Course Outline (as of 10-July-2016)

<table>
<thead>
<tr>
<th>Numerical course code</th>
<th>MTAT.03.094</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Software Engineering</td>
</tr>
<tr>
<td>Faculty/Department</td>
<td>Faculty of Mathematics and Computer Science, Institute of Computer Science, Chair of Software Systems</td>
</tr>
<tr>
<td>Amount of credits (1 ECTS = 26 hours)</td>
<td>6 ECTS</td>
</tr>
<tr>
<td>Amount of credits (before 31-Aug-2009)</td>
<td>4 CP</td>
</tr>
<tr>
<td>CP*1.5 (before 31-Aug-2009)</td>
<td>6</td>
</tr>
<tr>
<td>Duration in semesters</td>
<td>1</td>
</tr>
<tr>
<td>Final assessment</td>
<td>Differentiated</td>
</tr>
<tr>
<td>Course responsible</td>
<td>Dietmar Pfahl</td>
</tr>
<tr>
<td>Course instructors</td>
<td>Dietmar Pfahl, Svetlana Omelkova, Kristiina Rahkema, Margus Luik</td>
</tr>
<tr>
<td>Course language</td>
<td>English (lecture/exam) and English/Estonian (lab/practice sessions)</td>
</tr>
<tr>
<td>Study levels</td>
<td>Bachelor’s studies</td>
</tr>
<tr>
<td>Forms of teaching and learning</td>
<td>Lectures (incl. practical work / Labs): 56 hours Independent work: 100 hours</td>
</tr>
<tr>
<td>Study period</td>
<td>16 Weeks First lecture: 02-Sep-2016 (week 1) Last lecture: 09-Dec-2016 (week 15) First lab: 05-Sep-2016 (week 2) Last lab: 14-dec-2016 (week 16)</td>
</tr>
</tbody>
</table>

Prerequisites (must have been completed successfully before taking MTAT.03.094)
Compulsory: MTAT.03.130 Object-oriented Programming (6 ECTS, 4 CP)

Curricula containing this course
Computer Engineering (83376) mas. 2013/2014
Conversion Master in IT (144919) mas. 2016/2017
Mathematical Statistics (2474) bac. 2015/2016 2016/2017

Objectives
To obtain basic knowledge in software engineering and primary skills for working at any stage of software development projects.

Learning outcomes
Upon successful completion of this course, students will be able to demonstrate basic knowledge of and skills in:
- software engineering paradigms;
- system analysis;
- requirements analysis;
- planning;
- implementation;
- quality assurance (verification and validation; testing);
- maintenance (evolution);
- project management;
- software processes and methodology.
Course elements
The course covers:
  • software engineering paradigms
  • project management
  • system and requirements analysis
  • design
  • implementation
  • testing
  • quality management and control

Schedule of lectures (tentative – adjustments will be announced on the course wiki)
  • Week 01: Lecture 01 - Introduction to Software Engineering
  • Week 02: Lecture 02 - Requirements Engineering - I
  • Week 03: Lecture 03 - Requirements Engineering - II
  • Week 04: Lecture 04 - Analysis
  • Week 05: Lecture 05 - Development Infrastructure - I
  • Week 06: Lecture 06 - Development Infrastructure - II
  • Week 07: Lecture 07 - Architecture and Design
  • Week 08: Lecture 08 - Refactoring
  • Week 09: Lecture 09 - Verification and Validation - I
  • Week 10: Lecture 09 - Verification and Validation - II
  • Week 11: Lecture 10 - -- (no lecture)
  • Week 12: Lecture 11 - Testing Practices at Playtech Estonia (Industry Lecture I)
  • Week 13: Lecture 12 - Agile/Lean Methods
  • Week 14: Lecture 13 - Software Craftsmanship, the Codeborne Way (Industry Lecture II)
  • Week 15: Lecture 14 - Measurement / Course wrap-up, review and exam preparation
  • Week 16: -- (no lecture)

Schedule of labs (tentative – adjustments will be announced on the course wiki)
  • Week 01: -- (no labs)
  • Weeks 02-04: Requirements gathering
  • Weeks 04-06: Formalizing, modeling, planning
  • Weeks 06-08: Development infrastructure
  • Weeks 08-10: Realization - I
  • Weeks 10-12: Realization - II
  • Weeks 12-14: Automatic testing and refactoring
  • Weeks 14-16: Verification and validation

Assessment
  • Practice work / Labs (70% of total course grade) – group work (target group size: 3 students per group)
  • Written exam (30% of course grade) – individual / open book

Recommended Literature
  • Ivan Marsic: Software Engineering, 2012
    (http://www.ece.rutgers.edu/~marsic/books/SE/book-SE_marsic.pdf)
  • Ian Sommerville: Software Engineering, 9th edition, 2010
    (http://www.softwareengineering-9.com/)

Additional literature will be announced on the course wiki.