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 Assoc. Chair for Students, Date

ECE Department

__________________________________________________________________________

Program Officer, Date                ECE Department Chair, Date

ECE Department
1. **BSEE Degree/Equivalence** requirement satisfied by (fill in one):
   - BSEE degree from: __________________________ Month/year: __________________________
   - BSEE equivalence from NPS. Date: __________________________

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.

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

<table>
<thead>
<tr>
<th>Focus Areas</th>
<th>Communications &amp; Information Engineering</th>
<th>Cyber Engineering</th>
<th>Nano-electronics &amp; Energy Engineering</th>
<th>Sensor &amp; Control Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialties</td>
<td>(For USN students selecting this focus area: “Cyber” is required as one of the two specialties)</td>
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<tr>
<td>Communications</td>
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<tr>
<td>Computers</td>
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<tr>
<td>Cyber</td>
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<tr>
<td>Electronics</td>
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<td>Guidance &amp; Control</td>
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<tr>
<td>Networks</td>
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<tr>
<td>Power</td>
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</tbody>
</table>
   | 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**
   
   |☐| 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 (3.0)
- EC 4550 Digital Communications (4.0)
- EC 4580 Error Correction Coding (4.0)

Computer Systems:
Required Courses:
- EC 3800 Microprocessor Based System Design (3.0)
- EC 3840 Introduction to Computer Architecture (3.0)
- EC 4820 Advanced Computer Architecture (3.0)
- EC 4830 Digital Computer Design (3.0)

Cyber Systems:
Required Courses:
- EC3730 Cyber Network & Physical Infrastructures (3.0)
- EC3740 Reverse Engineering in Electronic Syst. (3.0)

AND select either the Classified or Unclassified set:
- Classified: (US only, with appropriate security clearance)
  - EC 3760 Information Operations Systems (3.0)
  - EC 4765 Cyber Warfare (3.0)
- OR
- Unclassified:
  - EC 4730 Covert Communications (3.0)
  - EC 4770 Wireless Communications Network Security (3.0)

Guidance, Control & Navigation Systems:
Required Courses:
- EC 3310 Optimal Estimation: Sensor & Data Association (3.0)
- EC 3320 Optimal Control Systems (3.0)
- EC 4310 Fundamentals of Robotics (3.0)
- EC 4350 Nonlinear Control Systems (3.0)

Network Engineering:
Required Courses:
- EC 3710 Computer Communications Methods (3.0)
- EC 3715 or CS3502 Computer Communications and Networks (4.0)
- EC 4725 Adv. Telecommunication Systems Eng. (3.0)
- EC 4745 Mobile Ad Hoc Wireless Networking (3.0)
- EC 4785 Internet Engineering (3.0)

Power Systems:
Required courses:
- EC 3130 Electrical Machinery Theory (3.0)
- EC 3150 Power Electronics (3.0)
- EC 4130 Advanced Electrical Machinery Systems (3.0)
- EC 4150 Advanced Power Electronics (3.0)

Electronics:
Required courses:
- EC 3200 Advanced Electronics Engineering (3.0)
- EC 3220 Semiconductor Device Technologies (3.0)
- EC 4220 Introduction to Analog VLSI (3.1)
- EC 4230 Reliability Issues for Military Electronics (3.0)

Signal Processing Systems:
Required Courses:
- EC 3400 Digital Signal Processing (3.0)
- EC 3410 Discrete-Time Random Signals (3.0)
- EC 4440 Statistical Digital Signal Processing (3.0)
- EC4450 or EC 4480 Image Processing and Recognition (3.0)

Sensor, Radar and EW Engineering:
Required Courses:
- EC 3600 Antennas & Propagation (3.0)
- EC 3615 Radar Fundamentals (3.0)
- EC 4630 or 4615 RCS Prediction & Reduction (until fy21) Advanced Radar (starting fy22) (3.0)
- EC4685 Principles of Electronic Warfare (3.0)
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
- EC 4300 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:

<table>
<thead>
<tr>
<th>MA</th>
<th>Number of credits</th>
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<tbody>
<tr>
<td>MA 3030</td>
<td>Introduction to Combinatorics and its Applications (4-1)</td>
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<td>MA 3042</td>
<td>Linear Algebra (4-0)</td>
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<tr>
<td>MA 3046</td>
<td>Matrix Analysis (4-1)</td>
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<td>MA 3132</td>
<td>Partial Differential Equations and Integral Transforms (4-0)</td>
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<td>MA 3232</td>
<td>Numerical Analysis (4-1)</td>
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<tr>
<td>MA 3677</td>
<td>Theory of Functions of a Complex Variable I (4-0)</td>
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</tbody>
</table>

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: _____________________

Effective date: 04/21/15; last update: 03/18/24
Please read Privacy Advisory
**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.*

<table>
<thead>
<tr>
<th>3000-level courses</th>
<th>Credits (X-X)</th>
<th>4000-level courses</th>
<th>Credits (X-X)</th>
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<tbody>
<tr>
<td>Selected Required Specialty Courses</td>
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**Graduate courses counted towards the BSEE equivalence**  
(Maximum of 4 allowed after approval by AA):

<table>
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<tr>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
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</table>

(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.