Master of Engineering (MEng) students must take 32 credits all of which must be at the 500 level or higher. The coursework requirements for the MEng degree are as follows: Core (2 courses), Concentration (2 courses from one concentration area), and Electives (4 courses). Among the 32 credits, the Practicum Requirement can be satisfied by up to two courses from the approved list. MEng students satisfy the advanced technical course requirement by taking at least two 500 or higher level courses from the Systems Engineering Concentration areas, or courses approved by the Systems Engineering Graduate Committee in advance. The Elective courses can be chosen to meet an individual student’s academic needs. The Electives may include no more than two Engineering Management courses listed on the reverse. The choice of courses must form a coherent and balanced program in Systems Engineering. MEng students should make their course selection in consultation with their faculty advisor. MEng students must maintain a cumulative GPA of 3.00 to remain in good academic standing and to graduate. All graduate courses are counted in the GPA. Grades of “C-” or lower are not acceptable for the MEng degree.

Course Requirements

Core  Select one course from each of two Core areas – 8 credits
A. SE/EC/ME 501 Dynamic Systems Theory, or SE/EC/ME 710 Dynamic Programming and Stochastic Control Semester/Grade ____________________________  
B. SE/EC 524 Optimization Theory and Methods Semester/Grade ____________________________  
C. SE/ME 714 Adv Stoch Modeling/Simulation, or EC 505 Stochastic Processes, or EK 500 Probability with Stat App Semester/Grade ____________________________

Concentration  Select two courses from one Concentration area listed on reverse – 8 credits

Circle the Concentration Area:
A. Computational and Systems Biology  
B. Control Systems  
C. Energy and Environmental Systems  
D. Network Systems  
E. Operations Research  
F. Production and Service Systems

Electives  Select 4 courses (16 credits) from the Concentrations listed on the reverse, if not used to satisfy the Concentration requirement; other Suggested Electives listed on the reverse; may include up to 8 credits from the approved Engineering Management courses listed on the reverse. Indicate course number, semester, and grade.

PRACTICUM  Indicate up to two courses from the approved list on the reverse.
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Concentration Areas
A. Computational and Systems Biology
ENG BE 505 Molecular Bioengineering I
ENG BE 561 DNA and Protein Sequence Analysis
ENG BE 562 Computational Biology: Genomes, Networks, Evolution
ENG BE 567 Nonlinear Dynamics in Biological Systems
ENG BE 747 Adv. Signals and Systems Analysis for Biomedical Eng
ENG BE 760 Structural Bioinformatics
ENG BE 767 Systems Biology
ENG BE 777 Computational Genomics I

B. Control Systems
ENG SE/EC/ME 501 Dynamic Systems Theory
ENG ME/MS 507 Process Modeling and Control
ENG ME 560 Precision Machine Design and Instrumentation
ENG ME 570 Robot Motion Planning
ENG SE/EC/ME 701 Optimal and Robust Control
ENG EC 702 Recursive Estimation and Optimal Filtering
ENG SE/ME 704 Adaptive Control
ENG EC 708 Advanced Process Control
ENG SE/ME/EC 710 Dynamic Programming and Stochastic Control
ENG SE/EC/ME 733 Discrete Event and Hybrid Systems
ENG SE/ME/EC 734 Hybrid Systems
ENG SE/ME 740 Vision Robotics and Planning
ENG SE/ME 762 Nonlinear Systems and Control

C. Energy and Environmental Systems
CAS EC 571 Game Theory
ENG SE/EC/ME 543 Sustainable Power Systems
ENG ME/MS 545 Electrochemistry of Fuel Cells and Batteries
CAS EC 571 Energy and Environmental Economics
CAS EC 572 Public Control of Business
ENG EC/MS 573 Solar Energy Systems
GRS GE 712 Regional Energy Modeling

Approved Practicum Courses:
1. SE 925 Graduate Project, OR
2. Two of the following, OR
   • ENG ME/MS 507 Process Modeling and Control
   • ENG ME/EC 514 Simulation
   • ENG SE/EC/ME 543 Sustainable Power Systems
   • ENG SE/EC/ME 544 Networking the Physical World
   • ENG ME 570 Robot Motion Planning
   • ENG SE/EC/ME 701 Optimal and Robust Control
   • ENG EC 702 Recursive Estimation and Optimal Filtering
   • ENG SE/ME 704 Adaptive Control
   • ENG EC 708 Advanced Process Control
   • ENG SE/EC/ME 710 Dynamic Programming and Stochastic Control
   • ENG EC 715 Wireless Communications
   • ENG SE/EC/ME 724 Advanced Optimization Theory and Methods
   • ENG SE/EC/ME 725 Queuing Systems

ELECTIVE COURSES
Other Suggested Electives:
CAS CS 571 Object-Oriented Software Principles
ENG SE 700 Advanced Special Topics
GSM OM 855 Project Management
ENG SE 900 Research
ENG SE 951 Independent Study

Engineering Management Courses
ENG EK 731 Biomedical Innovation
ENG ME 502 Invention: Technology Creation, Protection, & Commercialization
ENG ME 517 Product Development
ENG ME 525 Technology Ventures

GRS GE 716 Communication Networks Control
GSM OM 845 Clean Technology Business Models

D. Network Systems
ENG EC 541 Computer Communication Networks
ENG SE/EC/ME 544 Networking the Physical World
ENG EC 715 Wireless Communications
ENG SE/EC/ME 725 Queuing Systems
ENG SE/EC/ME 741 Randomized Network Algorithms
ENG EC 744 Mobile Ad Hoc Networking and Computing
ENG SE/ME 755 Communication Networks Control

E. Operations Research
ENG ME/EC 514 Simulation
ENG SE/EC/MSE 524 Optimization Theory and Methods
ENG SE/EC/ME 710 Dynamic Programming and Stochastic Control
ENG SE/ME 714 Advanced Stochastic Modeling and Simulation
ENG SE/ME/EC 724 Advanced Optimization Theory and Methods
ENG SE/EC/ME 725 Queuing Systems
ENG SE/EC/ME 732 Combinatorial Optimization and Graph Algorithms
ENG SE/EC/ME 733 Discrete Event and Hybrid Systems
ENG SE/ME 766 Advanced Scheduling Models and Methods

F. Production and Service Systems
ENG ME 510 Production Systems Analysis
ENG SE/EC/ME 543 Sustainable Power Systems
ENG SE/EC/ME 733 Discrete Event and Hybrid Systems
ENG SE/ME 763 Production System Design
ENG SE/ME 766 Advanced Scheduling Models and Methods
GSM OM 726 Creating Value Through Operations and Technology
GSM OM 854 Supply Chain Management

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