

ENGINEERING MANAGEMENT, MASTER OF ENGINEERING MANAGEMENT

Master of Engineering Management

A track must be chosen for this program: Applied Biomedical Engineering; Applied and Computational Mathematics; Applied Physics; Artificial Intelligence; Civil Engineering; Computer Science; Cybersecurity; Data Science; Electrical and Computer Engineering; Environmental Engineering, Science and Management Programs; Healthcare Systems Engineering; Information Systems Engineering; Materials Science and Engineering; Mechanical Engineering; Space Systems Engineering; Structural Engineering; Systems Engineering; and Technical Leadership.

The part-time Engineering Management program prepares ethically grounded, technically competent professional leaders with the technical, managerial, and leadership skills to produce innovative solutions to technical organizations' challenges. While management courses serve as the core of the program at Johns Hopkins Engineering for Professionals, students work within specialty tracks that span various engineering disciplines or within a technical leadership track. The tracks provide students a unique graduate-level opportunity to mix their chosen track with engineering management perspectives. For students pursuing a career in systems acquisition, systems development, or production domains as a project manager, program manager, or in general management, the Technical Leadership track is oriented for you. For the functional manager who wants to further develop a mix of management and technical skills, the specialty tracks will advance technical skills in your chosen area while enhancing your ability to manage and supervise technical personnel. The curriculum provides a unique opportunity to build both technical and leadership skills in order to contribute to a multi-disciplinary engineering management team. Instructors are experienced technical leaders and executives who discuss real-world challenges in formats that are convenient for professionals working at the nation's top engineering firms and R&D organizations.

Admission Requirements

Applicants (degree seeking and special student) must meet the general requirements for admission to a graduate program outlined in the Admission Requirements (<https://e-catalogue.jhu.edu/engineering/engineering-professionals/admission-requirements/>) section and must be accepted into both the Engineering Management program and their respective engineering track program (if pursuing the Technical Leadership track, the applicant only needs to be accepted into the Engineering Management program). The applicant's prior education must include a degree in a science or an engineering field. In addition, a minimum of two years of relevant full-time work experience in the field following the award of an undergraduate degree is required (note that internship and/or co-op periods do not satisfy this requirement), and a detailed work résumé and transcripts from all college studies must be submitted. Admitted students have typically earned a grade point average of at least 3.0 on a 4.0 scale (B or above) in the latter half of their undergraduate studies. When reviewing an application, the candidate's academic and professional background will be considered.

Program Requirements

Ten courses must be completed within five years. The curriculum consists of five core courses and five courses from the selected track. Only one C-range grade (C+, C, or C-) can count toward the master's degree. All elective course selections outside of the requirements of a student's track are subject to approval by both the Engineering Management advisor and respective track advisor. Tracks are not listed on the student's transcript.

Please refer to the course schedule (<https://ep.jhu.edu/courses/>) (<https://ep.jhu.edu/courses/>) published each term for exact dates, times, locations, fees, and instructors.

Courses

Code	Title	Credits
Core Courses		
EN.595.660	Planning and Managing Projects	3
EN.595.662	Technical Organization Management ¹	3
EN.595.665	Strategic Communications in Technical Organizations ¹	3
EN.595.676	Finance, Contracts, and Compliance for Technical Professionals ¹	3
EN.595.781	Executive Technical Leadership ²	3

Courses by Track

Students must pay close attention to prerequisites when selecting courses. Respective track advisors must approve the track program of study.

Applied Biomedical Engineering

Select five courses from the Applied Biomedical Engineering program EN.585.xxx. At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study. All ABE courses require previous coursework in signal processing, and math through ordinary differential equations.

Applied and Computational Mathematics

Select five graduate-level courses from the Applied and Computational Mathematics program EN.625.xxx. At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

One course (with significant math content) outside Applied and Computational Mathematics may be taken with track advisor approval.

Applied Physics

Select five graduate-level courses from the Applied Physics program EN.615.xxx. At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Artificial Intelligence

Select five graduate-level courses from the EP Artificial Intelligence program. At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to

determine the appropriate mix of technical courses and must approve the program of study.

Civil Engineering

Select five graduate-level courses from the Civil Engineering program EN.565.xxx. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Computer Science

Applicants for admission to Computer Science need to have completed a year of calculus and a suitable math beyond calculus (such as discrete mathematics, calculus 3, linear algebra, or differential equations). Java or C++, data structures, and computer organization are also required.

Select five graduate-level courses from the Computer Science program EN.605.xxx. At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Cybersecurity

Applicants for admission to Cybersecurity need to have completed a year of calculus and a suitable math beyond calculus (such as discrete mathematics, calculus 3, linear algebra, or differential equations). Java or C++, data structures, and computer organization are also required. Select five graduate-level courses from the Cyber Security program EN.695.xxx.

At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Data Science

Select a mix of five graduate-level courses from the Applied and Computational Mathematics program EN.625.xxx, the Computer Science Program EN.605.xxx, and the Data Science program 685.xxx subject to the following three requirements: (1) the ACM and CS/DS courses must be drawn from those listed as part of the DS curriculum in the EP catalogue; (2) at least one course (of the five) must be drawn from ACM (EN.625.xxx) and at least one from CS/DS (EN.605.xxx/EN.685.xxx); and (3) at least two of the five courses must be at the 700-level. Applicants for admission to Data Science need to have completed a year of calculus, discrete mathematics, and calculus 3. Java or C++, and data structures are also required. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Electrical and Computer Engineering

Select five graduate-level courses from the EP Electrical and Computer Engineering (ECE) program EN.525.xxx or full-time ECE program EN.520.xxx. At least two of the courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study. The seven technical focus areas within ECE may be helpful as a guide in selecting courses

Environmental Engineering, Science, and Management Programs

Select five graduate-level courses from the EP Environmental Engineering, Science, and Management programs. The advisor from the track will have the flexibility to work with each student to determine the

appropriate mix of technical courses and must approve the program of study.

Healthcare Systems Engineering

All students are required to take EN.655.662 Intro to Healthcare Systems Engineering, EN.655.767 Healthcare System Conceptual Design, EN.655.768 Healthcare System Design & Integration, and EN.655.769 Healthcare System Test and Evaluation. In addition, select one (1) from the Healthcare Systems Engineering electives specified in the catalogue with track advisor approval. The track advisor will work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Information Systems Engineering

Select five graduate-level courses from the Information Systems Engineering program EN.635.xxx. At least two courses must be at the 700-level. Applicants for admission to Information Systems Engineering need to have completed a semester of calculus or discrete mathematics, another semester of mathematics such as statistics, plus Java or C++. Depending on course selections, data structures may also be required.

The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Materials Science and Engineering

Select five graduate-level courses from the Materials Science and Engineering program (EN.515.6xx). Materials-related, graduate level courses from other programs can also be used with advisor approval. The advisor for this track will work with each student to determine the appropriate mix of technical courses to fulfill student needs and must approve the program of study.

Mechanical Engineering

All students are required to take EN.535.641 Mathematical Methods For Engineers. This course is typically taken as the first technical course in the program.

In addition, select four graduate-level courses from the Mechanical Engineering program EN.535.xxx. At least two courses must be at the 700-level. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Space Systems Engineering

All students are required to take EN.675.600 Systems Engineering for Space and EN.675.601 Fundamentals of Engineering Space Systems I. In addition, select three additional courses from the Space Systems Engineering program EN.675.xxx. The track advisor will work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Structural Engineering

Select five graduate-level courses from the Structural Engineering elective list within the Civil Engineering program EN.565.xxx. The advisor from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Systems Engineering

Select five graduate-level courses from the Systems Engineering program EN.645.xxx. At least two courses must be at the 700-level. The advisor

from the track will have the flexibility to work with each student to determine the appropriate mix of technical courses and must approve the program of study.

Technical Leadership

Select five graduate-level elective courses from the Engineering Management program EN.595.xxx. At least two of these elective courses must be at the 700-level (EN.595.802 Directed Studies in Engineering Management can count as the capstone experience in place of EN.595.781 or as one of the 700-level electives with Chair approval).

The Engineering Management advisor will have the flexibility to work with each student to determine the appropriate mix of courses and must approve the program of study.

Code	Title	Credits
Courses		Credits
EN.595.701	Product and Supply Chain Management for Technical Professionals	3
EN.595.727	Advanced Concepts in Agile Technical Management	3
EN.595.731	Business Law for Technical Professionals	3
EN.595.742	Quality Management in Technical Organizations	3
EN.595.758	Data Science for the Technical Leader	3
EN.595.762	Leading Technical Organizations ³	3
EN.595.766	Advanced Technology	3
EN.595.793	Applied Innovation for Technical Professionals	3
EN.595.802	Directed Studies in Engineering Management ^{2,4}	3
EN.675.740	Assuring Success of Aerospace Programs	3
<i>From the Homewood Residential Engineering Management Program, Center for Leadership Education (CLE) ⁵</i>		
EN.663.660	Managing People and Resolving Conflicts	1.5
EN.663.671	Leading Change	1.5
EN.663.673	Leading Teams in Virtual, International and Local Settings	1.5

¹ Prerequisite EN.595.660. Systems Engineering majors may contact the Systems Engineering Vice Chair regarding prerequisite substitution opportunities (this does not apply to Engineering Management / Systems Engineering Track students).

² Prerequisites: EN.595.660, EN.595.662 (or EN.595.661 or EN.595.663), EN.595.676 (or EN.595.664 or EN.595.666), EN.595.665

³ Prerequisites of EN.595.662 (or EN.595.661 or EN.595.663)

⁴ Can replace EN.595.781 as required capstone experience with Program Chair approval, or can count as one of the 700-level electives. This course is open only to candidates in the Master of Engineering Management/Technical Leadership track.

⁵ 1/2 semester credit – two courses required for full-semester equivalent