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

Overview

The College of Engineering offers a dual-degree program that culminates with students receiving a Bachelor of Science in Software Engineering and a Master of Science in Industrial Engineering concurrently. This program is available only to qualified students enrolled in the undergraduate program in Software Engineering at the University of Miami. This is a structured and integrated program totaling 151 credit hours. Students may pursue this program from either of the undergraduate concentrations available for Software Engineering Majors.

Note the following:

- At least 30 credit hours must be at the graduate (600 or 700) level.
- Interested SE Juniors with a cumulative GPA above 3.0 may declare their intent to participate by submitting an official application to the Graduate School for admission into the M.S.I.E. portion of the program.
- A student wishing to drop out of the five-year program without the M.S.I.E. degree could receive the B.S.S.E. degree after completing all its requirements, including the senior design project.
- To qualify for the M.S.I.E. degree, students must meet all the pertinent Graduate School requirements, including a minimum of 3.0 GPA in the 30 credit hours applied towards the M.S.I.E. degree.
- The student is awarded both the B.S.S.E. and the M.S.I.E. degrees after the requirements for both degrees are satisfied.
- If their schedule allows, students may be able to complete 6 credits of graduate classes during their fourth year.
- 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.

Admission Requirements

The dual B.S. SE/M.S. IE program is available only to qualified undergraduate students enrolled in the software engineering program of the Department of Electrical and Computer Engineering. Students must have undergraduate student status and a cumulative G.P.A. of at least 3.0 at the time of application.

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.

This program is intended for exceptional students to acquire both a Bachelor of Science and a Master of Science degree simultaneously, in five years rather than the 4 plus 2 years (approximately) it normally requires.

Curriculum Requirements: B.S. in Software Engineering / M.S. in Industrial Engineering

Code	Title	Credit Hours
B.S. IN SOFTWARE ENGINEERING REQUIREMENTS (121 CREDIT HOURS)		
Engineering Courses		
EGN 110	Innovation and Entrepreneurship in Engineering	3
or EGN 114	Global Challenges Addressed by Engineering and Technology	
EGN 123	Computing and Digital Solutions for the future	3
ECE 118	Introduction to Programming	3
ECE 211	Logic Design	3
ECE 212	Processors: Hardware, Software, and Interfacing	3
ECE 218	Data Structures	3
ECE 315	Digital Design Laboratory	1
ECE 318	Algorithms	3
ECE 322	Systems Programming	3
ECE 368	Internet Computing I	3
ECE 376	Introduction to Cybersecurity	3
ECE 412	Software Engineering and Architecture	3

ECE 413	Software Design and Verification	3
ECE 421	Computer Operating Systems	3
ECE 467	Database Design and Management	3
ECE 470	Network Client-Server Programming	3
ECE 481	Senior Project I	1
ECE 482	Senior Project II	2
Software Engineering Technical Electives and/or Concentrations		**18**
SE Technical Electives		
300 Level and above ECE or CSC courses with approval of Academic Advisor. Two electives may also be taken from CIM412, CIM413, CIM422, CIM443, CIM453.		
Artificial Intelligence Concentration (9 credits)		
ECE 537	Principles of Artificial Intelligence	
ECE 548	Machine Learning	
ECE 553	Neural Networks	
Cybersecurity Concentration (9 credits)		
ECE 534	Communication Networks	
ECE 576	Internet and Intranet Security	
ECE 579	Mobile Computing	
Math and Science Courses		
ECE 310	Introduction to Engineering Probability	3
MTH 151	Calculus I for Engineers	5
MTH 162	Calculus II	4
MTH 210	Introduction to Linear Algebra	3
MTH 309	Discrete Mathematics I	3
General Education Requirements		
Basic Science (/Lab)		12
Basic Science (/Lab) Electives are selected in consultation with the Academic Advisor from courses in Biology, Chemistry, Environmental Science, Geological Science, Marine Science, or Physics.		
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)		
M.S. IN INDUSTRIAL ENGINEERING REQUIREMENTS (30 CREDIT HOURS)		
ISE 694	Master's Capstone Design Project	3
ISE 712	Design of Experiments	3
ISE 742	Linear Programming and Extensions	3
ISE 757	Ergonomics and Occupational Biomechanics	3
ISE 763	Project Management Techniques	3
or ISE 764	Supply Chain Management	
Additional graduate electives		15
Total Credit Hours		**151**

Suggested Plan of Study: B.S. in Software Engineering / M.S. in Industrial Engineering

Freshman Year		
Fall		**Credit Hours**
EGN 110 or 114	Innovation and Entrepreneurship in Engineering or Global Challenges Addressed by Engineering and Technology	3

ECE 118	Introduction to Programming	3
WRS 105	First-Year Writing I	3
MTH 151	Calculus I for Engineers	5
	Credit Hours	**14**
Spring		
EGN 123	Computing and Digital Solutions for the future	3
ECE 218	Data Structures	3
WRS 107	First-Year Writing II: STEM	3
MTH 162	Calculus II	4
	Credit Hours	**13**
Sophomore Year		
Fall		
ECE 211	Logic Design	3
ECE 318	Algorithms	3
MTH 210	Introduction to Linear Algebra	3
Basic Science (/Lab)		4
Arts and Humanities Cognate [1]		3
	Credit Hours	**16**
Spring		
ECE 212	Processors: Hardware, Software, and Interfacing	3
ECE 315	Digital Design Laboratory	1
ECE 310	Introduction to Engineering Probability	3
ECE 368	Internet Computing I	3
MTH 309	Discrete Mathematics I	3
People and Society Cognate [1]		3
	Credit Hours	**16**
Junior Year		
Fall		
ECE 322	Systems Programming	3
ECE 376	Introduction to Cybersecurity	3
ECE 412	Software Engineering and Architecture	3
Basic Science (/Lab)		4
Arts and Humanities Cognate [1]		3
	Credit Hours	**16**
Spring		
ECE 413	Software Design and Verification	3
ECE 421	Computer Operating Systems	3
ECE 467	Database Design and Management	3
Basic Science (/Lab)		4
People and Society Cognate [1]		3
	Credit Hours	**16**
Senior Year		
Fall		
ECE 481	Senior Project I	1
SE Elective [2]		3
SE Elective [2]		3
SE Elective [2]		3
SE Elective [2]		3
Arts and Humanities Cognate [1]		3
Graduate Course [3]		3
	Credit Hours	**19**

Spring		
ECE 482	Senior Project II	2
ECE 470	Network Client-Server Programming	3
People and Society Cognate [1]		3
SE Elective [2]		3
SE Elective [2]		3
Graduate Course [3]		3
	Credit Hours	**17**
Fifth Year		
Fall		
ISE 712	Design of Experiments	3
ISE 763	Project Management Techniques	3
ISE 742	Linear Programming and Extensions	3
Graduate Elective		3
	Credit Hours	**12**
Spring		
ISE 757	Ergonomics and Occupational Biomechanics	3
ISE 764	Supply Chain Management	3
ISE 694	Master's Capstone Design Project	3
Graduate Elective		3
	Credit Hours	**12**
	Total Credit Hours	**151**

1 Humanities and Arts (HA) Cognates and the People and Society (PS) Cognates can be selected from the appropriate University List.

2 See the department electives page for a detailed list of available options.

3 Graduate courses should be selected with the assistance of the Graduate Program Coordinator in Industrial and Systems Engineering