



# CYBER DEFENSE LABORATORY

(CyDef)

Sponsored by the  
DEPARTMENT OF DEFENSE



## WHAT IS CyDef?

CyDef is a VMI conduit to grow the pipeline of next generation cybersecurity leaders. As such, students will undergo rigorous education and cyber security and leadership training in a dynamic, predictive, and responsive program.

Integral to CyDef is helping increase workforce diversity and providing extensive experiential learning with state-of-the-art tools and devices.

## GOAL

To enhance VMI's cybersecurity education through innovative curriculum with integrated leadership development and fusion of rigorous experiential and immersive learning.

# LEADERSHIP-INTEGRATED COMPETENCY DEVELOPMENT PROGRAM (LCDP)

- Develop and apply technical and nontechnical cybersecurity knowledge, skills, and abilities relevant to cybersecurity with emphasis on DoD work roles.
- Design, develop, implement, analyze, and maintain defensive and offensive cybersecurity strategies and solutions in cyber-physical-spaces.
- Understand and apply cybersecurity knowledge, technical and nontechnical skills, relevant policies, and leadership theories and strategies in case studies of real-world scenarios.

## Cyber Captains Initiative

Selected VMI cadets who meet the eligibility requirements will undergo rigorous preparation to be certified as Cyber Captains. The CCI program includes the cybersecurity minor, professional certifications, cyber club activities, and IT and community service. Students will receive a generous DoD Cyber Captains stipend.

## Capacity Enhancement and Development Initiative

VMI offers a multi-disciplinary Cybersecurity minor (CySec), a National Security Minor, and cybersecurity required and elective courses in multiple departments. CyDef provides varied dimensions of education in core and advanced cybersecurity education.

## Diversity and Outreach Initiative

CyDef plans to organize annual summer camps for high school students and teachers in cybersecurity. We will heavily recruit students from underrepresented groups in Rockbridge and surrounding rural counties, and may offer tailored programs to schools challenged by the digital divide.

## MISSION

To graduate citizen-soldiers with the knowledge, skills, and abilities to effectively perform, individually and as team members, the tasks required for cybersecurity work; and to have the readiness to serve DoD cyber missions emphasizing cyber leadership skills and Cyber Mission Force (CMF) work roles.



## VISION

To provide premier cybersecurity leadership education. Increasing the number of the next generation of leaders capable and ready to serve and protect our nation from existing and emerging cybersecurity challenges.

A CyDef priority is to grow the representation of underrepresented groups in the cybersecurity workforce.

# EXPERIENTIAL AND IMMERSIVE LEARNING PROGRAM (EILP)

- Build and evolve cybersecurity teams to address cybersecurity challenges.
- Monitor, analyze, and resolve simulated national-level cybersecurity challenges.
- Describe and apply methods for leading and responding to national-level cybersecurity priorities.
- Acquire cybersecurity professional skills through supervised workforce readiness experiences.

## Cybersecurity Application Intelligence Management Platform

CyDef seeks to provide a new direction in cybersecurity undergraduate learning, in part, through an in-house design, development and utilization of a novel educational platform for hands-on projects at VMI and the SMC consortium. Our platform, termed CyberAIMS, comprises a data-driven, dynamically reconfigurable Application Intelligence Management System with an integral Cloud-managed Internet of Things (IoT) populating smart-built spaces

## National Security Simulation with Cyber Fusion

VMI is well-positioned to serve in the nation's vanguard in cybersecurity leadership. The annual Commonwealth Cyber Fusion event held at VMI exposes cadets and student to the rigors of cybersecurity competition as well as to nationally renowned scholars, practitioners, and industry leaders. Cyber Fusion intends to include exercises in a National Security Simulation.

## Workforce Advancement and Readiness Program

CyDef plans to develop a new data-driven workforce skill advancement and readiness program, combining the efforts of faculty with Career Services professionals at VMI to better track opportunities, potential career paths, and the internship experience.



**"Our culture of service, rigor of leadership-infused cybersecurity education, commitment to diversity, complementary nature of programs, and excitement to collaborate, make our SMC consortium a natural conduit to graduate the next generation of cybersecurity leaders our nation critically needs."**

MOHAMED ELTOWEISSY  
DIRECTOR, CYBERDEFENSE LABORATORY



NORWICH  
UNIVERSITY™



THE CITADEL

# CYBER MISSION FORCE WORK ROLES

**DATA SCIENTISTS**

**VULNERABILITY RESEARCHERS**

**REVERSE ENGINEERING**

**MALWARE AND  
EXPLOITATION ANALYSTS**

**INFORMATION OPERATIONS  
INTEGRATORS INTO  
CYBER OPERATIONS**



## CADET INVOLVEMENT

### CYBER CAPTAIN INITIATIVE (CCI)

Cadets in CCI will serve for 10 hours a week during the academic year, and 10-20 hours a week during summer as teaching and technical assistants to help faculty, staff, and cadets on cybersecurity issues.

#### Responsibilities may include, but are not limited to:

Support IT in configuring, maintaining, and testing the cybersecurity laboratories.

Tutor fellow cadets in designated cybersecurity courses and capstone projects.

Assist faculty in preparing cybersecurity experiments and projects.

Assist in teaching summer workshops for 8-12 grades.

Assist in VMI Open House activities.

#### Cadets in CCI must:

Enroll in the cybersecurity minor.

Participate in an internship program.

Actively participate in the Cyber Club.

Receive designated professional certifications.

### INTERNSHIP OPPORTUNITIES

National Security Agency

Army Cyber Command

Air Force Cyber

Marine Force Cyber

SAP-NS2

### PROJECTS

Reverse Engineering IoT

AI-enabled Cyber Security Games

Platform for Personalized

Career-driven Cyber Security Education

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