

Summary of Graduate Courses Offered in Fall 2026 (1)

Course Number	Day	Time	Course Title	Concentration Area in the MSME program
MEGR 5090-001	MWF	1010-1100	Topics in Mech Engineering: Phase Transformations in Additive Manufacturing & Aerospace Applications	Solid Mechanics and Materials Science (need petition)
MEGR 5090-002	MW	1600-1715	Topics in Mech Engineering: Introduction to Robotics	Dynamics and Control (need petition)
MEGR 5090-003	TR	1600-1715	Topics in Mech Engineering: Control of Nonlinear Systems	Dynamics and Control (need petition)
MEGR 5098-001	TR	0830-0945	Topics in Precision Engineer: Intelligent and Sustainable Machining Processes	Metrology and Manufacturing (need petition)
MEGR 5210-090	MW	1730-1845	Automotive Power Plants	Motorsports and Automotive Engineering
MEGR 5211-001	TR	1730-1845	Road Vehicle Dynamics	Motorsports and Automotive Engineering
MEGR 5271-091	TR	1730-1845	Orthopedic Biomechanics	Interdisciplinary Biomedical Engineering
MEGR 529-001	MW	1600-1715	Battery Performance and Testing	Battery Engineering <i>or</i> Motorsports and Automotive Engineering (need petition)

Summary of Graduate Courses Offered in Fall 2026 (2)

Course Number	Day	Time	Course Title	Concentration Area in the MSME program
MEGR 6141/8141-001	MWF	1115-1205	Theory of Elasticity	Solid Mechanics and Materials Science
MEGR 6181/8181-001	TR	1600-1715	Engineering Metrology	Metrology and Manufacturing
MEGR 7114/8114-001	MWF	1325-1415	Advanced Fluid Mechanics	Thermal Science and Fluid Mechanics
MEGR 7172/8172-001	W	1730-2015	Computational Methods in Engineering	Mathematics Requirement <i>or</i> Capstone
MEGR 7174/8174-001	M	1730-2015	Engineering Analysis I	Mathematics Requirement
MEGR 7225/8225-001	TR	0830-0945	Linear Systems Theory	Dynamics and Control
MEGR7284/8284-001	T	1730-2015	Advanced Surface Metrology	Metrology and Manufacturing <i>or</i> Capstone

Brief Description of Special Topics Courses (1)

Course Number	Course Title	Brief Course Description
MEGR 5090-001	Topics in Mech Engineering: Phase Transformations in Additive Manufacturing & Aerospace Applications	Modern aerospace components and additively manufactured structures rely on precise control of phase transformations to achieve superior mechanical performance and reliability. This course introduces the thermodynamic and kinetic principles governing phase transformations and links them directly to engineering applications. Topics include solidification, diffusion-controlled transformations, martensitic and precipitation processes, and microstructure evolution during additive manufacturing. Case studies focus on aerospace alloys, microstructure design, and performance in extreme environments. Students will gain the knowledge needed to understand and engineer phase transformations for advanced manufacturing and structural applications.
MEGR 5090-002	Topics in Mech Engineering: Introduction to Robotics	Modeling of industrial robots including homogeneous transformations, kinematics, velocities, static forces, dynamics, computer animation of dynamic models, motion trajectory planning, and introduction to vision, sensors and actuators.
MEGR 5090-003	Topics in Mech Engineering: Control of Nonlinear Systems	An introduction to the analysis and exploitation of nonlinearity in the control of mechanical systems, emphasizing tools from differential geometry and applications to mobile robots
MEGR 5098-001	Topics in Precision Engineer: Intelligent and Sustainable Machining Processes	This course is designed to introduce students to the fundamental skills and knowledge on machining system approach, machining technology, and programming of CNC machining tools. Topics include machine tool architecture, cutting tool technology and inspection, Computer Numerical Control (CNC).