Boston University College of Engineering
Division of Systems Engineering
MEng Program Planning Sheet

Student Name: _____ BU ID _____
Advisor Signature: _____

Master of Engineering (MEng) students must complete 32 credits all of which must be at the 500 level or higher and 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. The coursework requirements for the MEng degree are: **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.

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 or in longer intervals.

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 Sem**/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

Course/Semester/Grade _____

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

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/ME 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 EE 712 Regional Energy Modeling
GRS EC 716 Game Theory
QST 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 545 Cyber-Physical Systems
ENG EC 715 Wireless Communications
ENG SE/EC/ME725 Queuing Systems
*ENG SE/EC 741 Randomized Network Algorithms
*ENG EC 744 Mobile Ad Hoc Networking and Computing
*ENG SE 755 Communication Networks Control

E. Operations Research
ENG EC 503 Intro to Learning from Data
*ENG ME/EC 514 Simulation
ENG EC/SE 523 Deep Learning
ENG SE/EC 524 Optimization Theory and Methods
CAS CS 542 Machine Learning
ENG SE/EC 674 Optimization Theory and Methods II (PhD students only)
*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 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
QST OM 726 Creating Value Through Operations and Technology
QST OM 854 Operations Analysis and Innovation

Approved Practicum Courses:

1. Two of the following (indicated in the Concentration course list, above, with an asterisk*),
   - 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 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/EC 734 Hybrid Systems
   - ENG SE/ME 740 Vision Robotics and Planning
   - ENG SE/EC 741 Randomized Network Algorithms
   - ENG EC 744 Mobile Networking and Computing
   - ENG SE 755 Communication Networks Control
   - ENG SE/ME 762 Nonlinear Systems and Control
   - ENG SE/ME 765 Production System Design
   - ENG SE/ME 766 Advanced Scheduling Models and Methods
2. OR, ONE Practicum Course from other College of Engineering departments (indicated in the Concentration course list, above, with two asterisks**):
   - ENG ME 526 – Simulation of Physical Processes
   - ENG ME 560 Precision Machine Design and Instrumentation
   - ENG EC 601 Product Design in ECE
   - ENG BE 700 Advanced Topics in Biomedical Engineering
   - ENG EC 952 Directed Group Project

ELECTIVE COURSES

Other Suggested Electives:
CAS EC 511 Object-Oriented Software (not on course inventory)
CAS CS 542 Machine Learning
ENG EC 504 Advanced Data Structures
CAS EC 611 Object-oriented Software Principles and Design
ENG SE 700 Advanced Special Topics
QST OM 855 Project Management
ENG SE 951 Independent Study
ENG SE 952 Mentored Project

Engineering Management Courses
ENG EK 731 Bench-to-Bedside:Translating BME Innov from Lab to Marketplace
ENG ME 502 Invention: Techonology Creation, Protection, & Commercialization
ENG ME 517 Product Development
ENG ME 525 Technology Ventures
ENG ME 583 Product Management
ENG ME 584 Manufacturing Strategy
QST MO 848 The Leadership Challenge
QST SI 839 Design Thinking and Innovation
QST SI 852 Starting New Ventures
QST SI 855 Entrepreneurship
QST SI 871 Strategies for Bringing Technology to Market
QST HM 801 Bench-to-Bedside:Translating BME Innov from Lab to Marketplace