Elective Course Options for MSE in Systems Engineering

Current as of November 2023
(updated regularly)
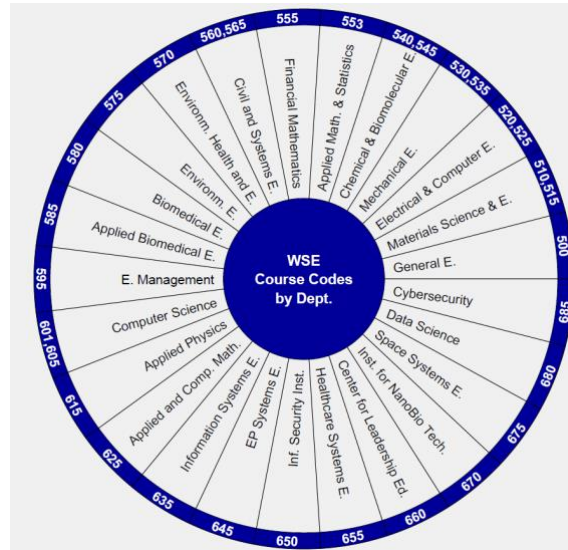

Figure 1: Department Codes

Courses from the Department of Civil and Systems Engineering

560.653 An Introduction to Network Modeling
560.601 Applied Math for Engineers
560.688 Computing for Applied Mathematics
560.641 Equilibrium Problems in Systems Engineering
560.649 Energy Systems
560.608 Multilevel and Multi-objective Optimization
560.741 Modern Machine Learning: Applicability, Interpretability, and Uncertainty Quantification
560.658 Natural Disaster Risk Modeling
560.650 Operations Research
560.740 Optimization and Learning
560.643 Optimization Modeling Foundations
560.618 Probabilistic Methods in Civil Engineering and Mechanics
560.643 Energy Markets and Risk Management
560.657 System Dynamics
560.645 Topics in Optimization: Integer and Robust Optimization
560.775 Bilevel Optimization in Energy Systems

Courses from other Departments

Department of Applied Mathematics and Statistics (AMS)
553.694 Applied and Computational Linear Algebra
553.613 Applied Statistics and Data Analysis

553.671 Combinatorial Analysis
553.766 Combinatorial Optimization
553.753 Commodities and Commodity Markets
553.667 Deep Learning in Discrete Optimization
553.665 Introduction to Convexity
553.636 Intro to Data Science
553.673 Intro to Nonlinear Dynamics and Chaos
553.653 Mathematical Game Theory
553.600 Mathematical Modeling and Consulting
553.764 Modeling, Simulation, and Monte Carlo
553.633 Monte Carlo Methods
553.646 Risk Measurement/Management in Financial Markets
553.639 Time Series Analysis
553.663 Network Models in Operations Research
553.761 Nonlinear Optimization I
553.762 Nonlinear Optimization II
553.661 Optimization in Finance
553.763 Stochastic Search and Optimization

Department of Environmental Health and Engineering (EHE)
570.616 Data Analytics in Environmental Health and Engineering
575.611 Economic Foundations, Public Decision Making
570.607 Energy Policy Planning Models
570.695 Environmental Health and Engineering Systems Design
570.654 Geostatistics: Understanding Spatial Data
570.697 Risk and Decision Analysis
570.608 Uncertainty Modeling for Policy & Management Decision Making

Department of Biomedical Engineering (BE)
580.618 Probabilistic Methods
580.750 Surgineering: Systems Engineering and Data Science in Interventional Medicine

Department of Computer Science (CS)
601.664 Artificial Intelligence
601.636 Algorithmic Game Theory
601.477 Causal Inference
601.661 Computer Vision
601.633 Intro Algorithms
601.690 Intro to Human-Computer Interaction
601.662 Intro to Spatial Computing
601.675 Machine Learning
601.676 Machine Learning: Data to Models
601.682 Machine Learning: Deep learning
601.686 Machine Learning: Artificial Intelligence System Design & Development
520.612 Machine Learning for Signal Processing
601.690 Introduction to Human-Computer Interaction

601.620 Parallel Computing for Data Science
601.615 Databases
601.771 Self-Supervised Statistical Models: Opportunities, Challenges and Risks

Center for Leadership Education (CLE)
663.667 Decision Analytics Fundamentals
663.670 Project Management

Other Departments (and Schools)

PH.221.604 Case Studies in Management Decision-Making
BU.420.710 Consumer Behavior
PH.646-649 Essentials of Probability and Statistical Inference I-IV
AS.180.611 Economics of Uncertainty
550.661 Foundations of Optimization
520.447 Intro to Information Theory and Coding
650.601 Intro to Information Security
650.658 Intro to Cryptography
491.691 Learning Theory I
520.640 Machine Intelligence on Embedded Systems
645.756 Metrics, Modeling, and Simulation for Systems Engineering
535.737 Multiscale Modeling and Simulation of Mechanical Systems
520.698 Networks Meet Machine Learning
520.629 Networked Dynamical Systems
550.690 Neural Networks and Feedback Control Systems
520.622 Principles of Complex Networked Systems
530.641 Statistical Learning for Engineers
PH.140.644 Statistical Machine Learning: Methods, Theory, and Applications
525.640 Satellite Communications Systems
550.636 System Identification and Likelihood Methods
645.771 - System of Systems Engineering

Electives Organized by Tracks
Current as of November 2023
(list updated regularly)

Theme: Cybersecurity and Space Systems
560.656 Space Systems Cybersecurity
650.601 Intro to Information Security
601.477 Causal Inference
650.658 Intro to Cryptography
525.640 Satellite Communications Systems
520.447 Introduction to Information Theory and Coding
491.691 Learning Theory I

601.690 Intro to Human-Computer Interaction
601.661 Computer Vision

Theme: Decision-Making Frameworks

PH.221.604 Case Studies in Management Decision-Making
663.667 Decision Analytics Fundamentals
575.611 Economic Foundations, Public Decision Making
575.608 Optimization Methods for Public Decision Making
580.618 Probabilistic Methods
570.697 Risk and Decision Analysis
570.608 Uncertainty Modeling for Policy & Management Decision Making

Track: Energy Infrastructure Systems

560.643 Energy Markets and Risk Management
560.775 Bilevel Optimization in Energy Systems
570.607 Energy Policy and Planning Models
553.753 Commodity Markets and Green Energy Finance
575.608 Optimization Methods for Public Decision Making

Theme: Healthcare Systems

601.664 Artificial Intelligence
PH.221.604 Case Studies in Management Decision-Making
570.695 Environmental Health and Engineering Systems Design
655.767 Healthcare System Conceptual Design
655.662 Intro to Healthcare Systems Engineering
605.201 Intro Programming Using Java
553.653 Mathematical Game Theory
520.629 Networked Dynamical Systems
553.762 Nonlinear Optimization II
PH.140.621 Statistical Methods in Public Health I
PH.140.621 Statistical Methods in Public Health II
553.763 Stochastic Search and Optimization
550.636 System Identification and Likelihood Methods

Theme: Natural Disaster Risk Management & Policy

553.753 Commodities and Commodity Markets
663.667 Decision Analytics Fundamentals
575.611 Economic Foundations, Public Decision Making
560.643 Energy Markets and Risk Management
AS.180.611 Economics of Uncertainty
570.607 Energy Policy Planning Models
570.654 Geostatistics: Understanding Spatial Data
553.600 Mathematical Modeling and Consulting
553.764 Modeling, Simulation, and Monte Carlo

553.633 Monte Carlo Methods
560.658 Natural Disaster Risk Modeling
553.661 Optimization in Finance
663.670 Project Management
570.697 Risk and Decision Analysis
560.646 Smart Cities
560.657 System Dynamics
553.639 Time Series Analysis
570.608 Uncertainty Modeling for Policy & Management Decision Making

Theme: Networks and Public Health

560.653 An Introduction to Network Modeling
570.616 Data Analytics in Environmental Health and Engineering
570.695 Environmental Health and Engineering Systems Design
520.698 Networks Meet Machine Learning
520.629 Networked Dynamical Systems
550.690 Neural Networks and Feedback Control Systems
520.622 Principles of Complex Networked Systems
553.761 Nonlinear Optimization I
553.762 Nonlinear Optimization II
553.763 Stochastic Search and Optimization

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