



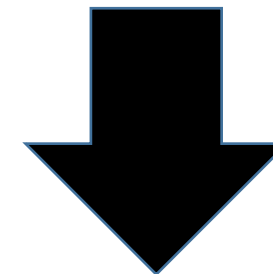
# Past NCX Winners



**First** NCX Winner: 2018  
U.S. Naval Academy



NCX Winner: 2021  
VIRTUAL  
U.S. Naval Academy



NCX Winner: 2019  
U.S. Air Force Academy



## WHAT IS THE PILOT CAE-NCX?

The CAE-NCX, which goes from the classroom to the cyber war room, helps to advance cybersecurity through education and training to develop and test cybersecurity skills, teamwork, planning, communication, critical thinking, and decision-making. It helps to prepare the competitors to become future cyber warriors and leaders, ensuring our national defense.

CAE-NCX's goal is for students from the NCAE in Cybersecurity to walk away with enhanced skills and knowledge to help meet the ever-evolving cyber threat in support of our Nation.

A trophy is awarded to the winning educational institution to be displayed for one year before its return to NSA.

## **CAE-NCX: ENVIRONMENT OF TRUST**

All NCX staff from NSA and all CAE participants, coaches, staff, and instructors competing in CAE-NCX 2022 will demonstrate total honesty and integrity while refusing to cheat or mislead in any form. NSA wants to ensure an honorable environment that demonstrates good ethics and character during the exercise that creates trust.

# NCX 2022: SCORING/FORMAT/SCHEDULE

## Scoring

- Modules 1-4: 15%
- Cyber Combat Exercise: 40%

## Format

April 11, 2022	April 12, 2022	April 13, 2022
MODULE 1 (4 hours) 15%	MODULE 3 (5 hours) 15%	MODULE 5 Cyber Combat Exercise (8 hours) 40%
MODULE 2 (4 hours) 15%	MODULE 4 (4 hours) 15%	NCX Trophy Presentation



# WHAT ARE THE MODULES?

- Active Attack - given live traffic, teams must devise and implement undetectable ways to intercept, manipulate or record targeted data in-motion within the environment
- Cryptography - teams are given an encryption scheme and must devise successful cryptographic attacks that reveal plaintext traffic and/or encryption keys
- Data Analysis (BIG DATA) - teams are given a large dataset and must identify specific data within it and produce predictive algorithms to proactively identify similar data in a live stream
- Forensics - teams determine nature and severity of an attack that already occurred
- Malware - teams build a passive-payload attack
- **Policy** - teams craft intelligent government policy regarding cyberspace and cyber activities
- Reverse Engineering - teams understand and counter a hardware-based attack against a friendly system
- Software Development - teams design specification for a simple software application on a given platform and must design a functioning version. It is incrementally attacked by an adversary and the developers are given an opportunity to patch their software before the next attack.
- **Cyber Combat Exercise** – an eight-hour scenario-based continuous, live-fire computer network attack and defend exercise in an educational and competitive learning environment

# NCX 2022: VIRTUAL FACILITATION

- 11-13 April 2022
- Credentials verified prior to NCX
- Provide introductory comments, overview, Rules of the Road, and expectations
- Centrally-located webpage with links to resources/tools
- Single URL for access to all modules
- Visibility of participants to Government staff
- Single communications tool (chat/email/MS Teams)

# CAE-NCX 2022: SCHEDULE

Virtual Environment Monday, April 11, 2022		Virtual Environment Tuesday, April 12, 2022		Virtual Environment Wednesday, April 13, 2022	
Welcome Remarks	0700-0710	Opening Remarks	0700-0710	Opening Remarks	
Module: CRYPTOGRAPHY	0710-1210	Module: POLICY	0710-1140	Cyber Combat Exercise	
Survey	1210 - 1225	Survey			
HOTWASH	1225 - 1255	HOTWASH			
<b>LUNCH</b>	1255-1330	<b>LUNCH</b>	1140-1230	<b>LUNCH</b>	
Module: MALWARE	1330 - 1730	Module: SOFTWARE DEVELOPMENT	1230-1600	Cyber Combat Exercise	
Survey	1730 - 1745	Break/Review/Survey			
HOTWASH	1745 - 1815	HOTWASH			
			1615-1630	Closing Remarks/Trophy Presentation	

Due to manual scoring, the CRYPTOGRAPHY MODULE will last 3.5 hours

# CAE-NCX 2022: TEAMS

## Number

- 3 teams each school

## Size

- 4 students per team

## Roster

- maximum 36 students

Participants must be U.S. Citizens

# NCX 2022: RULES

U.S. Citizen

Tools do not need to be publicly available but must be developed by students (not coaches/staff)

Cameras must be turned on

# NCX 2022: EXECUTION

## Contractor will participate in monthly teleconferences

- Starting in February 2022

### Modules

- Themed and interconnected, no scenario, challenge, task, etc. has been used before
- LINUX platform
- Central website/URL
- HOTWASH (except for Cyber Combat Exercise)
- Single telecommunication tool that is monitored
- Help to ensure “cameras on”
- Cryptography – 3.5 hours to allow for manual scoring
- Malware – one part is to develop an exploit in programming language of choice
- Policy – provides immediate feedback to Team Captain
- Software Development – two phases; build and break
- Cyber Combat Exercise – Challenge questions and attack/defend activity; announce phases of Setup, Configuration, and Conflict



# NCX 2022: MODULES

- Themed and connected - to extent possible
  - Cryptography – teams are given an encryption scheme and must devise successful cryptographic attacks that reveal plaintext traffic and/or encryption keys
  - Malware – teams build a passive payload attack
  - Policy – teams craft intelligent government policy regarding cyberspace and cyber activities
  - Software Development – teams design specification for a simple software application on a given platform and must design a functioning version. It is incrementally attacked by an adversary and the developers are given an opportunity to patch their software before the next attack
  - Cyber Combat Exercise – an 8-hour scenario-based continuous, live-fire computer network attack and defend exercise in a educational and competitive learning environment

# NCX 2022: TECH TALKS & HOTWASHES

## Tech Talks

- Fall academic semester – basic
- Spring academic semester – more advanced

Module	Session 1	Session 2	Session 3	Next semester
Cryptography	Tuesday, September 21, 2021 1930-2030	Thursday, September 23, 2021 1930-2030	Tuesday, September 28, 2021 1930-2030	January 2022
Policy	Tuesday, October 26, 2021 1930-2030	Thursday, October 28, 2021 1930-2030		February 2022
Software Development	Tuesday, 30 November, 2021 1930-2030	Thursday, 2 December, 2021 1930-2030		March 2022
Malware	TBD	TBD		February 2022

## Hotwashes

- 30-minutes in length
- Immediately following each module (exception: Cyber Combat Exercise)

# ACTIONS

- Determine school participation – 12 November
- Determine standing CAE-NCX 2022 Monthly Teleconference date/time (November, January, February, March, April)
- Forward PAO names/addresses to Bill Holly
- Determine POCs – Forward POCs /EMAIL/PHONE to Bill Holly
- Bill Holly to provide NSA's Policy reading list NLT 10 November
- Policy Reading List (PARSONS) – approx. 20 January 2022
- Rules of Engagement – approx. 10 February 2022
- Resource List – approx. 10 February 2022
- Teams/Roster Template – due 18 February 2022
- Credentials – confirmed at least five days prior (team captains)

# QUESTIONS



## CAE-NCX 2022: SMC DISCUSSIONS

- Team Composition (how to you decide who is on a team?)
- Team Training (how do your teams train?)
- Team Sharing (during competition, do you share between teams?  
Intent is for ALL teams to be competing individually.)

Round-Robin Order: Norwich University, The Citadel, and UNG.