MASTER OF SCIENCE IN THE FIELD OF MECHANICAL AND AEROSPACE ENGINEERING

The master of science in the field of mechanical and aerospace engineering degree program offers a rigorous course of study that helps prepare students for leadership roles in government and industry. Students have the opportunity to work across disciplines in emerging areas of technology. The program is designed to build a solid background on the fundamentals of the related discipline, and at the same time it can be tailored to meet individual needs under the guidance of an academic advisor. Students can tailor their program to meet their interests and goals by choosing from the following focus areas: aerospace engineering; design of mechanical engineering systems; fluid mechanics, thermal sciences, and energy; industrial engineering; solid mechanics and materials science; and structures and dynamics; and robotics, mechatronics, and controls. Thesis and non-thesis options are available.

More information is available on the departmental website (https://www.mae.seas.gwu.edu/).

Educational Planner:

In consultation with an academic advisor, each student must develop an Educational Planner through DegreeMAP that governs the student's degree requirements. The Educational Planner should be established soon after matriculation and must be completed before the end of the student's first semester. The Educational Planner must be approved by the advisor.

REQUIREMENTS

The following requirements must be fulfilled: Non-thesis option –33 credits; thesis option–30 credits, including 6 credits of thesis. In addition, students must select one focus area and complete the required 9 credits of courses in that area. The remaining credits are selected by the student in consultation with a faculty advisor.

Normally, no more than two courses taken outside the Department of Mechanical and Aerospace Engineering may be counted toward the requirements for the graduate degree. In special circumstances this may be changed with the approval of the advisor.

Aerospace engineering

Code	Title	Credits
Required		
APSC 6212	Analytical Methods in Engineering II	
APSC 6213	Analytical Methods in Engineering III	
MAE 6286	Numerical Solution Techniques in Mechanical and Aerospace Engineering	
One of the following:		
MAE 6207	Theory of Elasticity I	
MAE 6221	Fluid Mechanics	
Electives		
Remaining credits are taken as elective courses in aeroacoustics, aeronautics, astronautics, propulsion, or space systems.		

Design of mechanical engineering systems

Code	Title	Credits
Required		
MAE 6243	Advanced Mechanical Engineering Design	
MAE 6251	Computer-Integrated Manufacturing	
One of the following:		
APSC 6212	Analytical Methods in Engineering II	
APSC 6213	Analytical Methods in Engineering III	
MAE 6286	Numerical Solution Techniques in Mechanical and Aerospace Engineering	
Electives		
Remaining credits are taken as elective courses in computer-aided design, computer-integrated design and manufacturing, mechanical engineering design, or robotics.		

Fluid Mechanics, thermal sciences, and energy

Code	Title	Credits
Required		
APSC 6213	Analytical Methods in Engineering III	
MAE 6221	Fluid Mechanics	
MAE 6286	Numerical Solution Techniques in Mechanical and Aerospace Engineering	
Electives		
Remaining credits are taken in elective courses, selected in consultation with the advisor.		

Industrial engineering

Code	Title	Credits
Required		
EMSE 6755	Quality Control and Acceptance Sampling	
EMSE 6770	Techniques of Risk Analysis and Management	
MAE 6251	Computer-Integrated Manufacturing	
One of the following:		
APSC 6212	Analytical Methods in Engineering II	
APSC 6213	Analytical Methods in Engineering III	
Electives		
Remaining credits are taken in elective courses, selected in consultation with the advisor.		

Solid mechanics and materials science

Code	Title	Credits
Required		
APSC 6213	Analytical Methods in Engineering III	
Two of the following:		
MAE 6210	Continuum Mechanics	
MAE 6238	Biomaterials	
MAE 6239	Computational Nanosciences	
MAE 6291	Special Topics in Mechanical Engineering	
ECE 6221	Introduction to Physical Electronics	
Electives		
Remaining credits are taken in elective courses, selected in consultation with the advisor.		

Structures and dynamics

Code	Title	Credits
Required		
APSC 6213	Analytical Methods in Engineering III	
MAE 6207	Theory of Elasticity I	
MAE 6286	Numerical Solution Techniques in Mechanical and Aerospace Engineering	
Electives		
Remaining credits are taken in elective courses, selected in consultation with the advisor.		

Robotics, mechatronics, and controls

Code	Title	Credits
Required		
MAE 6243	Advanced Mechanical Engineering Design	
MAE 6245	Robotic Systems	
MAE 6246	Electromechanical Control Systems	
Electives		
Remaining credits are taken in elective courses, selected in consultation with the advisor.		

Graduation and Scholarship Requirements—Students are responsible for knowing the University's minimum GPA requirement for graduation and scholarships (http://bulletin.gwu.edu/engineering-applied-science/#graduation_requirements_ms). Students should contact the department for additional information and requirements.