Name/Rank/Service:

Month/Year Enrolled:

Projected Graduation Date:

CS Specialization:

**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.*

**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 (*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 to the Program Officer and Educational Technician.*

Completed Planned Qtr

\_\_\_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) \_\_\_\_\_\_\_\_

\_\_\_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 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 and/or Thesis Advisor approval.***

# ARTIFICIAL INTELLIGENCE (AI): (Coordinator: Dr. Rowe)

Students must take the following AI Core Sequence:

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

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

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

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

\_\_\_CS4313 Advanced Robotic Systems (3-2)

\_\_\_CS4317 Language Systems (3-2)

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

\_\_\_CS4677 Computer Forensics (3-2)

\_\_\_CS492x Seminar on Advanced Autonomous Systems Topics (4-1)

\_\_\_IS4205 Big Data Management, Architecture, and Applications (3-2)

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

\_\_\_OA3304 Decision Theory (4-0)

\_\_\_OS4106 Advanced Data Analysis (3-0)

\_\_\_OA4108 Data Mining (2-2)

# 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 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:

\_\_\_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 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)

# 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.*

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

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

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

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

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

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

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

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

 or CS4558 Network Traffic Analysis (3-2)

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

Students must take SW3460, CS3315, and CS3004 in the core.

In addition, students must choose six of the following SwE electives:

\_\_\_SW4520 Advanced Software Engineering (3-0)

\_\_\_SW4530 Software Engineering R&D in DoD (3-1)

\_\_\_CS4313 Advanced Robotic Systems (3-2)

\_\_\_CS4315 Introduction to Machine Learning and Data Mining (3-1)

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

\_\_\_CS4670 Quantum Computing (4-0)

\_\_\_CS3910 Science of Programming

\_\_\_MV4025 Cognitive and Behavioral Modeling for Simulations (3-2)

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

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

\_\_\_CC4101 System Engineering for Joint C4I Systems (4-2)

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

**4. 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)

\_\_\_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)

**5. 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

***\*\* 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 the Specialization Coordinator). In addition, I have listed my **one required Breadth Elective** (a 3000 or 4000 level general elective consisting of any course not in the core nor taken for a specialization).

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

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

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

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

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