B.S. ELECTRICAL ENGINEERING / M.S. ELECTRICAL AND COMPUTER ENGINEERING

Overview

This is a structured and integrated program of 151 credit hours. Students may pursue this program from either of the undergraduate option available for Electrical Engineering Majors. It includes two required courses, ECE 715 and ECE 716, as well as the selection of advanced technical electives.

Note the following:

- At least 30 credit hours must be at the graduate (600 or 700) level. Of these, at least 12 credit hours must be at 700 level. More specifically, in addition to ECE 715 (M.S. Design Project I) and ECE 716 (M.S. Design Project II), at least 6 credit hours must be in courses open to graduate students only (700 level).
- Interested ECE Juniors with cumulative GPA above 3.0 may declare their intent to participate by submitting an official application to the Departmental Graduate Committee for admission into the M.S.E.C.E. portion of the program.
- A student wishing to drop out of the five-year program without the M.S.E.C.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.E.C.E. degree, students must meet all the pertinent Graduate School requirements, including an acceptable G.R.E. score and a minimum of 3.0 GPA in the 30 credit hours applied towards the M.S.E.C.E. degree.
- The student is awarded both the B.S.E.E. and the M.S.E.C.E. degrees after the requirements for both degrees are satisfied.

For more information about the BS/MS Program please refer to the College of Engineering Section (http://bulletin.miami.edu/undergraduate-academic-programs/engineering/#fiveyearbsmsprogramtext).

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.

Requirements

You must be an undergraduate student in the College of Engineering (CoE). A master's degree is considered the first professional degree in engineering. The Admission Committee will carefully review academic credentials for admission into our M.S. program. Students should discuss the program and possibility of entering with an academic adviser. Completed applications are due prior to the beginning of the final exams in your junior year.

Get the application form (it is different for US students and International students) from the CoE Office of Research and Graduate Studies, fill it out and then return it to the same office. The application fee is waived for currently enrolled students in the CoE.

Take the GRE Examination before the end of your senior year and attain a combined score of more than 1000 on the Verbal and Quantitative portions. You must have a cumulative GPA of at least 3.0 at the time of application.

For further information about admission into the graduate school see the Bulletin of the Graduate School (http://bulletin.miami.edu/graduate-academic-programs/engineering/).

For more detailed information about the CoE Five-Year programs, please refer to the College of Engineering Bulletin section (http://bulletin.miami.edu/undergraduate-academic-programs/engineering/#fiveyearbsmsprogramtext).

Curriculum Requirements: B.S. in Electrical Engineering / M.S. Electrical and Computer Engineering

Code	Title	Credit Hours
B.S. IN ELECTRICAL 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	
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

Code	Title	Credit Hours
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 301	Electromagnetic Field Theory	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
EE Core Electives [1]		6
EE Design Elective [1]		3
ECE Electives [1,3]		9
Technical Electives [1]		9
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 ELECTRICAL AND COMPUTER ENGINEERING REQUIREMENTS (30 CREDIT HOURS)		
ECE 715	M.S. Design Project I	3
ECE 716	M.S. Design Project II	3
ECE Electives		9
ECE 600 Level Electives [1,3]		6
700 Level Technical Electives [1,3]		6
Total Credit Hours		**151**

Curriculum Requirements: B.S. in Electrical Engineering / M.S. Electrical and Computer Engineering - Audio Engineering Option

Code	Title	Credit Hours
B.S. IN ELECTRICAL ENGINEERING REQUIREMENTS (121 CREDIT HOURS)		
Common Engineering Requirements		
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 436	Digital Signal Processing	3
ECE 481	Senior Project I	1
ECE 502	Engineering Acoustics	3
ECE 540	Digital Speech and Audio Processing	3
EE Core Electives		3
ECE Design Elective		3
Audio Engineering Courses		
MMI 172	Audio Design Workshop III	1
MMI 220	Introduction to Music Recording	3
MMI 501	Transducer Theory	3
MMI 502	Digital Audio Theory	3
MMI 503	Audio Software Development I	3
Math & Basic Science Credit Hours		
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 224	University Physics II Lab	1
PHY 223	University Physics III	3
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 ELECTRICAL AND COMPUTER ENGINEERING REQUIREMENTS (30 CREDIT HOURS)		

ECE 715	M.S. Design Project I	3
ECE 716	M.S. Design Project II	3
Audio or Technical Electives		9
ECE 600 Level Electives		9
700 Level Technical Electives		6
Total Credit Hours		**152**

Suggested Plan of Study: B.S. in Electrical Engineering / M.S. Electrical and Computer 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
EE Core Elective [1]		3
EE Core Elective [1]		3
ECE Elective [1]		3
People and Society Cognate [1]		3
	Credit Hours	**16**
Senior Year		
Fall		
ECE 481	Senior Project I	1
ECE Elective [1]		3
ECE Design Elective [1]		3
ECE 600 Level Elective [1]		3
ECE 600 Level Elective		3
Technical Elective [1]		3
People and Society Cognate [1]		3
	Credit Hours	**19**
Spring		
Technical Elective [1]		3
Technical Elective [1]		3
Arts and Humanities Cognate [1]		3
Arts and Humanities Cognate [1]		3
ECE 600 Level Elective		3
ECE 600 Level Elective		3
	Credit Hours	**18**
Fifth Year		
Fall		
ECE 715	M.S. Design Project I	3
ECE 600 Level Elective		3
ECE 700 Level Elective		3
	Credit Hours	**9**
Spring		
ECE 716	M.S. Design Project II	3
ECE 600 Level Elective		3
ECE 700 Level Elective		3
	Credit Hours	**9**
	Total Credit Hours	**151**

[1]   See description of electives under the Departmental Electives Section.
[2]   Offered only in the Fall semester.

Suggested Plan of Study: B.S. in Electrical Engineering / M.S. Electrical and Computer Engineering - Audio Engineering Option

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

Code	Title	Credit Hours
MTH 151	Calculus I for Engineers	5
PHY 221	University Physics I	3
MMI 220	Introduction to Music Recording	3
	Credit Hours	**17**
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 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
MMI 502	Digital Audio Theory	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 436	Digital Signal Processing	3
EE Core Elective [1]		3
MMI 172	Audio Design Workshop III	1
MMI 503	Audio Software Development I	3
People and Society Cognate [1]		3
	Credit Hours	**17**
Senior Year		
Fall		
ECE 481	Senior Project I	1

ECE Design Elective [1]		3
Audio Engineering or Techinical Elective [1]		3
ECE 602	Engineering Acoustics	3
Audio Engineering or Techinical Elective [1, 3]		3
People and Society Cognate [1]		3
	Credit Hours	**16**
Spring		
MMI 501	Transducer Theory	3
MMI 503	Audio Software Development I	3
ECE 640	Digital Speech and Audio Processing	3
ECE 600 Level Elective [1]		3
Arts and Humanities Cognate [1]		3
Arts and Humanities Cognate [1]		3
	Credit Hours	**18**
Fifth Year		
Fall		
ECE 715	M.S. Design Project I	3
ECE 600 Level Elective		3
ECE 700 Level Elective		3
	Credit Hours	**9**
Spring		
ECE 716	M.S. Design Project II	3
ECE 600 Level Elective		3
ECE 700 Level Elective		3
	Credit Hours	**9**
	Total Credit Hours	**152**

[1] See description of electives under the Departmental Electives Section.
[2] Offered only in the Fall semester.
[3] Should be taken as Graduate (G) credits