Naval Postgraduate School
Cyber Academic Group
Graduation Checklist for CSO Program (326)
6208P Subspecialty Code
Version Feb 2024

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)

Planned Qtr

Students must take the following CS Degree Requirements:

___CS3101 Theory of Formal Languages and Automata (5-0) _____
___CS3310 Artificial Intelligence (4-1) _____
___CS3502 Computer Communications & Networks (3-2) _____
___CS3600 (part of the CSO/326 Core) _____

Additional CS Core Requirements:

___CS3001 Formal Foundation of Computer Science (3-2) _____
___OS3307 Modeling Practices for Computing (4-1) _____
___CS3070 Operating Systems (3-2) _____
___CS3315 Intro to Machine Learning & Big Data (3-1) _____

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

Network Operations:

___CS4552 Network Design & Programming (3-2) _____
___CS4554 Network Modeling & Analysis (4-0) _____
___CS4558 Network Traffic Analysis (3-2) _____
___Elective from CS Network & Mobility Track, upon agreement of Thesis Advisor:

_____

Defensive Cyber Operations:

___CS4558 Network Traffic Analysis (3-2) _____
___CS4677 Computer Forensics (3-2) _____
___CS4684 Cyber Security Incident Response & Recovery (3-2) _____
___CY4700 Defensive Cyberspace Operations (3-3) _____

Offensive Cyber Operations:

___CS3140 Low-Level Programming II (3-2) _____
___CS4678 Advanced Cyber Vulnerability Assessment (4-1) _____
___CS4648 Software Reverse Engineering and Malware Analysis (3-2) _____
___CY4710 Adversarial Cyberspace Operations (3-2) _____

Artificial Intelligence:

___CS4555 Machine Learning in Data Networks (3-2) _____
___MV4025 Cognitive and Behavioral Models for Simulations (3-2) _____
___CY3650 Foundations in Data Science (4-0) _____
___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)

Planned Qtr

Students must take the following CSO Degree Requirements:

___CY4410 Cyber Policy and Strategy (3-0) _____
___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) _____
___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) _____ } Required in consecutive qtrs.

___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: _____