

Department of Electrical and Computer Engineering Checklist for MSES(EE) Degree

This checklist is provided to document the completion of the MSES(EE) degree requirements.

Student name: _____ ; **email:** _____

Month/year enrolled: _____ ; **Graduation date:** _____

I certify that 1) the information contained on this form is correct; and 2) courses included in this checklist are not included in the requirements towards another Master degree.

Student : _____ ; **Date:** _____

We certify that this student has met the minimum requirements for the MSES(EE) degree.

Signatures:

**Academic Associate, Date
ECE Department**

ECE Assoc. Chair for Students, Date

Program Officer/Manager, Date

ECE Department Chair, Date

1. Undergraduate Institution(s):

List undergraduate institution(s), degree(s) and dates:

- _____
- _____
- _____

2. Thesis:

- Number of thesis credits (16 minimum): _____
- Advisor: _____
- Presentation date: _____ Location: _____
- Completed EC3000 during (specify quarter) _____

The remaining requirements must be met exclusive of thesis requirements.

3. Program of Study:

(Select **one** specialty: _____)

List of Specialties (each specialty has 4 required courses)

Recall: you must request enrollment in a certificate if you wish to get nominated for it (see EC0000 SOP for details)

Communications Systems:

Required Courses: (satisfies 287 certificate)

EC 3500	Analysis of Random Signals	(4-0)
EC 3510	Communications Engineering	(3-2)
EC 4550	Digital Communications	(4-0)
EC 4580	Error Correction Coding	(4-0)

Computer Systems:

Required Courses: (satisfies 286 certificate)

EC 3800	Microprocessor Based System Design	(3-2)
EC 3840	Introduction to Computer Architecture	(3-2)
EC 4820	Advanced Computer Architecture	(3-2)
EC 4830	Digital Computer Design	(3-2)

Cyber Systems:

Required Courses: (may satisfy 288 or 296 certificate)

EC3730	Cyber Network & Physical Infrastructures	(3-2)
EC3740	Reverse Engineering in Electronic Syst.	(3-2)

AND select *either* the Classified or Unclassified set:

Classified: (US only, with appropriate security clearance)

EC 3760	Information Operations Systems	(3-2)
EC 4765	Cyber Warfare	(3-2)

OR

Effective date: 02/10/17; last update: 04/28/22

Please read [Privacy Advisory](#).

Unclassified:

EC 4730	Covert Communications	(3-2)
EC 4770	Wireless Communications Network Security	(3-2)

Guidance, Control & Navigation Systems:

Required Courses: (satisfies 284 certificate)

EC 3310	Optimal Estimation: Sensor & Data Association	(3-2)
EC 3320	Optimal Control Systems	(3-2)
EC 4330	Navigation, Missile, & Avionics Systems	(3-2)
EC 4350	Nonlinear Control Systems	(3-2)

Network Engineering:

Required Courses (satisfies 295 certificate)

EC 3710	Computer Communications Methods	(3-2)
Or		
CS3502	Computer Communications and Networks	(4-2)
EC 4725	Adv. Telecommunication Systems Eng.	(3-2)
EC 4745	Mobile Ad Hoc Wireless Networking	(3-2)
EC 3795	Mobile Telecommunications Fundamentals	(3-2)

Power Systems:

Required courses: (satisfies 291 certificate)

EC 3130	Electrical Machinery Theory	(4-2)
EC 3150	Power Electronics	(3-2)
EC 4130	Advanced Electrical Machinery Systems	(4-2)
EC 4150	Advanced Power Electronics	(3-2)

Electronics:

Required courses:

EC 3200	Advanced Electronics Engineering	(3-2)
EC 3220	Semiconductor Device Technologies	(3-2)
EC 4220	Introduction to Analog VLSI	(3-2)
EC 4230	Reliability Issues for Military Electronics	(3-2)

Signal Processing Systems:

Required Courses: (satisfies 290 certificate)

EC 3400	Digital Signal Processing	(3-2)
EC 3410	Discrete-Time Random Signals	(3-2)
EC 4440	Statistical Digital Signal Processing	(3-2)
EC4450 Or EC 4480	Array Signal Processing Engineering Image Processing and Recognition	(3-2)

Sensor, Radar and EW Engineering:

Required Courses: (satisfies 292 certificate)

EC 3600	Antennas & Propagation	(3-2)
EC 3615	Radar Fundamentals	(3-2)
EC 4630 Or EC4615	RCS Prediction & Reduction (until fy21) Advanced Radar (starting fy22)	(3-2)
EC4685	Principles of Electronic Warfare	(3-2)

List of ECE courses not included above

Communications Systems

EC 4500	Adv. Topics in Communications	(3-0)
EC 4510	Cellular Communications	(3-0)
EC 4530	Soft Radios	(3-2)
EC 4560	Spread Spectrum Communications	(3-2)
EC 4570	Signal Detection and Estimation	(4-0)
EC 4590	Communications Satellite Systems Eng.	(3-0)

Computer Systems

EC 3800	Microprocessor Based System Design	(3-2)
EC 3820	Computer Systems	(3-2)
EC 4800	Adv. Topics in Computer Eng.	(3-1)
EC 4830	Digital Computer Design	(3-2)
EC 4870	VLSI Systems Design	(3-2)

Electronics Systems

EC 3230	Space Power & Radiation Effects	(3-1)
EC 3240	Renewable Energy at Military Bases	(3-2)
EC 3280	Intro to MEMS Design Advanced	(3-3)
EC 4950	Emerging Nanotechnology	(3-1)
EC 4280	MEMS Design II	(2-4)

Guidance & Control Systems

EC 4300	Adv. Topics in Modern Control Systems	(3-1)
EC 4310	Fundamentals of Robotics	(3-2)
EC 4320	Design of Robust Control Systems	(3-2)

Machine Power Systems

EC 3110	Electrical Energy	(3-2)
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Sensor Systems

EC 3210	Intro to Electro-Optics Systems Eng.	(4-1)
EC 3610	Microwave Engineering	(3-2)
EC 4210	Electro-Optics Systems Engineering	(3-0)
EC 4640	Airborne Radar Systems	(3-2)

Signal Processing Systems

EC 3460	Machine Learning for Signal Analytics	(3-2)
EC 4400	Adv. Topics in Signal Processing	(3-0)
EC 4910	DSP for Wireless Communications	(3-2)

Network Engineering

EC 4430	Multimedia Info. & Communications	(3-1)
EC 4710	High-Speed Networking	(3-2)

Cyber Systems

EC 3750	SIGINT Systems I ^(C)	(3-2)
EC 4715	Cyber System Vulnerabilities & Risk Assessment	(3-2)
EC 4747	Data Mining in Cyber Applications	(3-2)
EC 4755	Network Traffic, Activity Detection, & Tracking	(3-2)

^(C) : classified course

3. Course credit requirements

List all graduate courses taken in approved engineering, mathematics, physical science, and/or computer science.

- 1) EC3000 must be part of the program matrix but **do not** include EC3000 in the list below;
- 2) Lab credits count as half credits;
- 3) Only one instance of EC4900 may be counted towards meeting minimum degree requirements.

Note: course credit numbers are periodically re-evaluated and may have changed since you took a course. *Only the credits shown on your student transcripts will be counted to satisfy minimum requirements.*

3000-level courses	Credits (X-X)	4000-level courses	Credits (X-X)
Selected Required Specialty Courses			
Electives			

(a)	Total graduate credits of graduate level course work in approved engineering, mathematics, physical science, and/or computer science. (36 minimum at 3xxx and 4xxx-level)	
(b)	Total credits from (a) in ECE 3xxx and 4xxx courses. (20 graded credits minimum)	
(c)	Total credits from (a) at 4000 level. (12 graded credits minimum)	