration**

Select four of the following plus any two CSC courses numbered 600 and above:

- CSC 627 Introduction to Security
- CSC 628 Advanced Security
- CSC 629 Mobile App Design
- CSC 644 Security in Mobile App Design
- CSC 645 Intro to Ethical Hacking
- CSC 652 Network Forensics
- CSC 653 Intro to Soc Net Anlys and Mdl