Naval Postgraduate School
Department of Computer Science
Graduation Checklist for MSCS Degree (24-month)
6203P Subspecialty Code
(Revised: Fall AY13)

Name/Rank/Service: _____________________________________________________________
Month/Year Enrolled: __________________________________________________________
Projected Graduation Date: ______________________________________________________
CS Track: _____________________________________________________________________

1. Masters Thesis: *Thesis proposal must be approved by end of the 4th academic quarter.*

Title: _______________________________________________________________________
Advisor(s): __________________________________________________________________
Second Reader: __________________________________________________________________

2. Core Courses: *All of the following courses must be completed or validated to graduate*:  

<table>
<thead>
<tr>
<th>Completed</th>
<th>Planned Qtr</th>
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<tbody>
<tr>
<td>CS2020 Introduction to Objects &amp; Programming (4-2) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS2011 Computing Systems Principles (4-0) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS3000 Great Principles of Computing Technology (4-1) (Fall/Spr)</td>
<td>_____</td>
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<td>MA3025 Logic &amp; Discrete Mathematics (4-1) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS3021 Intro to Data Structures &amp; Intermed. Programming (4-2) (Win/Sum)</td>
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<td>CS3600 Introduction to Computer Security (4-2) (Fall/Win/Spr/Sum)</td>
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<tr>
<td>CS3101 Theory of Formal Languages and Automata (4-0) (Win/Sum)</td>
<td>_____</td>
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<tr>
<td>OS3307 Modeling Practices for Computing (4-1) (Win/Sum)</td>
<td>_____</td>
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<tr>
<td>CS3070 Operating Systems (3-2) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS3502 Computer Communications &amp; Networks (4-2) (Fall/Spr)</td>
<td>_____</td>
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<td>CS3310 Artificial Intelligence (4-1) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS3150 Design and Analysis of Algorithms (4-0) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS3113 Introduction to Compiler Writing (3-2) (Win/Sum)</td>
<td>_____</td>
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<td>CS3022 Programming Paradigms (4-2) (Win/Sum)</td>
<td>_____</td>
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<td>CS3060 Database Systems (3-1) (Win/Sum)</td>
<td>_____</td>
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<td>SW3460 Software Methodology (3-1) (Win/Sum)</td>
<td>_____</td>
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<tr>
<td>CS3004 Human-Computer Interaction (3-2) (Fall/Spr)</td>
<td>_____</td>
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<tr>
<td>CS4900 Technology &amp; Transformation I (0-2) (Win/Sum)</td>
<td>_____</td>
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<tr>
<td>CS4901 Technology &amp; Transformation II (0-2) (Fall/Spr)</td>
<td>_____</td>
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</tbody>
</table>

* Students must submit a plan for core courses completion by the end of the 4th academic quarter, in conjunction with Track selection and course matrix population in Python.
3. Track Requirements: *All CS students must complete one of the following Specialization Tracks.* *(Circle the completed track and initial each applicable course and specialization sequence.)*

- **NETWORK & MOBILITY TRACK:**
  
  *Students must take the following Network & Mobility Track Sequence:*
  
  ___CS4550 Computer Networks II (4-0) (Win/Sum) (Prereq. CS3502)
  ___CS4552 Network Design & Programming (3-3) (Fall/Spr) (Prereq. CS4550)
  ___CS4554 Network Modeling & Analysis (4-0) (Win/Sum) (Prereq. CS4550)
  ___CS4556 Business Economics Network Technology (4-0) (Fall/Spr)
  ___CS4533 Wireless Mobile Computing (3-2) (Fall) (Prereq. CS3502)
  ___CS4535 Mobile Devices (3-2) (Fall/Spr) (Prereq. CS4533)
  ___CS4537 Wireless Data Services (3-2) (Win) (Prereq. CS4533)
  ___CS4538 Mobile & Wireless Security (3-1) (Win) (Prereq. CS4533 and strongly suggest CS4535 & CS4537)

- **INFORMATION SECURITY & ASSURANCE TRACK:**
  
  *Students must take the following Information Security & Assurance Core Sequence:*
  
  ___CS3670 Information Assurance: Secure Management of Systems (3-2) (Fall/Spr) (Prereq CS3600)
  ___CS3690 Network Security (4-2) (Win/Sum) (Prereq CS3600, CS3502)
  ___CS4600 Secure Computer Systems (3-2) (Fall/Spr) (Prereq CS3600, CS3450, CS3502)
  ___CS4605 Security Policies, Models & Formal Methods (3-1) (Win/Sum) (Prereq CS3600, CS3150 and CS3101)

  *In addition, Information Security & Assurance Track student must select one (1) of the following Specialization Sequences:*

  **Network Security –**
  
  ___CS4678 Advanced Vulnerability Assessment (4-2) (Win) (Prereq CS3113, CS3070, CS3690); *Non-U.S. students* take CS3695 Network Vulnerability Assessment (3-2) (Win/Sum) (Prereq CS3502) instead;
  ___CS4615 Formal Analysis of Security Protocols (4-2) (Spr) (Prereq CS3600);
  ___CS4614 Advanced Topics in Computer Security (3-1) (Win/Sum) (Prereq CS3600, CS4600, CS4605);
  ___CS4538 Mobile and Wireless Security (3-1) (Spr) (Prereq CS3600, CS3690, CS4537).

  **Intrusion Detection and Response –**
  
  ___CS4675 Intrusion Detection and Response (3-1) (Win) (Prereq CS3600);
  ___CS4322 Internet Information Systems (3-2) (TBD) (Prereq CS2020, CS3310);
  ___CS4550 Computer Networks II (4-0) (Win/Sum) (Prereq CS3502);
  ___CS4614 Advanced Topics in Computer Security (3-1) (Win/Sum) (Prereq CS3600, CS4600, CS4605).
Exploitation and Crime –
___CS3610 Information Crime, Law and Ethics (4-0) (Fall);
___CS4677 Computer Forensics (3-2) (Fall/Spr) (Prereq CS2011, CS3600, CS3670);
___CS4322 Internet Information Systems (3-2) (TBD) (Prereq CS2020, CS3310);
___CS4554 Network Modeling and Analysis (4-0) (Win/Sum) (Prereq CS3502).

Security Requirements and Analysis –
___CS4650 Application of Security Evaluation Criteria for Information and Software Assurance (3-1) (Spr) (Prereq CS3600, CS4600);
___CS4615 Formal Analysis of Security Protocols (4-2) (Spr) (Prereq CS3600);
___CS4680 Introduction to Certification and Accreditation (3-2) (Fall/Spr) (Prereq CS3600, CS3670, CS3690) – U.S. students only;
___CS4614 Advanced Topics in Computer Security (3-1) (Win/Sum) (Prereq CS3600, CS4600, CS4605).

Computer Network Operations –
___CS4678 Advanced Vulnerability Assessment (4-2) (Win) (Prereq CS3113, CS3070, CS3690); Non-U.S. students take CS3675 Network Vulnerability Assessment (3-2) (Win/Sum) (Prereq CS3502) instead;
___CS4677 Computer Forensics (3-2) (Fall/Spr) (Prereq CS2011, CS3600, CS3670);
___CS4680 Introduction to Certification and Accreditation (3-2) (Fall/Spr) (Prereq CS3600, CS3670, CS3690) – U.S. students only;
___CS4650 Application of Security Evaluation Criteria for Information and Software Assurance (3-1) (Spr) (Prereq CS3600, CS4600).

Forensics –
___CS4677 Computer Forensics (3-2) (Fall/Spr) (Prereq CS2011, CS3600, CS3670);
___CS4678 Advanced Vulnerability Assessment (4-2) (Win) (Prereq CS3113, CS3070, CS3690); Non-U.S. students take CS3675 Network Vulnerability Assessment (3-2) (Win/Sum) (Prereq CS3502) instead;
___CS4614 Advanced Topics in Computer Security (3-1) (Win/Sum) (Prereq CS3600, CS4600, CS4605);
___CS4615 Formal Analysis of Security Protocols (4-2) (Spr) (Prereq CS3600).

SOFTWARE ENGINEERING & ARCHITECTURE TRACK:
Students must take the following Software Engineering & Architecture Core Sequence:
___SW4500 Introduction to Formal Methods in Software Engineering (3-1) (Prereq. SW3460)
___SW4583 Principles of Software Design (3-1)
___SW4591 Requirements Engineering (3-1)
___SW4592 Software Risk Assessment in DoD (3-1)

In addition, Software Engineering & Architecture Track students must select one (1) of the following Specialization Sequences:
Software-Intensive System Development – Choose four (4) of the following:
________ SW4530 Software Engineering Research and Development in DOD (3-1)
________ SW4540 Software Testing (3-1)
________ SW4560 Software Evolution (3-0)
________ SW4570 Software Reuse (3-0)
________ SW4580 Design of Embedded Real-time Systems (3-0)
________ SW4581 Software Reliability (3-1)
________ SW4582 Weapons System Software Safety (3-1)
________ SW4590 Software Architecture (3-1)
________ SW4600 Automata, Formal Specification & Verification (3-1)
________ SW4920 Advanced Topics in Systems Software Safety (3-0)
________ IS4300 Software Engineering and Management (3-2)
________ IS4031 Information Systems Economics (4-0)
________ MN3309 Acquisition of Embedded Weapon Systems Software (4-0)
________ MN3331 Principles of Systems Acquisition and Program Management (5-1)
________ SW4930 Introduction to Software Engineering Doctoral Studies (3-0)
________ SW4932 Advanced Area of Software Engineering Doctoral Studies (3-0)

Autonomous Systems – Choose four (4) of the following:
________ CS4313 Robotics (3-2)
________ CS4315 Learning Systems and Data Mining (3-1)
________ CS4317 Language Systems (3-2)
________ CS4330 Introduction to Computer Vision (3-2)
________ MV4100 Cognitive Engineering (4-1)
________ SW4580 Design of Embedded Real-Time Systems (3-0)

• AUTONOMOUS SYSTEMS TRACK:

  Students must take the following Autonomous Systems Core Sequence:
________ CS4313 Robotics (3-2)
________ CS4315 Learning Systems and Data Mining (3-1)
________ CS4317 Language Systems (3-2)
________ CS4330 Introduction to Computer Vision (3-2)
________ MV4100 Cognitive Engineering (4-1)

In addition, students must choose three (3) of the following Autonomous Systems Track Specialization courses:
________ CS4112 Distributed Operating Systems (3-2);
________ CS4533 Wireless Mobile Computing (3-2);
________ CS4322 Internet Information Systems (3-2);
________ MV4015 Agent-Based Autonomous Behavior for Simulations (4-2);
________ MV4025 Cognitive and Behavioral Models for Simulations (3-2);
________ EC4460 Artificial Neural Networks (3-1);
CYBER SYSTEMS & OPERATIONS TRACK SEQUENCE

*Students must choose eight (8) of the following CSO Core & Track courses; course sequence must be approved by CSO Track Manager.*

- CS2140 Low-Level Programming I (4-2)
- CS3140 Low-Level Programming II (4-2)
- CS3670 Secure Management of Systems (3-2)
- CS3690 Network Security (4-1)
- CS4558 Network Traffic Analysis (4-0)
- CS4648 Advanced Cyber Munitions
- CS4677 Computer Forensics (3-2)
- CS4678 Vulnerability Assessment (4-2)
- CS4679 Advances in Cyber Security Operations (3-2)
- CS4684 Cyber Incident Response & Recovery
- CY4700 Cyber Wargame Blue Force Operations
- CY4710 Cyber Wargame Red Force Operations (3-2)
- DA3105 Conflict & Cyberspace (4-1)
- EC3760 Information Operations Systems (3-2)
- EC4785 Internet Engineering (3-2)

CS-MOVES OPTION:

Students interested in a Master of Science in Computer Science degree with a focus on modeling, simulation and virtual environments may choose the CS-MOVES Option as their Specialization Track. Specialization sequence coursework will be coordinated by the student working with his/her MOVES thesis advisor, and course plan must be listed below and approved by CS-MOVES Option Track Manager (and/or thesis advisor).

4. **Additional Military Requirements:**

**All U.S. Navy & Marine Corps students**
- NW3230 Strategy & Policy (4-2) (Fall/Win/Spr/Sum)

**All U.S. Navy Line Officer students (except Engineering Duty Officers)**
- NW3275 Joint Maritime Operations Part 1 (4-0) (Fall/Win/Spr/Sum)
- NW3276 Joint Maritime Operations Part 2 (2-2) (Fall/Win/Spr/Sum)
- NW3285 National Security Decision Making (4-0) (Fall/Win/Spr/Sum)

**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**
- IT1500 Informational Program Seminar for International Officers (4-0)
- IT1600 Communication Skills for International Officers (3-0) (if required by the International Office)
- IT1700 Academic Writing for International Officers (2-0) (if required by the International Office)
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 four (4) segments of CS0810 may be taken.***

6. **Student Certification:** I certify the information contained on this form is correct. The below courses were taken as part of my Track Specialization (e.g., CS-MOVES Option), or reflect Track Specialization courses that were replaced due to non-availability (must be approved by Track Chair below):

   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

   Signature: _____________________________ Date: __________

7. **Track Chair Approval:** Track Specialization courses described above are approved.

   Signature: _____________________________ Date: __________