Department of Electrical and Computer Engineering

Checklist for combined MSEE & Electrical Engineer's Degrees

The program leading to the Master of Science in Electrical Engineering at NPS is accredited at the advanced level through the Accreditation Board of Engineering and Technology. This accreditation is based on degree requirements set forth by the Electrical and Computer Engineering Department at NPS and approved by the NPS Academic Council. This checklist is provided to document the completion of these MSEE degree requirements. This checklist is also used to document completion of the Electrical Engineer Degree requirements.

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

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

Month/Year accepted in the Electrical Engineer's Degree Program: _____
(Attach copy of signed application at the back)

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 in addition to the combined MSEE and Electrical Engineer's Degrees.

Student :_____; **Date:** _____

-- USN Students only (For P-codes issues)--
Final Checklist: Please attach Copy of Thesis Title & Abstract at the back

We certify that this student has met the minimum requirements for the MSEE and EE degrees.

Signatures:

_____
Academic Associate, Date
ECE Department

_____
ECE Assoc. Chair for Students, Date

_____
Program Officer, Date

_____
ECE Department Chair, Date

1. BSEE Degree/Equivalence requirement satisfied by (fill in one):

- BSEE degree from: _____ Month/year:_____
- BSEE equivalence from NPS. Date: _____

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2. Thesis:

- Number of thesis credits (16 minimum): _____
- Advisor: _____
- Presentation date: _____ Where? (ECE Seminar?)_____
- Completed EC3000 during (specify quarter) _____

The remaining requirements must be met exclusive of thesis requirements.

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3. Program of Study:

(Select **exactly two specialties contained within one focus area,** and check courses taken in those specialties):

Focus Areas → / Specialties ↓	Communications & Information Engineering	Cyber Engineering (For USN students selecting this focus area: "Cyber" is required as one of the two specialties	Nano-electronics & Energy Engineering	Sensor & Control Engineering
Communications	√	√		
Computers	√	√	√	
Cyber		√		√
Electronics	√		√	
Guidance & Control			√	√
Networks	√	√		
Power			√	√
Sensors	√			√
Signal Processing	√	√		√

Focus Area selected: _____

Specialties selected: *(1)* _____ *&* *(2)* _____

USN students only: Final Checklist - Please attach Copy of Thesis Title & Abstract at the back

For administrative use only – Subspecialty Code Assignment for US NAVY only *Program Officer → Check Selected Code*	
☐ *5302 – Communication Systems*	☐ *5308 – Total Ship Systems*
☐ *5304 – Guidance, Control & Navigation Systems*	☐ *5309 – Computer Systems*
☐ *5305 – Power Systems*	☐ *5310 – Sensor Systems Engineering*
☐ *5306 – Digital Signal Processing*	☐ *5311 – EE Energy Focus (curric 593)*
☐ *5307 – Electronics*	☐ *5312 – Networks*
	☐ *5313 - Cyber*

List of Specialties (each specialty has 4 required courses)

Communications Systems:

Required Courses:

	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:

	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:

	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

Unclassified:

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

Guidance, Control & Navigation Systems:

Required Courses:

	EC 3310	Optimal Estimation: Sensor & Data Association	(3-2)
	EC 3320	Optimal Control Systems	(3-2)
	EC 4310	Fundamentals of Robotics	(3-2)
	EC 4350	Nonlinear Control Systems	(3-2)

Network Engineering:

Required Courses:

	EC 3710 or CS3502	Computer Communications Methods Computer Communications and Networks	(3-2) (4-2)
	EC 4725	Adv. Telecommunication Systems Eng.	(3-2)
	EC 4745	Mobile Ad Hoc Wireless Networking	(3-2)
	EC 4785	Internet Engineering	(3-2)

Power Systems:

Required courses:

	EC 3130	Electrical Machinery Theory	(3-3)
	EC 3150	Power Electronics	(3-2)
	EC 4130	Advanced Electrical Machinery Systems	(3-3)
	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	(3-1)
	EC 4230	Reliability Issues for Military Electronics	(3-1)

Signal Processing Systems:

Required Courses:

	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	Image Processing and Recognition Array signal Processing	(3-2)

Sensor, Radar and EW Engineering:

Required Courses:

	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) (3-2)
	EC4685	Principles of Electronic Warfare	(3-2)

List of ECE Electives 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

	EC4300	Adv. Topics in Modern Control Systems	(3-1)
	EC 4330	Navigation, Missile, & Avionics Systems	(3-2)
	EC 4320	Design of Robust Control Systems	(3-2)

Machine Power Systems

	EC 3110	Electrical Energy	(3-2)

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 4450	Sonar Systems Engineering	(4-1)
	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

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4. At least 3 graded credit in a graduate course in mathematics:

MA_____ Number of credits: _____

Selected Mathematics Courses (all others require approval of the Academic Associate)

	MA 3030	Introduction to Combinatorics and its Applications	(4-1)
	MA 3042	Linear Algebra	(4-0)
	MA 3046	Matrix Analysis	(4-1)
	MA 3132	Partial Differential Equations and Integral Transforms	(4-0)
	MA 3232	Numerical Analysis	(4-1)
	MA 3677	Theory of Functions of a Complex Variable I	(4-0)

5. 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) No selected specialization courses may be taken Pass/Fail (P/F). Only one instance of independent/special study course (graded P/F) may be counted towards meeting minimum degree requirements;
4) Do not include any graduate courses already counted for the BSEE equivalence in the Table below;
5) After entry in the program, students must maintain an average GQPR of 3.5 through the last quarter.

Final quarter GQPR: _____

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			

Graduate courses counted towards the BSEE equivalence (Maximum of 4 allowed after approval by AA):			
1)	2)	3)	4)

(a) Total graduate credits in approved engineering, mathematics, physical science, and/or computer science: (72 minimum at 3xxx and 4xxx-level): _____

(b) Total credits from (a) in ECE[1] 3xxx and 4xxx courses: (54 graded credits minimum) _____

(c) Total credits from (a) at 4000 level: (36 minimum, which must be graded) _____

*Note: 1. Up to 6 credits from graded, graduate-level courses in other engineering and physical science departments can be substituted for ECE courses with the **advanced approval** of the ECE Academic Associate and Chairperson.*