B.S. IN ELECTRICAL 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 Electrical Engineering and a Master of Science in Industrial Engineering concurrently. This program is available only to qualified students enrolled in the undergraduate program in Electrical 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 options available for Electrical Engineering Majors.

Note the following:

- At least 30 credit hours must be at the graduate (600 or 700) level.
- Interested ECE 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.E.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.E.E. and the M.S.I.E. degrees after the requirements for both degrees are satisfied.
- Up to 6 credit hours of technical electives earned during the fourth year can be counted toward the 30 credit hours required for the M.S. degree. If their schedule allows, students may be able to complete an additional 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. ECE/M.S. IE program is available only to qualified undergraduate students enrolled in 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 Electrical Engineering / M.S. in Industrial Engineering

Code	Title	Credit Hours
B.S. IN ELECTRICAL ENGINEERING REQUIREMENTS (120 CREDIT HOURS)		
Engineering Courses		
EGN 110	Innovation and Entrepreneurship in Engineering	3
or EGN 114	Global Challenges Addressed by Engineering and Technology	
or EGN 123	Computing and Digital Solutions for the future	
ECE 112	Introduction to Engineering II	2
ECE 118	Introduction to Programming	3
ECE 201	Electrical Circuit Theory	3
ECE 202	Electronics I	3
ECE 203	Electrical Circuits Laboratory	1
ECE 206	Circuits, Signals, and Systems	3
ECE 211	Logic Design	3
ECE 212	Processors: Hardware, Software, and Interfacing	3
ECE 218	Data Structures	3
ECE 302	Electronics II	3

ECE 303	Electronics Laboratory	1
ECE 315	Digital Design Laboratory	1
ECE 316	Structured Digital Design	1
ECE 336	Discrete-Time Signals and Systems	3
ECE 481	Senior Project I	1
ECE 482	Senior Project II	2
ECE Core Electives		6
ECE Design Elective		3
Engineering and Technical Electives		
ECE 301	Electromagnetic Field Theory	3
ECE Electives		9
Technical Electives		3
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 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)		
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	
Five additional graduate courses		15
Total Credit Hours		**150**

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

Freshman Year		
Fall		**Credit Hours**
EGN 110, 114, or 123	Innovation and Entrepreneurship in Engineering or Global Challenges Addressed by Engineering and Technology or Computing and Digital Solutions for the future	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		
ECE 112	Introduction to Engineering II	2
ECE 118	Introduction to Programming	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		
ECE 201	Electrical Circuit Theory	3
ECE 218	Data Structures	3
MTH 311	Introduction to Ordinary Differential Equations	3
PHY 223	University Physics III	3
PHY 225	University Physics III Lab	1
Arts and Humanities Cognate [1]		3
	Credit Hours	**16**
Spring		
ECE 202	Electronics I	3
ECE 203	Electrical Circuits Laboratory	1
ECE 206	Circuits, Signals, and Systems	3
ECE 211	Logic Design	3
MTH 210	Introduction to Linear Algebra	3
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
	Credit Hours	**17**
Junior Year		
Fall		
ECE 301	Electromagnetic Field Theory	3
ECE 302	Electronics II	3
ECE 303	Electronics Laboratory	1
ECE 315	Digital Design Laboratory	1
ECE 336	Discrete-Time Signals and Systems	3
ECE 310	Introduction to Engineering Probability	3
People and Society Cognate [1]		3
	Credit Hours	**17**
Spring		
ECE 212	Processors: Hardware, Software, and Interfacing	3
ECE 316	Structured Digital Design	1
ECE Core Elective [2]		3
ECE Core Elective [2]		3
ECE Elective [2]		3
People and Society Cognate [1]		3
	Credit Hours	**16**
Senior Year		
Fall		
ECE 481	Senior Project I	1
ECE Elective [2]		3
ECE Elective [2]		3

ECE Design Elective [2]		3
People and Society Cognate [1]		3
Technical elective taken as graduate course [2]		3
Graduate Course [3]		3
	Credit Hours	**19**
Spring		
ECE 482	Senior Project II	2
Technical Elective [2]		3
Arts and Humanities Cognate [1]		3
Arts and Humanities Cognate [1]		3
Technical elective taken as graduate course [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
	Credit Hours	**9**
Spring		
ISE 757	Ergonomics and Occupational Biomechanics	3
ISE 764	Supply Chain Management	3
ISE 694	Master's Capstone Design Project	3
	Credit Hours	**9**
	Total Credit Hours	**150**

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