**MS in Mechanical Engineering Plan of Study**

See reverse for course options and information.

Select two mathematics courses from those listed (6 credit hours).

<table>
<thead>
<tr>
<th>Mathematics Courses</th>
<th>Term</th>
<th>Hours</th>
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Select a concentration:

- [ ] Dynamics and Control
- [ ] Solid Mechanics and Materials Science
- [ ] Metrology and Manufacturing
- [ ] Thermal Science and Fluid Mechanics
- [ ] Motorsports Engineering
- [ ] Interdisciplinary Biomedical Engineering

Select four concentration courses from those listed (12 credit hours).

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<tr>
<th>Concentration Courses</th>
<th>Term</th>
<th>Hours</th>
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Thesis Option: Select two elective courses. (6 credit hours)

Non-Thesis/Project Option: Select three elective courses. (9 credit hours)

<table>
<thead>
<tr>
<th>Elective Courses</th>
<th>Term</th>
<th>Hours</th>
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Select one of the following capstone completion options:

- [ ] Thesis Option—6 credit hours

  Master’s Thesis Research | Term | Hours
  -------------------------|------|-------
  MEGR 7991                |      |       
  MEGR 7991                |      |       

- [ ] Non-Thesis/Project Option—3 credit hours

  Capstone Course | Term | Hours |
  ---------------|------|-------|
  Total Hours     |      |       |

**Semester-by-Semester Plan**

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<tr>
<th>Semester 1:</th>
<th>Hours</th>
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<td>Total Hours</td>
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<th>Semester 2:</th>
<th>Hours</th>
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<th>Semester 3:</th>
<th>Hours</th>
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<td>Total Hours</td>
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<th>Semester 4:</th>
<th>Hours</th>
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<td>Total Hours</td>
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**Degree Milestones for Thesis Option**

- [ ] Thesis Committee Appointment
- [ ] Thesis Proposal Defense
- [ ] Final Thesis Defense
- [ ] Thesis Submission
- [ ] Graduation Application

**Graduate Faculty Advisor Approval**

The faculty advisor for all Non-Thesis/Project option students is the Graduate Programs Director.

**INSTRUCTIONS:** Submit this completed form via email to megrad@uncc.edu.
Mathematics Courses
Select two of the following:

MEGR 7172: Computational Methods in Engineering (3)
MEGR 7174: Engineering Analysis I (3)
MEGR 7175: Engineering Analysis II (3)
MATH 6171: Advanced Applied Mathematics I (3)
MATH 6172: Advanced Applied Mathematics II (3)

Concentration Courses
Declare a concentration and take 12 credit hours of courses listed in that concentration:

Dynamics and Control Concentration
MEGR 7130: Introduction to Control Systems (3)
MEGR 7145: Advanced Topics in Dynamics (3)
MEGR 7221: Vibration of Discrete and Continuous Systems (3)
MEGR 7222: Mechatronics (3)
MEGR 7223: Mathematical Concepts for Dynamics and Control (3)
MEGR 7224: Analytical Mechanics (3)

Metrology and Manufacturing Concentration
MEGR 6181: Engineering Metrology (3)
MEGR 7182: Machine Tool Metrology (3)
MEGR 7191: Introduction to Optical Fabrication and Testing (3)
MEGR 7283: Advanced Coordinate Metrology (3)
MEGR 7284: Advanced Surface Metrology (3)

Motorsports Engineering Concentration
MEGR 7131: Automotive Power Plants (3)
MEGR 7132: Advanced Automotive Power Plants (3)
MEGR 7133: Applied Vehicle Aerodynamics (3)
MEGR 7134: Advanced Road Vehicle Dynamics (3)
MEGR 7135: Advanced Tire Mechanics (3)

Solid Mechanics and Materials Science Concentration
MEGR 6141: Theory of Elasticity I (3)
MEGR 6166: Mechanical Behavior of Materials I (3)
MEGR 7108: Finite Element Analysis and Applications (3)
MEGR 7163: Materials Characterization and Analysis (3)
MEGR 7172: Computational Methods in Engineering (3)
MEGR 7173: Engineering Design Optimization (3)

Thermal Science and Fluid Mechanics Concentration
MEGR 7113: Dynamics and Thermodynamics of Compressible Flow (3)
MEGR 7114: Advanced Fluid Mechanics (3)
MEGR 7117: Statistical Thermodynamics (3)
MEGR 7213: Introduction to Computational Fluid Dynamics (3)
MEGR 7214: Turbulent Shear Flows (3)
MEGR 7215: Turbulence Modeling and Simulations (3)

Interdisciplinary Biomedical Engineering Concentration
MEGR 7119: Thermal Applications in Biomedical Engineering (3)
MEGR 7151: Orthopedic Biomechanics (3)
MEGR 7152: Mechanics of the Human Locomotor System (3)

Dual Concentration
Students may request to complete two concentrations. However, an additional 12 credit hours are required with no course double-counting toward two concentrations.

Elective Courses
Thesis Option: 6 credit hours
Non-Thesis/Project Option: 9 credit hours

Select two or three of the following; additional concentration courses may be taken as electives. No more than 6 credit hours may be taken from outside MEES. No more than 6 credit hours may be in Individual Study.

MEGR 6090: Special Topics (3)
MEGR 7090: Special Topics (3)
MEGR 7129: Structural Dynamics of Production Machinery (3)
MEGR 7169: Introduction to Transmission Electron Microscopy (3)
MEGR 7183: Design of Precision Machines and Instruments I (3)
MEGR 7185: Gear Manufacturing and Metrology (3)
MEGR 7090: Flexures (3)
MEGR 7090: Tribology (3)
ECGR 6115: Optimal Control Theory I (3)
EMGT 6924: Lean Six Sigma Practice and Management (3)
ENER 6120: Energy Generation and Conversion (3)
NANO 8102: Nanoscale Phenomena (3)
NANO 8104: Fabrication of Nanomaterials (3)
NANO 8301: Nanomedicine (3)
NANO 8351: Nanoscale Materials for Energy Applications (3)
NANO 8354: Solar Applications of Nanomaterials (3)
OPTI 5371: Waves and Optics (3)
OPTI 6206: Physical Optics Design and Simulation (3)
OPTI 6241: Optical System Function and Design (3)

Capstone Course
A capstone course has a class project component. No capstone course can be double-counted to also satisfy a Concentration or Elective Course requirement.

With prior approval from the Graduate Program Director, an offering of MEGR 7892 that includes a project may be approved to count as the required capstone course. Select one of the following:

MEGR 7108: Finite Element Analysis and Applications (3)
MEGR 7172: Computational Methods in Engineering (3)
MEGR 7173: Engineering Design Optimization (3)
MEGR 7186: Data Analysis and Uncertainty (3)
MEGR 7213: Introduction to Computational Fluid Dynamics (3)
MEGR 7214: Turbulent Shear Flows (3)
MEGR 7215: Turbulence Modeling and Simulations (3)
MEGR 7222: Mechatronics (3)
MEGR 7284: Advanced Surface Metrology (3)

Refer to the Course Delivery Schedule on the MEES website for additional options and details. The course schedule in Banner is the most up-to-date resource for course options and information.