Systems Engineering, Certificate

Associate Dean for Academic Affairs: Mark Federle, Ph.D.
Master's Across Boundaries Certificates Programs webpage (https://www.marquette.edu/engineering/graduate-degrees.php#Certificate)

DEGREE OFFERED

Certificate

PROGRAM DESCRIPTION

This interdisciplinary engineering certificate responds to the push for innovation, preparing practicing engineers to assess and manage risk, striking a balance among competing objectives. By completing this certificate, students develop the skills and knowledge required to solve complex systems engineering problems in a variety of domains using current tools and approaches.

Systems engineers provide value to communities and society at large by leading interdisciplinary engineering analysis, design and deployment of a system to ensure that it efficiently satisfies stakeholder needs, fulfills its intended operation and has a long and useful operating life.

Faculty Sponsor: Mark Federle, PH.D., P.E., CPC

The graduate certificate in systems engineering (SYEN) is intended to develop the capabilities required to apply current tools and approaches to solve complex systems engineering problems in a variety of application domains. Students are able to apply mathematical and scientific principles to the interdisciplinary engineering design, development and operation of systems that efficiently satisfy stakeholder needs, fulfill the intended operation and have a long and useful operating life. In this integrative and leadership role, systems engineers find success by being able to leverage their technical expertise and experiences while integrating multiple disciplinary perspectives, assessing and managing risks, and inspiring and guiding valuable solutions.

The certificate in systems engineering requires four courses for a total of 12 credit hours. The 12 credits of course work are proposed by a student in consultation with the program director or academic adviser. All certificate programs meet the requirements in the Graduate School Bulletin, including any course prerequisite requirements. Any deviations from the approved courses in the Graduate School Bulletin or course substitutions must be approved by the Certificate Faculty Sponsor and the associate dean for academic affairs in the Opus College of Engineering. This certificate is designed for practicing professionals. As such, it is anticipated that only the part-time option is likely to be pursued.

Code	Title	Hours
Required Courses:		
GEEN 5820	Systems Engineering Principles and Practice	3
GEEN 5830	Engineering Risk Analysis	3
Elective Courses - Choose two from the following:		6
BIEN 5320	Biomedical Instrumentation Design	
BIEN 5510	Image Processing for the Biomedical Sciences	
BIEN 5700	Systems Physiology	
CEEN 5640	Traffic Characteristics and Design	
CEEN 5715	Sustainable Engineering	
COSC 5360	Software and System Security	
COSC 5600	Fundamentals of Artificial Intelligence	
EECE 5210	Design and Analysis of Electric Motor-Drive Systems	
EECE 5390	Developments in Control	
EECE 5460	Sensor Devices: Theory, Design and Applications	
EECE 5630	Software Testing	
EECE 5650	Introduction to Algorithms	
EECE 5850	Introduction to Intelligent Systems	
EECE 6310	Modern Control Theory	
GEEN 5810	Industrial Ecology and Sustainable Design	
GEEN 5840	Model-Based Systems Engineering	
MEEN 5270	Physical Systems Modeling	
MEEN 5410	Experimental Design	
PSYC 5330	Human Factors Engineering	

Other courses as approved by the Certificate Faculty Sponsor and the associate dean for academic affairs in the Opus College of Engineering.	
Total Credit Hours:	**12**

Master's Across Boundaries Certificate Programs

- Clinical Immersion in Medical Device Design, Certificate (https://bulletin.marquette.edu/graduate/clinical-immersion-medical-device-design-certificate/)
- Machine Learning for Engineering Applications, Certificate (https://bulletin.marquette.edu/graduate/machine-learning-engineering-applications-certificate/)
- Renewable Energy Technology and Integration, Certificate (https://bulletin.marquette.edu/graduate/renewable-energy-technology-integration-certificate/)
- Systems Engineering, Certificate (p. 1)