

# MECHANICAL ENGINEERING MAJOR

## Major Requirements

### Bachelor of Science in Mechanical Engineering

134 credits

#### Natural Science and Math Requirements

Code	Title	Credits
CHEM 1171 & 1171L	General Chemistry I and General Chemistry I Lab	4
MATH 1141	Calculus I for Chemistry, Engineering, and Physics Majors <sup>1</sup>	4
MATH 1142	Calculus II for Chemistry, Engineering, and Physics Majors <sup>1</sup>	4
MATH 2243	Calculus III for Chemistry, Engineering, and Physics Majors	4
MATH 2251	Ordinary Differential Equations	3
MATH 3332	Partial Differential Equations	3
PHYS 1171 & 1171L	General Physics I and General Physics I Lab <sup>1</sup>	4
PHYS 1172 & 1172L	General Physics II and General Physics II Lab <sup>1</sup>	4
<b>Total Credits</b>		<b>30</b>

<sup>1</sup> Fulfills *Magis* Core requirement

#### Major Requirements

For a major in mechanical engineering, students complete the following:

Code	Title	Credits
<b>Engineering Foundation</b>		
ELEG 2213 & 2213L	Introduction to Electric Circuits and Electric Circuits Lab	4
ENGR 1031	Fundamentals of Engineering	3
ENGR 2130	Engineering Graphics I	3
ENGR 2145	Mathematical Analysis	3
ENGR 4961	Senior Design Project I	3
ENGR 4962	Senior Design Project II	3
<b>Mechanical Engineering Depth</b>		
MEEG 2201	Engineering Statics	3
MEEG 2203	Kinematics and Dynamics	3
MEEG 2206L	Mechanics Lab	1
MEEG 2207	Materials Science	3
MEEG 2307L	Dynamics Systems Lab	1
MEEG 3241	Principles of Thermodynamics	3
MEEG 3308	Strength of Materials	3
MEEG 3311	Machine Design	3
MEEG 3318	Finite Element Analysis	3
MEEG 3342	Applications of Thermodynamics	3

MEEG 3347	Fluid Mechanics	3
MEEG 3348L	Thermal and Fluids Lab	1
MEEG 4325	Engineering Systems Dynamics	3
MEEG 4349	Heat Transfer	3
MEEG 4350L	Energy Transfer Lab	1
Select five electives in Mechanical Engineering		15
<b>Total Credits</b>		<b>71</b>

#### Mechanical Engineering Electives

Possible electives may include:

Code	Title	Credits
<b>Thermal Systems</b>		
MEEG 4346	Energy Conversion	3
MEEG 4353	Computational Fluid Dynamics	3
MEEG 4354	Heat and Mass Transfer	3
MEEG 4356	Renewable Wind Energy	3
MEEG 4358	Heating, Ventilation, and Air Conditioning Systems Design	3
MEEG 4362	Gas Turbine Aerodynamics	3
MEEG 4364	Combustion	3
<b>Mechanical Systems</b>		
ENGR 3260	Robots	3
ENGR 4301	Feedback Control Systems	3
ENGR 4303	Industrial Automation	3
ENGR 4305	Design of Mechatronics Systems	3
ENGR 4308	Autonomous Mobile Robots	3
MEEG 4310L	Product Manufacturing Lab	1
MEEG 4312	Advanced Product Design and Manufacturing	3
MEEG 4319	Applications of Finite Element Analysis	3
MEEG 4321	Theory and Applications of Robot Kinematics	3
MEEG 4322	Advanced Dynamics	3
MEEG 4324	Micro and Nano Manufacturing	3
MEEG 4327	Fracture Mechanics	3
MEEG 4330	Mechanics of Composite Materials	3
MEEG 4372	Applications of Theory of Elasticity	3
MEEG 4376	Stability of Structures	3
MEEG 4990	Independent Study	1-3

Note: In addition to the undergraduate courses listed, juniors and seniors may take appropriate graduate-level courses as electives with the permission of the department chair and the instructor.

#### Concentrations

Students in the Mechanical Engineering program may earn an **Aerospace Engineering Concentration** or **Automation, Robotics and Manufacturing Concentration** by fulfilling the major elective requirement with the 5 courses identified below.

#### Aerospace Engineering Concentration

Code	Title	Credits
MEEG 3347	Fluid Mechanics (required course)	3
Select four courses from the following: <sup>1</sup>		12

MEEG 4362	Gas Turbine Aerodynamics
MEEG 4353	Computational Fluid Dynamics
MEEG 4364	Combustion
MEEG 4330	Mechanics of Composite Materials
MEEG 4319	Applications of Finite Element Analysis
MEEG 4327	Fracture Mechanics
MEEG 4372	Applications of Theory of Elasticity
MEEG 4376	Stability of Structures
<b>Total Credits</b>	<b>15</b>

<sup>1</sup> Students in the 5-year BS/MS program may select the equivalent 5000 level major elective (if available) in support of their program requirement.

### Automation, Robotics and Manufacturing (ARM) Concentration

Code	Title	Credits
MEEG 4325	Engineering Systems Dynamics (required course)	3
Select four courses from the following: <sup>1</sup>		12-13
ENGR 4303	Industrial Automation	
ENGR 4308	Autonomous Mobile Robots	
ENGR 3260	Robots	
ENGR 4305	Design of Mechatronics Systems	
MEEG 4321	Theory and Applications of Robot Kinematics	
MEEG 4312 & MEEG 4310L	Advanced Product Design and Manufacturing and Product Manufacturing Lab	
MEEG 4322	Advanced Dynamics	
MEEG 4319	Applications of Finite Element Analysis	
ENGR 4301	Feedback Control Systems	
MEEG 4324	Micro and Nano Manufacturing	
<b>Total Credits</b>		<b>15-16</b>

<sup>1</sup> Students in the 5-year BS/MS program may select the equivalent 5000 level major elective (if available) in support of their program requirement.