

Boston University College of Engineering

Division of Systems Engineering

MS (Thesis) Program Planning Sheet



Student Name: _____

Advisor Signature: _____

BU ID _____

MS (Thesis) students must take 32 credits all of which must be at the 500 level or higher. The coursework requirements for the MS (Thesis) are as follows:
Core (3 courses), **Concentration** (2 courses), **Elective** (4-8 credits), and **Thesis** (4-8 credits). The **Practicum Requirement** is satisfied by 4 credits of SE 954 Thesis or SE 900 Research (PhD Only). Courses used to satisfy the Core requirement may not also be used to satisfy the Concentration or Elective requirements. Elective courses may be chosen, with advisor approval, to meet an individual student's academic needs. MS students must also satisfy the **Advanced Technical Course** Requirement by taking at least two 700-level or higher courses from the Concentration areas, or courses approved by the Systems Engineering Graduate Committee in advance. MS 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 MS degree. **MET courses cannot be used to satisfy the program requirements for the MS degree. This Program Planning Sheet does not supersede the ENG Graduate Bulletin.**

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.

CORE (Select one course from each Core area. 12 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 and Sim**, or **EC 505 Stoch Processes**, or **EK 500 Probability with Statistical Applications** Semester/Grade

CONCENTRATION (Select two courses from one Concentration area.)

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

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/ME 725 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

ELECTIVE (4-8 credits from Concentrations listed above or suggested below.

* (only one Engineering Management Course may be selected from the list.)

Suggested Electives: **ENG EC 504 Advanced Data Structures**, **CAS CS 511 Formal Methods I**, **CAS EC 513 Game Theory**, **CAS CS 542 Machine Learning**, **ENG EC 601 Product Design in ECE**, **CAS EC 611 Object-oriented Software Principles and Design**, **ENG SE 700 Advanced Special Topics**, **GRS EC 716 Game Theory**, **QST OM 855 Project Mgt**, **ENG SE 900 Research (PhD Only)**, **SE 925 Graduate Project**, or **SE 952 Mentored Project**.

THESIS: (4-8 credits of SE 954 Thesis or SE 900 Research (Phd Only)

Course/Semester/Grade _____

Course/Semester/Grade _____

Course/Semester/Grade _____

Course/Semester/Grade _____