

Naval Postgraduate School
 Department of Computer Science
 Graduation Checklist for MSCS Degree (368)
 6203P Subspecialty Code
Version 2021

Name/Rank/Service: _____
 Month/Year Enrolled: _____ Projected Graduation Date: _____
 CS Specialization: AIAS 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 additional thesis blocks 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 of the 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.*

<u>Completed</u>	<u>Planned Qtr</u>
___ CS2011 Computing System Principles (4-0)	_____
___ CS3040 Low-Level Programming I (4-2)	_____
___ CS3001 Formal Foundation of Computer Science (4-2)	_____
___ OS3307 Modeling Practices for Computing (4-1)	_____
___ CS3200 Computer Architecture (3-2)	_____
___ CS3021 Intermediate Programming & Data Structures (4-2)	_____
___ CS3502 Computer Communications & Networks (4-2)	_____
___ CS3070 Operating Systems (3-2)	_____
___ CS3600 Introduction to Computer Security (4-2)	_____
___ CS3140 Low-Level Programming II (3-2)	_____
___ CS3101 Theory of Formal Languages and Automata (4-2)	_____
___ CS3310 Artificial Intelligence (4-1)	_____

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___ CS4900 Technology & Transformation I (2-0)	_____
___ CS3250 Intro to Cyber Physical Systems (3-2)	_____
___ CS3150 Design and Analysis of Algorithms (4-0)	_____
___ CS3060 Database Systems (3-1)	_____
___ SW3460 Software Methodology (4-2)	_____
___ 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 AND AUTONOMOUS SYSTEMS (AIAS):**

(Coordinator: Dr. Rowe)

Students must take the following AIAS 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)	_____

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

___ CS4340 Trustworthy and Responsible Artificial Intelligence (3-2)*	_____
___ CY3650 Cyber Data Management and Analytics (4-0)	_____
___ CS49xx 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)	_____

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

<i>Students must take the following CSD Core Sequence:</i>	<u>Planned QTR</u>
___ 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)

<i>Students must choose six of the following N&M electives:</i>	<u>Planned QTR</u>
___ 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)	_____

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):

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

<i>Students must choose six of the following SwE electives:</i>	<u>Planned QTR</u>
<input type="checkbox"/> SW4530 Software Engineering R&D in DoD (3-1)	_____
<input type="checkbox"/> SW4555 Engineering Network Centric Systems (3-1)	_____
<input type="checkbox"/> SW4582 Weapon System Software Safety (3-1)	_____
<input type="checkbox"/> SW4590 Software Architecture (3-1)	_____
<input type="checkbox"/> CS3910 Science of Programming (4-2)	_____
<input type="checkbox"/> CS4340 Trustworthy and Responsible Artificial Intelligence (3-2)*	_____
<input type="checkbox"/> CS4313 Advanced Robotic Systems (3-2)	_____
<input type="checkbox"/> CS4678 Advanced Cyber Vulnerability Assessment (3-2)	_____
<input type="checkbox"/> CY4710 Adversarial Cyberspace Operations (3-3)	_____

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

5. Additional Military Requirements:

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

<input type="checkbox"/> NW3230 Strategy & Policy (4-2)	_____
<input type="checkbox"/> NW3275 Joint Maritime Operations Part 1 (4-0)	_____
<input type="checkbox"/> NW3276 Joint Maritime Operations Part 2 (2-2)	_____
<input type="checkbox"/> 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):

<input type="checkbox"/> MN3331 Principles of System Acquisition & Program Management (5-1)	_____
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International Military students (as required by the International Office):

<input type="checkbox"/> IT1500 Informational Program Seminar for International Officers (4-0)	_____
<input type="checkbox"/> IT1600 Communication Skills for International Officers (3-0)	_____
<input type="checkbox"/> 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

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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: _____

7. Thesis Advisor approval: Specialization courses above are approved.

Signature: _____ Date: _____

8. 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.