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 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: _____

We certify that this student has met the minimum requirements for the MSEE degree.

Signatures:

_____	_____
Academic Associate, Date	**ECE Assoc. Chair for Students, Date**
ECE Department	
_____	_____
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 <u>one option only</u>, and check all courses taken in that given option only):

Option selected: _____

Communications Systems:

Required Courses:

	EC 3500	Analysis of Random Signals	(4-0)
	EC 3510	Communications Engineering	(3-1)
	EC 4550	Digital Communications	(4-0)
	EC 4580	Coding and Information Theory	(4-0)

At least one of:

	EC 4500	Advanced Topics in Communications	(3-0)
	EC 4530	Soft Radios	(3-2)
	EC 4570	Signal Detection and Estimation	(4-0)
	EC 4590	Communications Satellite Systems Engineering	(3-0)

At least one of:

	EC 4510	Cellular Communications	(3-0)
	EC 4560	Spread Spectrum Communications	(3-2)

Computer Systems:

At least three of:

	EC 3800	Microprocessor Based System Design	(3-2)
	EC 3820	Computer Systems	(3-1)
	EC 3830	Digital Computer Design Methodology	(3-2)
	EC 3840	Introduction to Computer Architecture	(3-2)

At least two of:

	EC 4800	Advanced Topics in Computer Engineering	(3-0)
	EC 4810	Fault Tolerant Computing	(3-2)
	EC 4820	Advanced Computer Architecture	(3-1)
	EC 4830	Digital Computer Design	(3-1)
	EC 4840	Advanced Microprocessors	(3-1)
	EC 4710	High Speed Networking	(3-2)
	EC 4870	VLSI Systems Design	(3-2)

Guidance, Control, & Navigation Systems:

Required Courses:

	EC 3310	Optimal Estimation: Sensor and Data Association	(3-2)
	EC 3320	Optimal Control Systems	(3-2)
	EC 4350	Nonlinear Control Systems	(3-2)

At least two of:

	EC 4300 or EC 4310	Adv. Topics in Modern Control Syst. Fundamentals of Robotics	(3-1) (3-2)
	EC 4320	Design of Robust Control Systems	(3-2)
	EC 4330 /4340	Navigation, Missile, and Avionics Systems	(3-2)
	EC 4360	Adaptive Control Systems	(3-1)

Network Engineering:

Required Courses:

	EC 3710	Computer Communications Methods	(3-2)
	EC 3500 or EC3410	Analysis of Random Signals Discrete-Time Random Signals	(4-0) (3-2)
	EC 4710	High-Speed Networking	(3-2)
	EC 4745	Mobile Ad Hoc Wireless Networking	(3-2)

At least two of:

	EC 4785	Internet Engineering	(3-1)
	EC 4430	Multimedia Information and Communications	(3-1)
	EC 4700 or EC 4725	Advanced Topics in Network Eng Advanced Telecommunication Systems Eng	(3-2) (3-2)
	EC 3760	Information Operations Systems	(3-2)
	EC 3550	Fiber Optic Systems	(3-1)

Solid State Microelectronics & Power Systems:

At least three of:

	EC 3130	Electrical Machinery Theory	(4-2)
	EC 3150	Solid State Power Conversion	(3-2)
	EC 3200	Advanced Electronics Engineering	(3-2)
	EC 3220	Semiconductor Device Technology	(3-2)

At least two of:

	EC 4130	Advanced Electrical Machinery Systems	(4-2)
	EC 4150	Advanced Solid State Power Conversion	(4-1)
	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	(3-1)
	EC 3410	Discrete-Time Random Signals	(3-2)
	EC 4440	Statistical Digital Signal Processing	(3-2)

At least two of:

	EC 4400 or EC 4910	Advanced Topics in Signal Processing DSP for Wireless Communications	(3-0) (3-2)
	EC 4410	Speech Signal Processing	(3-1)
	EC 4420	Modern Spectral Analysis	(3-1)
	EC 4450	Sonar Systems Engineering	(4-1)
	EC 4460	Artificial Neural Networks	(3-1)
	EC 4480	Image Processing and Recognition	(3-2)

Signals Intelligence:

Required Courses:

	EC 3710	Computer Communications Methods	(3-2)
	EC 3750	SIGINT Systems I	(3-2)

Three required courses in ONE of the following sub-options:

1. Communications Engineering:

	EC 3500	Analysis of Random Signals	(4-0)
	EC 3510	Communications Engineering	(3-1)
	EC 4550	Digital Communications	(4-0)

2. Signal Processing Systems:

	EC 3400	Digital Signal Processing	(3-1)
	EC 3410	Discrete-Time Random Signals	(3-2)
	EC 4570	Signal Detection and Estimation	(4-0)

3. Joint Services Electronic Warfare:

	EC 3600	Antennas & Propagation	(3-2)
	EC 4610	Radar Systems	(3-2)
	EC 4680	Joint Network-enabled Electronic Warfare II	(3-2)

Three courses from either of the sub-options not picked or from the following list:

	EC 3210	Introduction to Electro-Optical Engineering	(4-1)
	EC 3310	Optimal Estimation: Sensor and Data Association	(3-2)
	EC 3550	Fiber Optic Systems	(3-1)
	EC 3610	Microwave Engineering	(3-2)
	EC 3630	Radiowave Propagation	(3-0)
	EC 3800	Microprocessor Based System Design	(3-2)
	EC 3840	Introduction to Computer Architecture	(3-2)
	EC 4420	Modern Spectral Analysis	(3-1)
	EC 4440	Statistical Digital Signal Processing	(3-2)
	EC 4560	Spread Spectrum Communications	(3-2)
	EC 4580	Coding Information Theory	(4-0)
	EC 4590	Communications Satellite Systems Engineering	(3-0)
	EC 4700	Advanced Topics in Information Warfare	(3-0)
	EC 4750	SIGINT Systems II	(3-4)

One of the following graduate courses in Mathematics:

	MA3046	Matrix Analysis	(4-1)
	MA4362	Astrodynamics	(3-0)
	MA4570	Cryptography	(4-0)

Sensor Systems Engineering:

At least two of:

	EC3210	Introduction to Electro-Optical Engineering	(4-1)
	EC 3600	Antennas & Propagation	(3-2)
	EC 3610	Microwave Engineering	(3-2)
	EC 3630	Radiowave Propagation	(3-2)

Complete at least three additional courses:
(1) Complete either of the first two sub-options AND also complete one additional course from any listed here (including those in the first block),
OR
(2) Complete the Underwater Sensors sub-option.

Radio Frequency Sensors (choose 2 of 4)

	EC 4610	Radar Systems	(3-2)
	EC 4630	RCS Prediction & Reduction	(3-2)
	EC 4640	Airborne Radar Systems	(3-2)
	EC 4600	Advanced Topics in Sensor Systems	(3-0)

Sensor Attack and Protection (choose 2 of 4)

	EC 3700	Joint Network-enabled Electronic Warfare I	(3-2)
	EC 4690/80(US)	Joint Network-enabled Electronic Warfare II	(3-2)
	EC 49XX	Digital Receivers and Sensor Technology	(3-2)
	EC 4600	Advanced Topics in Sensor Systems	(3-0)

Underwater Sensors (first three courses are required)

	EC 3500 or EC 3410	Analysis of Random Signals Discrete Time Random Signals	(4-0) (3-2)
	EC 3450	Fundamentals of Ocean Acoustics	(4-0)
	EC 4450	Sonar Systems Engineering	(4-1)
	EC 4600	Advanced Topics in Sensor Systems	(3-0)

4. **At least two graduate level graded EC courses outside of the selected option** (not required for the Signals Intelligence option, courses already used for the BSEE equivalence cannot be selected):

_____ _____

5. 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)

	MA3030	Introduction to Combinatorics and its Applications	(4-1)
	MA3046	Matrix Analysis	(4-1)
	MA3132	Partial Differential Equations and Integral Transforms	(4-0)
	MA3232	Numerical Analysis	(4-1)
	MA3400	Mathematical Modeling Processes	(4-0)
	MA3675 /3676	Theory of Functions of a Complex Variable I & II	(3-0)

Course credit requirements

1) List all graduate courses taken in approved engineering, mathematics, physical science, and/or computer science; 2) EC3000 must be part of the program matrix. However, do not include EC3000 in the list below; 3) Lab credits count as half credits; 4) Do not include any graduate courses already counted for the BSEE equivalence in the Table below; 5) At most one independent/special study course (graded P/F) will be counted towards the degrees; 6) After entry in the program, students must maintain an average GQPR of 3.5 through the last quarter.

Final quarter GQPR: _____

3000-level courses	Credits (X-X)	4000-level courses	Credits (X-X)

Graduate courses counted towards the BSEE equivalence:			
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, 4 courses 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*