Master of Applied Computing - Curriculum 367 (DL)

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Brief Overview
The Master of Applied Computing (MAC) is a distributed learning (DL) degree program that equips graduates with the essential skills and knowledge to specify, evaluate, and manage computing systems, as well as the ability to provide technical guidance in the analysis, design, and application of computing systems used in the Navy. The MAC degree is designed to be completed by combining a sequence of NPS graduate-level certificates in areas related to computing, such as computer science, cyber systems and operations, robotics, and data science. The program's flexible design provides sponsoring agencies and students the ability to achieve specific professional education goals by selecting a tailored combination of certificates. There is no thesis or capstone requirement for this degree.

The MAC degree program is open to any U.S. military officers and U.S. Government civilians, as well as international students and defense contractors, who are eligible for entry to NPS certificate programs. The Master of Applied Computing program must be completed within 5 years.

Learning Outcomes
Graduates of the MAC program will be able to:
- Apply current best practices to solve computing problems (analyze, design, implement and evaluate).
- Apply the knowledge of computing and data systems theory to analyze problems, assess trade-offs, and develop creative solutions.
- Analyze the current and evolving state of computing tools and technologies.
- Assess and recommend computing technology innovations in military contexts
- Demonstrate flexible communication to work with diverse teams and audiences.

Requirements for Entry
A baccalaureate degree with above-average grades is required. Completion of at least two semesters of college-level algebra or trigonometry is considered to be the minimum mathematical preparation. The minimum APC requirement for entry to this program 325; in addition, APC requirements for individual certificate programs that a student undertakes

for the MAC degree will apply. International students should refer to NPS Admissions for current TOEFL and other entrance requirements.

Entry Date
As a fully-online stackable certificate curriculum, entry date for this program will be predicated on specific entry dates for NPS DL certificate programs being undertaken for this degree. Students may be admitted into this curriculum after beginning work on NPS certificate programs, however, all NPS certificate programs require formal admission. If further information is needed, contact the Program Officer or the Academic Associate for this curriculum or the NPS Admissions Office.

Program Length
The length of the MAC curriculum will depend upon the length of time a student must take to complete the set of certificate programs used to meet the degree requirements. In all cases, the NPS Academic Policy Manual (APM) states that all requirements for any master's degree must be completed within a period of five (5) years after being accepted into the degree program.

Degree Requirements
1. Completion within five years (per NPS APM) of three or four NPS DL certificates, all but one of which must be managed by the CS Department. New certificates will be eligible for inclusion, subject to approval by CS Department.

2. Minimum 44 graduate credit hours (per NPS APM), at least 20 hours of which are from CS, MV, or SW courses.

3. A minimum of 12 4000-level credit hours from CS, MV, or SW courses.

4. (Optional) At the preference of certain sponsors, a capstone project may be completed with three CS4920 "Advanced Topics in CS" or similar courses, as equivalent to the fourth required certificate.

Typical Course of Study
The following certificate programs show a typical course of study a student may take to complete the MAC degree in cyber security or artificial intelligence focus-areas:

Cyber Security Fundamentals (curriculum 256, 12.5-13 hours)
- CS4600, Secure System Principles (3-2),
  or CS3600, Introduction to Cybersecurity (4-1)
- CS3670, Secure Management of Systems (3-2)
- CS3690, Network Security (4-1)

Cyber Security Defense (curriculum 258, 12 hours) – choose any 3 of the following:
- CS4558, Network Traffic Analysis (3-2)
- CS4677, Computer Forensics (3-2)
- CS4684, Cyber Security Incident Response and Recovery (3-2)
- CS4600, Secure System Principles (3-2)

Cyber Security Adversarial Techniques (curriculum 260, 13.5 hours)
- CS4648, Software Reverse Engineering and Malware Analysis (3-2), or CS4558, Network Traffic Analysis (3-2)
- CS4678, Advanced Cyber Vulnerability Assessment (4-2)
- CS4679, Advances in Cyber Security Operations (4-1)

Artificial Intelligence for Military Use Certificate (curriculum 128, 13 hours total)
- CS4000, Harnessing Artificial Intelligence (0-2)
- CS3331, Basics of Artificial Intelligence (4-0)
- CS3332, Applied Machine Learning (4-0)
- CS4333, Current Directions in Artificial Intelligence (4-0)

Data Science Certificate (curriculum 268, 14 hours)
- CY3650, Cyber Data Management and Analytics (3-1)
- OS4108, Advanced Data Analysis (2-2)
- CS4315, Introduction to Machine Learning and Data Mining (3-1)
- OS4118, Statistical and Machine Learning (4-0)

Robotics Certificate (curriculum 223, 17 hours)
- ME3420, Computational Foundations for Robotics (3-2)
- EC4310, Fundamentals of Robotics (3-2)
- PC3014, Intermediate Applied Physics Laboratory (3-4)
- AE4820, Robotic Multibody Systems (3-2)