Naval Postgraduate School
Department of Computer Science
Graduation Checklist for MSCS Degree (368)
6203P Subspecialty Code
Version 2023

Name/Rank/Service: _____
Month/Year Enrolled: _____ Projected Graduation Date: _____
CS Specialization (*select one*): AI CO CSD SwE N&M MOVES

General Notes:

- *Students are responsible for meeting the requirements and timelines of this checklist.*
- *Indicate courses already completed and populate "planned QTR" for future coursework.*
- *See the Projection of Advanced Course Offerings on the CS Website (curriculum tab) to assist with course planning.*
- *Track electives must be entered into Python as "curricular electives", whereas non-track electives (breadth elective or validation replacements) are entered as "general electives"*
- *Students may petition the Academic Associate for one additional thesis block to replace validated coursework IAW the Academic Policy Manual Section 6.6.2.*
- *Any "Directed Study" coursework must not constitute a proxy for additional thesis blocks.*
- *Directed Studies may support a student's thesis research, but must comprise study of an academic subject.*

1. **Thesis/Capstone:** *Proposal must be approved **by end of the 4th academic quarter** (not counting Qtr-0). Proposal must be approved in order to take CS0810 thesis research blocks.*

   Title: _____
   _____
   Advisor(s): _____
   Co-Advisor / Second Reader: _____

2. **Core Courses:** *All core courses below must be completed or validated to graduate. Students must submit **by the end of their 4th academic quarter** a plan for completing all core courses to the Program Officer and Education Technician.*

Completed	Planned QTR
___CS2011 Computing System Principles (4-0)	_____
___CS3040 Low-Level Programming I (3-2)	_____
___CS3001 Formal Foundation of Computer Science (3-2)	_____
___OS3307 Modeling Practices for Computing (4-1)	_____
___CS3200 Computer Architecture (3-2)	_____
___CS3021 Intermediate Programming & Data Structures (4-1)	_____
___CS3502 Computer Communications & Networks (3-2)	_____
___CS3070 Operating Systems (3-2)	_____
___CS3600 Introduction to Computer Security (4-1)	_____
___CS3140 Low-Level Programming II (3-2)	_____
___CS3101 Theory of Formal Languages and Automata (5-0)	_____
___CS3310 Artificial Intelligence (4-1)	_____
___CS4900 Technology & Transformation I (2-0)	_____
___CS3250 Intro to Cyber Physical Systems (3-2)	_____

___CS3150 Design and Analysis of Algorithms (5-0) _____
___CS3060 Database Systems (3-1) _____
___SW3460 Software Methodology (4-1) _____
___CS3315 Introduction to Machine Learning and Big Data (3-1) _____
___CS3004 Human-Computer Interaction (3-2) _____
___CS4903 Research Methods in CS (2-0) _____

3. **Specialization:** *All CS students must complete one of the following specialization tracks. Circle choice and initial each completed course or annotate when it will be taken* ***Variations or combinations of any area are permissible, subject to Coordinator and/or Thesis Advisor approval.***

- **ARTIFICIAL INTELLIGENCE (AI):** (Coordinator: Dr. Rowe)

Students must take the following AI Core Sequence: Planned QTR
___CS4313 Advanced Robotic Systems (3-2) _____
___CS4321 Deep Learning (3-2) _____
___CS4330 Intro to Computer Vision (3-2) _____
___MV4025 Cognitive and Behavioral Models for Simulations (3-2) _____
___CS4340 Trustworthy and Responsible Artificial Intelligence (3-2) _____

In addition, students must choose one of the following AI electives:

___CY3650 Foundations in Data Science (4-0) _____
___CS492x Seminar on Advanced Autonomous Systems Topics (4-1) _____
___IS4205 Big Data Management, Architecture, and Applications (3-2) _____
___ME4800 Machine Learning for Autonomous Operations (3-2) _____

- **CYBER OPERATIONS (CO):** (Coordinator: Dr. Irvine)

Students must take the following CO Core Sequence: Planned QTR
___CS3690 Network Security (4-1) _____
___CS4679 Advances in Cyber Security Operations (4-1) _____
___CY4700 Applied Defensive Cyber Operations (3-3) _____
___CY4710 Adversarial Cyber Operations (3-3) _____

In addition, students must choose two of the following CO electives:
___CS4558 Network Traffic Analysis (3-2) _____
___CS4600 Secure Computer Systems (3-2) _____
___CS4648 Advanced Cyber Munitions (3-2) _____
___CS4678 Advanced Cyber Vulnerability Assessment (4-2) _____
___CS4684 Cyber Security Incident Response & Recovery (3-2) _____

- **CYBER SECURITY & DEFENSE (CSD):** (Coordinator: Dr. Irvine)

Students must take the following CSD Core Sequence: Planned QTR

___CS3670 Secure Management of Systems (3-2) _____
___CS3690 Network Security (4-1) _____
___CS4600 Secure Computer Systems (3-2) _____
___CY4700 Applied Defensive Cyber Operations (3-3) _____

In addition, students must choose two of the following CSD electives:

___CS4558 Network Traffic Analysis (3-2) _____
___CS4615 Cryptographic Protocol Design and Attacks (3-1) _____
___CS4648 Advanced Cyber Munitions (3-2) _____
___CS4677 Computer Forensics (3-2) _____
___CS4678 Advanced Cyber Vulnerability Assessment (4-2) _____
___CS4684 Cyber Security Incident Response & Recovery (3-2) _____
___CS4538 Mobile Device and Wireless Security (3-2) _____

- **MOVES:** (Coordinator: Dr. C. Darken)

Students interested in a CS degree with a focus on Modeling, Virtual Environments and Simulation (MOVES) may choose the MOVES Option as their Specialization. ***Students will work with their Advisor(s) to create a six-course sequence applicable to this specialization area. Their course plan must be listed below, and approved by the MOVES Specialization Coordinator.*** List course and Planned QTR, if applicable:

_____ _____

_____ _____

_____ _____

- **NETWORK & MOBILITY (N&M):** (Coordinator: Dr. Xie)

Students must take six of the following N&M classes: Planned QTR

___CS4552 Robust and Secure Network Design (3-2) _____
___CS4554 Tactical Network Modeling & Survivability (3-2) _____
___CS4555 Machine Learning in Data Networks (3-2) * _____
___CS4558 Network Traffic Analysis (3-2) _____
___CS4535 Mobile Devices (3-2) _____
___CS4537 5G and Wireless Data Services (3-2) _____
___CS4538 Mobile Device and Wireless Security (3-2) _____
___CS4615 Cryptographic Protocol Design and Attacks (3-1) _____

A student may substitute up to two of these electives to support their thesis topic, as approved by the student's thesis advisor (list course *and* Planned QTR, if applicable):

- **SOFTWARE ENGINEERING (SwE):** (Coordinator: Dr. Luqi)

Students must choose six of the following SwE electives: Planned QTR

___SW4530 Software Engineering R&D in DoD (3-1) _____
___SW4555 Engineering Network Centric Systems (3-1) _____
___SW4582 Weapon System Software Safety (3-1) _____
___SW4590 Software Architecture (3-1) _____
___CS3910 Science of Programming (4-2) _____
___CS4340 Trustworthy and Responsible Artificial Intelligence (3-2) _____
___CS4313 Advanced Robotic Systems (3-2) _____
___CS4678 Advanced Cyber Vulnerability Assessment (3-2) _____
___CY4710 Adversarial Cyberspace Operations (3-3) _____

4. **Breadth Elective:** *All CS students must complete one breadth elective (general elective consisting of any 3000 or 4000 level course not in the core nor taken to fulfill a specialization requirement). This course is listed below:*

Course Name_____ Course number_____

5. Additional Military Requirements:

All U.S. Navy Line Officer students (*except* Engineering Duty Officers) must complete JPME Phase 1:

___NW3230 Strategy & Policy (4-2) _____
___NW3275 Joint Maritime Operations Part 1 (4-0) } Required in consecutive qtrs. _____
___NW3276 Joint Maritime Operations Part 2 (2-2) } _____
___NW3285 National Security Decision Making (4-0) _____

All U.S. Marine Corps students (*may be dropped with concurrence of the Senior Marine Office; optional for U.S. 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) _____

6. Credit Hour Requirements:

___40 graduate credit hours at 3000 or 4000 level, with at least 12 of those hours at the 4000 level
___28 of the 40 graduate credit hours must be in CS, MOVES, SW courses

7. **Student Certification:** I certify that the information on this form is correct, and that I have completed all requirements for the MSCS degree, with any course deviations from my Specialization sequence listed below (must be approved by the Specialization Coordinator).

Signature: _____ Date: _____

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

Signature: _____ Date: _____

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

Signature: _____ Date: _____

* Indicated course number is projected, awaiting finalization by the Academic Council. Course description is not resident within the Academic Catalog, contact the appropriate Track Manager for course details if desired.