

Mechanical Engineering- Master of Science

For information, contact:

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Introduction

The Master of Science in Mechanical Engineering prepares students for future engineering practice that requires a higher level of mastery in mechanical engineering. It is best suited for individuals with backgrounds in mechanical engineering or related areas such as materials science, biomedical engineering or physics. The degree includes core courses in mathematical modeling, dynamical systems and control, thermal-fluid systems, and mechanics and mechanical behavior of materials as well as diverse options for courses in science, engineering, and mathematics.

The degree is offered with thesis and non-thesis options. All students are required to complete graduate coursework as defined below.

- Students in the thesis option must earn a total of **24 credit hours** in concentration and elective courses (with a minimum of **15 credit hours** of concentration courses), two credit hours in graduate seminar and six credit hours of master's thesis, for a minimum of 32 total credit hours.
- Students in the non-thesis option must earn a **total of 30 credit hours** in concentration and elective courses (with a **minimum of 18 credit hours of concentration courses**), one credit hour in graduate seminar and three credit hours of a graduate research project, for a minimum of 34 total credit hours.

Program Requirements

Students must complete one of the following two options:

Option 1- Research option (thesis)

The research option requires completion of a minimum of 32 credit hours of graduate study and any additional hours needed to satisfy prerequisites. The distribution of hours is summarized as follows:

Code	Title	Credit Hours
Concentration and elective courses - see below (minimum of 15 credit hours of concentration courses) ¹		24
MME 610	Graduate Seminar (take twice)	1,1
MME 700	Research for Master's Thesis	6
Total Credit Hours		32

¹ At least 3 credit hours must be MME 600-level from the list of concentration courses.

Option 2 - Course intensive option (non-thesis)

The course intensive option requires the completion of a minimum of 34 credit hours and any additional hours needed to satisfy prerequisites. The distribution of hours is summarized as follows:

Code	Title	Credit Hours
Concentration and elective courses - see below (minimum of 18 credit hours of concentration courses) ¹		30
MME 610	Graduate Seminar	1
MME 704	Non-Thesis Project	3
Total Credit Hours		34

¹ At least 3 credit hours must be MME 600-level from the list of concentration courses.

Concentration Courses

Code	Title	Credit Hours
MME 503	Heat Transfer ¹	3
MME 512	Advanced Mechanics of Materials ¹	3
MME 513	Introduction to Compressible Flow ¹	3
MME 536	Control of Dynamic Systems ¹	3
MME 570	Special Topics in Mechanical Engineering ²	1-4
MME 595	Introduction to Applied Nonlinear Dynamics ¹	3
MME 613	Computational Fluid Dynamics	3
MME 615	Advanced Vibration	3
MME 621	Finite Element Analysis	3
MME 623	Mechanical Behavior of Materials	3
CPB/MME 612	Engineering Analysis	3

¹ Students who have taken the 400-level version of this course or its equivalent must select from among other concentration/elective courses.

² Student can take special topics which are pre-approved by the department for graduate level courses

Elective Courses

Students select elective courses in consultation with their faculty advisor.

Code	Title	Credit Hours
CPB 512	Chemical Engineering Thermodynamics ¹	3
CPB 514	Mass Transfer and Unit Operations ¹	3
CPB 518	Biological Transport Phenomena ¹	4
CPB 519	Biomaterials ¹	3
CPB 611	Transport Phenomena in Engineering	3
CSE 543	High Performance Computing & Parallel Programming ¹	3
CSE 609	Programming for Engineers and Scientists	3

CSE 616	Simulation of Physical Systems	3
ECE 525	Digital Signal Processing ¹	3
ECE 601	State Variables for Engineers	3
MTH 532	Optimization ¹	3
MTH 535	Mathematical Modeling Seminar ¹	3
MTH 632	Advanced Optimization	3
PHY 537	Intermediate Thermodynamics and Introduction to Statistical Physics ¹	4
PHY 551	Classical Mechanics ¹	4
PHY 583	Mathematical Methods in Physics ¹	4
STA 501	Probability ¹	3
STA 504	Advanced Data Visualization ¹	3
STA 563	Regression Analysis ¹	4
STA 566	Experimental Design Methods ¹	4

¹ Students who have taken the 400-level version of this course or its equivalent must select from among other concentration/elective courses.