SYSTEMS ENGINEERING

Graduate Program Head
Colin Neill

Program Code
SYSEN

Campus(es)
Great Valley (M.Eng.)
World Campus (M.Eng.)

Degrees Conferred
Master of Engineering (M.Eng.)

The Master of Engineering in Systems Engineering degree is a graduate degree program that provides students the skills required to model, analyze, architect, integrate, and manage complex systems and processes. The primary goal of the program is to prepare engineers to develop the next generation of engineering products, systems, and services for industry and government.

The curriculum consists of 36 credits, delivered both in residence at the School of Graduate Professional Studies (Great Valley) and online through the Penn State World Campus. The program provides in-depth coverage of core systems engineering topics such as requirements analysis, systems architecture, model-based systems engineering, systems testing, and integrated models and simulations for complex system analysis.

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

Admission to the M.Eng in Systems Engineering program will be based on baccalaureate academic records, applicable work experience, and one letter of recommendation from a previous professor or supervisor who can attest to the applicant’s academic potential. Applicants with an undergraduate degree in a quantitative discipline such as science or engineering may apply. Students from other disciplines will be considered based on prior course work and/or standardized test scores. Normal admission requirements include two semesters of calculus (Calculus 1 and Calculus 2). 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 (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-305-admission-requirements-international-students) for more information.

Degree Requirements
Master of Engineering (M.Eng.)

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

The M. Eng. in Systems 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 (with at least 6 credits at the 500 level). The program curriculum includes 18 credits of core courses, 15 credits of electives, and 3 credits of capstone experience.

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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>SYSEN 520</td>
<td>Systems Engineering</td>
<td>3</td>
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<td>SYSEN 522</td>
<td>Systems Verification Validation &amp; Testing</td>
<td>3</td>
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<tr>
<td>SYSEN 532</td>
<td>Simulation in Systems Engineering: Discrete-Time Systems</td>
<td>3</td>
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<tr>
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<td>SYSEN 880</td>
<td>Systems Architecture and Models</td>
<td>3</td>
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<tr>
<td>SWENG 586</td>
<td>Requirements Engineering</td>
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Electives
An additional 15 credits of elective courses must be selected from a list of approved elective courses maintained by the graduate program office.

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

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Total Credits
36

Student Aid
Graduate assistantships available to students in this program and other forms of student aid are described in the Tuition & Funding (http://gradschool.psu.edu/graduate-funding) section of The Graduate School’s website. Students on graduate assistantships must adhere to the course load limits (http://gradschool.psu.edu/graduate-education-policies/gsad/gsad-900/gsad-901-graduate-assistants) set by The Graduate School.

World Campus students in graduate degree programs may be eligible for financial aid. Refer to the Tuition and Financial Aid section (http://www.worldcampus.psu.edu/tuition-and-financial-aid) of the World Campus website for more information.

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.
Learning Outcomes

1. **KNOW.** Develop heterogeneous engineered solutions to complex problems using contemporary methods, processes, and tools.

2. **CRITICAL THINKING.** Understand system interdependencies to analyze the associated tradespaces these generate to identify optimal solution alternatives.

3. **PROBLEM SOLVING.** Use integrated models and simulations for multi-level system analysis and practices.

4. **APPLY.** Manage the budgets and schedules of large-scale projects and programs while delivering.

5. **TEAMWORK.** Work effectively and collaboratively within interdisciplinary teams.

Contact

**Campus**
Great Valley

**Graduate Program Head**
Colin Neill

**Director of Graduate Studies (DGS)**
Nil Hande Ergin

**or Professor-in-Charge (PIC)**
Katie E Kerstetter

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Penn State Great Valley
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(610) 648-3277

**Program Website**
View (http://greatvalley.psu.edu/academics/masters-degrees/systems-engineering)

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