

Electrical Engineering, MSEE

Master of Science in Electrical Engineering Degree Program Requirements

General Requirements

Select two of the following:	6
GNEG 5304	Engineering Probability and Statistics
GNEG 5306	Engineering Analysis I
GNEG 5307	Engineering Analysis II
GNEG 5313	Engineering Numerical Methods
Technical Electives (see list of technical elective options below)	
At least two technical electives must be taken in the Electrical Engineering department	12
Concentration (select one concentration from below):	12
Total Hours	30

Thesis Concentration

ELEG 5699	Thesis	6
Select two classes from one of the tracks listed below:		6
Computer Engineering Track		
ELEG 6310	Advanced Computer Systems Design	
ELEG 6311	Computer Architecture & Advanced Logic Design	
ELEG 6312	The Internet: Design and Implementation	
ELEG 6314	Fault Tolerant Computing	
ELEG 6315	Information Networks	
ELEG 6316	Statistical Learning for Big Data	
ELEG 6318	Deep Learning	
ELEG 6360	Modern Artificial Intelligence	
ELEG 6361	Advanced Artificial Intelligence	
ELEG 6365	Intro to High Perf Computing	
ELEG 6370	Selected Topics in Deep Learning	
ELEG 6380	Introduction to Bioinformatics	
ELEG 6381	Advanced Bioinformatics	
ELEG 6382	Computational Systems Biology	
ELEG 6383	Computational Modeling of Biological Systems	
Communication and Signal Processing Track		
ELEG 6312	The Internet: Design and Implementation	
ELEG 6320	Wireless Networks	
ELEG 6321	Digital Communication	
ELEG 6322	Coding Theory	
ELEG 6324	Advanced Broadband Communications Systems	
ELEG 6325	Telecommunications Network Security	
ELEG 6330	Signal Detection and Estimation	
ELEG 6331	Stochastic Processes	
ELEG 6333	Wavelets and Their Applications	
Microelectronics Track		
ELEG 6342	VLSI and ULSI Design	
ELEG 6350	Advanced Photonics Materials and Devices	
ELEG 6351	Advanced Quantum Devices	
ELEG 6352	Advanced Characterization of Materials and Devices	
ELEG 6354	Advanced Solid State	
Power Engineering Track		
ELEG 6371	Power System Faults Protective	

ELEG 6372	Power System Stability
ELEG 6373	High Voltage Direct Current
ELEG 6374	Power Gen Oper Control
ELEG 6375	Advanced Power System
ELEG 6376	Power Electronics Power System
ELEG 6377	Advanced Electric Drives
ELEG 6378	Advanced Power Electronics
ELEG 6385	Fundamentals of Power Electronics and Motor Drives
ELEG 6386	Renewable Energy Sources
ELEG 6387	Smart Grid: Fundamentals of Design and Analysis

Total Hours**12****Non-Thesis Concentration**

ELEG 5391	Engineering Project	3
-----------	---------------------	---

Select three classes from one of the tracks listed below: 9

Computer Engineering Track

ELEG 6310	Advanced Computer Systems Design
ELEG 6311	Computer Architecture & Advanced Logic Design
ELEG 6312	The Internet: Design and Implementation
ELEG 6314	Fault Tolerant Computing
ELEG 6315	Information Networks
ELEG 6316	Statistical Learning for Big Data
ELEG 6318	Deep Learning
ELEG 6360	Modern Artificial Intelligence
ELEG 6361	Advanced Artificial Intelligence
ELEG 6365	Intro to High Perf Computing
ELEG 6370	Selected Topics in Deep Learning
ELEG 6380	Introduction to Bioinformatics
ELEG 6381	Advanced Bioinformatics
ELEG 6382	Computational Systems Biology
ELEG 6383	Computational Modeling of Biological Systems

Communication and Signal Processing Track

ELEG 6312	The Internet: Design and Implementation
ELEG 6320	Wireless Networks
ELEG 6321	Digital Communication
ELEG 6322	Coding Theory
ELEG 6324	Advanced Broadband Communications Systems
ELEG 6325	Telecommunications Network Security
ELEG 6331	Stochastic Processes
ELEG 6333	Wavelets and Their Applications
ELEG 6330	Signal Detection and Estimation

Microelectronics Track

ELEG 6342	VLSI and ULSI Design
ELEG 6350	Advanced Photonics Materials and Devices
ELEG 6351	Advanced Quantum Devices
ELEG 6352	Advanced Characterization of Materials and Devices
ELEG 6354	Advanced Solid State

Power Engineering Track

ELEG 6371	Power System Faults Protective
ELEG 6372	Power System Stability
ELEG 6373	High Voltage Direct Current
ELEG 6374	Power Gen Oper Control

ELEG 6375	Advanced Power System	
ELEG 6376	Power Electronics Power System	
ELEG 6377	Advanced Electric Drives	
ELEG 6378	Advanced Power Electronics	
ELEG 6385	Fundamentals of Power Electronics and Motor Drives	
ELEG 6386	Renewable Energy Sources	
ELEG 6387	Smart Grid: Fundamentals of Design and Analysis	

Total Hours**12**

Technical Electives

Electrical Engineering Technical Electives

ELEG 6310	Advanced Computer Systems Design	3
ELEG 6311	Computer Architecture & Advanced Logic Design	3
ELEG 6312	The Internet: Design and Implementation	3
ELEG 6314	Fault Tolerant Computing	3
ELEG 6315	Information Networks	3
ELEG 6316	Statistical Learning for Big Data	3
ELEG 6318	Deep Learning	3
ELEG 6320	Wireless Networks	3
ELEG 6321	Digital Communication	3
ELEG 6322	Coding Theory	3
ELEG 6324	Advanced Broadband Communications Systems	3
ELEG 6325	Telecommunications Network Security	3
ELEG 6330	Signal Detection and Estimation	3
ELEG 6331	Stochastic Processes	3
ELEG 6333	Wavelets and Their Applications	3
ELEG 6342	VLSI and ULSI Design	3
ELEG 6350	Advanced Photonics Materials and Devices	3
ELEG 6351	Advanced Quantum Devices	3
ELEG 6352	Advanced Characterization of Materials and Devices	3
ELEG 6354	Advanced Solid State	3
ELEG 6360	Modern Artificial Intelligence	3
ELEG 6361	Advanced Artificial Intelligence	3
ELEG 6365	Intro to High Perf Computing	3
ELEG 6370	Selected Topics in Deep Learning	3
ELEG 6371	Power System Faults Protective	3
ELEG 6372	Power System Stability	3
ELEG 6373	High Voltage Direct Current	3
ELEG 6374	Power Gen Oper Control	3
ELEG 6375	Advanced Power System	3
ELEG 6376	Power Electronics Power System	3
ELEG 6377	Advanced Electric Drives	3
ELEG 6378	Advanced Power Electronics	3
ELEG 6380	Introduction to Bioinformatics	3
ELEG 6381	Advanced Bioinformatics	3
ELEG 6382	Computational Systems Biology	3
ELEG 6383	Computational Modeling of Biological Systems	3
ELEG 6385	Fundamentals of Power Electronics and Motor Drives	3
ELEG 6386	Renewable Energy Sources	3
ELEG 6387	Smart Grid: Fundamentals of Design and Analysis	3
ELEG 6391	Special Topics in Elec Engr ¹	3

Other Technical Electives

CHEG 5302	Microelectronics Materials	3
CINS 5306	Data Structures and Algorithms	3
COMP 5315	Design and Analysis of Algorithms	3
COMP 5324	Distributed Computing and Parallel Processing	3
CVEG 5300	Physical/Chemical Unit Operations in Water and Wastewater Treatment	3
CVEG 5303	Finite Element Analysis	3
GNEG 5304	Engineering Probability and Statistics	3
GNEG 5306	Engineering Analysis I	3
GNEG 5307	Engineering Analysis II	3
GNEG 5313	Engineering Numerical Methods	3
GNEG 5319	Special Topics	3
MCEG 5302	Advanced Thermodynamics	3
MCEG 5325	Advanced Engineering Materials	3

¹ Special topics courses vary in content and may cover areas such as artificial intelligence, machine learning, cybersecurity, and power systems.

Master of Science in Electrical Engineering Degree Sequence

First Year

Fall - Semester 1	Hours	Spring - Semester 2	Hours
General Requirement		3 General Requirement	3
Concentration Track Elective		3 Concentration Track Elective	3
Technical Elective		3 Technical Elective	3
Total		9 Total	9

Total Hours: 18

Second Year

Fall - Semester 1	Hours	Spring - Semester 2	Hours
Concentration Track Elective - Non-Thesis Option or Technical Elective - Thesis Option		3 Option Non-Thesis Option	6
Technical Elective	3	ELEG 5391 and Technical Elective Thesis Option GNEG 5608	
Total		6 Total	6

Total Hours: 12

Name	Unit
------	------

Total Semester Credit Hours: 30

Marketable Skills

Marketable skills, as defined by the Texas Higher Education Coordinating Board's 60x30TX Plan (<http://www.60x30tx.com/>), include interpersonal, cognitive, and applied skill areas, are valued by employers, and can be either primary or complementary to a major. Marketable skills are acquired by students through education, including curricular, co-curricular, and extracurricular activities.

MS Electrical Engineering

Degree Skills

1. Analytical, technical and engineering design skills necessary to innovate and create electronic components, sensors and systems
2. Advanced training in one of the following areas of emphasis in electrical engineering: microelectronics, computer engineering, telecommunications and signal processing, energy and power systems, cybersecurity, and bioinformatics
3. Technical, cognitive and interpersonal skills

Concentration Skills

1. Computer engineering
2. Communication and signal processing and the power systems
3. Advanced skills in the microelectronics area

Co-curricular and Extracurricular Skills

1. Advanced skills in leadership and communication
2. Advanced skills in system design and analysis
3. Advanced skills in machine learning, deep learning and artificial intelligence