### MS in Mechanical Engineering Coursework Completion Plan

#### Mathematics — 3 credit hours

Select one of the following:

- MATH 6171 — Advanced Applied Mathematics I (3)
- MATH 6172 — Advanced Applied Mathematics II (3)
- MEGR 7090 — Engineering Analysis (3)
- MEGR 7172 — Computational Methods in Engineering (3)
- MEGR 7090 — Engineering Analysis II (3)

#### Core Courses — 9 credit hours

Select three of the following:

- MEGR 6141 — Theory of Elasticity I (3)
- MEGR 6181 — Engineering Metrology (3)
- MEGR 7108 — Finite Element Analysis and Applications (3)
- MEGR 7130 — Introduction to Control Systems (3)
- MEGR 7131 — Automotive Power Plants (3)
- MEGR 7135 — Advanced Tire Mechanics (3)
- MEGR 7163 — Materials Characterization and Analysis (3)
- MEGR 7172 — Computational Methods in Engineering (3) *
- MEGR 7173 — Engineering Design Optimization (3)
- MEGR 7221 — Vibration of Discrete and Continuous Systems (3)

* MEGR 7172 may fulfill the mathematics requirement or a core course requirement, but not both.

#### Elective Courses — 12 credit hours

Select four of the following. Core courses may also be included. Refer to Course Deliver Schedule and Graduate Catalog for complete listing. Not more than 6 credit hours may be taken from outside the Department of Mechanical Engineering and Engineering Science.

- MEGR 6166 — Mechanical Behavior of Materials I (3)
- MEGR 7090 — Special Topics (1 to 6)
- MEGR 7104 — Fabrication of Nanomaterials (3)
- MEGR 7111 — Advanced Engineering Thermodynamics (3)
- MEGR 7112 — Radiative Heat Transfer (3)
- MEGR 7113 — Dynamics and Thermodynamics of Compressible Flow (3)
- MEGR 7114 — Advanced Fluid Mechanics (3)
- MEGR 7115 — Convective Heat Transfer (3)
- MEGR 7117 — Statistical Thermodynamics (3)
- MEGR 7129 — Structural Dynamics of Production Machinery (3)
- MEGR 7132 — Advanced Automotive Powerplants (3)
- MEGR 7133 — Applied Vehicle Aerodynamics (3)
- MEGR 7134 — Advanced Road Vehicle Dynamics (3)
- MEGR 7142 — Theory of Elasticity II (3)
- MEGR 7143 — Inelastic Behavior of Materials (3)
- MEGR 7145 — Advanced Topics in Dynamics (3)
- MEGR 7146 — Experimental Stress Analysis (3)
- MEGR 7147 — Flight Dynamics (3)
- MEGR 7148 — Stability and Control of Nonlinear Systems (3)
- MEGR 7151 — Orthopedic Biomechanics (3)
- MEGR 7152 — Mechanics of the Human Locomotor System (3)
- MEGR 7164 — Diffraction/Spectroscopic Studies of Matter (3)
- MEGR 7165 — Diffraction and NDE Methods in Materials Science (3)
- MEGR 7166 — Deformation and Fracture of Materials (3)
- MEGR 7167 — Mechanical Behavior of Materials II (3)
- MEGR 7182 — Machine Tool Metrology (3)
- MEGR 7183 — Design of Precision Machines and Instruments I (3)
- MEGR 7184 — Design of Precision Machines and Instruments II (3)
- MEGR 7187 — Flexures (3)
- MEGR 7213 — Introduction to Computational Fluid Dynamics (3)
- MEGR 7214 — Turbulent Shear Flows (3)
- MEGR 7215 — Turbulence Modeling and Simulations (3)
- MEGR 7281 — Theory and Application of Computer-Aided Tolerancing (3)
- MEGR 7282 — Computer-Aided Process Planning (3)
- MEGR 7283 — Advanced Coordinate Metrology (3)
- MEGR 7284 — Advanced Surface Metrology (3)
- MEGR 7480 — Advanced Manufacturing Processes and Equipment (3)
- MEGR 7893 — Advanced Topics in Precision Engineering (3)
- ECRG 6115 — Optimal Control Theory I (3)
- EMGT 6924 — Lean Six Sigma Practice and Management (3)
- ENER 6120 — Energy Generation and Conversion (3)

#### Select one of the following capstone completion options:

- **Thesis Option — 30 credit hours total**
  
<table>
<thead>
<tr>
<th>Course</th>
<th>Term</th>
<th>Hours</th>
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<tr>
<td>MEGR 7991</td>
<td>Graduate Master Thesis Research</td>
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- **Design Option — 30 credit hours total**
  
<table>
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<tr>
<td>MEGR 7955—Graduate Design I</td>
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<tr>
<td>MEGR 7956—Graduate Design II</td>
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#### Graduate Faculty Advisor Approval

The faculty advisor for all design option students is the Associate Chair for Graduate Programs.

Advisor Name

Date