## PhD in Mechanical Engineering Plan of Study

See reverse for course options and information.

### Mathematics Courses

<table>
<thead>
<tr>
<th>Mathematics Courses</th>
<th>Term</th>
<th>Hours</th>
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### MEGR Courses (18 credit hours)

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### Elective Courses (21 credit hours)

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### Doctoral Dissertation Research (21 credit hours)

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<th>Doctoral Dissertation Research</th>
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### Additional Coursework/Research (6 credit hours)

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**TOTAL DEGREE HOURS:** 72

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### Additional Required Coursework for Doctoral Students

These requirements do not apply to total required degree hours (72).

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
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<tr>
<td>GRAD 8990: Academic Integrity</td>
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<td>GRAD 8302: Responsible Conduct of Research</td>
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<tr>
<td>MEGR 8000: Research Seminar</td>
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All Ph.D. students are required to register for MEGR 8000 each semester. This 1 credit hour course is graded on a pass/unsatisfactory basis, and does not count toward the required 72 degree hours.

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.

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### Degree Milestones for Doctoral Degree

- [ ] Qualifying Exam
- [ ] Committee Appointment
- [ ] Proposal Defense
- [ ] Final Defense
- [ ] Dissertation Submission/ETD
- [ ] Graduation Application

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### Graduate Faculty Advisor Approval

<table>
<thead>
<tr>
<th>Faculty Advisor Name</th>
<th>Signature</th>
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Mathematics Courses
Select two of the following (6 credit hours):
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)

MEGR Courses
Select six MEGR courses (18 credit hours):
Dynamics and Control
MEGR 7129: Structural Dynamics of Production Machinery (3)
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)
MEGR 7090: Tribology (3)

Metrology and Manufacturing
MEGR 6181: Engineering Metrology (3)
MEGR 7182: Machine Tool Metrology (3)
MEGR 7183: Design of Precision Machines and Instruments I (3)
MEGR 7185: Gear Manufacturing and Metrology (3)
MEGR 7186: Data Analysis and Uncertainty (3)
MEGR 7191: Introduction to Optical Fabrication and Testing (3)
MEGR 7283: Advanced Coordinate Metrology (3)
MEGR 7284: Advanced Surface Metrology (3)
MEGR 7480: Advanced Manufacturing Processes and Equipment (3)
MEGR 7090: Tribology (3)

Motorsports Engineering
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
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 7169: Introduction to Transmission Electron Microscopy (3)
MEGR 7172: Computational Methods in Engineering (3)
MEGR 7173: Engineering Design Optimization (3)

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

Elective Courses
Select seven elective courses (21 credit hours):
MEGR 6090: Special Topics (3)
MEGR 7090: Special Topics (3)
MEGR 7173: Engineering Design Optimization (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)