

**Motion from CGE re: Professional Science Master's option in the MS program in
Cyber Security & Privacy
Approved by the Faculty Senate
22 November 2016**

PROGRAM ANNOUNCEMENT

November 2016

Institution:	New Jersey Institute of Technology
New Option of Existing MS Program Title:	MS in Cyber Security and Privacy Professional Science Master Option: Cyber Defense
Degree Designation:	MS in Cyber Security and Privacy Professional Science Master Option: Cyber Defense
Degree Abbreviation:	PSM CSP
CIP Code and Nomenclature (<i>if possible</i>):	11.1003 Computer and Information Systems Security
Campus(es) where the program will be offered:	Newark Campus, NJIT
Date when program will begin (month and year):	September 2017
List the institutions with which articulation agreements will be arranged:	None

Is licensure required of program graduates to gain employment? Yes No

Will the institution seek accreditation for this program? Yes No

If yes, list the accrediting organization:

PSM CSP Narrative:

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Descriptive Information

I. Objectives

The new Professional Science Master in Cyber Security and Privacy degree (PSM CSP) is offered as an option of the MS in Cyber Security and Privacy. As a standard development model, this will not be a new program, but another option of the existing MS program in Cyber Security and Privacy. The objective of the PSM CSP degree is to create leaders with strong communication and management skills in addition to the strong technical knowledge in security and privacy of computer systems, networks and web applications. PSM CSP is designed for working professionals or students professionals or students who already have acquired some professional experience. NJIT is well position to offer this PSM CSP option given its recent designation as National Center of Academic Excellence in Cyber Defense Education by the National Security Agency and Department of Homeland Security (see Appendix A).

II. Differences from the Existing MS CSP Program

The existing MS CSP program prepares graduates with excellent technical skills in cyber security and privacy. However, the national workforce also demands cybersecurity professionals with excellent professional communication skills and business acumen. This trend is reflected in the emergence of the Professional Science Master degrees, the fastest growing segment of science graduate education. The PSM degrees adeptly address the documented need for management-trained professionals “for technology-based companies, governmental agencies, and non-profit organizations” (NPSMA.org). The PSM CSP option will prepare its graduates for attractive jobs such as: Information Security Managers, Lead Software Security Engineer, Chief Information Security Officer (CISO), Network Security Architect, and Computer/Network Security Consultant. The hiring companies prefer applicants with a PSM degree in an information security-related area for these jobs because the necessary advanced coursework ensures a solid knowledge of security principles and practices as well as management and communication skills.

III. Admission Requirements

PSM CSP has the same academic admission criteria as the MS CSP (e.g., GPA over 3.0 and a bachelor degree in a computing related field). In addition to the academic criteria, applicants must be either working professionals or demonstrate that they have already acquired some professional experience.

IV. Resources to Support PSM CSP

The existing faculty in the Department of Computer Science will handle the majority of the coursework and will be complemented by faculty from the Department of Informatics, Martin Tuchman School of Management, and the Department of Humanities. NJIT has sufficient laboratory and equipment resources to support this option in addition to the existing MS CSP program. All courses in the PSM CSP option already exist in the Ying Wu College of Computing (YWCC), the Department of Humanities, and Martin Tuchman School of Management.

V. Curriculum

In creating the curriculum for this program, we used feedback from the YWCC Board of Visitors, which consists of industry leaders from the NY-NJ area. The Department of Computer Science will administer the PSM option in Cyber Security and Privacy together with the current MS in Cyber Security and Privacy. A committee composed of faculty and university lecturers from Computer Science, Humanities and the Martin Tuchman School of Management together with YWCC student advisors will oversee advisement of students in the program and monitor their progress.

The Faculty Overseer Committee for the program will consist of the following faculty:

- R. Curtmola (Security and Cryptography)
- D. Karvelas (Networking and Security)
- K. Rohloff (Security and Cryptography)
- Q. Tang (Security and Cryptography)
- G. Wang (Networking and Security)
- C. Borcea (Networking and Systems)
- A. Klobucar (Professional Communication)
- C. Sylla (Management)

The following Administrative Staff will assist the Faculty Overseer Committee:

- Amanda Ackerman
- Tony Angelella
- Michele Bell

In addition, we plan to set up an External Advisory Board, consisting of industry leaders from the NY-NJ region. The role of this Advisory Board is to provide us with frequent curriculum feedback as well as to guide us on fostering relations with potential employers and setting up internships for our students.

The PSM CSP courses are divided in four categories: (i) Cybersecurity Core; (ii) Professional Communication (iii) Management, and (ii) Cybersecurity Elective;

A PSM CSP course program must satisfy the following distribution requirement:

- 36 credits are required.
- All Cybersecurity Core courses are required.
- 6 credits are required from the PTC list (professional communication)
- 6 credits are required from the Management list
- 6 credits are from the Cybersecurity Elective list
- An elective course can be replaced with an MS project course

If a student chooses to work on an MS project, the project must be related to cybersecurity. Furthermore, team-oriented MS projects designed in collaboration with employers are encouraged.

Each PSM CSP student, who is not working full-time, is required to either participate in one summer internship or register for an MS project before graduation.

Core Courses

CS 608 Cryptography and Security
 CS 645 Security and Privacy in Computer Systems
 CS 646 Network Protocols Security
 CS 647 Counter-Hacking Techniques
 CS 656 / ECE 637 - Internet and Higher-Layer Protocols
 CS 696 / ECE 638 - Network Management and Security

PTC Courses

PTC 601 Advanced Professional and Technical Communication
 PTC 624 Professional and Technical Editing (PTC 601 is prerequisite)
 PTC 628 Analyzing Social Networks (PTC 601 is prerequisite)
 PTC 632 Content Management and Information Architecture (PTC 601 is prerequisite)
 PTC 620 Proposal Writing
 PTC 622 Working in Team: Collaborative and Interpersonal Communications
 PTC 629 Theory and Practice of Social Media

Management Courses

MGMT 641 Global Project Management
 MGMT 650 Knowledge Management
 EM 636 Project Management
 MGMT 682 Business Research Methods
 MGMT 688 Information Technology, Business, and the Law
 MGMT 691 Legal and Ethical Issues
 FIN 600 Corporate Finance I
 ACCT 615 Management Accounting

Cybersecurity Elective Courses

CS 610 Data Structures and Algorithms
 CS 630 Operating System Design

CS 631 Data Management System Design
CS 632 Advanced Database Systems
CS 634 Data Mining
CS 643 Cloud Computing
CS 660 Digital Watermarking
CS 673 Software Design and Production Methodology
CS 680 Linux Kernel Programming
CS 708 Advanced Data Security and Privacy
CS 755 / ECE 782 Security and Privacy in Wireless Networks
IS 680 Information Systems Auditing
IS 681 Computer Security Auditing
IS 682 Forensic Auditing for Computing Security
IT 620 Wireless Network Security & Administration
IT 640 Network Services Administration
ECE 636 Computer Networking Laboratory

Appendix A



Keywords: Faculty Senate, Motion, CGE, MS, Cyber Security & Privacy