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, including 2 Advanced Technical Electives). The Advanced Technical Elective Requirement is satisfied by taking at least two 500-level or higher courses from the SE-designated courses in the Concentration or Elective course lists, or other 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. Among the 32 credits, the Practicum Requirement can be satisfied by up to two courses from the approved list. 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. Grades of “C-” or lower are not acceptable for the MEng degree.

NOTE: Courses are color coded to indicate when they are usually offered, in Fall, Spring, either semester (subject to change). Courses may be offered every other year.

Course Requirements

Core
Highlight 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
Highlight the Concentration Area:
A. Computational and Systems Biology Course/Semester/Grade _______________________
B. Control Systems Course/Semester/Grade _______________________
C. Energy and Environmental Systems Course/Semester/Grade _______________________
D. Network Systems Course/Semester/Grade _______________________
E. Operations Research Course/Semester/Grade _______________________
F. Production and Service Systems Course/Semester/Grade _______________________

ELECTIVES
Select 4 courses (16 credits). Must include at least two 500-level SE-designated courses 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.

Course/Semester/Grade _______________________
Course/Semester/Grade _______________________
Course/Semester/Grade _______________________
Course/Semester/Grade _______________________

PRACTICUM
Indicate up to two courses (8 cr), from the approved list on the reverse, used to satisfy Core, Concentration or Elective Requirements.

Course/Sem/Grade _______________________
Course/Sem/Grade _______________________

APPROVED COURSES ON PAGE 2
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MEng Program Planning Sheet, Page 2

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 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 513 Game Theory (both semesters)  
ENG ME 533 Energy Conversion  
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. EK 691 Lean and Agile New Product Development  
   • ENG ME/MS 507 Process Modeling and Control  
2. Two of the following, OR  
   • ENG ME/EC 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 SE/EC/ME 710 Dynamic Programming and Stochastic Control  
   • ENG SE/ME 714 Advanced Stochastic Modeling and Simulation  
   • ENG SE/EC/ME 724 Advanced Optimization Theory and Methods  
   • ENG SE/ME 765 Advanced Scheduling Models and Methods

ELECTIVE COURSES

Other Suggested Electives:  
CAS CS 511 Object-Oriented Software Principles  
CAS CS 542 Machine Learning  
ENG EC 504 Advanced Data Structures  
ENG EC 528 Cloud Computing  
ENG SE 700 Advanced Special Topics  
GSM OM 855 Project Management  
ENG SE 951 Independent Study

Engineering Management Courses  
ENG EK 731 Biomedical Innovation  
GRS GE 716 Game Theory  
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 SE/EC/ME 725 Queuing Systems  
ENG SE/EC 741 Randomized Network Algorithms  
ENG EC 744 Mobile Ad Hoc Networking and Computing  
ENG SE/ME 755 Communication Networks Control

E. Operations Research  
ENG EC 503 Learning from Data  
ENG ME/EC 514 Simulation  
ENG SE/EC 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/EC/ME 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 ME 518 Product Quality  
ENG SE/EC/ME 543 Sustainable Power Systems  
ENG SE/EC/ME 733 Discrete Event and Hybrid Systems*  
ENG SE/ME 765 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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