

Educating IA Professionals

Building the IA Workforce

Julie Ryan

Assistant Professor

The George Washington University

Washington, DC

The First Question



- What’s an “IA Professional”?
 - The IA field is very complex
 - Analogous to “medical professional”
 - Whole range of doctors
 - Pathologists to pediatricians to brain surgeons
 - Whole range of nurses
 - LPNs, RNs, Nurse-anesthetists, etc
 - Whole range of other specialities
 - Pharmacists, lab technicians, etc
 - Medical administrators
 - From insurance claims processors to hospital managers
- Bottom line:
 - An “IA Professional” can be a lot of different people

Given That....



- To build an IA Workforce, must address each area
- Opportunities for education
 - Technical education
 - From electrons to data structures
 - Practical training
 - From configuring firewalls to patch management
 - Legal education
 - From law enforcement to intellectual property law
 - Engineering education
 - From systems engineering to security architectures
 - Management education
 - From policy development to resource allocation

A complete IA workforce needs all those elements

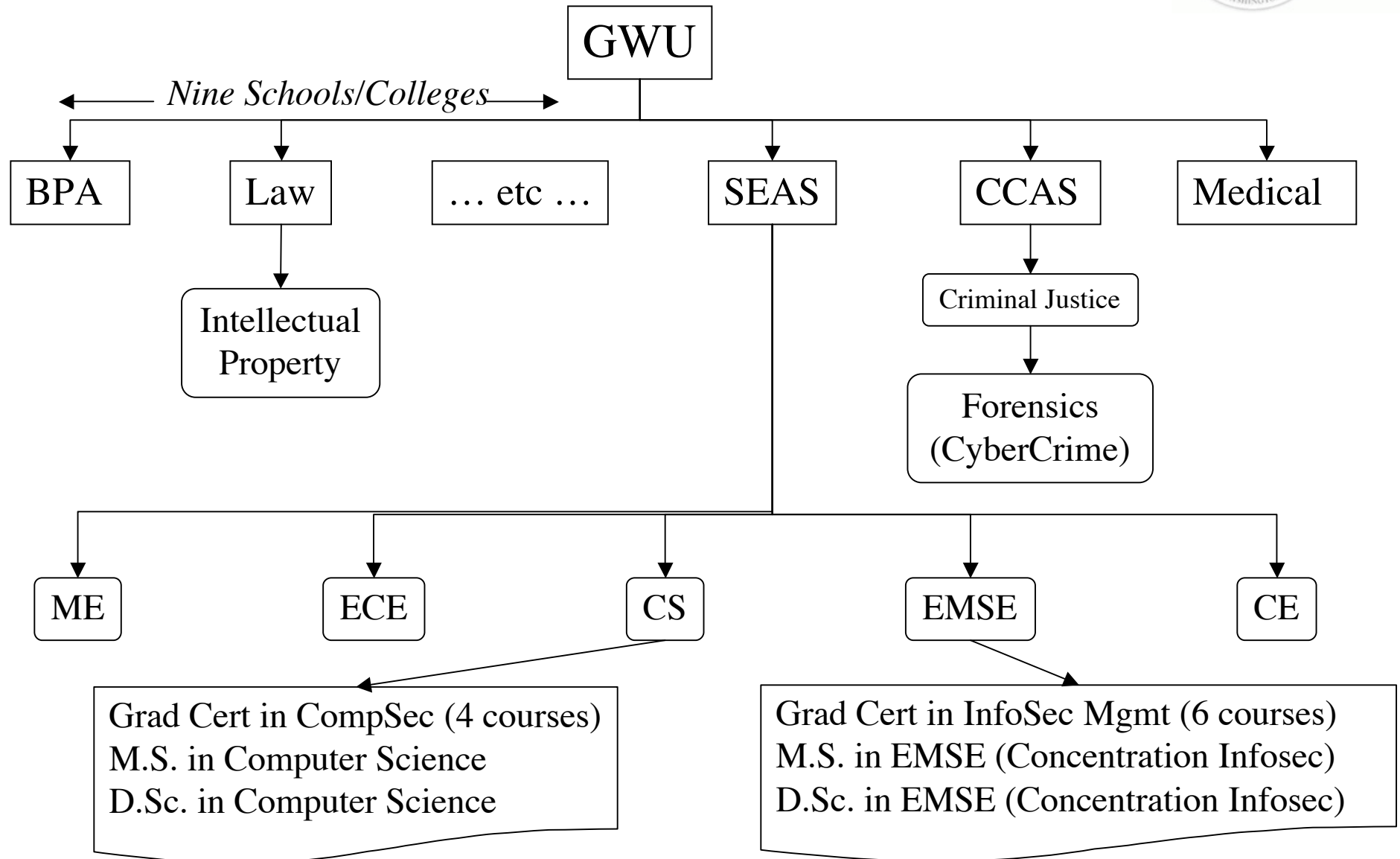
And they all need to work together

Challenges



- Not all employers recognize the needs
- Employees are handicapped
 - By previous education
 - By effects of the go-go 90s
 - By perceptions about what an IA professional is
- Educational institutions are biased
 - By lack of understanding/knowledge
 - By perception that “anyone can teach security”

Our Approach



The EMSE Approach


- The Graduate Education Certificate (also the MS Core)
 - EMSE 218: Intro & Overview
 - Everything at a micron deep
 - EMSE 315: Law
 - Contracts, Case law, torts, ethics, etc
 - EMSE 312: Protect (minus Crypto)
 - Personnel, Physical, Ops, Computer, Network, etc
 - EMSE 313: Crypto
 - All crypto, all the time
 - EMSE 314: Detect
 - Audit, monitor, IDS, etc
 - EMSE 316: React/Correct
 - Biz continuity, crisis mgmt, recovery
- The MS Electives (2 of...)
 - EMSE 317: Cybercrime
 - Criminal law, forensics processes
 - EMSE 318: Info Ops
 - Effect of global economy on security
 - EMSE 319: Emerging Issues
 - Wireless security
 - EMSE 320: E-Commerce
 - How to, how to secure
- The EMSE Core requirements for all MS tracks
 - EMSE 212: Mgt of Tech Orgs
 - EMSE 260: F&A for Engr Mgrs
 - EMSE 269: Decision Theory
 - EMSE 283: Systems Engineering


Topics Covered



- The short list:
 - Threats
 - Vulnerability assessments
 - Risk management
 - Secure computing
 - Operational security
 - Admin security
 - Policy
 - Law
 - Ethics
 - Network security
 - Life cycle management
 - Personnel security
 - History of computer security
 - History of comms security
 - Crypto, crypto, crypto
- And more....
 - Common Criteria
 - Rainbow series
 - Auditing
 - Monitoring
 - Intrusion detection systems
 - Crisis management
 - Business continuity planning
 - Resource allocation
 - Security engineering
 - Malicious software
 - Trust
 - Passwords
 - Authentication
 - Access control
 - And still more

What We Don't Teach

- Computer Science
 - Not a single line of code generated
 - Not a single algorithm developed

Computer Science
Dept does this
- Electrical Engineering
 - Not a single circuit analyzed

Electrical & Computer
Engineering Dept does this
- Hands on skills
 - Not a single firewall configured
 - Not a single system administrated
- Hacking
 - Cover the theory in advanced classes but forbid them to do it
- BUT!
 - We do teach them why each and every element of those specialties is a critical component of security engineering and management

Why?



- The demand is there
 - Huge requirement for education of non-computer science types
 - Weapons acquisition managers
 - Program managers of all other sorts
 - The other engineers increasingly required to work with IT
 - Senior executives forced to deal with security issues
 - Business types in the IT workforce with no computer science background
 - Strongly believe in the systems engineering approach to security in operational environments
 - Solution in real world is not a computer science problem

Student Outcomes



- Who Hires Our Graduates?
 - The government
 - Defense contractors
 - Large corporations
- Demand is driven by:
 - Demographics of the DC metro area
 - Requirement for knowledge to apply to large systems

Contact Information



Julie J.C.H. Ryan, D.Sc.

1776 G. Street NW #110

Washington DC, 20052

jjchryan@gwu.edu

<http://www.seas.gwu.edu/~infosec/>



The George Washington University is an NSA Certified Center of Academic Excellence in Information Assurance Education. We offer Graduate Certificate, Master's, and Doctoral level education in Information Security Management for professionals from all educational backgrounds. GWU is located in the heart of Washington DC very near the White House and other government offices.

<http://www.seas.gwu.edu/~infosec/>