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*

- **<u>CYBER SYSTEMS & OPERATIONS (CSO) TRACK:</u>** (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*

- **<u>MOVES TRACK:</u>** (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: _____