BOSTON UNIVERSITY

The Master of Science in Mechanical Engineering: Non-Thesis Program Planning Sheet (matriculated after 2024)

Student Name: _____ BU ID#_____

Email Address: _____ Advisor Name: _____

Expected Graduation Date: _____

Fill out sheet below with the courses you will use fulfill your MS requirements.
All instructions and explanations can be found on succeeding pages.

1) Focus Area Requirement – 12 credits

Focus Area: _____

Course #	Course Name	Credits	Semester/Year	Grade
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

2) Breadth Requirement – 4 credits

Course #	Course Name	Credits	Semester/Year	Grade
_____	_____	_____	_____	_____

3) Mechanical Engineering Requirement – 8 credits

Course #	Course Name	Credits	Semester/Year	Grade
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

4) Engineering, Math and Physical Science Requirement – 8 credits

Course #	Course Name	Credits	Semester/Year	Grade
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

5) Practicum* (Indicate your practicum course from the above courses): _____

*For full list of Practicum courses, see page 3

Approved By:

_____ _____

Advisor Signature Date Student Signature Date

The Master of Science in Mechanical Engineering
Curricular Requirements

The program requires 32 credit hours at the 500-level or above. At least 20 credits must be ME courses. At least 24 credits must be taken at Boston University. To graduate, a cumulative grade point average of at least 3.0 (B) must be attained.

If necessary, student can take more than 32 credits and drop the lowest grade. Grades of C– or lower are not acceptable for master's degrees under any circumstance. Successful completion of a 3-credit course in either the College of Arts and Sciences or the Questrom School of Business does not obviate the need to complete 32 credits. Students are permitted to take a single course multiple times to achieve the GPA requirement, but will only receive 4 credits if used against the degree requirements.

1. Focus Area Requirement (12 credits)
Each student must take three courses within one of the focus areas listed on the last page. This guideline is intended to provide each student with core competency in a specific area of mechanical engineering. However, a student may instead elect to choose a more general course of study through an alternate selection of three graduate-level ME courses that constitute an individually designed program of study. If a student chooses this alternative program of study instead of the Focus Area requirement, the program must be approved by the student's advisor and by the Director of Master's Programs prior to initiation.

2. Breadth Requirement (4 credits)
Each student must take one course from a focus area different from that used to fulfill the Focus Area Requirement. A course in this category is not in this focus area, but it is helpful to support a focus area with additional information.

3. Mechanical Engineering Elective Requirement (8 credits)
Each student must complete two additional 500-level or above courses in Mechanical Engineering to fulfill the ME Elective Requirement.

4. Engineering, Math and Physical Science Requirement (8 credits)
Each student must complete two graduate-level courses in any engineering course, **or** from the math courses listed below **or** from any physical science course, all of which need to be 500-level or above. These courses may be taken in any department or division of the College of Engineering or in the College of Arts and Sciences. The advisor must approve the two courses used to fulfill this requirement.

Acceptable (**but *not* required**) math courses* are:

ME566 Advanced Engineering Mathematics
ME712 Applied Mathematics in Mechanics
EK500 Probability with Statistical Applications
EK501 Mathematical Methods I: Linear Algebra and Complex Analysis
EC505 Stochastic Processes
MA511 Introduction to Analysis I
MA555 Numerical Analysis I
MA561 Methods of Applied Mathematics I
PY501 Mathematical Physics

*Note: If there is a math course a student wishes to take that is not on the list above, please reach out to the Director of Master's Programs for approval.

5. Practicum Requirement

One of the courses used to fulfill the Focus Area Requirement, the Mechanical Engineering Elective or the Engineering and Physical Science Electives must be a Practicum Course. The Practicum Courses are:

ME500 Manufacturing Processes for Design and Production
ME526 Simulation of Physical Processes
ME537 Product Realization
ME557 Additive Manufacturing
ME560 Precision Machine Design and Instrumentation
ME568 Soft Robotics
ME570 Robot Motion Planning
ME571 Medical Robotics
ME579 Nano/Microelectronic Device Technology
ME691 Advanced Product Design

6. Engineering Management

Student may be interested in the following engineering management course:

ME584 Manufacturing and Supply Chain Strategy

Focus Areas

*NOTE: Courses with a * are generally taught yearly*

Solid & Thermal-Fluid Mechanics	
Focus on governing equations based on conservation equations and macroscopic constitutive relations.	
ME500	Modeling of Motion in Mech. Syst.
ME500	Molecular Transport in Connective Tissues
ME515*	Vibration of Complex Mech. Systems
ME519*	Theory of Heat Transfer
ME520*	Acoustics
ME521*	Continuum Mechanics
ME526	Simulation of Physical Processes
ME527	Transport Phenomena in Mat. Proc.
ME533	Energy Conversion
ME538*	Intro to Finite Element Analysis
ME542*	Advanced Fluid Mechanics
ME546	Micro/Nanofluidics
ME547	Computational Fluid Dynamics
ME580	Theory of Elasticity
ME712*	Applied Mathematics in Mechanics
ME788*	Soft Tissue Biomechanics

Design & Manufacturing	
Focus is on manufacturing devices and products based on mechanical, material, and societal factors	
ME500*	Manufacturing Process. for Design & Production
ME500	Advanced Manufacturing
ME510*	Production Systems Analysis
ME518	Product Quality
ME535	Green Manufacturing
ME537*	Product Realization
ME555*	MEMS: Fabrication & Materials
ME557*	Additive Manufacturing
ME560*	Precision Machine Design & Instrumentation
ME568*	Soft Robotics
ME576	Nanomanufacturing and Hierarchical Materials
ME584*	Manufacturing and Supply Chain Strategy
ME691*	Advanced Product Design and Engineering
ME692*	Advanced Product Design and Engineering
ME778	Micromachined Tranducers

Materials	
Focus on how microscale structure and behavior influence macroscale material properties and function	
ME503*	Kinetic Processes in Materials
ME504*	Polymers and Soft Materials
ME505*	Thermo & Statistical Mechanics
ME516	Statistical Mech. Concepts in Engineering
ME545*	Electrochem. Of Fuel Cells and Batteries
ME549	Structures and Function of the Extracellular Matrix
ME582	Mechanical Behavior of Materials
ME726	Fundamentals of Biomaterials
ME727*	Principles and Applications of Tissues

Decision & Control	
Focus is on sensing and controlling mechanical systems	
ME500	Introduction to Biological Feedback & Control
EK505*	Intro to Robotics & Autonomous Systems
ME501*	Dynamic System Theory
ME543*	Sustainable Power Systems
ME570*	Robot Motion Planning
ME701	Optimal & Robust Control
ME710*	Dyn. Program. & Stochastic Control
ME714*	Adv. Stochastic Modeling & Simul.
ME724*	Adv. Optim, Theory & Methods
ME740*	Vision, Robotics & Planning
ME762*	Nonlinear Systems & Control

The courses below emphasize skills or technologies that cross between or augment the above focus areas and, in addition to courses above, can be used as a ME Elective

ME Electives	
ME500	Application Advances of Quantum DOTS
EK546*	Sustainable Energy Technologies
ME566*	Advanced Engineering Mathematics
ME571*	Medical Robotics
ME733*	Discrete Event & Hybrid Systems