

Course Outline (as of 11-September-2013)

Numerical course code	MTAT.03.094
Title	Software Engineering
Faculty/Department	Faculty of Mathematics and Computer Science, Institute of Computer Science, Chair of Software Systems
Amount of credits (1 ECTS = 26 hours)	6 ECTS
Amount of credits (before 31-Aug-2009)	4 CP
CP*1.5 (before 31-Aug-2009)	6
Duration in semesters	1
Final assessment	Differentiated
Course responsible	Dietmar Pfahl
Course instructors	Dietmar Pfahl, Dmitri Danilov
Course language	English and Estonian (lab/practice sessions)
Study levels	Bachelor's studies
Forms of teaching and learning	Lectures (incl. practical work / Labs): 56 hours Independent work: 100 hours
Study period	16 Weeks First lecture: 06-Sep-2013 (week 1) Last lecture: 06-Dec-2013 (week 14, tentative) First lab: 09-Sep-2013 (week 2) Last lab: 20-dec-2013 (week 16, tentative)

Prerequisites

Compulsory: MTAT.03.130 Object-oriented Programming (6 ECTS, 4 CP)

Curricula containing this course

Computer Engineering (83376)	mas. 2012/13	2013/14
Computer Engineering (83866)	bac. 2012/13	2013/14
Computer Science (2476)	bac. 2012/13	1013/14

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: Introduction to Software Engineering
- Week 02: Requirements Engineering - I
- Week 03: Requirements Engineering - II
- Week 04: Analysis
- Week 05: Development Infrastructure - I
- Week 06: Development Infrastructure - II
- Week 07: Architecture and Design
- Week 08: Refactoring
- Week 09: Measurement
- Week 10: Agile/Lean Methods
- Week 11: Verification and Validation - I (incl. Software Quality)
- Week 12: Verification and Validation - II
- Week 13: Process Improvement
- Week 14: Course wrap-up, review and exam preparation (optional)
- Week 15: -- (no lecture)
- 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.