



# DOCTOR OF ENGINEERING IN ENGINEERING MANAGEMENT ONLINE – DN17

## Introduction

The School of Engineering and Applied Science Online Programs awards the Doctor of Engineering (D.Eng.) degree in Engineering Management. Offered on Saturday, the Doctor of Engineering cohort 17 (DN17) will begin in January 2023 with a target graduation date of December 2024. Under the direction and supervision of Professor Shahram Sarkani, Ph.D., P.E., SEAS Online Programs Director, professionals who are employed full-time, study and pursue research in an intense, focused environment alongside like-minded fellow students.

## The Doctor of Engineering in Engineering Management

The D.Eng. (EM) addresses the widespread need for practitioners who can apply knowledge from the program of study in a business or technical environment. Unlike a Doctor of Philosophy degree student, whose fundamental research leads to foundational work that is published in archival professional journals and contributes to the basic understanding of the field, the D.Eng. student engages a practical problem and takes a new approach to its resolution, applying advanced engineering management theories and practices to research and recommend a useful solution. The D.Eng. empowers the student – who is likely already a practicing engineer – to create advanced, hands-on treatments of complex engineering management problems.

## Curriculum

The curriculum comprises 45 credit hours divided into a classroom phase of 10 graduate-level, 3 credit hour courses, and a research phase during which the student writes and defends a praxis paper. The research phase requires a minimum of 15 credit hours.

### Proposed Courses

EMSE 6025	Entrepreneurship and Technology
EMSE 6420	Uncertainty Analysis in Cost Engineering
EMSE 6710	Applied Optimization Modeling
EMSE 6765	Data Analysis for Engineers and Scientists
EMSE 6769	Applied Machine Learning for Engineers
EMSE 6790	Logistics Planning
EMSE 6992	Special Topics: Emerging Technologies on Geopolitics
EMSE 8030	Risk Management Process for Engineering Managers
EMSE 8099	Survey of Research Formulation for Engineering Management
EMSE 8100	The Praxis Proposal

Course work culminates in the praxis proposal, a research report that proposes a practice-based solution – to a problem of the student's own choosing – that could be used by practicing engineers.

## Classroom Phase Schedule

Course sessions last 10 weeks. Classes meet Saturday mornings from 9:00 am-12:00 pm and afternoons from 1:00-4:00 pm (all times Eastern). This program is taught in an accelerated, cohort format in which students take all courses in lock step. Classes cannot be taken out of sequence, attendance at all class meetings is expected, and students must remain continuously enrolled; i.e., leaves of absence are permitted only in medical or family emergency, or in case of deployment to active military duty.

Session	#Courses	#Credit Hours	Session Dates
Spring-1 2023	2	6	January 7 – March 11, 2023
Spring-2 2023	2	6	March 18 – May 20, 2023
Summer 2023	2	6	June 3 – August 5, 2023
Fall-1 2023	2	6	August 12 – October 14, 2023
Fall-2 2023	2	6	October 21 – January 13, 2024

*No classes on Thanksgiving, Christmas, New Year, and Memorial Day Weekends*

## Research Phase (Min. 15 Credit Hours)

In order to be successfully awarded the D.Eng. degree, students must earn a grade point average of at least 3.2 in the 10 classroom courses, and no grade below B-. Upon completion of the classroom phase, students are registered for a minimum of 15 credit hours (ch) of EMSE 8199 Praxis Research: 6 ch in Spring 2024, 3 ch in Summer 2024, and 6 ch Fall 2024. Throughout the research phase, the student develops the praxis on an advisor-approved topic related to engineering management. Faculty research directors meet with students at least once per month, who are expected to attend each meeting.

## Research Areas for Praxis

With the advisors' consent, the student may elect to focus on an area within the Engineering Management field. Below, find sample published D.Eng. praxis paper titles:

- A Technology Maturity Assessment of Sustainment-Dominated Systems under the Influence of Obsolescence
- Planning for the Influence of Emerging Disruptive Technologies on IT Systems
- A Generalized Approach to Measure and Predict Innovation Maturity Progression Aligned to Business Objectives
- Identifying and Overcoming the Barriers to Cloud Adoption within the Government Space

## Cost

All classes meet live online through synchronous distance learning technologies. Classes are recorded for future viewing. Tuition is billed at \$1625 per credit hour for the 2022-2023 year. A non-refundable tuition deposit of \$995, which is applied to tuition in the first semester, is required when the student accepts admission.

## Course Descriptions

See also <http://bulletin.gwu.edu/courses/emse/>

**EMSE 6025 Entrepreneurship and Technology.** Concepts and methods associated with starting an entrepreneurial venture: organization design, team building, protection of intellectual property, strategies for developing and marketing a technology product; financial, legal, and market valuation issues and methods for a start-up venture.

**EMSE 6420. Uncertainty Analysis in Cost Engineering.** Basic skills for building probability models to perform meaningful engineering economic studies, financial feasibility assessments, and cost uncertainty analysis in the planning phase of engineering projects; analytical and closed form equations from probability theory; simulation modeling for problems with structures without closed form equations.

**EMSE 6710 Applied Optimization Modeling.** Analysis of linear, integer, and nonlinear optimization models of decision problems that arise in industry, business and government. Modeling Techniques and applications; use of optimization software to solve models.

**EMSE 6765 Data Analysis for Engineers and Scientists.** Design of experiments and data collection. Regression, correlation, and prediction. Multivariate analysis, data pooling, data compression. Model validation.

**EMSE 6769 Applied Machine Learning for Engineers.** Theory and practice of machine learning, leveraging open-source frameworks to explore the ideas, algorithms, and techniques. Restricted to graduate students.

**EMSE 6790 Logistics Planning.** Quantitative methods in model building for logistics systems, including organization, procurement, transportation, inventory, maintenance, and their interrelationships. Stresses applications.

**EMSE 6992 Special Topics: Emerging Technologies on Geopolitics.** Nations go to war to protect their interests and today national interests surround the development, operation, and economy of emerging technologies. Learn how geopolitical competition around emerging technology impacts technological advancements, statecraft, and our society.

**EMSE 8030 Risk Management Process for Engineering Managers.** Risk management process; individual and collaborative responsibilities of program and engineering managers; practical applications of risk-based planning and risk management tools essential to success of any program; communicating the process and its value in avoiding catastrophic outcomes. Case studies.

**EMSE 8099 Survey of Research Formulation for Engineering Management.** Researching the praxis paper. Introduces the design of research studies in applied engineering management settings from a practical perspective. Fundamentals of applied research, formulating research questions/hypotheses and research designs from empirical data. Restricted to students in the DEng in the field of engineering management program.

**EMSE 8100 The Praxis Proposal.** Overview of research methods. Aims and purpose of the praxis. Development of praxis research strategies, formulation and defense of a praxis proposal. Praxis proposal defense must be passed before the student is admitted to degree candidacy to undertake praxis work. Restricted to students who have completed all required coursework for the D.Eng. in the field of engineering management degree.

**EMSE 8199 Praxis Research.** Independent applied research in engineering management culminating in the final praxis report and final examination for the degree of Doctor of Engineering. May be repeated for credit. Restricted to students in the D.Eng. in the field of engineering management program.

*The University reserves the right to adjust course offerings, schedules, and tuition rates.*

