Electrical and Computer Engineering with Concentration in Computer Systems and Software, MSECE (Seattle)

For program contact information, please visit this website (https://ece.northeastern.edu/academics/graduate-studies/ms-elee/).

The master's degree programs in electrical and computer engineering offer in-depth coursework within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on groundbreaking research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

Students cannot take excluded courses as part of the MSECE program and may not petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, DAMG, INFO, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Fundamental Courses

Code	Title	Hours
Complete at least 8 semester hours from the following:		8
EECE 5640	High-Performance Computing	
EECE 7205	Fundamentals of Computer Engineering	
EECE 7352	Computer Architecture	
EECE 7376	Operating Systems: Interface and Implementation	

Options

Complete one of the following options:

COURSEWORK OPTION

Code	Title	Hours
Concentration Courses		
Complete a minimum of 8 semester hours from the concentration course list below. Any fundamental course not used to meet the fundamental course requirement can be used toward the concentration course requirement. Complete a minimum of 16 semester hours from the concentration course list below. Any fundamental course not used to meet the fundamental course requirement can be used toward the concentration course requirement. (p. 2)		16
Electives		
Students may complete a maximum of 8 semester hours from either the concentration course list or a maximum of 8 semester hours from the elective course list.		8

THESIS OPTION

Code	Title	Hours
Thesis		
EECE 7945	Master's Project	4
EECE 7990	Thesis	4
In addition to completing the thesis course, students must successfully complete the thesis submission process, including securing Committee and Graduate School of Engineering signatures and submission of an electronic copy of their MS Thesis to ProQuest.		
Concentration Courses		
Complete a minimum of 8 semester hours from the concentration course list below. Any fundamental course not used to meet the fundamental course requirement can be used toward the concentration course requirement. (p. 2)		8
Electives		
Students may complete a maximum of 8 semester hours from either the concentration course list or a maximum of 8 semester hours from the elective course list.		8

Optional Co-op Experience

Code	Title	Hours
Complete the following. Students must complete ENCP 6100 to qualify for co-op experience:		
ENCP 6100	Introduction to Cooperative Education	1
ENCP 6964	Co-op Work Experience	0
or ENCP 6954	Co-op Work Experience - Half-Time	
or ENCP 6955	Co-op Work Experience Abroad - Half-Time	
or ENCP 6965	Co-op Work Experience Abroad	

Program Credit/GPA Requirements

32 total semester hours required (33 with optional co-op)
Minimum 3.000 GPA required

Course Lists

A maximum of three courses may be taken outside of electrical and computer engineering.

CONCENTRATION COURSES

Code	Title	Hours
CS 5200	Database Management Systems	
CS 5500	Foundations of Software Engineering	
CS 5600	Computer Systems	
CS 6410	Compilers	
CS 6510	Advanced Software Development	
CS 6650	Building Scalable Distributed Systems	
EECE 5552	Assistive Robotics	
EECE 5640	High-Performance Computing	
EECE 5643	Simulation and Performance Evaluation	
EECE 5698	Special Topics in Electrical and Computer Engineering (Field Programmable Gate Arrays in the Cloud)	
EECE 5698	Special Topics in Electrical and Computer Engineering (Nano-Computing System Design)	
EECE 5699	Computer Hardware and System Security	
EECE 6400	Special Problems in Electrical and Computer Engineering	
EECE 7205	Fundamentals of Computer Engineering	
EECE 7352	Computer Architecture	
EECE 7353	VLSI Design	
EECE 7368	High-Level Design of Hardware-Software Systems	
EECE 7376	Operating Systems: Interface and Implementation	
EECE 7390	Computer Hardware Security	
EECE 7398	Advanced Special Topics in Electrical and Computer Engineering (Advanced Computer Architecture)	
EECE 7398	Advanced Special Topics in Electrical and Computer Engineering (Compilers)	
EECE 7945	Master's Project	
EECE 7990	Thesis	

Elective Courses

Code	Title	Hours
CS 5100	Foundations of Artificial Intelligence	
CS 5180	Reinforcement Learning and Sequential Decision Making	
CS 5335	Robotic Science and Systems	
CS 6200	Information Retrieval	
CS 6220	Data Mining Techniques	
CS 6760	Privacy, Security, and Usability	
CS 7800	Advanced Algorithms	

CY 5770	Software Vulnerabilities and Security
CY 6740	Network Security
DS 5110	Essentials of Data Science
EECE 5360	Combinatorial Optimization
EECE 5512	Networked XR Systems
EECE 5550	Mobile Robotics
EECE 5554	Robotics Sensing and Navigation
EECE 5612	Statistical Inference: An Introduction for Engineers and Data Analysts
EECE 5614	Reinforcement Learning and Decision Making Under Uncertainty
EECE 5626	Image Processing and Pattern Recognition
EECE 5639	Computer Vision
EECE 5641	Introduction to Software Security
EECE 5642	Data Visualization
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5645	Parallel Processing for Data Analytics
EECE 6400	Special Problems in Electrical and Computer Engineering
EECE 7150	Autonomous Field Robotics
EECE 7204	Applied Probability and Stochastic Processes
EECE 7215	Introduction to Distributed Intelligence
EECE 7223	Riemannian Optimization
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7315	Digital Image Processing
EECE 7323	Numerical Optimization Methods
EECE 7337	Information Theory
EECE 7345	Big Data and Sparsity in Control, Machine Learning, and Optimization
EECE 7370	Advanced Computer Vision
EECE 7393	Analysis and Design of Data Networks
EECE 7397	Advanced Machine Learning
EECE 7400	Advanced Special Problems in Electrical and Computer Engineering
IE 5360	Digital Manufacturing
MATH 7233	Graph Theory
PHIL 5010	AI Ethics