Naval Postgraduate School

Department of Computer Science

Graduation Checklist for MSCS Degree

6203P Subspecialty Code

**(Revised: Fall AY14)**

Name/Rank/Service:

Month/Year Enrolled:

Projected Graduation Date:

CS Track:

**1. Thesis: *proposal must be approved by end of 3rd academic quarter (or no CS-0810 Thesis Research Blocks until complete).***

Title:

Advisor(s):

Second Reader:

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 3rd academic quarter a plan for completion of any core courses not yet taken, in conjunction with Track selection and population of course matrix in Python.***

Completed Planned Qtr

\_\_\_CS3021 Intro to Data Structures & Intermed. Programming (4-2) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3502 Computer Communications & Networks (4-2) (Fall/Spr) \_\_\_\_\_\_\_\_

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

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

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

\_\_\_CS3150 Design and Analysis of Algorithms (4-0) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3310 Artificial Intelligence (4-1) (Win/Sum) \_\_\_\_\_\_\_\_

\_\_\_CS3200 Large Scale Architecture (4-2) (Win/Sum) \_\_\_\_\_\_\_\_

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

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

\_\_\_CS3060 Database Systems (3-1) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_SW3460 Software Development (2-1) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS3004 Human-Computer Interaction (2-1) (Fall/Spr) \_\_\_\_\_\_\_\_

\_\_\_CS4901 Technology & Transformation II (2-0) (Fall/Spr) \_\_\_\_\_\_\_\_

**3. Specialization Track: *All CS students must complete one of the following Specialization Tracks. (Circle track, and initial each completed course, or annotate when it will be taken.)***

# AUTONOMOUS SYSTEMS (AS) TRACK: (Track Manager: Dr. Rowe)

Students must take the following AS Core Sequence:

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

\_\_\_CS4315 Learning Systems and Data Mining (3-1) (Pre. any college-level programming course)

\_\_\_CS4317 Language Systems (3-2) (Pre. CS3310, CS3150, CS3101)

\_\_\_CS4330 Intro to Computer Vision (3-2) (Pre. CS2020 *or* CS2171 *or* CS2173)

\_\_\_MV4100 Cognitive Engineering (4-1) (Pre. none)

***In addition, students must choose one (1) or three (3) of the following courses (or other course in AS by approval of Advisor or AS Track Manager), as applicable, depending on having three (3) or four (4) quarters of track courses:***

\_\_\_CS4322 Internet Information Systems Technology (3-2) (Pre. CS2020, CS3310)

\_\_\_CS49xx Seminar on Advanced Autonomous Systems Topics (4-1)

\_\_\_MV4015 Agent-Based Autonomous Behavior for Simulations (4-2)

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

\_\_\_OA4108 Data Mining (2-2) (Pre. OA3103)

# INFORMATION SECURITY & ASSURANCE (ISA) TRACK: (Track Mgr: Dr. Irvine)

Students must take the following ISA Core Sequence:

\_\_\_CS3690 Network Security (4-1) (Pre. CS3600; CS3502 or IS3502)

\_\_\_CS4600 Secure Computer Systems (3-2) (Pre. CS3600, CS3070, CS3502)

\_\_\_CY4700 Cyber Wargame: Blue Force Operations (2-5) (Pre. CS3600 *or* CY3520 *or* CS3690 *or* DA3104)

***In addition, students must choose three (3) or five (5) of the following ISA Specialization courses, as applicable, depending on having three (3) or four (4) quarters of track courses:***

\_\_\_CS3670 Secure Management of Systems (3-2) (Pre. CS3600)

\_\_\_CS3695 Network Vulnerability Assessment & Risk Mitigation (3-2) (Pre. CS3502 *or* IS3502 *or* CS3690)

\_\_\_CS4605 Security Policies, Models & Formal Methods (3-1) (Pre. CS3600, CS3150 and CS3101)

\_\_\_CS4614 Advanced Topics in Computer Security (3-1) (Pre. CS3600, CS4600, CS4605)

\_\_\_CS4615 Formal Analysis of Cryptographic Protocols (3-1) (Pre. CS3600) – *Confidential clearance required*

\_\_\_CS4677 Computer Forensics (3-2) (Pre. CS3600, CS3670)

\_\_\_CS4680 Introduction to Certification and Accreditation (3-2) (Pre. CS3670, CS3690) – *U.S. students only*

\_\_\_CS4684 Cyber Security Incident Response & Recovery (3-2) (Pre. CS3690)

\_\_\_CY4650 Information Management for Cyber Operations (4-0) (Pre. DA3105, CY4400, CY4600) – *Confidential clearance required*

# CYBER SYSTEMS & OPERATIONS (CSO) TRACK: (Track Manager: Dr. Irvine)

Students must take the following CSO Core Sequence:

\_\_\_CS3690 Network Security (4-1) (Pre. CS3600; CS3502 or IS3502)

\_\_\_CY4700 Cyber Wargame: Blue Force Operations (2-5) (Pre. CS3600 *or* CY3520 *or* CS3690 *or* DA3104)

\_\_\_CY4710 Cyber Wargame: Red Force Operations (2-5) (Pre. CY4600 and CY4700; or any one of: CS3695, CS4678, CS4558, EC4755, EC4765, EC4785)

***…and must choose one of the following CSO sub-tracks:***

***- Adversarial:***

\_\_\_CS3140 Low-Level Programming II (3-2) (Pre. CS3040 or Course Coordinator approval)

\_\_\_CS4678 Adv. Cyber Vulnerability Assessment (4-2) (Win/Sum) (Pre. CS3070, CS3690) – *Unclassified FOUO, U.S. Only; Confidential clearance required*

***- Defensive:***

\_\_\_CS4558 Network Traffic Analysis (3-2) (Pre. CS3502, CS4550)

\_\_\_CS4679 Advances in Cyber Security Operations (4-1) (Pre. CS3690) – *Based on case studies, this course will be taught at either the unclassified or SECRET*

***In addition, students must choose one (1) of the following CSO Specialization courses:***

\_\_\_CS3670 Secure Management of Systems (3-2) (Pre. CS3600)

\_\_\_CS4558 Network Traffic Analysis (3-2) (Pre. CS3502, CS4550)

\_\_\_CS4648 Advanced Cyber Munitions (3-2) (Pre. CS3070, CS3140) – *TS/SCI clearance required*

\_\_\_CS4679 Advances in Cyber Security Operations (4-1) (Pre. CS3690) – *Based on case studies, this course will be taught at either the unclassified or SECRET level*

\_\_\_CS4677 Computer Forensics (3-2) (Pre. CS3600, CS3670)

\_\_\_CS4684 Cyber Security Incident Response & Recovery (3-2) (Pre. CS3690) – *Based on case studies, this course will be taught at either the unclassified or TS/SCI level*

***\*\*CSO Track students who do not require JPME, and/or have additional time in their matrix (e.g., four (4) quarters of track courses) will complete the Core, and both Adversarial and Defensive sub-tracks above. In addition they will take the following CSO Specialization courses, time permitting:***

\_\_\_CS4600 Secure Computer Systems (3-2) (Pre. CS3600, CS3070, CS3502)

\_\_\_CS4677 Computer Forensics (3-2) (Pre. CS3600, CS3670)

\_\_\_CS4648 Advanced Cyber Munitions (3-2) (Pre. CS3070, CS3140) – *TS/SCI clearance required*

# MOVES TRACK: (Track Manager: Dr. Chris Darken)

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

***Students will work with their Advisor to create a six (6) or eight (8) course specialization sequence, as applicable. Course plan must be listed in paragraph 6 below, and approved by Advisor and MOVES Track Manager.***

# NETWORK & MOBILITY (N&M) TRACK: (Track Manager: Dr. Xie)

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

\_\_\_CS4550 Computer Networks II (4-0) (Pre. CS3502)

\_\_\_CS4552 Network Design & Programming (3-3) (Pre. CS4550)

\_\_\_CS4554 Network Modeling & Analysis (4-0) (Pre. CS3502)

\_\_\_CS4533 Wireless Mobile Computing (3-2) (Pre. CS2020, CS3021, CS3502)

\_\_\_CS4535 Mobile Devices (3-2) (Pre. CS2020)

\_\_\_CS4537 Wireless Data Services (3-2) (Pre. CS4533, CS4535)

***\*\*N&M Track students who do not require JPME, and/or have additional time in their matrix (e.g., four (4) quarters of track courses) will complete the following three courses in addition to track sequence above:***

\_\_\_CS4558 Network Traffic Analysis (3-2) (Pre. CS3502, CS4550)

\_\_\_CS4538 Mobile Device and Wireless Security (3-2) (Pre. CS3600, CS4537)

\_\_\_CS3690 Network Security, or CS4556 Business & Economics of Network Technology, or any other course subject to approval by thesis advisor.

# SOFTWARE ENGINEERING (SwE) TRACK: (Track Manager: Dr. Luqi)

Students must take the following SwE Core Sequence:

\_\_\_SW4510 Computer-Aided Prototyping (3-0) (Pre. SW3460)

\_\_\_SW4520 Advanced Software Engineering (3-0) (Pre. SW3460)

\_\_\_SW4530 Software Engineering R&D in DoD (3-1) (Pre. SW3460)

***In addition, students must choose three (3) courses from the following:***

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

\_\_\_CS4677 Computer Forensics (3-2) (Pre. CS3600 & CS3670)

\_\_\_CS4533 Wireless Mobile Computing (3-2) (Pre. CS2020, CS3021, CS3502)

\_\_\_CS4552 Network Design & Programming (3-3) (Pre. CS4550)

\_\_\_CS3690 Network Security (4-1) (Pre CS3600 & CS3070)

\_\_\_CS3695 Network Vulnerability Assessment & Risk Mitigation (3-2) (Pre. CS/IS3502 *or* CS3690)

\_\_\_CS4684 Cyber Security Incident Response & Recovery (3-2) Pre. CS3690)

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

***\*\*Students with four (4) track quarters choose any two (2) additional track electives from the above.***

**4. Additional Military Requirements:**

# All U.S. Navy & Marine Corps students

\_\_\_NW3230 Strategy & Policy (4-2) (all quarters)

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

\_\_\_NW3275 Joint Maritime Operations Part 1 (4-0) (all quarters)

\_\_\_NW3276 Joint Maritime Operations Part 2 (2-2) (all quarters)

\_\_\_NW3285 National Security Decision Making (4-0) (all quarters)

# All U.S. Marine Corps & Army students

\_\_\_MN3331 Principles of System Acquisition & Program Management (5-1)

Optionally recommended for Marine Corps students:

\_\_\_SE4011 Systems Engineering for Acquisition Managers (3-2)

# 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 or above the 3000 level

\_\_\_12 of the 40 graduate credit hours must be at the 4000 level

***\*\* No more than 3 sections of CS0810 may be taken, except that Qtr-7 students may take a 4th section. No more than 2 sections may be taken in a given quarter.***

**6. Student Certification:** I certify the information contained on this form is correct. The below courses were taken as part of my Track Specialization, or reflect courses taken to replace unavailable required Track courses (must be approved by Advisor or Track Manager):

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

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

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

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

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