SOFTWARE ASSURANCE FORUM

BUILDING SECURITY IN

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DHS-DoD-DoC Software Assurance Forum Working Group on Workforce Education and Training Status Briefing

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Three Current Areas of Interest

- Revisions of “recommended” higher education curricula
- Higher education course offerings
- Certification of personnel

Computer Science Undergraduate Curriculum Revision (CS2008?)

CS 2001 Interim Review Contents

June 2008

wiki.acm.org/cs2001/index.php

Sam Redwine

CS Revision Motivations for Security

- "**The emergence of security as a major area of concern"**
- "But in addition topics such as **security have gained a greater degree of prominence**. **These considerations have caused some adjustments to the core** in CS2008."
- "Review Task Force has **received urgent requests from industrialists requesting that substantial attention to security matters be regarded as compulsory for all computing graduates**."

Topic of Security within Curriculum

- Core topic in:
  - Net-centric computing
  - Information Management (but little time allocated)
  - Social and Professional Issues (Privacy, Intellectual Property)
  - Software Engineering (Project Mgt.)
- Elective topic in:
  - Operating systems
  - Human Factors
  - Social and Professional Issues (Operations, Crime)
  - Software Engineering (Many places including as major sub-topic area)

Not covered in: Discrete structures, Graphics and visual computing, Algorithms and complexity, Intelligent systems, Architecture and organization, Computational science

Sw. Eng. Body of Knowledge Revision

- An effort to do a “quick fix” via a number of small changes is underway
- Later a Specialized and Contributed Knowledge Area on Software Security will be produced for passage through consensus process
- SWEBOK is a key input for software engineering curriculum revision

Graduate Sw. Eng. Curriculum Project

- Early draft of Graduate Software Engineering Reference Curriculum (GSwERC) v 0.25 February 29, 2008 had no mention of security in curriculum
- Input was supplied regarding this
- GSwERC v 0.50 October 2008 should have security related content

IS2002 Undergraduate Curriculum

- Covers security and/or privacy under fundamentals, networks, ebusiness, policy, hardware and systems software, database design and administration, and personal productivity, but not under application systems other than ebusiness
- Revision underway, reportedly a number of changes will occur related to security and risk

MSIS 2006 Course Content

Course	Security	Compliance
• IT Infrastructure	2	1
• Analysis, Modeling, and Design	1	1
• Enterprise Models	1	
• Emerging Technologies and Issues	1	
• Project and Change Mgmt.		
• Strategy and Policy	1	1
• Implications of Digitization	2	1
• HCI		
• Integrated Capstone	1	2

1=strong, 2=weak, blank=none

IT Core Topics: Instructional Hours

- IAS. Information Assurance and Security (23 core hours)
- IPT5. Software Security Practices (4)
- NET4. Security (2)
- SP4. Intellectual Property (2)
- SP9. Privacy and Civil Liberties (1)
- WS5. Vulnerabilities (1)
- 33 instructional hours out of 313 for core

Also: SP5. Legal Issues in Computing (2)

Comments provided

Conclusion

- Computer Science and Information Technology draft revised curricula have significant security-oriented content
- SWEBOK revisions underway to include security; GSwERC v.0.50 should have some coverage
- IS undergraduate emphasizes ebusiness; revision of masters level has “strong” security-related content in many areas
- IT little concerned with software internals
- The good news is, the situation will be improving in many curricula
  - And by the end of revisions may be even better than current drafts

Course Offerings in Higher Education

- Increasing number of software secure programming and security testing courses being offered –
- A few covering software engineering or HCI
- But search of web does not reveal large numbers of software security courses
- Not clear how much is being integrated into existing courses

Recent Efforts in Professional Certification

- New ISC2 Certified Secure Software Lifecycle Professional (CSSLP (cm)) is designed to validate secure software development knowledge and best practices
- QAI revising Software Certifications Programs to include security (not all being done immediately)
  - QAI Professional Certifications include:
    - Certified Software Quality Analyst (CSQA)
    - Certified Software Tester (CSTE)
    - Certified Software Project Manager (CSPM)
    - Certified Manager of Software Testing (CMST)
    - Certified Manager of Software Quality (CMSQ)
- SWEBOK revision will affect content of IEEE Computer Society Certified Software Development Professional (CSDP)
- Also remember: SANS Programming-related effort (covered in prior forums)

Conclusion

- Revisions of “recommended” curricula: substantial improvements occurring
- Higher education courses: appears gradual increase although good data is lacking
- Certification of personnel: Three new efforts/revisions underway