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This presentation was given at the 2023 National Cybersecurity Education Colloquium



# Careers Preparation National Center

<https://www.caecommunity.org/national-center/careers-preparation-national-center>

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# NCAE-C Careers Preparation National Center (CPNC)

## Mission

- **Pull together** NCAE-C efforts in development of graduating and completing students with the knowledge, skills and competencies required for **government** and industry employment based on requirements identified by participating employers
- **Collaborate with the CAE Community** to compile employer entry-level workforce requirements
- **Publish a reference database** to guide academic programs and match NCAE-C designated institution programs to cybersecurity career opportunities in government and industry.
- **Compile requirements** to address **federal**, state and local government and industry requirements from published documents and tools, and from collaboration with departments, agencies, and industry partners.
- **Coordinate** the work and deliverables

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Cooperative Education  
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PM: Mr. Ran Hinrichs

Competency Development  
(CSUSB)

PI: Dr. Sharon Hamilton  
PR: Dr. Zoe Fowler, Norwich  
Dr. Dan Manson, Norwich

Student Development  
(Montreat College)

PI: Ms. Kelli Burgin

Credit Transfer  
(Purdue NW; Forsyth Tech)

Regional Exercises/SOC in a Box  
Mr. John Kunelius (NUARI)

Credit Transfer TF  
PI: Dr. Michael Tu (PNW)

Integrate ABCDE/Develop e-library  
PI: Dr. Vincent Nestler (CSUSB)

Articulation Agrmnt Database  
PI: Mr. Thomas Brown  
(Forsyth Tech)

Competency Constructor  
PI: Dr. Sidd Kaza (SecurEd)

Evaluate Comp Tools  
PI: Dr. Susanne Wetzel (Stevens)

# CPNC Team & Tasks



# Competency Development & Documentation

**Competency Development**

PI: Dr. Sharon Hamilton, [shamilto@norwich.edu](mailto:shamilto@norwich.edu)  
Principal Researcher: Dr. Zoe Fowler, [zfowler@norwich.edu](mailto:zfowler@norwich.edu)

**Regional Exercises/SOC in a Box  
Mr. John Kunelius (NUARI)**

[jkuneliu@norwich.edu](mailto:jkuneliu@norwich.edu)

**Integrate Competencies/ABCDE  
PI: Dr. Vincent Nestler (CSUSB)**

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**Assess Competition Competencies  
Dr. Dan Manson (Norwich)**

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**Competency Constructor  
PI: Dr. Sidd Kaza (SecurEd)**

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**Evaluate Competency  
Learning Environments  
PI: Dr. Susanne Wetzel (Stevens)**

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Careers  
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## Competency Work

“Competency is the ability for the student to complete a task or tasks in the context of a work role.”

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# Applying competency statements to experiential learning

## ABCDE

An actor (A) performs a behavior (B\*) within a context (C) to an acceptable degree (D) according to the normative expectations of an employer (E).

\*Behaviors cross-reference existing frameworks which position tasks within work roles. For example, the DCWF or NICE Framework.



# Competency E-handbook and Train the Trainers

Dr. Vincent Nestler & Dr. Zoe Fowler

## Tasks

- Integrate competency development activities and resources into established and new curricula
- Develop recommendations for inclusion of competency development in CAE-C requirements

## Recent Accomplishments

- Continuing development of Essential Elements (ABCDE) framework
- Produced e-handbook for educators to link competency statements to learning objectives (posted on CAE-C CPNC website)
- Delivering “train-the-trainers” program
- Conducting action research to produce evidence on impact of writing competency statements upon practitioners and educators

## Community Support

- Sign up for 'train the trainer' sessions 21-22 SEP (NCEC) & 12-13 OCT
- Join the Monthly working group meetings!

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# Develop E-library & Competency Constructor

Dr. Sidd Kaza & Ms. Paige Zaleppa

## Task

Develop system that will allow for the creation, storage, and maintenance of CAE-C's competency statements

## Recent Accomplishments

- Designed, developed, and tested data model, low fidelity prototype, and alpha version. Closed beta was launched in May 2023.
- Designed and began implementation of a public facing E-library for competencies. Alpha testing to begin in October 2023.
- Participating in Competency Working Group and 'train the trainer' workshop events and contributing section to e-handbook.

## Community Support

- Attend a Train the Trainer Workshop and start developing competency statements!
- Provide feedback on the Competency Constructor system





# Competition Competencies

Dr. Dan Manson

## Tasks

- Conduct interviews with participants in CAE-C related competitions (NCL, CCDC, CPTC, CAE Cyber Games, DOE Cyber Force) to discuss benefits, growth opportunities, and enhancements to an individual's cybersecurity competence through cybersecurity competitions.
- Conduct discussions with CAE-C competition organizers to better map competition scoring and activities to competencies and framework work roles and tasks (DCWF & NICE)

## Recent Accomplishments

- Conducted 27 in-depth interviews with cyber competition competitors
- Entered 15 ABCDE Competencies into Competency Constructor
- Began discussions with competition organizers on mapping to competencies

## Community Support

- Identify potential interview subjects with competition experience (current students and alumni. last 5 years)
- Identify competition organizers to discuss mapping to competencies

# Learning Environment

Dr. Susanne Wetzel

## Tasks

- Develop a suitable comprehensive process to evaluate non-commercial and freemium learning environments
- Provide pertinent information to the NCAE-C community

## Recent Accomplishments

- Exploring the best ways to publish the information gathered
  - Visit exhibit for demos of some learning environments
- Moving forward with questionnaires for freemium learning environments
- Exploring how learning environment evaluations fit into the e-library using the ABCDE elements

## Community Support

Seeking tool nominations for the freely available and freemium tools you use!



<https://forms.gle/qRGN6PvEsc8DAQ35A>

# Collection & Compilation of Data (CCD)

Dr. Ram Dantu (ram.dantu@unt.edu)

**Tasks:** Collect, compile, and manage data to feed database

- Use published information (DCWF, NICE Framework, OPM, Indeed, ...)
- Rake knowledge, entry-level competency requirements, and expectations defined by the employers
- *Classify, map, format, and automatically feed data to database*

## Recent Accomplishments

- Met with federal/state/industry partners
- Identifying and documenting entry-level workforce requirements for data collection
- Identifying contacts, links, and websites (issues, permissions, rate limiters, etc.)

## Community Support

- Identify federal/state/industry partners

***The objective is to match academic programs offered by designated NCAE-C participating institutions to job postings***

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# Cooperative Learning

Dr. Barbara Endicott-Popovsky (bendicot@norwich.edu)

Mr. Ran Hinrichs (rhinrich@norwich.edu)

## Task

Collaborate with employers and NCAE-C institutions to establish at least one cooperative education program in each NCAE-C region.

## Recent Accomplishments

- Completed first pilot in Pacific Northwest
- Leverages snap in/out co-op content (CompTIA, RedHat, EC-Council)
- Uses rubric based on CAE-C Competency elements, NICE Framework (DCWF in the future), and regional employer requirements
- Leverages world-wide faculty, mentors, apprentices, companies.
- Expanding to SW Region in Year 2





# Cooperative Learning Approach

**Cybersecurity in a box:** self-contained, sustainable, and holistic approach to teaching CAE-C certified curriculum with: Competencies / Mentors / Corporations / Work product / Wellness

## Components

- Assessment: cybersecurity competency assessment
- Baseline: NCAE-C certificate in risk management
- Industry: integration of EC-Council & iQ4
- Mentors: stipend-based milestone delivery with industry
- Apprenticeship: Optiv: consulting, architecture, SOC, & GRC
- Placement: CyberWallet

## Community Support

AY 23/24, develop pilots in 1-2 NCAE regions

**Looking for partners!**

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# Student Professional Development

Kelli Burgin ([kelli.burgin@montreat.edu](mailto:kelli.burgin@montreat.edu))

## Task

Provide students' access to programs that develop and document the employability skills necessary for success in a cybersecurity career

## Recent Accomplishments

- Completed Cybersecurity Ethics Book and Cybersecurity Curriculum  
<http://cybersecurityoath.com>
- Embedding Cybersecurity Ethics/Professional Skills challenge into Cyber Competency initiatives
- Creating version 1.0 of Professional and Ethics "Toolbox" for students/schools to use for Professional Development Skills (Career Videos, curriculum, etc.)
- Uploaded to clark.center Guide for Professionalism/Ethics Curriculum Pilot Project

## Community Support

- Extending the student professionalism pilot program to at least one school in each region via virtual/hybrid train-the-trainer. **Need volunteer CAEs!**
- Feedback once products are disseminated

# NCAE-C Cybersecurity Credit Transfer Agreement (CTA)

Dr. Michael Tu (Michael.Tu@pnw.edu)

## Task 1

- Compile an initial set of cybersecurity credit transfer agreements
  - 2Y to 4Y CAE programs CTAs, K-12 to CAE Institutions CTAs
- **Recent Accomplishments**
  - CTA status survey created, IRB approved, and distributed to CAE community
    - CAE-C community Team, CAE regional Hubs, NSA CAE PMO (**Thank you!**)
  - Response received: **223** CAE institutions

## Task 2

- Facilitate cybersecurity credit transfer agreement development
- **Recent Accomplishment**
  - New CTA development promotion material under development (Posters)
  - Received **34** CAE schools with interests to develop new CTAs with K12 schools
  - Virtual workshop under Plan with DCE/Concurrent Enrollment Expertise

## Task 3

- Establish a database of the credit transfer agreements
- **Recent Accomplishment** collecting survey responses

**Community Support:** Please **respond** to the CTA status survey!

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# Rebuild K-12 Database with CAE-C Institutions

Thomas (Tony) Brown (tbrown@forsythtech.edu)

## Recent Accomplishments

- Rebuilt K-12 Database. 400+ schools are now in the Database!
- Previous schools that did not redesignate were eliminated
- Talked with CAE National Center to incorporate the database on the Map page, highlighting all CAE Schools and their programs of study

## Year 2 Initiatives

- Work with Perdue NW and Dakota State to collect Articulation Agreements from CAE schools (Form Based)
- Submit a list of schools and Articulation Agreements to the CAE National Center to post on the Map page
- Work on procedures for CAE Schools to update their school and Articulation Agreement information on the CAE Community Map page
- Continue to support CPNC where needed

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