SOFTWARE ENGINEERING M.S.

The graduate plan in Software Engineering leads to the Master of Science (M.S.) degree. The software engineering degree is designed to prepare students for jobs such as system analyst, requirements engineer, software architect, software project manager or software designer. Students are best prepared for this program by having an undergraduate degree in Computer Science Studies or related field. The plan prepares students for key software positions in industry, government and institutions where software engineering has become a key activity. Students may choose the extended course work option or thesis option. The plan requires a total of 30 hours of study. The plan also allows for one of three specializations: Software Project Management, Robotics Software, and Software Development.

Credit earned before acceptance.

No more than six hours of graduate-level Software Engineering classes may be applied to the SWEN degree if taken without admission into the program. No more than six hours graduate credit may be transferred to the Software Engineering degree.

Students accepted in the Software Engineering program must file a Candidate Plan of Study (CPS) with their assigned faculty adviser within the first semester of study. The CPS will list the core courses and all electives and indicate if the student is choosing capstone or thesis option. If a sub-plan is chosen all electives will be chosen from the sub-plan. A student is not required to select a specialization. Once completed the CPS details all courses the student must take to fulfill the degree requirements.

Requirements

Students seeking admission into the degree plan in Software Engineering are best served by a bachelors degree in computer science; however other fields of study are accepted depending on the students area of study. The GRE is required of students whose GPA is less than 3.0. A GPA of 3.00 or higher is required though in some instances work experience might be considered. The faculty graduate admissions committee will decide acceptance into the program based upon program need, the requirements stated herein and university admission requirements. Once admitted, the student must file a candidate plan of study (CPS) in the first semester of enrollment. Foundation (preparatory) courses and other courses considered necessary may be added to the CPS and must be completed in or before the first year of enrollment. These preparatory requirements may include: proficiency in at least two modular programming languages, including C or C++, data structures, as well as a course in probability and statistics, and discrete math or its equivalent.

Core Requirements (21 hours)

- SWEN 5236: Engineering Software I
- SWEN 5237: Engineering Software II
- SWEN 5239: Agile Software Development
- SWEN 5232: Software Construction
- SWEN 5235: Software Construction II
- SWEN 5233: Software Architecture
- SWEN 5432: Software Engineering Life Cycle

Capstone Option

(3 hours of capstone + 12 hours of electives*)

- SWEN 6837: 3-hour Software Engineering Capstone Project
- or SWEN 6838: 6-hour SWEN technical elective 4000-6000 level

Capstone enrollment is limited to students who are in their graduating semester (last 9 hours of study including capstone) and who have completed all 8 courses and any required foundation courses identified on their CPS.

*Courses taken as electives in SWEN require permission of the faculty adviser before enrolling. Independent Study courses are only allowed for thesis students and require permission of the SWEN thesis chair as well as the program chair before enrolling. Only 3 hours of Independent Study are allowed under these conditions.

Thesis Option

(6 hours of thesis + 9 hours of electives*)

- SWEN 6939: 6-Hour Master's Thesis Research
- 9-hour SWEN technical elective 5100-6000 level

Thesis: Students must form a thesis committee and prepare a thesis proposal in the semester prior to enrollment into thesis. Contact the SCE advising office for instructions. Only full time tenure track faculty members may chair a SWEN thesis. Independent Study courses are only allowed for thesis students and require permission of the SWEN thesis chair as well as the program chair before enrolling. Only 3 hours of Independent Study are allowed under these conditions.
Courses taken as electives require permission of the faculty adviser before enrolling.

Software Engineering Specializations

Students interested in concentrating their study in a sub-area of software engineering such as Gaming, Software Development or Project Management should choose as electives those courses listed under the respective sub-plans listed below. Any courses within a sub-plan are allowable electives in SWEN.

Gaming and Robotics Software Specialization (Pick 3 courses from below)
- DMST 5131 Game Theory and Design
- CENG 5437 Mobile Robots
- CENG 5435 Robotics and ROS
- SWEN 5138 Design and Development of Virtual Worlds, Sims and Animation Scripting

Software Project Management Specialization (Pick 3 from below)
- SENG 5330 Risk Management
- SWEN 5130 Requirements Engineering
- SWEN 5230 Software Project Management
- SWEN 5435 Personal Software Process

Software Development Specialization (Pick 3 from below)
- SWEN 5431 Testing Verification and Validation
- SWEN 5430 Software Metrics
- SWEN 5131 Software Engineering Tools
- SWEN 5435 Personal Software Process

Online Option

The Software Engineering program may be taken fully online. Online courses are offered less frequently than face to face courses. Students requiring >50% of their courses online may take longer to graduate than those who choose a mix of face to face and online courses to fulfill the degree. Foundation courses are only offered as traditional face to face classes. Foundation courses must be taken either at UHCL or at another university before entry into the SWEN distance option.

Web Based Electives

Electives are offered online as well as face to face.

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>SENG 5330</td>
<td>Risk Management</td>
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<tr>
<td>SWEN 5132</td>
<td>Software Design Patterns</td>
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<tr>
<td>SWEN 5134</td>
<td>Gaming Software Development with Service</td>
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<tr>
<td>SWEN 5230</td>
<td>Software Project</td>
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<tr>
<td>SWEN 5431</td>
<td>Testing, Validation and Verification</td>
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<td>SWEN 5435</td>
<td>Personal Software Process</td>
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<tr>
<td>SWEN 5534</td>
<td>Reuse and Reengineering</td>
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