Naval Postgraduate School

Department of Computer Science

Graduation Checklist for MSCS Degree (368)

6203P Subspecialty Code

**(Revised: SPRING 2018)**

Name/Rank/Service:

Month/Year Enrolled:

Projected Graduation Date:

CS Specialization:

**1. Thesis/Capstone: *proposal must be approved by end 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 (*circle one*):

Joint Thesis Members, if applicable:

**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 not yet taken as part of their Specialization selection, and also populate their course matrix in Python.***

Completed Planned Qtr

\_\_\_CS2011 Computing System Principles (4-0) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3040 Low-Level Programming I (4-2) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3025 Formal Foundation of Computer Science (4-2) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_OS3307 Modeling Practices for Computing (4-1) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3200 Computer Architecture (3-2) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3021 Intermediate Programming & Data Structures (4-2) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3502 Computer Communications & Networks (4-2) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3070 Operating Systems (3-2) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS4900 Technology & Transformation (2-0) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3600 Introduction to Computer Security (4-2) (Fall/Win/Spr/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3140 Low-Level Programming II (3-2) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3101 Theory of Formal Languages and Automata (4-2) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3310 Artificial Intelligence (4-1) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3250 Intro to Cyber Physical Systems (3-2) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3150 Design and Analysis of Algorithms (3-2) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3060 Database Systems (3-1) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_SW3460 Software Methodology (4-2) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS4901 Research Methods (1-0) (Win/Sum) – *only if offered* \_\_\_\_\_\_\_\_

\_\_\_CS3315 Big Data and Machine Learning (3-1) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3004 Human Computer Sys. Interaction (3-2) (Fall/Spr) \_\_\_\_\_\_\_\_

**3. Specialization: All CS students must complete one of the following Specialization areas. 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* approval.
See the NPS catalog for prerequisites and offering quarters for all courses listed below*.***

# AUTONOMOUS SYSTEMS AND DATA SCIENCE (ASDS): (Coordinator: Dr. Rowe)

Students must take the following ASDS Core Sequence:

\_\_\_CY3650 Cyber Data Management and Analytics (4-0)

(Prereq.: CY3520, CS3502, or IS3502)

\_\_\_CS4330 Intro to Computer Vision (3-2)

(Prereq.: some programming, some linear algebra, some statistics)

\_\_\_MV4025 Cognitive and Behavioral Models for Simulations (3-2) (Prereq. CS3310)

***In addition, students must choose three (3) of the following ASDS electives (or other course in ASDS by approval of Advisor or ASDS Manager):***

\_\_\_CS4313 Advanced Robotic Systems (3-2) (Prereq. CS3310)

\_\_\_CS4317 Language Systems (3-2) (Prereq. CS3310)

\_\_\_CS4558 Network Traffic Analysis (3-2) (Prereq.: CS3502 and CS4550)

\_\_\_CS4677 Computer Forensics (3-2) (Prereq.: CS3600)

\_\_\_CS492x Seminar on Advanced Autonomous Systems Topics (4-1) (No official prereq)

\_\_\_MV4655/OA4655 Introduction to Joint Combat Modeling (4-0)

 (Prereq.: programming, and statistics)

\_\_\_OA3304 Decision Theory (4-0) (No prereq)

\_\_\_OA4103 Advanced Probability (3-0) (No prereq)

\_\_\_OA4106 Advanced Data Analysis (3-1) (Prereq: OA3103)

\_\_\_OS4118 Statistical and Machine Learning (3-0) (Prereq: OA3106)

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

Students must take the following CSD Core Sequence:

\_\_\_CS3690 Network Security (4-1)

\_\_\_CS3670 Secure Management of Systems (3-2)

\_\_\_CS4600 Secure Computer Systems (3-2)

\_\_\_CY4700 Applied Defensive Cyber Operations (3-3)

***In addition, students must choose two (2) of the following CSD electives:***

\_\_\_CS4558 Network Traffic Analysis (3-2)

\_\_\_CS4615 Formal Analysis of Cryptographic Protocols (3-1)

\_\_\_CS4650 Fundamentals of Information System Security Engineering (3-1)

\_\_\_CS4680 Introduction to Certification and Accreditation (3-2)

\_\_\_CS4684 Cyber Security Incident Response & Recovery (3-2)

\_\_\_CS4690 Security for Cyber Physical Systems (3-1)

# CYBER OPERATIONS (CO): (Coordinator: Dr. Irvine)

Students must take the following CO Core Sequence:

\_\_\_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 (2) of the following CO electives:***

\_\_\_CS4648 Advanced Cyber Munitions (3-2)

\_\_\_CS4678 Advanced Cyber Vulnerability Assessment (4-2)

\_\_\_CS4558 Network Traffic Analysis (3-2)

\_\_\_CS4684 Cyber Security Incident Response & Recovery (3-2)

\_\_\_CS4600 Secure Computer Systems (3-2)

\_\_\_CS4690 Security for Cyber Physical Systems (3-1)

# MOVES Option: (Coordinator: Dr. C. Darken)

# Students interested in a CS degree with a focus on modeling, virtual environments and simulation may choose the MOVES Option as their Specialization.

***Students will work with their Advisor(s) to create a six (6) course sequence applicable to this specialization area. Their course plan must be listed below, and approved by their Thesis Advisor or MOVES Specialization Coordinator (para 7 below).***

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

***Students must take the following N&M Core Sequence:***

\_\_\_CS4552 Network Design & Programming (3-3)

\_\_\_CS4554 Network Modeling & Analysis (4-0)

\_\_\_CS4533 Wireless Mobile Computing (3-2)

\_\_\_CS4535 Mobile Devices (3-2)

\_\_\_CS4537 Wireless Data Services (3-2)

***In addition, students must choose one (1) of the following N&M electives:***

\_\_\_CS4538 Mobile Device and Wireless Security (3-2)

\_\_\_CS4558 Network Traffic Analysis (3-2) or

\_\_\_CS4920 Introduction to the Internet of Things

# SOFTWARE ENGINEERING (SwE): (Coordinator: Dr. Luqi)

* ***Students will work with their Advisor(s) to choose six (6) courses applicable to this specialization area. Their course plan must be listed below, and approved by their Thesis Advisor or Software Engineering Specialization Coordinator (para 7 below).***
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**4. Additional Military Requirements:**

# All U.S. Navy & Marine Corps students

\_\_\_NW3230 Strategy & War (4-2)

# All U.S. Navy Line Officer students (*except* Engineering Duty Officers)

\_\_\_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)

Recommended for all Marine Corps students; may be dropped only with concurrence of the Senior Marine Office.

# 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. Credit Hour Requirements:**

\_\_\_40 graduate credit hours at 3000-4000 level, with at least 12 of those hours at 4000 level.

\_\_\_28 of the 40 graduate credit hours must be in CS, MOVES, SW courses.

***\*\* No more than 4 total sections of CS0810 may be taken, and no more than 2 sections may be taken during a given quarter.***

**6. 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 Advisor or Specialization Manager). In addition, I have listed my one (1) required **Breadth Elective**.

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**7. Advisor or Specialization Manager approval:** Specialization courses above are approved.

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_