

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.

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](#)

Concentration/Course/Semester/Grade
Concentration/Course/Semester/Grade

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](#)

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

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

Course/Semester/Grade
Course/Semester/Grade

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 _____