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.

<table>
<thead>
<tr>
<th>Completed</th>
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<tbody>
<tr>
<td>___CS2011 Computing System Principles (4-0) (Fall/Spr)</td>
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<td>___CS3040 Low-Level Programming I (4-2) (Fall/Spr)</td>
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<td>___CS3025 Formal Foundation of Computer Science (4-2) (Fall/Spr)</td>
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<td>___OS3307 Modeling Practices for Computing (4-1) (Fall/Spr)</td>
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<td>___CS3200 Computer Architecture (3-2) (Win/Sum)</td>
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<td>___CS3021 Intermediate Programming &amp; Data Structures (4-2) (Win/Sum)</td>
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<td>___CS3502 Computer Communications &amp; Networks (4-2) (Win/Sum)</td>
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<td>___CS3070 Operating Systems (3-2) (Win/Sum)</td>
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<td>___CS4900 Technology &amp; Transformation (2-0) (Win/Sum)</td>
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<td>___CS3600 Introduction to Computer Security (4-2) (Fall/Win/Spr/Sum)</td>
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<td>___CS3140 Low-Level Programming II (3-2) (Fall/Spr)</td>
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<td>___CS3101 Theory of Formal Languages and Automata (4-2) (Fall/Spr)</td>
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<td>___CS3310 Artificial Intelligence (4-1) (Fall/Spr)</td>
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<td>___CS3250 Intro to Cyber Physical Systems (3-2) (Win/Sum)</td>
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<td>___CS3150 Design and Analysis of Algorithms (3-2) (Win/Sum)</td>
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<td>___CS3060 Database Systems (3-1) (Win/Sum)</td>
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<td>___SW3460 Software Methodology (4-2) (Fall/Spr)</td>
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<td>___CS4901 Research Methods (1-0) (Win/Sum) – only if offered</td>
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<td>___CS3315 Big Data and Machine Learning (3-1) (Fall/Spr)</td>
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<td>___CS3004 Human Computer Sys. Interaction (3-2) (Fall/Spr)</td>
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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: ______________