SOFTWARE ENGINEERING

Graduate Program Head
Raghu Sangwan

Program Code
SWENG

Campus(es)
Great Valley (M.S.E.)
World Campus (M.S.E.)

Degrees Conferred
Master of Software Engineering (M.S.E.)

The Graduate Faculty

The Master of Software Engineering program at Penn State Great Valley prepares computer professionals to develop software products and services for industry and government through software analysis, design and architecture; system verification; data storage and retrieval; and managing globally distributed development. This program is STEM designated.

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (https://gradschool.psu.edu/graduate-admissions/how-to-apply/). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (https://gradschool.psu.edu/graduate-education-policies/).

Normal admission requirements include background in operating systems, programming languages, data structures and algorithm analysis. Applications must include a statement of professional goals and a curriculum vitae or resume. Test scores from the GMAT or GRE exams are not required. An undergraduate cumulative grade-point average of 3.0 or better on a 4.0 scale in the final two years of undergraduate studies is required.

The language of instruction at Penn State is English. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. See GCAC-305 Admission Requirements for International Students (https://gradschool.psu.edu/graduate-education-policies/gcac-gcac-305-admission-requirements-international-students/) for more information.

Degree Requirements

Master of Software Engineering (M.S.E.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-700 Professional Degree Policies (https://gradschool.psu.edu/graduate-education-policies/).

The Master of Software Engineering degree is conferred upon students who earn a minimum of 36 credits of course work while maintaining an average grade-point average of 3.0 or better in all course work, including at least 18 credits at the 500 or 800 level. The program curriculum includes 18 credits of core courses, 12 credits of electives, and 6 credits of capstone experience.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWENG 505</td>
<td>Software Project Management</td>
<td>3</td>
</tr>
<tr>
<td>SWENG 581</td>
<td>Software Testing</td>
<td>3</td>
</tr>
<tr>
<td>SWENG 586</td>
<td>Requirements Engineering</td>
<td>3</td>
</tr>
<tr>
<td>SWENG 587</td>
<td>Software Systems Architecture</td>
<td>3</td>
</tr>
<tr>
<td>SWENG 837</td>
<td>Software System Design</td>
<td>3</td>
</tr>
<tr>
<td>SWENG 861</td>
<td>Software Construction</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

An additional 12 credits of elective courses must be selected from a list of approved elective courses maintained by the graduate program office.

<table>
<thead>
<tr>
<th>Title</th>
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<tr>
<td>SWENG 894</td>
<td>6</td>
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</tbody>
</table>

Total Credits

36

All students will complete their program of study with a capstone project that provides students with an opportunity to apply their knowledge of the software engineering theories, methods, processes, and tools learned throughout their program, in a culminating and summative experience. Students complete the capstone project while enrolled in SWENG 894.

Minor

A graduate minor is available in any approved graduate major or dual-title program. The default requirements for a graduate minor are stated in Graduate Council policies listed under GCAC-600 Research Degree Policies (https://gradschool.psu.edu/graduate-education-policies/) and GCAC-700 Professional Degree Policies (https://gradschool.psu.edu/graduate-education-policies/), depending on the type of degree the student is pursuing:

- GCAC-611 Minor - Research Doctorate (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-611-minor-research-doctorate/)
- GCAC-641 Minor - Research Master’s (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-641-minor-research-masters/)
- GCAC-709 Minor - Professional Doctorate (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-709-professional-doctoral-minor/)
- GCAC-741 Minor - Professional Master’s (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-741-masters-minor-professional/)

Student Aid

Refer to the Tuition & Funding (https://gradschool.psu.edu/graduate-funding/) section of The Graduate School’s website. Students in this program are not eligible for graduate assistantships.

Financial aid for students in on-campus programs is in the form of student loans and a limited number of small scholarships, as described on the Penn State Great Valley website (https://greatvalley.psu.edu/tuition-and-financial-aid/).

World Campus students in graduate degree programs may be eligible for financial aid. Refer to the Tuition and Financial Aid section (https://
Courses

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Software Engineering (SWENG) Course List (https://bulletins.psu.edu/university-course-descriptions/graduate/sweng/)

Learning Outcomes

1. KNOW. Graduates will be able to demonstrate mastery of concepts and methods for modeling, designing, developing and testing software solutions using legacy and contemporary environments.
2. CRITICAL THINKING. Graduates will be able to critically and creatively plan and manage development of software intensive systems using project management methods and tools.
3. PROBLEM SOLVING. Graduates will be able to demonstrate proficiency in exploring the trade space within a given set of internal and external constraints for a system under development.
4. COMMUNICATE. Graduates will be able to effectively communicate their ideas within their organization, to other practicing professionals and the general public.
5. TEAMWORK. Graduates will be able to work collaboratively within and with project teams including those that are geographically distributed.

Contact

Campus

Great Valley

Graduate Program Head

Raghu Sangwan

Director of Graduate Studies (DGS) or Professor-in-Charge (PIC)

Raghu Sangwan

Program Contact

MICHELLE WHALEN
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mmw6441@psu.edu

Program Website

View (http://greatvalley.psu.edu/academics/masters-degrees/software-engineering/)

World Campus

Graduate Program Head

Raghu Sangwan

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Program Contact

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Program Website

View (http://www.worldcampus.psu.edu/degrees-and-certificates/software-engineering-masters/overview/)

www.worldcampus.psu.edu/tuition-and-financial-aid/) of the World Campus website for more information.