

SFEMS - Software Engineering

Overview

Program Type

Master of Science

College

College of Engineering

Career

Graduate

Total Units

30

Program Description

Software engineering is key to how we engage with digital devices, and skills in programming and design position you to pioneer advancements in this dynamic field. The master's program in Software Engineering not only broadens your understanding of existing software architecture across a variety of technologies, but it also teaches you how to build and adapt software, leveraging your software developer degree to emerging technologies. Opt for a thesis or non-thesis track. The thesis path features classes such as Cloud Computing Principles and Practices; Principles of Artificial Intelligence; and Web Development and the Internet of Things, while the non-thesis route includes classes like Data Mining and Robotics.

NTHSFEMS - Non-Thesis Option

SFEMSAMP - Accelerated Master's Program

THSFEMS - Thesis Option

Program Requirements

Simple Requisites

Program Requirements

Minimum Credit Units

Type

Completion Requirement

Additional Comments:

30

Core Coursework Requirements

Type

Completion Requirement

Additional Comments:

Program Curriculum:

The MS Software Engineering requires 30 credit hours to complete

Students may elect either the Thesis or Non-Thesis Option

- Thesis route: 24 units of SFWE graded coursework + 6 units of SFWE 910 (Thesis)
- Non-Thesis route: 30 units of SFWE graded coursework

Required Core Courses (12 total):

- SFWE 507 (3) - Foundations of Software Engineering (NEW)

Complete 3 courses of additional Core coursework (*select 3 from the following list of courses*):

- SFWE 502 (3) - Software DevSecOps
- SFWE 503 (3) - Software Project Management
- SFWE 504 (3) - Software Requirements Analysis and Test
- SFWE 505 (3) - Software Architecture and Design
- SFWE 506 (3) - Distributed Computing

Elective Coursework

Type

Completion Requirement

Additional Comments:

Complete one of the two subplan options below.

Additional Requirements

Type

Completion Requirement

Additional Comments:

The Master's Thesis Committee must abide by the **Graduate College's committee requirements**. A minimum of two SFWE eligible faculty members must serve on the committee. The third member may be a Special Member.

Student Handbook

Type

Completion Requirement

Additional Comments:

Please refer to the **Graduate Student Handbook** for students who are pursuing this program of study.

Subplan

Non-Thesis Option

Type

Completion Requirement

Additional Comments:

Minimum Credit Units

30

Core Coursework Requirements

See program requirements above.

Elective Coursework

The remaining SFWE graduate elective credits will be selected with the approval of an SFWE Faculty Advisor.

Non-Thesis Option:

Complete 18 units from the **Technical Computing Electives** list below or in a closely related computing field (must be approved by graduate studies committee).

- Any SFWE core courses not used to meet the 12-units of *Core* coursework requirement can also be used as technical electives
 - SFWE 501 (3) - SW Assurance
 - SFWE 508 (3) – Data Mining
 - SFWE 509 (3) – Cloud Computing Principles and Practices
 - SFWE 510 (3) – Cloud Native Software Engineering
 - SFWE 511 (3) – Software for Industrial Control Systems
 - SFWE 512 (3) – Robotics

- SFWE 513 (3) – Software Engineering Research Methods
- CSE 501 (3) – Operating System Design
- ECE 503 (3) – Probability and Random Processes for Engineering Applications
- ECE 509 (3) – Cybersecurity Concept, Theory, Practice
- ECE 513 (3) – Web Development and the IoT
- ECE 523 (3) – Engineering Applications of Machine Learning and Data Analytics
- ECE 562 (3) – Computer Architecture and Design
- ECE 576A (3) – Engineering of Computer Based Systems
- ECE 576B (3) – Embedded System Design and Optimization
- ECE 579 (3) – Principles of Artificial Intelligence
- SIE 533 (3) – Fundamentals of Data Science for Engineers
- SIE 558 (3) – Model Based Systems Engineering
- SIE 577 (3) – Introduction to Biomedical Informatics
- *Other courses may be added at the discretion of the faculty advisor and GSC, or as additional new SFWE courses not listed in section III. **New Courses Needed** are developed.*

Additional Requirements

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Student Handbook

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Thesis Option

Type

Completion Requirement

Additional Comments:

Minimum Credit Units

30

Core Coursework Requirements

See program requirements above.

Elective Coursework

The remaining SFWE graduate elective credits will be selected with the approval of an SFWE Faculty Advisor.

Thesis Option:

Complete 12 units from the **Technical Computing Electives** listed below or in a closely related computing field (must be approved by graduate studies committee).

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- *Other courses may be added at the discretion of the faculty advisor and GSC, or as additional new SFWE courses not listed in section III. **New Courses Needed** are developed.*

Also complete 6 units of thesis (SFWE 910)

Additional Requirements

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Student Handbook

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Accelerated Master's Program

Type

Completion Requirement

Additional Comments:

Minimum Credit Units

30

Core Coursework Requirements

Program Curriculum:

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- SFWE 505 (3) - Software Architecture and Design
- SFWE 506 (3) - Distributed Computing

Elective Coursework

The remaining SFWE graduate elective credits will be selected with the approval of an SFWE Faculty Advisor.

Non-Thesis Option:

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No Requirement Level