BACHELOR OF SCIENCE WITH A MAJOR IN MECHANICAL ENGINEERING, ROBOTICS OPTION

Mechanical engineering encompasses a vast range of industrial activities. Mechanical engineers conceive, plan, design, and direct the manufacture, distribution, and operation of complex systems. Applications include aerospace, energy conversion, computer-aided design and manufacturing, power and propulsion systems, robotics, and control systems. The bachelor of science with a major in mechanical engineering, robotics option degree program prepares students to work in the robotics industry or to pursue graduate study in robotics engineering. It provides a strong foundation in robotic mechanisms design, analysis, and integration; kinematics, dynamics, and control of robots; mechatronics design; sensing, actuation, and measurement; microprocessors for robotic systems; robotic haptics; and topics on artificial intelligence. The mechanical engineering (ME) program is accredited by the Accreditation Commission of ABET (https://www.abet.org/).

Visit the program website (http://www.mae.seas.gwu.edu/programs-degrees/) for additional information.

Bachelor of Sciences with a Second Major in Mechanical Engineering, Robotics Option

Any undergraduate student who is enrolled at GW may declare a second major in mechanical engineering only if his or her primary degree is a BS. The student must meet the degree requirements for a bachelor of science in mechanical engineering, including SEAS general, major, technical electives, humanities/social science, and SEAS/technical GPA requirements. Students earning other degrees (e.g., BA, BBA, BFA) must meet the requirements for a double degree (http://bulletin.gwu.edu/university-regulations/#DDegrees).

Graduation grade-point average criteria:
To satisfactorily complete a second major in biomedical engineering, a student must have a minimum grade-point average of 2.2 in all technical engineering courses outlined in the fifth, sixth, seventh, and eighth semesters of the curriculum.

REQUIREMENTS

Recommended program of study

Code	Title	Credits
First semester		
CHEM 1111	General Chemistry I [1]	
or CHEM 1113	General Chemistry for Engineers	
UW 1020	University Writing [1]	
MAE 1001	Introduction to Mechanical and Aerospace Engineering	
MATH 1231	Single-Variable Calculus I [1]	
SEAS 1001	Engineering Orientation	
Humanities, social science, or non-technical elective [2]		
Second semester		
MATH 2184	Linear Algebra I	
MAE 1004	Engineering Drawing and Computer Graphics	
MATH 1232	Single-Variable Calculus II [1]	
MAE 1117	Introduction to Engineering Computations	
PHYS 1021	University Physics I [1]	
Third semester		
APSC 2057	Analytical Mechanics I	
APSC 2113	Engineering Analysis I	
MAE 2117	Engineering Computations	
MATH 2233	Multivariable Calculus [1]	
PHYS 1022	University Physics II [1]	
Fourth semester		
APSC 2058	Analytical Mechanics II	
ECE 2110	Circuit Theory	
MAE 2131	Thermodynamics	
CE 2220	Introduction to the Mechanics of Solids	
Humanities, social science, or non-technical elective [2]		
Fifth semester		
MAE 3166W	Materials Science and Engineering	
MAE 3191	Mechanical Design of Machine Elements	
MAE 3192	Manufacturing Processes and Systems	
APSC 3115	Engineering Analysis III	
MAE 3126	Fluid Mechanics I	
MAE 3127	Fluid Mechanics Lab	
Sixth semester		

ECE 2115	Engineering Electronics
MAE 3120	Methods of Engineering Experimentation
MAE 3187	Heat Transfer
MAE 3193	Mechanical Systems Design
MAE 3134	Linear System Dynamics
MAE 3167W	Mechanics of Materials Lab
Seventh semester	
MAE 4182	Electromechanical Control System Design
MAE 4151	Capstone Design Project I
Technical elective or robotics elective [3,4]	
Two humanities, social science, or non-technical electives [2]	
Eighth semester	
MAE 4152W	Capstone Design Project II
MAE 4194	Mechatronics Design
MAE 6245	Robotic Systems
Technical elective or robotics elective [3,4]	
Two humanities, social science, or non-technical electives [2]	

[1]Course satisfies the University General Education Requirement (http://bulletin.gwu.edu/university-regulations/general-education/) in quantitative reasoning, scientific reasoning, and written communication.

[2]To satisfy the SEAS humanities, social sciences, and non-technical electives requirement, all mechanical engineering students must take one humanities course and two social sciences courses from the University General Education Requirement (http://bulletin.gwu.edu/university-regulations/general-education/); PHIL 2135 Ethics in Business and the Professions; and two additional humanities or social sciences or non-technical courses from the MAE Department's pre-approved list of electives. Each course selected to satisfy this requirement must be taken for at least 3 credits. NOTE: Students in the patent law concentration must take MAE 2170 History and Impact of the U.S. Patent System in lieu of one of the additional humanities, social sciences, or non-technical course.

[3] Robotics option students must take two technical electives. All technical electives must be approved by the undergraduate advisor. On a case-by-case basis, technical electives may be chosen from other departments if approved by both the undergraduate advisor and the department chair. Technical electives are chosen from MAE courses in the 3000, 4000, and 6000 series, excluding: MAE 3171 Patent Law for Engineers, MAE 4172 Engineering Design and the Patent System, MAE 6298 Research, MAE 6998 MS Thesis Research, and MAE 6999 MS Thesis Research.

[4] Robotics option students must take one 3-credit robotics elective, which must be selected from the following: MAE 6246 Electromechanical Control Systems, MAE 6254 Applied Nonlinear Control, BME 4835 Introduction to Assistive Robotics, or a technical elective course relevant to robotics with the approval of the undergraduate advisor and department chair.

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