Cyber Operations
Centers of Academic Excellence

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Why a Second “Cyber” Center of Academic Excellence?

Cyber Operations

- Cyber Ops Work Roles & KSAs

Cyber Ops Knowledge Units

Information Assurance/Computer Defense

- IA/CD Work Roles & KSAs

IA/CD Knowledge Units

Common Core

- Specialized Cybersecurity Workforce
- IA Workforce
- CNSS Training Standards

Cyber Operations Knowledge Units

- IA Workforce
- CNSS Training Standards

Specialized Cybersecurity Workforce

- IA Workforce
- CNSS Training Standards
“Cyber Operations” CAE: Next Steps

• Continue to work closely with the National IA Education & Training Program (NIETP), linking new “Cyber Operations” program to existing CAE-IAE/R program

• Present final program requirements and criteria at the CAE principals meeting in November 2011

• Applications for 2012 designation accepted until 15 January 2012

• Designations announced at CISSE in June 2012
Increase cyber human capital capacity for our Nation by promoting \textit{deeply technical, inter-disciplinary}, higher education programs that will produce a large number of professionals with expertise in various disciplines related to specialized cyber operations.

\begin{quote}
While IA can be classified as “cyber,” “cyber” goes beyond traditional IA.

Therefore, the “Cyber Operations” CAEs would be a complementary program, likely involving a smaller subset of schools who will offer a cyber operations focus in their academic programs.
\end{quote}
The CAE-IAE has:

- Directed the attention of academia to the importance of the field, stimulated the number of students enrolled in Information Assurance (IA), and improved the breadth and depth of IA curricula.
- Improved campus security awareness and posture.
- Created collaborative community of institutions dedicated to IA; enabled specialized communities of practice; increased and sustained opportunities for networking interactions with Government, Academia, and Industry.
- Provided institutions with capacity building grants that have increased and improved the availability of qualified faculty and professionals.
- Through the National Science Foundation, provided students with scholarships for IA study.
The CAE-Cyber Ops will:

- Strengthen the CAE designation as an indicator of excellence.
- Implement a rigorous validation process building on ABET accreditation requirements to provide deep visibility into the content of the institution’s academic program.
- Require and benefit from a strong SEAL-School relationship.
- Provide a classified element to expose Cyber Operations students to information that will deepen their understanding of the application of the knowledge they are gaining.
- Prepare students with sufficient CNO technical knowledge to allow employers (e.g., NSA, USCC) to focus on teaching unique, organization specific tradecraft.
Draft/Proposed Academic Requirements for New “Cyber Operations” Program

- Systems Level Programming
- Reverse Engineering
- Networking & Telecommunication Technology and Protocols
- Operating Systems Theory
- Discrete Math
- Overview of Cyber Defense and Exploitation Techniques
- Cyber Operations Planning and National Cyber Resources

- Secure Coding Principles
- Embedded Systems
- Network, System, Device and Data Forensics
- Applied Cryptography
- Foundational Security Principles

Required

Recommended
Draft/Proposed Programmatic Criteria for New “Cyber Operations” Program

- Existing, high quality programs in CS, CE, Network Technologies, EE
  - ABET accreditation or demonstrated equivalence

- Cyber Operations treated as an inter-disciplinary science

- Cyber related academic program is robust, active and up-to-date
  - On-site review of curricula (course content, schedule, updated cycle, professor) focusing on areas not addressed by ABET

- Faculty must be active in current Cyber Operations research
  - Research with peer reviewed results and publications
  - Government and/or industry partnerships on projects

- Academic Program encourages student research in Cyber Operations topics
  - Need for government to provide topics

- Students participate in cyber “service learning” activities (e.g., community outreach K-12, cyber competitions)

- Participation in classified component of Cyber Operations CAE Program
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