SYSTEMS ENGINEERING

- Master of Science in Systems Engineering
- Master of Science in Engineering in Systems Engineering (ABET-accredited)


- Post-Master’s Certificate in Systems Engineering
- Graduate Certificate in Systems Engineering

COURSES

CORE COURSES FOR MASTER’S DEGREES AND GRADUATE CERTIFICATE

645.462 Introduction to Systems Engineering
645.467 Management of Systems Projects
645.767 System Conceptual Design
645.768 System Design and Integration
645.769 System Test and Evaluation

COURSES BY FOCUS AREA

The focus areas offered represent related groups of courses that are relevant for students with interests in the selected areas. The focus areas are presented as an aid to students in planning their course schedules and are only applicable to students seeking a Master’s degree. They do not appear as official designations on a student’s transcript or diploma.

BIOMEDICAL SYSTEMS ENGINEERING

CORE COURSES

585.405 Physiology for Applied Biomedical Engineering
585.406 Physiology for Applied Biomedical Engineering
585.409 Mathematical Methods for Applied Biomedical Engineering
645.805 Biomedical Systems Engineering Master’s Project

ELECTIVES (SELECT ONE)

580.630 Theoretical Neuroscience*
585.408 Medical Sensors and Devices
585.608 Biomaterials
585.634 Biophotonics

CYBERSECURITY SYSTEMS ENGINEERING

CORE COURSES

645.806 Cybersecurity Systems Engineering Master’s Project
695.401 Foundations of Information Assurance
695.721 Network Security

ELECTIVES (SELECT TWO)

695.421 Public Key Infrastructure and Managing E-Security
695.422 Web Security
695.791 Information Assurance Architectures and Technologies

HUMAN SYSTEMS ENGINEERING

CORE COURSES

645.450 Foundations of Human Systems Engineering
645.451 Integrating Humans and Technology
645.808 Human Systems Engineering Master’s Project

ELECTIVES (SELECT TWO)

635.461 Principles of Human-Computer Interaction
645.754 Social and Organizational Factors in Human Systems Engineering
645.755 Methods in Human-System Performance Measurement and Analysis

MODELING AND SIMULATION SYSTEMS ENGINEERING

CORE COURSES

625.403 Statistical Methods and Data Analysis
645.757 Foundations of Modeling and Simulation in Systems Engineering
645.758 Advanced Systems Modeling Simulation
645.801 Systems Engineering Master’s Thesis
645.802 Systems Engineering Master’s Thesis

* 580.xxx courses are offered through the full-time Department of Biomedical Engineering.
PROJECT MANAGEMENT

**CORE COURSES**
- 595.461 Technical Group Management
- 595.465 Communications in Technical Organizations OR 595.466 Financial and Contract Management
- 645.764 Software Systems Engineering
- 645.800 Systems Engineering Master’s Project

**ELECTIVES (SELECT ONE)**
- 645.742 Management of Complex Systems
- 645.753 Enterprise Systems Engineering
- 645.761 Systems Architecting
- 645.771 System of Systems Engineering

SYSTEMS ENGINEERING

**CORE COURSES**
- 645.764 Software Systems Engineering

**SELECT ONE**
- 645.742 Management of Complex Systems
- 645.753 Enterprise Systems Engineering
- 645.761 Systems Architecting
- 645.771 System of Systems Engineering Master’s Project or Thesis

**SELECT ONE**
- 645.800 Systems Engineering Master’s Project

**ELECTIVES (SELECT ONE–TWO BASED ON COURSE SELECTION ABOVE)**
- 645.469 Systems Engineering of Deployed Systems
- 645.756 Metrics, Modeling, and Simulation for Systems Engineering

Selections from Applied Biomedical Engineering; Applied Physics; Computer Science; Electrical and Computer Engineering; Information Systems Engineering; Technical Management; and Environmental Engineering, Science, and Management may also be chosen.

SYSTEMS ENGINEERING SOFTWARE

**CORE COURSES**
- 605.401 Foundations of Software Engineering
- 605.402 Software Analysis and Design
- 645.807 Software Systems Engineering Master’s Project

**ELECTIVES (SELECT TWO)**
- 605.407 Agile Software Development Methods
- 605.411 Foundations of Computer Architecture
- 605.701 Software Systems Engineering
- 605.705 Software Safety
- 605.708 Tools and Techniques of Software Project Management
- 695.421 Public Key Infrastructure and Managing e-Security
- 695.422 Web Security

COURSES FOR POST-MASTER’S CERTIFICATE

**REQUIRED**
- 645.742 Management of Complex Systems
- 645.753 Enterprise Systems Engineering
- 645.761 Systems Architecting
- 645.771 System of Systems Engineering

**ELECTIVES (SELECT ONE)**
- 645.803 Post-Master’s Systems Engineering Research Project
- 645.804 Post-Master’s Systems Engineering Research Project

Two approved 700-level courses

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