B.S. IN MECHANICAL ENGINEERING/M.S. IN SOFTWARE ENGINEERING

Overview

The College of Engineering offers a dual-degree program that culminates with students receiving a Bachelor of Science in Mechanical Engineering and a Master of Science in Software Engineering concurrently. The program is intended for exceptional students who are admitted to the graduate program in their junior year. Students applying for this program must have a grade point average of at least 3.0. The two degrees are awarded simultaneously when the combined requirements have been met for both degrees.

- Juniors who have maintained at least a 3.0 GPA have the option to apply for admission to the 5-year BS ME-MS SE program.
- Those who are accepted into this accelerated program must maintain at least a 3.0 GPA and a minimum of a 3.0 GPA for the final 30 credit hours.
- Up to 6 credit hours of Technical electives earned during the fourth year can be counted toward the 30 credit hours required for the MS degree.
- Students must be registered for a minimum of 12 undergraduate credit hours per semester in their fourth year.
- Students can register for a maximum of 6 graduate credit hours in each semester of their fourth year.
- If a student needs to withdraw from the BS ME/MS SE program then all the requirements for the specific BS Concentration must be completed for graduation with the BS degree.

Admission Requirements

Juniors in the Mechanical and Aerospace Engineering department of the University of Miami who have maintained at least a 3.0 GPA may apply to the dual degree program. Qualified students are strongly advised to apply to the dual degree program as early as possible in their junior year to facilitate academic advising and course selection in the second semester of their junior year. Students opting for an M.S. degree in a discipline different from their B.S. degree may need to take some prerequisite coursework. Before submitting an application, students should discuss the program and possibility of entering with an academic adviser.

Curriculum Requirements

Code	Title	Credit Hours
BS IN MECHANICAL ENGINEERING REQUIREMENTS (120 CREDIT HOURS)		
Engineering Courses		
CAE 210	Mechanics of Solids I	3
ECE 205	Principles of Electrical Engineering--I	3
ISE 311	Applied Probability and Statistics	3
EGN 123	Computing and Digital Solutions for the future (can also be EGN 110 or EGN 114)	3
MAE 112	Introduction to Engineering II	2
MAE 202	Dynamics	3
MAE 207	Mechanics of Solids II	3
MAE 241	Measurements Laboratory	3
MAE 301	Engineering Materials Science	3
MAE 302	Mechanical Behavior of Materials	3
MAE 303	Thermodynamics	3
MAE 309	Fluid Mechanics	3
MAE 310	Heat Transfer	3
MAE 341	Mechanical Design I	3
MAE 342	Mechanical Design II	3
MAE 351	Mechanics Laboratory	2
MAE 362	Computer Analysis of Mechanical and Aerospace Engineering Problems	3
MAE 404	Experimental Engineering Laboratory	2
MAE 412	System Dynamics	3
MAE 415	Automatic Control	3
MAE 441	Design of Fluid and Thermal Systems	3
MAE 442	Capstone Design Project-I	3
MAE 443	Capstone Design Project-II	3

Math and Science Courses		
MTH 151	Calculus I for Engineers	5
MTH 162	Calculus II	4
MTH 211	Calculus III	3
MTH 311	Introduction to Ordinary Differential Equations	3
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
PHY 221	University Physics I	3
PHY 222	University Physics II	3
PHY 223	University Physics III	3
PHY 224	University Physics II Lab	1
PHY 225	University Physics III Lab	1
General Education Requirements		
Written Communication Skills:		
WRS 105	First-Year Writing I	3
WRS 107	First-Year Writing II: STEM	3
Quantitative Skills:		
MTH 151	Calculus I for Engineers (fulfilled through the major)	
Areas of Knowledge:		
Arts and Humanities Cognate		9
People and Society Cognate		9
STEM Cognate (9 credits) (fulfilled through the major)		
MS IN SOFTWARE ENGINEERING REQUIREMENTS (30 CREDIT HOURS)		
Technical elective taken as graduate course		3
Other Electives		9
ECE 610	Software Requirements and Interaction Design	3
ECE 618	Software Engineering and Operations	3
Core electives (select at least 4)		12
ECE 612	Software Architecture and Design	
ECE 632	VLSI Systems	
ECE 637	Principles of Artificial Intelligence	
ECE 648	Machine Learning	
ECE 672	Object-Oriented and Distributed Database Management Systems	
Total Credit Hours		**150**

Plan of Study

Freshman Year		
Fall		**Credit Hours**
EGN 123	Computing and Digital Solutions for the future (can also be EGN 110 or EGN 114)	3
WRS 105	First-Year Writing I	3
MTH 151	Calculus I for Engineers	5
PHY 221	University Physics I	3
	Credit Hours	**14**
Spring		
MAE 112	Introduction to Engineering II	2
CAE 210	Mechanics of Solids I	3
WRS 107	First-Year Writing II: STEM	3
MTH 162	Calculus II	4
PHY 222	University Physics II	3
PHY 224	University Physics II Lab	1
	Credit Hours	**16**

Sophomore Year

Fall

MAE 207	Mechanics of Solids II	3
ISE 311	Applied Probability and Statistics	3
MTH 211	Calculus III	3
PHY 223	University Physics III	3
PHY 225	University Physics III Lab	1
PS Cognate (PS Elective) [1]		3
	Credit Hours	**16**

Spring

MAE 202	Dynamics	3
MAE 241	Measurements Laboratory	3
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
ECE 205	Principles of Electrical Engineering--I	3
HA Cognate (HA Elective) [1]		3
	Credit Hours	**16**

Junior Year

Fall

MAE 302	Mechanical Behavior of Materials	3
MAE 303	Thermodynamics	3
MAE 309	Fluid Mechanics	3
MAE 341	Mechanical Design I	3
MTH 311	Introduction to Ordinary Differential Equations	3
HA Cognate (HA Elective)		3
	Credit Hours	**18**

Spring

MAE 301	Engineering Materials Science	3
MAE 310	Heat Transfer	3
MAE 342	Mechanical Design II	3
MAE 351	Mechanics Laboratory	2
MAE 362	Computer Analysis of Mechanical and Aerospace Engineering Problems	3
PS Cognate (PS Elective) [1]		3
	Credit Hours	**17**

Senior Year

Fall

MAE 404	Experimental Engineering Laboratory	2
MAE 412	System Dynamics	3
MAE 441	Design of Fluid and Thermal Systems	3
Technical elective taken as graduate course [2]		3
MAE 442	Capstone Design Project-I	3
Graduate Level Course [3]		3
	Credit Hours	**17**

Spring

MAE 415	Automatic Control	3
MAE 443	Capstone Design Project-II	3
HA Cognate (HA Elective) [1]		3
PS Cognate (Adv. PS Elective) [1]		3
Graduate Level Course [3]		3
	Credit Hours	**15**

Fifth Year (Graduate)		
Fall		
ECE 610	Software Requirements and Interaction Design	3
MSSE electives [4]		9
	Credit Hours	**12**
Spring		
ECE 618	Software Engineering and Operations	3
MSSE electives [4]		6
	Credit Hours	**9**
	Total Credit Hours	**150**

[1]   You must complete a minimum of 1 PS cognate and 1 HA cognate to be selected from the list of available cognates. Each cognate should be a minimum of three courses (9 credit hours).

[2]   Technical Electives are advanced courses in mathematics, science or engineering, approved by the Faculty Advisor, as appropriate for individual objectives.

[3]   Graduate courses are 600 or 700 level courses chosen from the ECE course offerings with the approval of the advisor. Note that 12 credits must be core SE electives, 6 credits must be 600-level, and 6 credits must be 700-level

[4]   MSSE electives must be selected from graduate level ECE course offerings. Note that 12 credits must be core SE electives, 6 credits must be 600-level, and 6 credits must be 700-level