

t.SSI - Software-Sicherheit

Person responsible for the course: Marc Rennhard, rema

Responsible OU:

ECTS: 4

Valid for: 2012/2013

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Expertise:

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Methodological skills:

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Social skills:

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Personal skills:

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Learning objectives:

The students get a profound introduction to software security. The focus is in the areas "secure software development process", "security-testing of software and systems", and "secure software development with Java". In particular, the students will learn the following competencies:

- You know and understand what must be considered during secure software development.
 - You can apply the principles of secure software development to an arbitrary software development process to turn it into a secure software development process.
 - Using appropriate methods and tools, you can test applications and systems with respect to security and exploit uncovered vulnerabilities.
 - You know typical, security-critical programming errors that are often made and know how you can prevent them in your own programs.
 - You are capable of developing secure Java applications (with a focus on Java EE web applications) by appropriately using the security features provided by Java and security libraries.
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Course content:

Lecture:

Secure software development process (10 lessons)

- Introduction to software security
 - The secure development lifecycle
 - Security Design Principles / Controls
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- Security Requirements Engineering and Threat Modeling
- Security Risk Analysis

Security-testing (6 lessons)

- Finding and exploiting vulnerabilities in web applications- Security-Testing Tools: Static Code Analysis and vulnerability scanners
- Penetration testing

Secure programming with a focus on Java (12 lessons)

- Typical programming errors (buffer-overflows, race conditions...)
- Java security libraries (JCA, JCE, JSSE)
- Secure programming of web applications with Java (input validation, access control...)

Lab:

You will work on practical problems corresponding to all major topics of the lecture. The tasks are a mix of security analysis, security design, security-testing and secure programming with Java.

Previous knowledge:

SWE (Software Engineering) and ISI (Internet-Sicherheit) recommended

Teaching method:

| Type of lesson: | Number of lessons per week: |
|--------------------|-----------------------------|
| Lecture | 14*2 |
| Tutorial/Practicum | 14*2 |
| Block instruction | |

Assessment:

According to the table or as specified in writing by the lecture at the beginning of the semester!

| description | type | form | scope | assessment | weighting |
|---|-------------|--------------------|------------|--|-----------|
| Performance records during school hours | Graded labs | Written and orally | All labs | Points that are added to the points achieved in the final exam | 20% |
| Semester end exam | Test | Written | 90 minutes | Grading | 80% |

Language of instruction:

Deutsch

Instruction material:

Lecture slides with additional comments

Additional literature:

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Comments:

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