



CAE Community of Practice In Cyber Defense



The University of Memphis Center for Information Assurance (CfIA)

Director: Prof. Dipankar Dasgupta, Computer Science (PI)
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CfIA site: <https://www.memphis.edu/cfia/>

CAE-CD since 2005

CAE-R since 2010



NCAE-C-001-2021 Project

Cybersecurity Education for Critical Infrastructure Protection

(in Community Development) through Regional Coalition.

Preparing cybersecurity professionals for today and tomorrow

In collaboration with:

- University of West Florida
- North Carolina A&T State University
- The Citadel College
- Indian River State College

This inter-disciplinary Community educational project focuses on enhancing the security and resilience of critical infrastructure systems.

Project Goals and Objectives

Overall Project Goal

Develop a multidisciplinary critical infrastructure cybersecurity program to address:

- **Technical needs of NCAE-C students (future workforce)**
- **State and local government, Industry partners in energy, water and wastewater systems, and related Critical Infrastructure Sectors.**

Project Objectives

- **Design and develop an education and outreach program for critical infrastructure professionals**
- **Provide educational experiences for NCAE-C students that enhance their expertise in Critical Infrastructure security**
- **Deliver competency-based training courses and workshops**

NCAE-C Partner Institution Roles and Deliverables:

CAE Coalition			Curriculum	# Participants	
Institution	Role	Faculty involved	Critical Infrastructure Security course/module	NCAE-C Students	Workshop+ Online
UofM	Lead	Dr. Dipankar Dasgupta / Dr. James McGinnis/ Dr. Hasan Ali/ Dr. Amanda Rockinson-Szapkiw	CIS, IMS, SGC, SCC. Also Host workshop	100	40 F2F + 150 online
UWF	Sub-awardee	Dr. Guillermo Francia, III/ Dr. Eman El-Sheikh /	ICS-RE, NERC-CIP, CMMC, ICS-RE	120	30 F2F+ 100 online
NC A&T	Sub-awardee	Dr. Kaushik Roy/ Dr. Xiaohong Yuan	IoT Security, host workshop (optional yr)	100	
Citadel	Sub-awardee	Dr. Shankar Banik / Dr. Cory Nance/ Dr. Melissa Graves	CITADEL collaborate with UofM for course development and delivery-host workshop	100	30 F2F+ 50 online
IRSC	Sub-awardee	Dr. Kevin Cooper	IRSC collaborate with UWF for course development and delivery-host workshop.	50	100 online

In 2022 we hosted two workshops at the University of Memphis

CYBER SECURITY FOR CRITICAL INFRASTRUCTURE WORKSHOP

April 1, 2022

Agenda

12Noon Welcome Remarks - Dr. Jim McGinnis
Participants Introduction

12:10 - 12:25 pm Discussion on Current State of Cybersecurity --Dr. Dasgupta

12:25 - 12:50 pm Case Studies Review
Hampton Roads Sanitation / SolarWinds -
(Dr. James McGinnis & Nathan Seymour)

1:00 – 1:45 pm Benjamin Denkers, EVP of Operations at CynergisTek. Infrastructure Under Attack: Weaponizing Cyber for Strategic or Tactical Advantage

1:45 – 2:00 pm Break

2:00 – 2:55 pm Guest Speaker, Dr Csilla Farkas - U. of South Carolina Cyber-Risk Assessment – a Data-driven View

3:10 - 4:50 pm Dr. James McGinnis-- Infrastructure Social Engineering, Remote Access, Work from Home

3:35 – 4:10pm Guest Speaker: Jeremy Baker, FBI Memphis Field Office

4:15 – 4:45pm Defense in Depth - Dr. Dasgupta & Cody Seymour-- Zero Trust Model & Penetration Testing Demo

4:50- 5:00 pm Questions and Answers / Closing Remarks, Dr. Dasgupta

CRITICAL INFRASTRUCTURE PROTECTION WORKSHOP TOPICS

An underlying theme for the workshop was “Advance your Career in Cybersecurity related profession and opportunities at the University of Memphis”. Topics discussed and talks presented included:

1. Moving Towards Zero Trust
2. Authentication and ID Management
3. EndPoint Detection and Response
4. FedRamp Program for Cloud Security

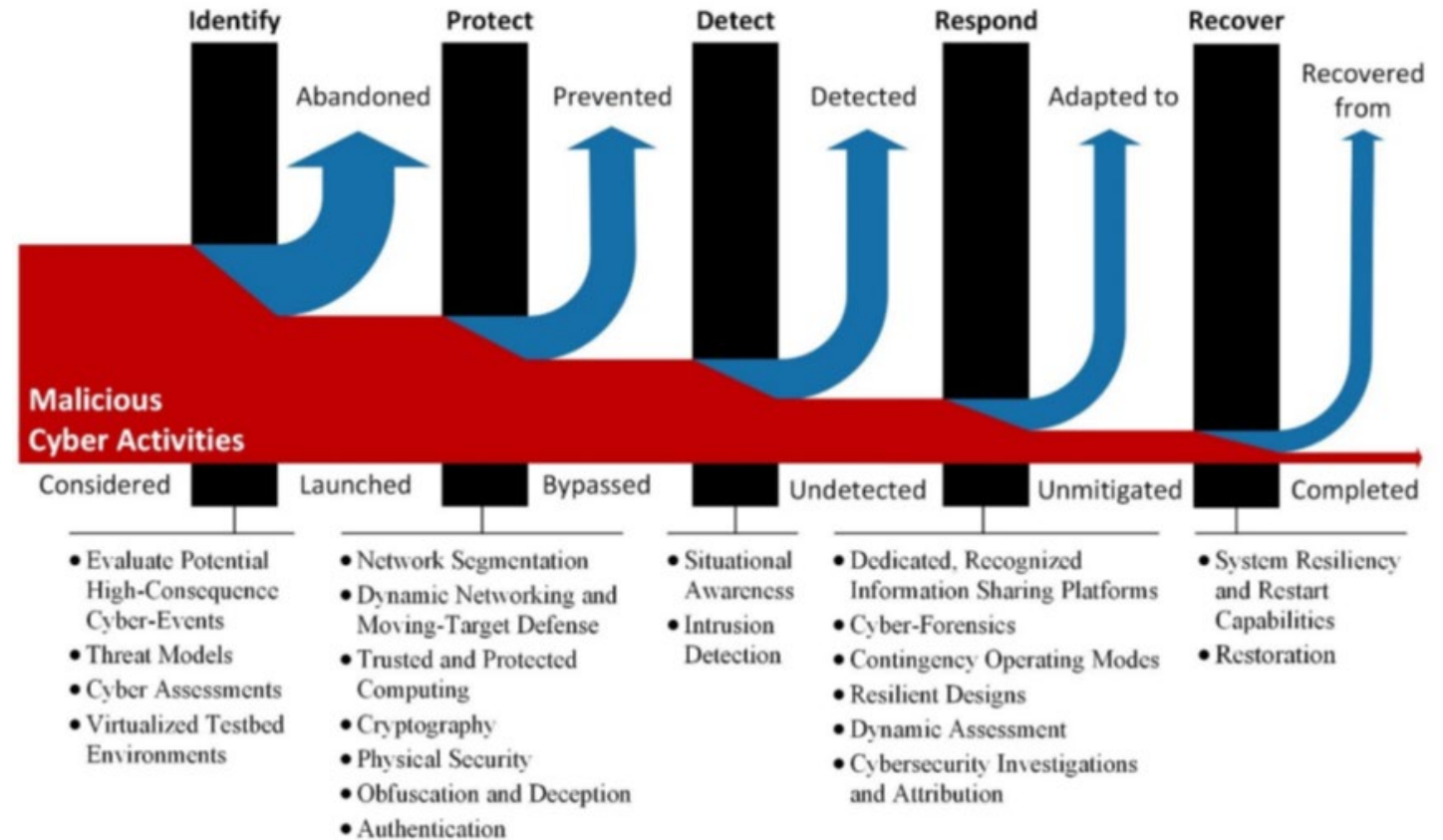
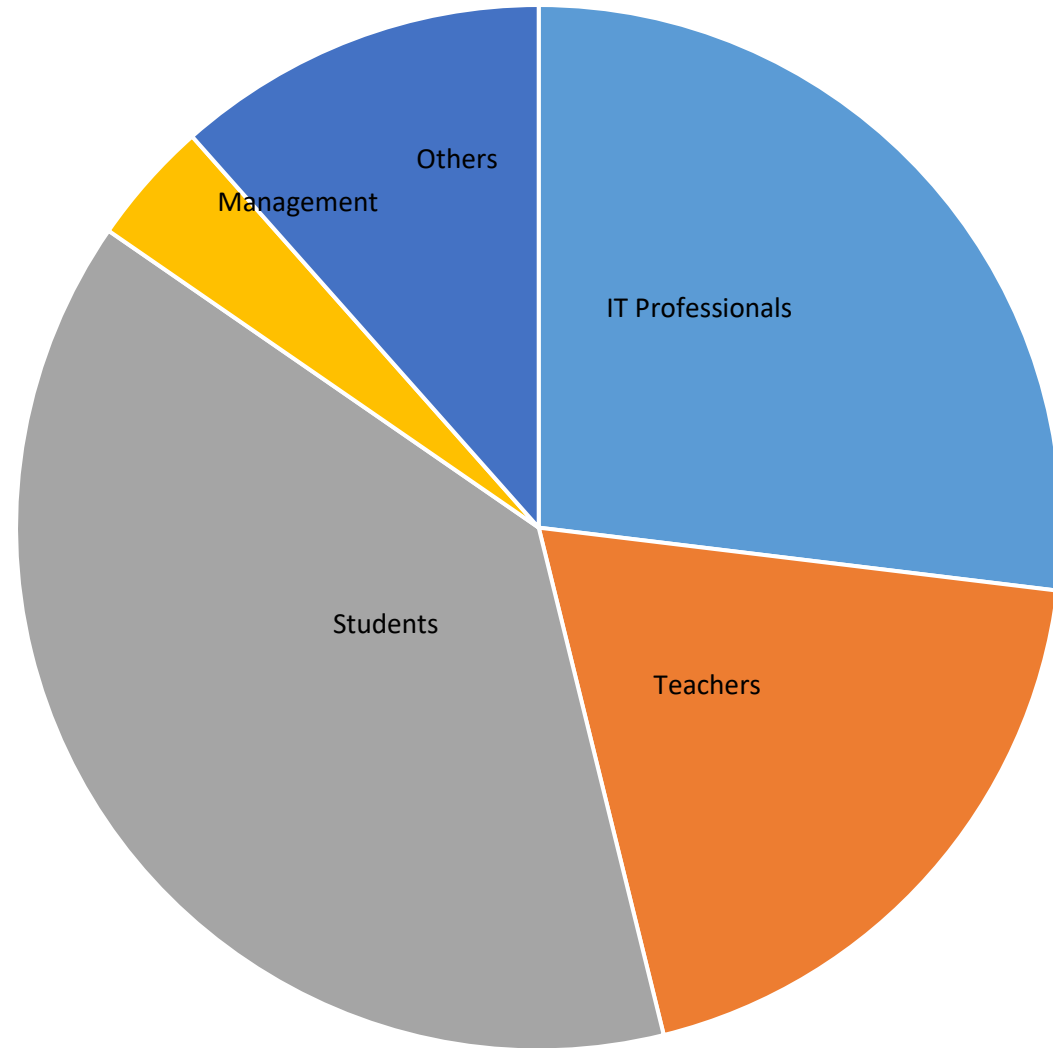


Figure: Thwarting malicious cyber activities with defensive using the five NIST Cybersecurity Framework functions [18]

***Presidential Policy Directive 21 and the National Critical Infrastructure Security and Resilience (CISR) Research and Development Plan.**

CYBER SECURITY FOR CRITICAL INFRASTRUCTURE WORKSHOP PARTICIPATION

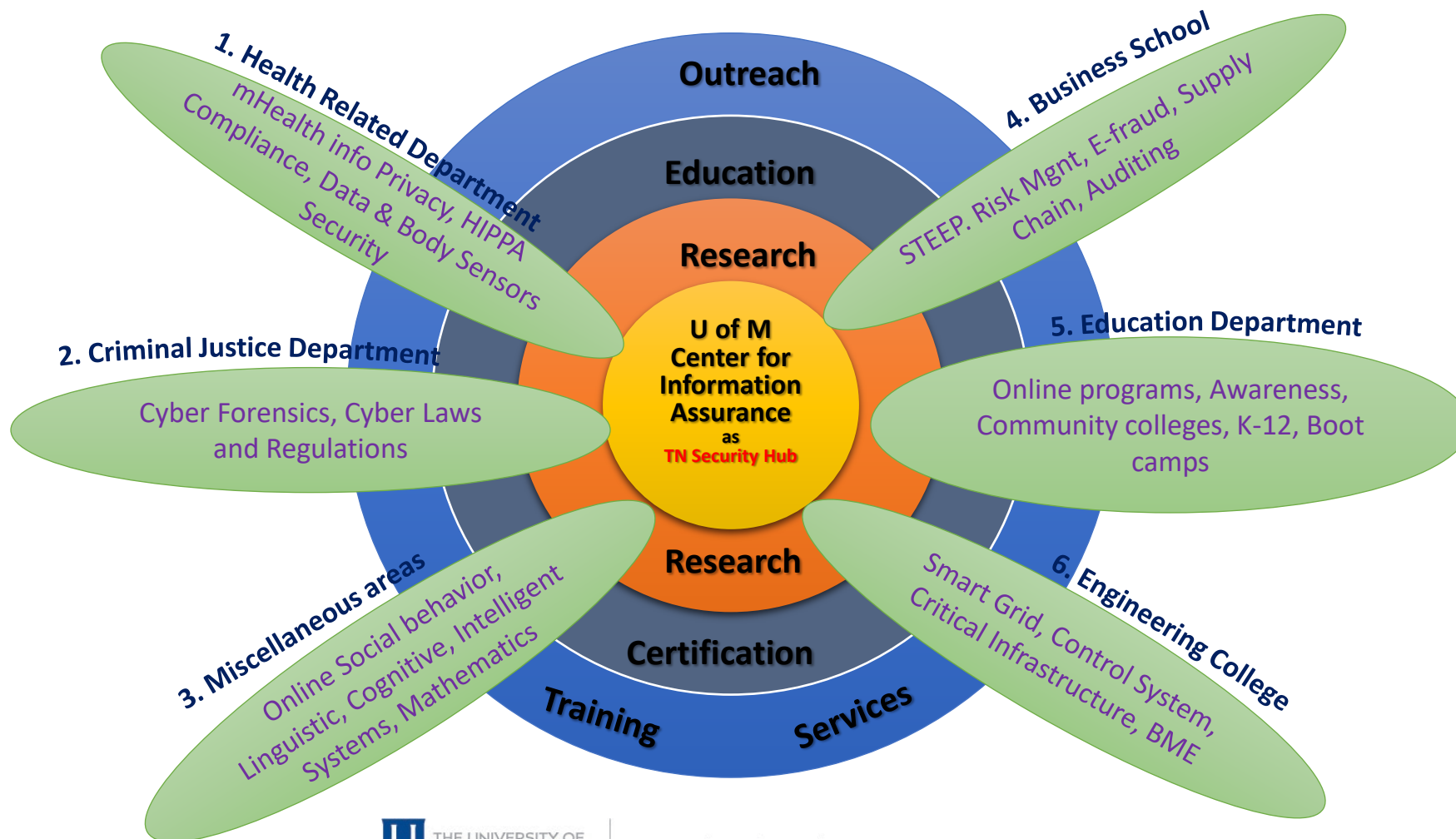
Participants Statistics



■ IT Professional ■ Teacher ■ Student ■ Management ■ Other



Multi-Disciplinary Research





UM Current Validated PoS



- **BS Computer Science, Cybersecurity Concentration**
 - Offer by the department of Computer Science [Program Details: https://catalog.memphis.edu/preview_program.php?catoid=22&poid=8366](https://catalog.memphis.edu/preview_program.php?catoid=22&poid=8366)
- **Other PoS(s) that the University of Memphis:**
 - Graduate Certificate Program in [Cybersecurity and Information Assurance](#)
 - Graduate Certificate Program in [Business Information Assurance](#)
- **Program Focus** and/or target [NICE Cybersecurity Workforce Framework](#), NIST and IEEE Security Standards.
- **Other Colleges and departments offer Cyber security, privacy, regulation, policy, law and compliance related courses: Criminal Justice, Law School, Finance, Education, etc.**



UM Cybersecurity Specialties And Subject Matter Expertise



- **Network Security, Wireless & Mobile Security (Dr. Wang, Dr. Yang, Dr. Papadopoulos, Dr. Won).**
- **Secure Software Design & Development (Dr. Fleming, Dr. Shiva)**
- **Cybersecurity: Authentication & Access Control (Dr. Dasgupta)**
- **Cloud Security, Data Security, Applied Cryptography (Dr. Yang, Dr. Shiva)**
- **Adversarial ML, Trustworthy AI/ML (Dr. Dasgupta, Dr. Yang, Dr. Venugopal)**
- **Smart-Grid and Infrastructure Security (Dr. Ali, Dr. McGinnis, Dr. Won)**
- **Game Theory Inspired Defense Architecture (Dr. Shiva, Dr. Dasgupta)**
- **Cybersecurity Education (Dr. Dasgupta, Dr. McGinnis, Dr. Cooks)**
- **IoT Sensor Security and Privacy (Dr. Kumar, Dr. Yang, Dr. Wang, Dr. Won)**

UM/CfIA National-Level Collaboration

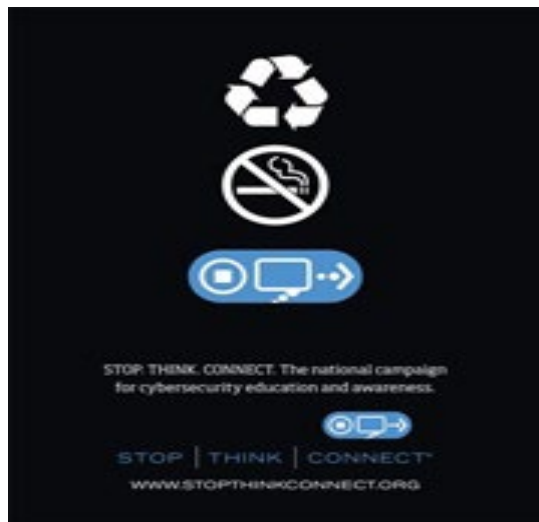
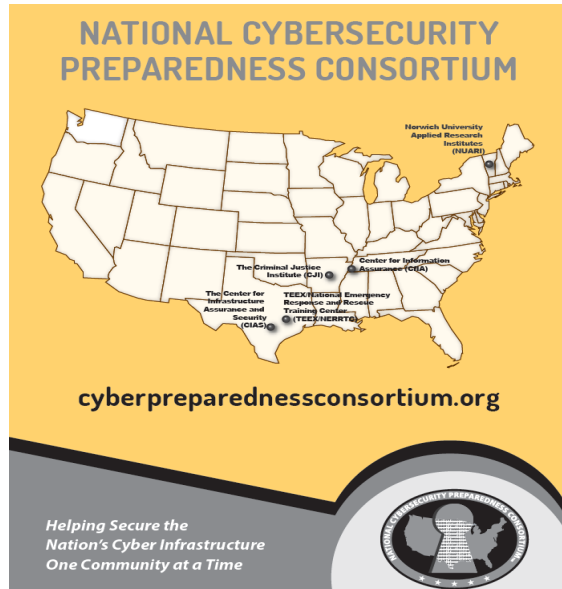
<http://www.cyberpreparednessconsortium.org/>

NCPC Consortium members:

- The University of Texas at San Antonio
- The University of Memphis
- The University of Arkansas
- Norwich University
- Texas A&M University



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Thank You!

