



2024

Case Study: Using the NSA CAE RING materials with a high school STEM cohort

Stan Mierzwa, POC – Kean University

CAE Community Symposium

2024 CAE

STEAM – Summer STEM Program

- Funded and established by the Port Authority of NY/NJ.
- Four-week program on STEM (Math; Global Business Supply Chain; Cybersecurity).
- Three cohorts of students from underserved communities (Jersey City; Elizabeth; Newark – NJ).
- Students spend four days each in a subject area and then circulate.
- High school students.

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CAE-CD Community
Thank you!

- First, I have never taught high school students – other than coaching basketball and soccer.
- Second, I wasn't sure where to start with getting age appropriate cybersecurity materials.
- **Enter: CAE-CD Community – thank you to Stan Kostka and Mike Qaissaunee for introducing me to the materials made available from the RING team.**
- **Thank you to Prof. Jesse Hairston – Univ. of Alabama Huntsville for granting me access to the materials. I only had 3 weeks to get ready.**
- **High 5 to the CAE –Community!!!**

Symposium

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STEAM



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STEAM



Stadium

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STEAM



SIUM

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STEAM



osium

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STEAM



Workshop

RING Modules

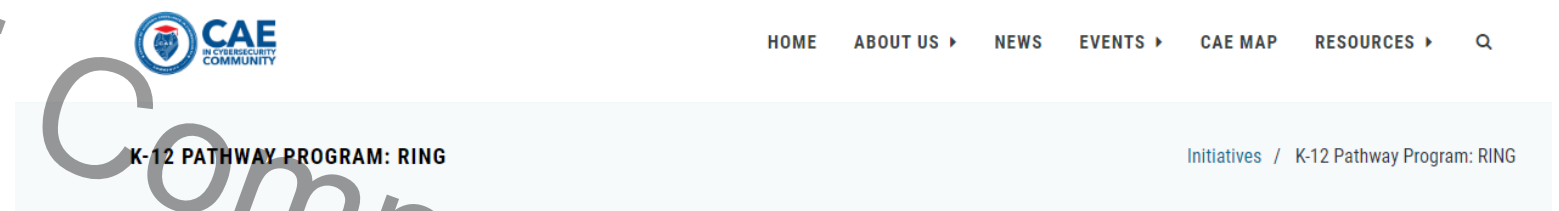
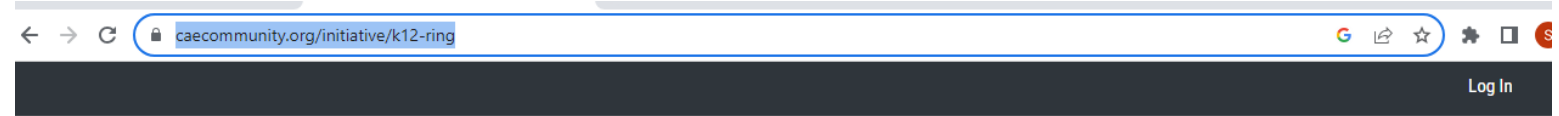
 <p>Cybersecurity Career</p> <p>Unit 0: Introduction Content List</p>	 <p>Unit 1: Ethics Content List</p>	 <p>Unit 2: Establishing Trust Content List</p>	 <p>Unit 3: Ubiquitous Connectivity Content List</p>	 <p>Unit 4: Data Security Content List</p>
 <p>Unit 5: Introduction to Python Programming Content List</p>	 <p>Unit 6: System Security Content List</p>	 <p>Unit 7: Adversarial Thinking Content List</p>	 <p>Unit 8: Risk Content List</p>	 <p>Unit 9: Implications Content List</p>

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RING Materials
Utilized



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RING Materials Utilized



K-12 PATHWAY PROGRAM: RING

Initiatives / K-12 Pathway Program: RING



Leading Institutions: The University of Alabama Huntsville, Moraine Valley Community College

<https://caecommunity.org/initiative/k12-ring>

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RING Materials
Utilized

- Provided access to Canvas class.
- Ability to use directly in Canvas or download
 - Student/Teacher versions.
- Lesson Plans, Slides, Vocabulary Organizers, and Activities.
- Comprehensive materials.
- Introductory students – many with NO background in cybersecurity.

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RING Materials
Utilized

- Selected the following lecture materials
 - Cybersecurity and why it matters?
 - Cybersecurity & Ethics
 - Trust Computing
 - Ubiquitous Computing
 - Data Security
 - Python Programming
 - System Security

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RING Materials
Utilized

- **Activities – labs, assignments (examples)**
 - EXIF Extraction (drum up curiosity)
 - Caesar Cipher
 - CIA Triad
 - DDoS Attacks
 - Linux Command Line
 - Bits & Bytes (binary conversions)
 - Locate IP and MAC address
 - Traceroute
 - DNS – what and how?
 - Basic Programming Concepts (eMates)

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RING Materials
Utilized

- **Activities – labs, assignments (examples)**
 - **Phishing Test**
 - **CIA Game**
 - **Python Programming**
- **End with a poster**
 - **Aligning cybersecurity to the transportation sector (Port Authority)**

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Do's and Don'ts



Refer back to their worlds – IG, SC, YT.



Talk too much – 15 mins max!!



Use lots of labs and experiments – Do!



Underestimate their knowledge.



Let them work together – cyber is a team sport.



Don't settle, new approaches will evolve.



Play LoFi music while working on labs.



Go at it alone.

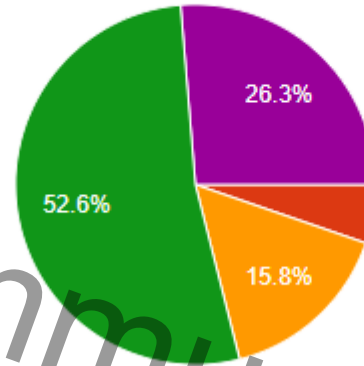
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Student Feedback

How much did you enjoy this class?

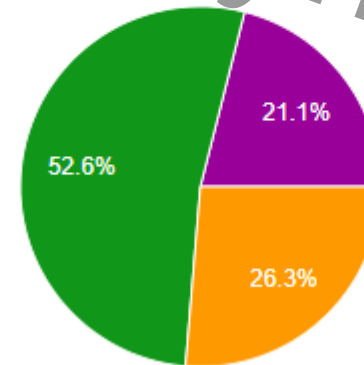
19 responses



- Not at all
- A little bit
- Somewhat
- A lot
- A great deal

How well did the cybersecurity materials help you learn and improve your knowledge on the topic?

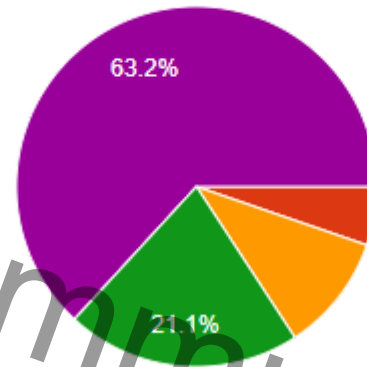
19 responses



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How clear and organized was the teacher's teaching style?

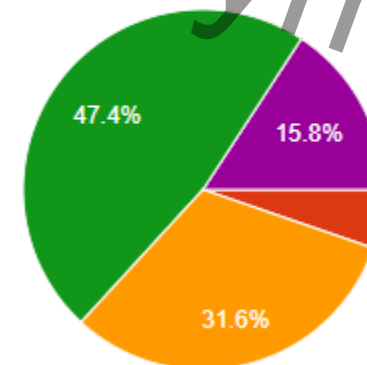
19 responses



- Not at all
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- Somewhat
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- A great deal

How engaged and interested were you in this class?

19 responses



- Not at all
- A little bit
- Somewhat
- A lot
- A great deal

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Student Feedback

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Student Feedback

What were some of your favorite activities about the class?

19 responses

writing our own python scripts

python

The game we played

Labs

linux !!!

Programming

Binary code, encryption and coding on dos

Working in teams

The game and the programming

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Student Feedback

What were some of your favorite activities about the class?

19 responses

I liked the little game and worksheets we got to do together with each other.

Doing the bot language/101010

Nun

the website command

My favorite was learn python and python sandbox.

I liked how we actually got to work and do labs rather than just listen to lectures.

The phyton assignment

Supply chain

The Cesar Cyphers and rbe binary conversion worksheet was very engaging and fun. The puzzles in general were very interesting to do

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Thank you!

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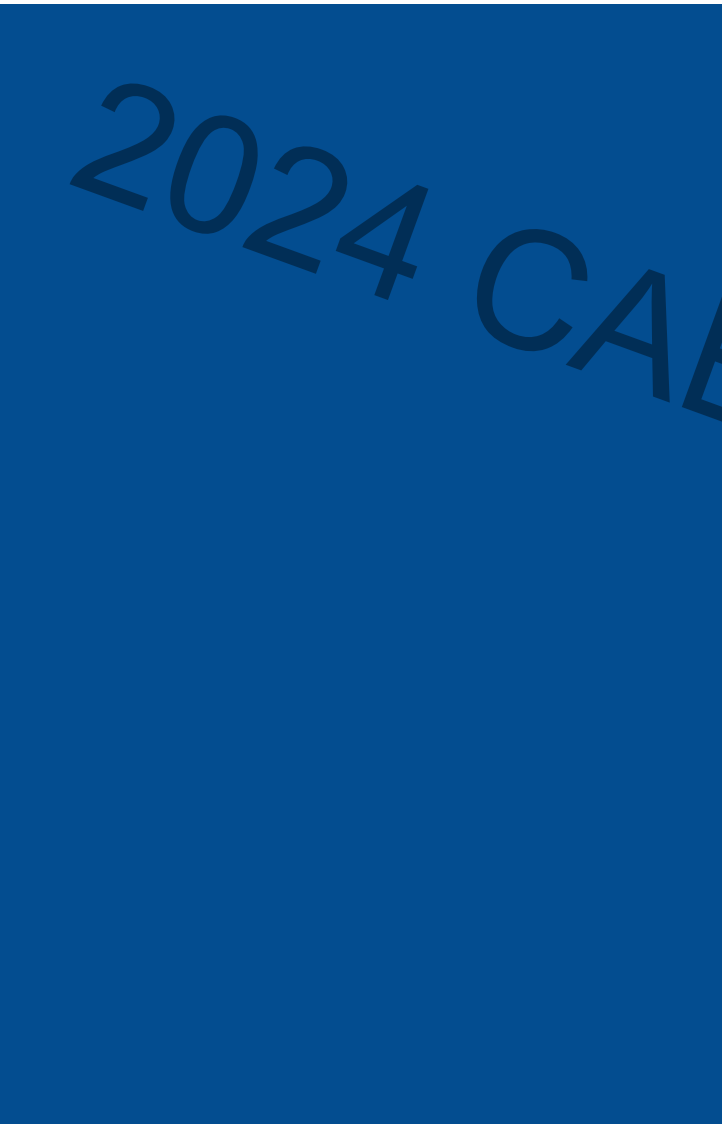
Swizzle

The
GALTHOUSE
LEGENDARY ♦  ♦ LOUISVILLE

WALKERS
Exchange



CAE
IN CYBERSECURITY
COMMUNITY



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