Name/Rank/Service: ___________________________________________
Month/Year Enrolled: __________________ Projected Graduation Date: __________________
CSO Track: Operational Computational Electrical Engineering Engineering Science

General Notes:
- Students are responsible for meeting the requirements and timelines of this checklist.
- Consult the NPS Python Course Catalog for course prerequisites and offerings.
- Use checkboxes for courses already completed and “planned QTR” for future coursework.

1. Thesis/Capstone: Proposal must be approved by end the 4th academic quarter, prior to taking any XX0810 thesis research blocks.

Title: _______________________________________________________
______________________________________________________________
Advisor(s): ____________________________________________________
Co-Advisor / Second Reader (circle one): _____________________________
Joint Thesis Members, if applicable: ________________________________

2. Core Courses: All of the courses below must be completed or validated to graduate. Students will select their track during the second week of quarter 2 and must submit by the end of their 2nd academic quarter a plan for completing all core courses not yet taken as part of their Track selection, and also populate their course matrix in Python.

Completed Planned Qtr
__CS2020 Introduction to Programming (3-2) ____________
__EC2700 Intro to Cyber Systems (4-1) ____________
__MA2025 Logic & Discrete Math (4-1) ____________
__CS3600 Introduction to Computer Security (4-1) ____________
__CS3040 Low-Level Programming I (3-2) ____________
__EC3730 Cyber Network & Physical Infrastructures (3-2) ____________
__CY3000 Intro to Cyber Systems & Operations (3-0) ____________
__EC3760 Information Operations Systems (3-2) ____________
__CS3690 Network Security (4-1) ____________
__CS3250 Intro to Cyber Physical Systems (3-2) ____________
__EC3740 Reverse Engineering in Electronic Systems (3-2). ____________
__CY4400 Cyber Mission Planning w/Capstone (3-2) ____________
3. **Track Selection:** All CSO students will select one of the following Tracks.

**A. COMPUTATIONAL TRACK (MSCS):**

(PO: LCDR Kenny Adesanya, AA: Dr. Duane Davis)

*Students must take the following CS Degree Requirements:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS3101</td>
<td>Theory of Formal Languages and Automata (5-0)</td>
</tr>
<tr>
<td>CS3310</td>
<td>Artificial Intelligence (4-1)</td>
</tr>
<tr>
<td>CS3502</td>
<td>Computer Communications &amp; Networks (3-2)</td>
</tr>
<tr>
<td>CS3600</td>
<td>(part of the CSO/326 Core)</td>
</tr>
</tbody>
</table>

*Additional CS Core Requirements:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS3001</td>
<td>Formal Foundation of Computer Science (3-2)</td>
</tr>
<tr>
<td>OS3307</td>
<td>Modeling Practices for Computing (4-1)</td>
</tr>
<tr>
<td>CS3070</td>
<td>Operating Systems (3-2)</td>
</tr>
<tr>
<td>CS3315</td>
<td>Intro to Machine Learning &amp; Big Data (3-1)</td>
</tr>
</tbody>
</table>

*Finally, one Computational Track sub-specialization area from below shall be taken:*

**Network Operations:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS4552</td>
<td>Network Design &amp; Programming (3-2)</td>
</tr>
<tr>
<td>CS4554</td>
<td>Network Modeling &amp; Analysis (4-0)</td>
</tr>
<tr>
<td>CS4558</td>
<td>Network Traffic Analysis (3-2)</td>
</tr>
</tbody>
</table>

*Elective from CS Network & Mobility Track, upon agreement of Thesis Advisor:*

**Defensive Cyber Operations:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS4558</td>
<td>Network Traffic Analysis (3-2)</td>
</tr>
<tr>
<td>CS4677</td>
<td>Computer Forensics (3-2)</td>
</tr>
<tr>
<td>CS4684</td>
<td>Cyber Security Incident Response &amp; Recovery (3-2)</td>
</tr>
<tr>
<td>CY4700</td>
<td>Defensive Cyberspace Operations (3-3)</td>
</tr>
</tbody>
</table>

**Offensive Cyber Operations:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS3140</td>
<td>Low-Level Programming II (3-2)</td>
</tr>
<tr>
<td>CS4678</td>
<td>Advanced Cyber Vulnerability Assessment (4-1)</td>
</tr>
<tr>
<td>CS4648</td>
<td>Software Reverse Engineering and Malware Analysis (3-2)</td>
</tr>
<tr>
<td>CY4710</td>
<td>Adversarial Cyberspace Operations (3-2)</td>
</tr>
</tbody>
</table>

**Artificial Intelligence:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS4555</td>
<td>Machine Learning in Data Networks (3-2)</td>
</tr>
<tr>
<td>MV4025</td>
<td>Cognitive and Behavioral Models for Simulations (3-2)</td>
</tr>
<tr>
<td>CY3650</td>
<td>Foundations in Data Science (4-0)</td>
</tr>
</tbody>
</table>

*Elective from CS AI Track, upon agreement of Thesis Advisor:*
Credit Hour Requirements:
___At least 40 quarter hours of graduate-level work, of which at least 12 quarter hours must be at the 4000 level.

___At least 28 of the 40 graduate-level credit hours listed above must be CS, MOVES, SW courses.

B. OPERATIONS TRACK (MSCSO):
   (PO: LCDR Kenny Adesanya, AA: Mr. Steve Iatrou)

   Students must take the following CSO Degree Requirements:
   ___CY4410 Cyber Policy and Strategy (3-0)                  Planned Qtr
   ___CY4700 Applied Defensive Cyber Operations (3-3)
   ___CY4710 Adversarial Cyber Operations (3-2)

   In addition, the following courses are required plus two electives:
   ___OS3307 Modeling Practices for Computing (4-1)            Planned Qtr
   ___CS3070 Operating Systems (3-2) (Win/Sum)
   ___CS3502 Computer Communications & Networks (4-2)
   ___CY3650 Foundations in Data Science (4-0)
   ___CS4558 Network Traffic Analysis (3-2)
   ___EC4765 Cyber Warfare (3-2)

   Two Operations Track Electives as approved by the Thesis Advisor:
   __________________________________________________________

C. ELECTRICAL ENGINEERING TRACK (Master of Science in Electrical Engineering (MSEE):
   (PO: LCDR Brannon Chapman, AA: Dr. Preetha Thulasiraman)

   Two Electrical Engineering Tracks from the list below must be completed (4 courses each):

   Communications Systems
   ___EC3500 Analysis of Random Signals (4-0)
   ___EC3510 Communications Engineering (3-2)
   ___EC4550 Digital Communications (4-0)
   ___EC4580 Error Correction Coding (4-0)

   Cyber Systems Classified Track
   ___EC3730 Cyber Network & Physical Infrastructures (3-2)
   ___EC3740 Reverse Engineering in Electronic Systems (3-2)
   ___EC3760 Information Operations Systems (3-2) (TS/SCI)
   ___EC4765 Cyber Warfare (3-2) (TS/SCI)
Cyber Systems Unclassified Track
___EC3730 Cyber Network & Physical Infrastructures (3-2)
___EC3740 Reverse Engineering in Electronic Systems (3-2)
___EC4730 Covert Communications (3-2)
___EC4770 Wireless Communications Network Security (3-2)

Power Systems
___EC3130 Electrical Machinery Theory (4-2)
___EC3150 Power Electronics (3-2)
___EC4130 Advanced Electric Machinery Systems (4-2)
___EC4150 Advanced Power Electronics (3-2)

Electronics
___EC3200 Advanced Electronics Engineering (3-2)
___EC3220 Semiconductor Device Technologies (3-2)
___EC4220 Introduction to Analog VLSI (3-2)
___EC4230 Reliability Issues for Military Electronics (3-2)

Signal Processing Systems
___EC3400 Digital Signal Processing (3-2)
___EC3410 Discrete Time Random Signals (3-2)
___EC4440 Statistical Digital Signal Processing (3-2)
___EC4550 Array Signal Processing Engineering
   OR
___Image Processing and Recognition (3-2)

Sensor, Radar and EW Engineering
___EC3600 Antennas and Propagation (3-2)
___EC3615 Radar Fundamentals (3-2)
___C4615 Advanced Radar (3-2)
___EC4685 Principles of Electronic Warfare (3-2)

D. ENGINEERING SCIENCES TRACK (Master of Science in Engineering Science (MSES) Electrical Engineering:
(PO: LCDR Brannon Chapman, AA: Dr. Preetha Thulasiraman)

One Electrical Engineering Track from the list below must be completed
(4 courses each):

Communications Systems
___EC3500 Analysis of Random Signals (4-0)
___EC3510 Communications Engineering (3-2)
___EC4550 Digital Communications (4-0)
___EC4580 Error Correction Coding (4-0)
Cyber Systems Classified Track
___ EC3730 Cyber Network & Physical Infrastructures (3-2)
___ EC3740 Reverse Engineering in Electronic Systems (3-2)
___ EC3760 Information Operations Systems (3-2) (TS/SCI)
___ EC4765 Cyber Warfare (3-2) (TS/SCI)

Cyber Systems Unclassified Track
___ EC3730 Cyber Network & Physical Infrastructures (3-2)
___ EC3740 Reverse Engineering in Electronic Systems (3-2)
___ EC4730 Covert Communications (3-2)
___ EC4770 Wireless Communications Network Security (3-2)

Power Systems
___ EC3130 Electrical Machinery Theory (4-2)
___ EC3150 Power Electronics (3-2)
___ EC4130 Advanced Electric Machinery Systems (4-2)
___ EC4150 Advanced Power Electronics (3-2)

Electronics
___ EC3200 Advanced Electronics Engineering (3-2)
___ EC3220 Semiconductor Device Technologies (3-2)
___ EC4220 Introduction to Analog VLSI (3-2)
___ EC4230 Reliability Issues for Military Electronics (3-2)

Signal Processing Systems
___ EC3400 Digital Signal Processing (3-2)
___ EC3410 Discrete Time Random Signals (3-2)
___ EC4440 Statistical Digital Signal Processing (3-2)
___ EC4550 Array Signal Processing Engineering
OR
___ Image Processing and Recognition (3-2)

Sensor, Radar and EW Engineering
___ EC3600 Antennas and Propagation (3-2)
___ EC3615 Radar Fundamentals (3-2)
___ C4615 Advanced Radar (3-2)
___ EC4685 Principles of Electronic Warfare (3-2)

4. Additional Military Requirements:
All U.S. Navy Line Officer students (except Engineering Duty Officers)
____NW3230 Strategy and War (4-2)
____NW3275 Joint Maritime Operations Part 1 (4-0)
____NW3276 Joint Maritime Operations Part 2 (2-2)
____NW3285 Theater Security Decision Making (4-0)

All U.S. Marine Corps & Army students
____MN3331 Principles of System Acquisition & Program Management (5-1)

International Military students (as required by the International Office)
____IT1500 Informational Program Seminar for International Officers (4-0)
____IT1600 Communication Skills for International Officers (3-0)
____IT1700 Academic Writing for International Officers (2-0)

5. **Student Certification:** I certify that the information on this form is correct, and that I have completed all requirements for the CSO Curriculum 326 degree, with any course deviations from the requirements detailed in this checklist described below (must be approved by Thesis Advisor).

Signature: __________________________ Date: ______________

6. **Thesis Advisor approval:** Specialization courses above are approved.

Signature: __________________________ Date: ______________

7. **Program Officer final review:** Checklist complete.

Signature: __________________________ Date: ______________