



## MS Approved Lecture Courses

This document lists approved lecture courses and provides related regulations for Mechanical Engineering Master Students. Students who joined the Mechanical Engineering Master Program before May 31, 2015 may have additional courses counted toward their MS degree if these courses were listed on the previously approved Degree Plan or taken before May 31, 2015.

General regulations governing our Master Program are described in *ME Graduate Student Handbook* and instructions provided in the *Master of Science Degree Plan Form*.

### 1. Advanced Mathematics requirement

Master students are required to take two Advanced Mathematics lecture courses from the list provided in Table I. These courses must satisfy the following criteria:

- At least one course should be taken **from the ME department**.
- The required courses should be selected from **two different groups** defined in Table I. (This rule has been introduced because of course content overlap.)

### 2. Concentration and Breadth requirements

Master students are required to take three lecture courses in their concentration area and two breadth lecture courses outside their concentration area. The Concentration and Breadth courses should be chosen from the lists given in Table II.

### 3. Elective Courses

Elective lecture courses can be selected from courses offered by the ME department (*ME 5xxx* and *ME 6330* Advanced Topics in Mechanical Engineering) and from engineering and science courses offered by other departments at TTU. Elective courses should have a significant engineering/science component. (No more than one exception to this condition will be approved; courses that may be approved need to be relevant for careers in engineering-related fields).

Detailed regulations governing elective lecture, research, and internship courses are described in the instructions provided in the *Master of Science Degree Plan Form*.

**Note 1:** Some courses taught by the Department of Mathematics and Statistics are not intended for engineering students, and therefore will not count toward the Master Program course requirements. The list of courses that are **not approved** is given in Table III.

**Note 2:** Some current *ME 5xxx* courses were previously taught as *ME 6330* courses (Advanced Topics). Since there is considerable overlap in the content in such cases, **only one course version** will count toward ME Master Program requirements.

**TABLE I. List of courses satisfying Advanced Mathematics requirement.**

<b>Group A</b>	
<i>ME 6330</i>	Analysis of Vectors, Tensors, and Linear Systems

  

<b>Group B</b>	
<i>ME 5301</i>	Analysis of Engineering Systems
<i>MATH 5310</i>	Principles of Classical Applied Analysis I
<i>MATH 5332</i>	Partial Differential Equations I

  

<b>Group C</b>	
<i>ME 5302</i>	Numerical Analysis of Engineering Systems
<i>MATH 5334</i>	Numerical Analysis I
<i>MATH 5311</i>	Principles of Classical Applied Analysis II

**\*Note:** The course *MATH 5332* may be difficult for Mechanical Engineering students. Talk to the instructor before you decide to take this course.

**TABLE II. List of courses satisfying Concentration and Breadth requirements.**

<b>Dynamics and Controls</b>	
<i>ME 5311</i>	Advanced Dynamics
<i>ME 5312</i>	Control Theory I
<i>ME 5313</i>	Control Theory II
<i>ME 5314</i>	Nonlinear Dynamics
<i>ME 5316</i>	Advanced Vibrations
<i>ME 5317</i>	Robot and Machine Dynamics

  

<b>Thermal Sciences and Fluid Mechanics</b>	
<i>ME 5321</i>	Thermodynamics
<i>ME 5322</i>	Conduction Heat Transfer
<i>ME 5325</i>	Convection Heat Transfer
<i>ME 5326</i>	Combustion
<i>ME 5327</i>	Advanced Heat Transfer
<i>ME 5330</i>	Boundary Layer Theory
<i>ME 5335</i>	Mathematical Models of Turbulence
<i>ME 5336</i>	Computational Fluid Dynamics
<i>ME 5338</i>	Advanced Fluid Mechanics
<i>ME 5360</i>	Bio-Fluid Mechanics

  

<b>Solid Mechanics and Materials</b>	
<i>ME 5340</i>	Elasticity
<i>ME 5342</i>	Fracture and Failure Analysis
<i>ME 5343</i>	Contact Mechanics of Engineering Materials
<i>ME 5345</i>	Computational Mechanics I
<i>ME 5337</i>	Mechanics of Nanomaterials
<i>ME 6330</i>	Physical Metallurgy
<i>ME 5358</i>	Biomaterials
<i>ME 6330</i>	Nanomanufacturing

  

<b>Design</b>	
<i>ME 5351</i>	Advanced Engineering Design
<i>ME 5352</i>	Probabilistic Design
<i>ME 5356</i>	Digital Human Modeling for Human-Centric Design
<i>ME 6330</i>	Automotive Systems (updated title: Vehicle Dynamics)

**TABLE III. List of courses that do not satisfy Mechanical Engineering Master Program requirements.**

**These courses cannot be included in the degree plan.**

<b>Courses not approved</b>	
<i>MATH 5360</i>	Advanced Mathematics for Teachers I
<i>MATH 5361</i>	Advanced Mathematics for Teachers II
<i>MATH 5366</i>	Introduction to Analysis I
<i>MATH 5367</i>	Introduction to Analysis II
<i>MATH 5368</i>	Abstract Algebra Applied I
<i>MATH 5369</i>	Abstract Algebra Applied II
<i>MATH 5370</i>	History of Mathematics
<i>MATH 5371</i>	Topology of the Real Line I
<i>MATH 5372</i>	Topology of the Real Line II
<i>MATH 5375</i>	Modern Geometry I
<i>MATH 5376</i>	Modern Geometry II
<i>MATH 5377</i>	Applied Mathematics I
<i>MATH 5378</i>	Applied Mathematics II
<i>STAT 5302</i>	Applied Statistics I
<i>STAT 5303</i>	Applied Statistics II