Department of Electrical and Computer Engineering
Checklist for MSEE Degree

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: __________________________

--- 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
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 \ Specialties</th>
<th>Communications &amp; Information Engineering</th>
<th>Cyber Engineering (For USN students selecting this focus area: “Cyber” is required as one of the two specialties)</th>
<th>Nano-electronics &amp; Energy Engineering</th>
<th>Sensor &amp; Control Engineering</th>
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</thead>
<tbody>
<tr>
<td>Communications</td>
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<td>Computers</td>
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<td>Cyber</td>
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<td>Electronics</td>
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<td>Guidance &amp; Control</td>
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<td>Networks</td>
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<td>Power</td>
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<tr>
<td>Sensors</td>
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<tr>
<td>Signal Processing</td>
<td>√</td>
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</tr>
</tbody>
</table>

   Focus Area selected: ___________________________
   Specialties selected: (1) ________________________ & (2) ________________________

   USN students only: Final Checklist - Please attach Copy of Thesis Title & Abstract at the back
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 3830 Digital Computer Design Methodology (3-2)
- EC 3840 Introduction to Computer Architecture (3-2)
- EC 4810 Fault Tolerant Computing (3-2)
- EC 4820 Advanced Computer Architecture (3-2)

### Cyber Systems:
**Required Courses:**
- EC 3730 Cyber Network & Physical Infrastructures (3-2)
- EC 3740 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)

- **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 4330 Navigation, Missile, & Avionics Systems (3-2)
- EC 4350 Nonlinear Control Systems (3-2)

### Power Systems:
**Required Courses:**
- 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 (3-1)
- 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)
- EC 4480 Image Processing and Recognition (3-2)

### Sensor Systems Engineering:
**Required Courses:**
- EC 3600 Antennas & Propagation (3-2)
- EC 3630 Radiowave Propagation (3-2)

And select **either** the RADAR or EW set:
**RADAR:**
- EC 4610 Radar Systems (3-2)
- EC 4630 RCS Prediction & Reduction (3-2)

**OR**
**EW:**
- EC 3700 Joint Network-Enabled Electronic Warfare I (3-2)
- EC 4680/90 Joint Network-enabled Electronic Warfare II (3-2)

### Network Engineering:
**Required Courses:**
- EC 3710 Computer Communications Methods (3-2)
- EC 4725 Adv. Telecommunication Systems Eng. (3-2)
- EC 4745 Mobile Ad Hoc Wireless Networking (3-2)
- EC 4785 Internet Engineering (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
- **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)

#### 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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MA 3030</td>
<td>Introduction to Combinatorics and its Applications</td>
<td>(4-1)</td>
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<tr>
<td>MA 3042</td>
<td>Linear Algebra</td>
<td>(4-0)</td>
</tr>
<tr>
<td>MA 3046</td>
<td>Matrix Analysis</td>
<td>(4-1)</td>
</tr>
<tr>
<td>MA 3132</td>
<td>Partial Differential Equations and Integral Transforms</td>
<td>(4-0)</td>
</tr>
<tr>
<td>MA 3232</td>
<td>Numerical Analysis</td>
<td>(4-1)</td>
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<tr>
<td>MA 3677</td>
<td>Theory of Functions of a Complex Variable I</td>
<td>(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:** ____________________
**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><strong>Selected Required Specialty Courses</strong></td>
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| **Electives** | | | |
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**Graduate courses counted towards the BSEE equivalence**

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<tr>
<th>(Maximum of 4 allowed after approval by AA):</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
</tr>
</thead>
</table>

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

2. Total credits from 1) in ECE\(^1\) 3xxx and 4xxx courses: (54 graded credits minimum)

3. Total credits from 1) 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.
<table>
<thead>
<tr>
<th>Name:</th>
<th>Contact Phone:</th>
<th>E-mail:</th>
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</thead>
</table>

A. Curriculum no.  
- □ 590  
- □ 591  
- □ 525  
- □ 533  
- □ 592  
- □ (other, specify)  

B. NPS Degree enrolled:  

C. Quarter enrolled:  

Graduation date:  

- I wish to enroll in:  
  - Academic Certificate  
  - (check all that apply, see entrance requirements below)  

### Specific courses required:  

- **Guidance, Navigation & Control Systems**  
  - EC3310  
  - EC3320  
  - EC4350  
  - EC4330  

- **High Performance Computer Architecture**  
  - EC3800  
  - EC3840  
  - Select One out of (check):  
    - EC4820; EC4830  

- **Digital Communications**  
  - EC3500  
  - EC3510  
  - EC4550  
  - EC4580  

- **Cyber Warfare**  
  - EC3760  
  - EC4765  
  - Select One out of AND satisfy 12 credit hours (check):  
    - DA3105  
    - EC3730; EC3750  
    - EC4730; EC4755  
    - CS4558; EC3970  

- **Signal Processing**  
  - EC3400  
  - EC3410  
  - EC4440  
  - Select One out of (check):  
    - EC3460; EC4430  
    - EC3940; EC4450  
    - EC4400; EC4480  
    - EC4910  

- **Electric Ship Power Systems**  
  - EC3130  
  - EC3150  
  - EC4130  
  - EC4150  

- **Electronic Warfare (EW) Engineer**  
  - EC3600  
  - EC3630  
  - EC3700  

- **Journeyman EW Engineer**  
  - EC3210  
  - EC3610  
  - EC4610  

Quarter planned or taken:  

- For administrative use only  
  - Enrollment Approval & Date  
  - Completion - Completion Date  

- □ Y □ N □ Y □ N  
- □ Y □ N □ Y □ N  
- □ Y □ N □ Y □ N  
- □ Y □ N □ Y □ N  
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Application Process:

For NPS Resident Students only: Students must turn in the completed enrollment form to the ECE Department Education Technician NLT the end of the second week of their graduating quarter. They must include a copy of their Python transcripts showing scheduled certificate courses and associated grades to insure they are awarded the certificate. Further information is available at [http://www.nps.edu/ece/Academics/Certificates.html](http://www.nps.edu/ece/Academics/Certificates.html).

For DL Students only: Individuals must apply to NPS online at [www.nps.edu](http://www.nps.edu).

Certificate Award Entrance Requirements for NPS Students: students must be already enrolled in one of the degree programs already offered by the ECE Department, or be accepted by the ECE Department if not currently enrolled in any of the degree programs currently offered by the ECE Department.

Certificate Award Requirements: The academic certificate program must be completed within 3 years of taking the first certificate course. Minimum CQPR is 3.0.

Double Counting Courses: Courses taken as part of an academic certificate may be applied to a degree at NPS; there is no bar on ‘double counting’ certificate courses for degree purposes. Courses may not be double counted for multiple certificates. Only NPS courses will be counted towards meeting certificate requirements. Transferred courses are NOT eligible to meet certificate requirements.