Principles of Secure Software Design

Course introduction

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• **Raimundas Matulevičius**, PhD, Professor

  – **Since February 2019:**
    Professor of Information Security at the University of Tartu, Estonia

**My research interests:**

– Elicitation of Security Requirements
– Model driven security engineering
– Privacy by design solutions
On successful completion of this course

• Identify causes and consequences of (lack of) system and software security

• Master essential techniques to reduce and avoid system and software security problems, to introduce and reason on security requirements and controls

• Apply advanced modelling techniques (notations, tools, and processes) to build secure systems and software
Previous Year Feedback

• Focus on the assignments and practice session.
• Having exercises after every class (almost every) cemented the implementation of models and reinforced the notes presented in the lecture.

• It is an awesome course, if you pay attention and work every week.
• The amount of independent work was quite a lot. It took about 6 hours per week to do properly. But it had to be done to learn about the topic.

• This course killed all my two days every week during the semester.
• This course will destroy most of your free time in second semester and at the end don't expect to get good grade. Just be happy that you will pass this course.
Practical usefulness

• I did not achieve anything useful. Models we learned there have no useful outcome in my profession as Cyber Security professional.

• Topics that where covered in his course are useless - by my 15 years IT field working experience.

• Stop teaching stuff that no one is using and focus more on the modeling languages actually in use in corporations, that is what the students need.

• <…>
Practical usefulness

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Topics that were covered in this course are useless by my 15 years IT field working experience.

On 19 Apr 2017 …

I am currently doing my traineeship in European Central Bank and I was appointed into the Architecture department of the Security and Architecture Division. At the beginning of your course, while finding the topic of modelling interesting, I thought that the real world applications would be non-substantial. While being here I have been immersed into the work of high level system architects and knowledge gained in your course has made getting on track here a lot easier as a lot of the work evolves modelling using ARIS approach. The topic has started to intrigue me … <...>
Practical usefulness

- On 8 Jun 2018, at ...

I would like to thank you for the course. I found it helpful, and now I am looking forward to finding the application for learned modeling techniques not only in the System Security domain. One of the biggest discoveries was also the **UML Class Diagram**. Seems like pretty generic and trivial thing to know, but I wasn't familiar with it before. Now it helps me in the work. You did also a good job in structuring the material. The course became challenging closer to the end, and the learning curve was quite organic. <...>

- On 19 Apr 2017 ...

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Institute of Computer Science Cyber Security alumnus Ilhan Çelebi won the Swedbank employees' technical thesis award for his work on privacy modelling language for GDPR compliance. <…> Extension of Secure Tropos!!! <Raimundas comment>

21.09.2018

About the Course

- Course material
  <https://courses.cs.ut.ee/2020/SSD/spring>
  - Lectures
    - Links to slides and videos
  - Practicals
    - Tests, exercises, and workshop
  - Readings
    - Self-study material
    - Articles and other readings
## Course outline / Schedule

<table>
<thead>
<tr>
<th></th>
<th>Introduction, ISSRM domain model</th>
<th>13 February</th>
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<tbody>
<tr>
<td>2</td>
<td>Security risk, Security requirements, Metrics</td>
<td>20 February</td>
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<tr>
<td>3</td>
<td>Test 1 and exercises</td>
<td>27 February</td>
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<td>4</td>
<td>Security modelling: Securing business processes, Secure goals</td>
<td>5 March</td>
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<td>5</td>
<td>Exercises and test 2</td>
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<td>6</td>
<td>Security modelling: Securing System Functions and behavior</td>
<td>19 March</td>
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<td>7</td>
<td>Workshop (day one)</td>
<td>26 March</td>
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<td>8</td>
<td>Workshop (day two)</td>
<td>2 April</td>
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<tr>
<td>9</td>
<td>Workshop (presentation day)</td>
<td>9 April</td>
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<td>10</td>
<td>Access control</td>
<td>16 April</td>
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<td>11</td>
<td>Exercises and test 3</td>
<td>23 April</td>
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<tr>
<td>12</td>
<td>Security patterns</td>
<td>30 April</td>
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<td>13</td>
<td>Exercises and test 4</td>
<td>7 May</td>
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<td>14</td>
<td>Guest lectures</td>
<td>14 May</td>
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<tr>
<td>15</td>
<td>Secure system development approaches, Summary</td>
<td>21 May</td>
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*Test taking (only if you missed any previous)*

Changes are possible!
Available at


- Chapter presentations
  - pdf and videos
- Exercises

Password: book
Modalities and Assessment

- **Practicals** – 35 points
- **Workshop** – 25 points
- **Exam** – 40 points
Modalities and Assessment

- **Practicals** – 35 points
  - Tests and Exercises

- **Workshop** – 25 points
  - Prepared in teams (3-5 people)

To be admitted to the exam, at least 35 points from the practical assignments need to be collected during the semester

- **Exam** – 40 points
  - Closed book
  - Examples of exam tasks could be find at [https://courses.cs.ut.ee/2020/SSD/spring/Main/Exam](https://courses.cs.ut.ee/2020/SSD/spring/Main/Exam)
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<table>
<thead>
<tr>
<th>Points Range</th>
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<tr>
<td>91-100</td>
<td>A</td>
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<tr>
<td>81-90</td>
<td>B</td>
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<td>71-80</td>
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<td>61-70</td>
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<td>6-50</td>
<td>F</td>
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<tr>
<td>0-5</td>
<td>Not attended</td>
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**If you passed the course:**
• There will be no extra assignments
• You will not be allowed to retake the exam
e-mail: rma@ut.ee
Subject: [SSD2020]