



State of Rhode Island and Providence Plantations
Council on Postsecondary Education
OFFICE OF THE POSTSECONDARY COMMISSIONER

Enclosure 5b4.
February 24, 2016

Barbara S. Cottam
Chair

**Council on Elementary and
Secondary Education**

Daniel P. McConaghy
Chair

Amy Beretta, Esq.

Colleen A. Callahan, Ed.D.

Karin Forbes

Jo Eva Gaines

Marta V. Martinez

Lawrence Purtill

Joyce L. Stevos, Ph.D.

**Council on Postsecondary
Education**

William Foulkes
Chair

Michael Bernstein

Dennis Duffy, Esq.

The Honorable Thomas Izzo

Judy Ouellette

Kerry I. Rafanelli, Esq.

John J. Smith, Jr.

Dr. Jeffery A. Williams

TO: Members of the Council on Postsecondary Education

FROM: Jim Purcell, Ed.D, Commissioner for Postsecondary Education

DATE: February 14, 2016

RE: Associate in Science in Cybersecurity at the
Community College of Rhode Island

Background

The Community College of Rhode Island (CCRI) is proposing to offer an Associate in Science in Cybersecurity. Cybersecurity programs focus on the technological and operational aspects of information warfare including cyber-attack and cyber-defense. Academic programs in Cybersecurity include instruction in computer and network security, cryptography, computer forensics, systems security engineering, software applications, threat and vulnerability assessment, wireless networks and satellite communications, tactical and strategic planning, legal and ethical issues and cyber warfare systems development and acquisition.

Rationale

Cybersecurity has been identified as a high-demand and fast-growth occupation sector with need routinely outstripping supply. This associate degree program is intended to provide skills required for those interested in entering Cybersecurity careers and provide the opportunity to update or enhance skills for those already working within the industry. The AS in Cybersecurity also provides foundational study for the bachelor's degree in Cybersecurity or a related field.

CCRI has participated in the Real Jobs RI Information Technology Partnership of employers and strategic partners which received planning and implementation grants to identify and plan for meeting training and employment needs within the information technology industry. CCRI has also met with members of the RI Defense Industry Alliance to discuss emerging and long-term needs within the industry and developing a pipeline of skilled labor. Through these partnerships CCRI has gained an understanding of the emerging employment needs related to the security of computer networks.

The associate degree in Cybersecurity would assist in developing a pipeline of skilled employees by building on competencies gained in career technical education, the community college and the baccalaureate institutions. CCRI also has had discussions with the Southeastern New England Defense Industry Alliance (SENEDIA) on providing cybersecurity training for dislocated and incumbent workers and with RI Emergency Management Agency and the RI National Guard on training needs related to Cybersecurity.

The proposal cites data from *The Economic Impact of the Rhode Island Defense Sector* (2013) showing that the defense industry is the highest paying sector in RI. The average annual wage of civilian employees of Naval Undersea Warfare Center Division Newport was 155% higher than the average wage for RI non-farm employees, and the average wage of employees of a private defense contractor was 66% higher than the average wage in RI for non-farm workers.

Program

This program will be offered at CCRI's four major campuses; courses will be offered during day and evening hours. The program will also be available through distance learning. The AS in Cybersecurity consists of 61 credits.

Curriculum

The curriculum is based on the National Security Agency(NSA)/Department of Homeland Security (DHS) National Center of Academic Excellence in Information Assurance/Cyber Defense (IA/CD) two year Core Knowledge Units (KUs) and includes competencies in:

Basic Data Analysis
Basic Scripting or Introductory Programming
Cyber Defense
Cyber Threats
Fundamental Security Design Principles
Information Assurance Principles
Introduction to Cryptography
IT Systems Components
Networking Concepts
Policy, Legal, Ethics and compliance
System Administration

The Cybersecurity courses designated to meet the required competencies include:

COMI 1150	Programming Concepts	3 credits
COMI 1225	Programming in C# or	3 credits
COMI 1510	Java Programming	3 credits
COMP 1200	Database Design and Management	3 credits
COMI 2035	Introduction to Computer Forensics	3 credits
COMI 2036	Introduction to Computer Ethics	3 credits
COMI 2037	Introduction to Cybersecurity	3 credits

COMP 2430	Operating Systems	3 credits
CNVT 1810 (CISCO 1850)	Networking Technology	3 credits
CNVT 1820(CSC0 1860)	Intermediate Networking	3 credits
CNVT 1830 (CSCO 1870)	Local Area Networking (LAN) Design and Management	3 credits
CNVT 2200 (CSCO 1990)	Network Security Hardware	3 credits
CNVT 1200 (ETEK 1500)	Introduction to Wireless Networks	3 credits
COMP 2500	Cybersecurity Capstone (internship)	3 credits

The program has initiated the process to receive NSA/DHS designation as a National Center of Academic Excellence in Information Assurance 2-year Education (CAE/2y). To earn this designation the curriculum must address the competencies above and include access to cybersecurity practitioners and applied training through a 150-hour practicum. Students will gain access to on-the-job experience working with industry professionals and employers will have the opportunity to identify future employees. The Cybersecurity Capstone (Internship) is a new course.

Institutional Role

This program is reflective of the community college's mission to enable students to gain the skills needed to enter the workforce directly or after transferring for a bachelor's degree. Specifically, the program responds to the college's mission to "respond to community needs and contribute to our state's economic development and the region's workforce."

Interinstitutional Considerations

URI offers a Cybersecurity professional certificate and a minor in Cybersecurity to undergraduates and a professional science master's degree in cybersecurity; in addition, masters and doctoral students in computer science may select a concentration in Cybersecurity. URI is the only Rhode Island institution currently that has earned the NSA/DHS National Center of Academic Excellence in Information Assurance/Cyber Defense for academic program and for research. URI program materials note that many of the Cybersecurity students take basic networking courses in CCRI's CISCO Academy. CCRI states that a meeting is scheduled to discuss establishing formal articulation agreements which would enable students who finish coursework in the areas of Digital Forensics or Cybersecurity to transfer their courses toward a BA or BS degree at URI in a related field.

Among the independent colleges and universities in RI, there are a variety of programs available related to Cybersecurity. Roger Williams University offers a BS in Cybersecurity and Networking; an undergraduate minor and a certificate in digital forensics; graduate certificates in digital forensics, Cybersecurity, and Cybersecurity specialist; and a MS in Cybersecurity. Johnson and Wales University will begin offering a degree in Cyber Threat and Intelligence in fall of 2016. New England Institute of Technology offers a BS in Cybersecurity. CCRI states that articulation agreements exist with Roger Williams and with Johnson and Wales for individual course transfer and is planning to develop a program articulation agreement with Johnson and Wales. Brown offers an Executive MS in Cybersecurity.

Faculty

The department intends to hire an additional faculty position plus adjunct faculty to support this program; other faculty needs will be covered by cross-training existing faculty.

Students

It is anticipated that students in other CCRI information technology programs will transfer into the Cybersecurity major. Based on conversations with SENEDIA and the Naval Undersea Warfare Center (NUWC), the college anticipates there are a significant number of workers in the defense sector currently who would be interested in this degree.

Evaluation

The program will be evaluated on by student performance in their internships and by traditional measures such as grade distribution. Lastly the certification process with NSA/DHS will provide program evaluation.

Learning Resources

A computer lab dedicated to Cybersecurity will be required. This can be accomplished by reorganizing existing space.

Financial Viability

The program anticipates attracting cohorts of 15-20 students which would make the program financially viable.

RIOPC review

The University of Rhode Island noted that the AS in Cybersecurity would offer students the opportunity to gain critical skills that private and public organizations find necessary to combat threats to private and corporate security as well as the security issues faced in our private and business lives. Further, the University states its intention of working toward creating a smooth transition to the BS in Computer Science through supportive transfer articulation agreements.

RIOPC staff reviewed the information on the proposed Associate of Science degree in Cybersecurity supplied by the Community College of Rhode Island and comments received from the University of Rhode Island. The academic changes presented are within the mission, role and scope of the Community College of Rhode Island and do not require Council approval.