



Stevens Software Assurance Strategy – Preliminary

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Summary

- Graduate Software Assurance Curriculum Recommendations, sponsored by DHS and..., is expected to be released soon
 - Close informal ties to GSwE2009
 - One of the Stevens faculty members, Dr. Mark Ardis, has been a member of the team responsible for the recommendations
- Stevens Software Engineering fully supports curriculum
- In Fall 2010, Stevens will Launch a MS in Software Engineering with a concentration in Software Assurance

Doctoral Degree in Systems Engineering (60 credits, post Master's; minimum 30 research credits)

Master of Science in Software Engineering (SSW) (10 courses/30 credits)

Core Course Requirements

All students must take:

SSW 540: Fundamentals of Quantitative Software Engineering
SSW 533: Software Estimation and Measurement
SSW 800: Masters Project

Additional required courses:

SSW 564 Software Requirements Analysis and Engineering
SSW 565 Software Architecture and Component-Based Design
SSW 567 Software Testing, Quality Assurance and Maintenance
4 Electives (Advisor Approved)

SOFTWARE ENGINEERING

SSW 540: Fundamentals of Quantitative Software Engineering
SSW 533: Software Estimation and Measurement

Plus two of the following courses:

CS 573 Fundamentals of CyberSecurity
SSW 564 Software Requirements Analysis and Engineering
SSW 565 Software Architecture and Component-Based Design
SSW 567 Software Testing, Quality Assurance & Maintenance
SSW 687 Engineering of Large Software Systems
SSW 689 Software Reliability and Safety Engineering

11/30/09

SYSTEMS-CENTRIC SOFTWARE ENGINEERING

SSW 540 Fundamentals of Quantitative Software Engineering
SYS 625 Fundamentals of Systems Engineering
SYS 612/MGT 609 Project Mgt. for Complex Systems
SSW 565 Software Architecture and Component-Based Design

SOFTWARE DESIGN & DEVELOPMENT

SSW 565 Software Architecture and Component-Based Design
SSW 555 Agile Methods for Software Development
CS 574 Object-oriented Design and Analysis
CS 546 Web Programming
or CS 548 Engineering of Enterprise Software Systems

SOFTWARE PROGRAM MANAGEMENT

SSW 540 Fundamentals of Quantitative Software Engineering
SSW 533 Software Estimation & Measurement
SYS 612/MGT 609 Project Management for Complex Systems
SSW 687 Engineering of Large Software Systems

DEPENDABLE SYSTEMS

SSW 540 Fundamentals of Quantitative Software Engineering
SSW 565 Software Architecture and Component-Based Design
SSW 689 Software Reliability & Safety Engineering
CS 573 Fundamentals of Cybersecurity
or SES 602 Secure Systems Foundations

SOFTWARE ACQUISITION AND INTEGRATION

SSW 540 Fundamentals of Quantitative Software Engineering
SSW 564 Software Requirements Analysis and Engineering
SSW 687 Engineering of Large Software Systems
SYS 605 Systems Integration

FINANCIAL SOFTWARE ENGINEERING

SSW 540 Fundamentals of Quantitative Software Engineering
SSW 687 Engineering of Large Software Systems
or SSW 689 Software Reliability and Safety Engineering
FE 510 Introduction to Financial Engineering
FE 595 Financial Systems Technology

Graduate Certificates (4 courses/12 credits)



Software Assurance Concentration: Implementation Strategy

- Additional software assurance material will be added to the 5 core software engineering courses
 - Consistent with program's focus on dependable, trusted systems
- Capstone Project will be (for SA students) in software assurance area
- 4 additional required courses
 - SES 602/603 - Existing Systems Engineering Security Courses: Fundamentals and Lab -
 - Supplemented with additional material if required
 - SSW 655: Trusted Systems Software Development Techniques
 - New course
 - SSW 689: Software Reliability and Safety Engineering
 - Supplemented w/ additional software assurance material if needed



Secure Systems Foundations: SES 602

- SES 602 encompasses all aspects of systemic security issues. Systemic security components include infrastructure as well as information attributes, disruption profiles, identity management, security information management, and recovery alternatives. The course also addresses human and workforce components of security such as governance processes, technology management, and enterprise systems operations. SES 602 provides a solid background in systemic methods, tools, and procedures for value preservation in an environment of changing threats. It covers all concepts important in evaluating enterprise security design alternatives.



Secure Systems Laboratory: SES 603

- SES 603 extends the Secure Systems Foundations course, SES 602 by providing a hands-on environment to explore the concepts learned in SES 602. It includes exposure the methods, processes and tools that are commonly used to implement security features as well as those used by attackers to breach system security. Students will be divided into teams which alternately assume role and responsibilities of enterprise management, enterprise administration, enterprise operations, and enterprise adversary. Challenging lab scenarios will provide students with experience in executing the responsibilities associated with each role

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- SSW 533: Software Estimation and Measurement
- SSW 800: Masters Project

Additional required courses:

- SSW 564 Software Requirements Analysis and Engineering
- SSW 565 Software Architecture and Component-Based Design
- SSW 567 Software Testing, Quality Assurance and Maintenance
- 4 Electives (Advisor Approved)

SOFTWARE ENGINEERING

- SSW 540: Fundamentals of Quantitative Software Engineering
- SSW 533: Software Estimation and Measurement

Plus two of the following:

- CS 573 Fundamental CyberSecurity
- SSW 564 Software Requirements Analysis and Engineering
- SSW 565 Software Architecture and Component-Based Design
- SSW 567 Software Testing, Quality Assurance and Maintenance
- SSW 687 Engineering of Large Software Systems
- SSW 689 Software Reliability and Safety Engineering

SYSTEMS ENGINEERING SOFTWARE ENGINEERING

Software Assurance Certificate (TO BE ADDED)
 SES 602 System Security Fundamentals
 SES 603 System Security Lab
 SSW 655
 SSW 689 Software Reliability and Safety Engineering

SOFTWARE PROGRAM MANAGEMENT

- SSW 540 Fundamentals of Quantitative Software Engineering
- SSW 533 Software Estimation & Measurement
- SYS 612/MGT 609 Project Management for Complex Systems
- SSW 687 Engineering of Large Software Systems

SOFTWARE ACQUISITION AND INTEGRATION

- SSW 540 Fundamentals of Quantitative Software Engineering
- SSW 564 Software Requirements Analysis and Engineering
- SSW 687 Engineering of Large Software Systems
- SYS 605 Systems Integration

DEPENDABLE SYSTEMS

- SSW 540 Fundamentals of Quantitative Software Engineering
- SSW 565 Software Architecture and Component-Based Design
- SSW 689 Software Reliability & Safety Engineering
- CS 573 Fundamentals of Cybersecurity
- or SES 602 Secure Systems Foundations

FINANCIAL SOFTWARE ENGINEERING

- SSW 540 Fundamentals of Quantitative Software Engineering
- SSW 687 Engineering of Large Software Systems
- or SSW 689 Software Reliability and Safety Engineering
- FE 510 Introduction to Financial Engineering
- FE 595 Financial Systems Technology

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Graduate Certificates (4 courses/12 credits)



Operational Rollout Details

- Due to importance of program to industry and government, it will be offered as a cohort in fall of 2010 in Hoboken
- Course Rollouts – Initial Offerings
 - Fall 2010 -- SSW 540, 564, SSE 602, 603
 - Spring 2010 – SSW 533, 565, 567, 655 (Programming course)
 - Fall 2011 – SSW 689 and 800 – Master's Project
- Implementation strategy
 - Step 1: (Fall 2010)
 - Additional SA required material will be overlaid on first four courses (all existing)
 - If due to time constraints, some required SA material is not available, will offer special on-line supplemental modules at a later date.
 - Step 2: (Spring 2010)
 - Additional SA required material will be overlaid on next three courses,
 - New course (655) will be piloted
 - Step 3: (Fall 2010-> Fall 2011)

6/30/2010 • SA material will be integrated into existing courses (plus 1 new course).



Issues

- SA recommendations not yet publicly available
- Lots of details to be worked