Blekinge Institute of Technology
Department of Software Engineering

Revision: 2
Reg.no: BTH-4.1.14-0910-2022

COURSE SYLLABUS

Research Methods and Master's Thesis (60 credits) in Software Engineering for Professionals

Research Methods and Master's Thesis (60 credits) in Software Engineering for Professionals

18 credits (18 högskolepoäng)

Course code: PA2592
Main field of study: Software Engineering
Disciplinary domain: Technology
Education level: Second-cycle
Specialization: A1E - Second cycle, contains degree project for Master of Arts/Master of Science (60 credits)

Language of instruction: English
Applies from: 2023-01-16
Approved: 2022-09-01

1. Descision

This course is established by Dean 2022-03-11. The course syllabus is approved by Head of Department of Software Engineering 2022-09-01 and applies from 2023-01-16.

2. Entry requirements

Admission to the course requires at least 120 credits within technology and 7.5 credits in an advanced (A1N) course in software engineering area and a minimum of 2 years of professional experience in software development (shown by, for example, a work certificate from an employer).

3. Objective and content

3.1 Objective

The aim of the course is to introduce, discuss and train a scientific approach, to familiarize yourself with current research in a chosen field and to train scientific writing. The student will also receive an introduction to social and ethical aspects of research i Software Engineering.

During the thesis work the student will in-depth knowledge, understanding, abilities and attitudes within the chosen education, as well as the opportunity to apply and synthesize the knowledge acquired during the program.

3.2 Content

The course includes the following components:

Introduction to research

o Ethics and sustainability considerations in research

o Information retrieval (finding scientific literature)

o Evaluating empirical research

o Formulating research questions

o Selecting methods for research, data collection, and analysis

o Pre-study and defining a research project

Planning, conducting, and reporting research

o Implementation (research work, progress tracking, and written report)

o Written opposition

o Oral presentation and defense

4. Learning outcomes

The following learning outcomes are examined in the course:

4.1. Knowledge and understanding

- demonstrate a broad knowledge and understanding in software engineering,
- show substantially deeper knowledge of at least one sub-area of software engineering, including a deeper insight into current research and development,

- demonstrate deeper methodological knowledge and understanding within software engineering.

4.2. Competence and skills

- demonstrate the ability to creatively, critically and independently identify and formulate scientific questions,
- demonstrate the ability to answer scientific questions using suitable methods and thereby contribute to the development of knowledge in software engineering,
- demonstrate the ability to plan, monitor and complete an independent research project within a given timeframe and supervision resources,
- demonstrate the ability to orally and in writing clearly explain and discuss his or her conclusions and the knowledge and arguments behind them, in dialogue with researchers, students at the same level in the field and lay people,
- discuss the thesis orally and in writing in English,
- demonstrate the ability to systematically and on a scientific basis apply knowledge acquired during their education, and to identify, analyze, synthesize and critically examine scientific literature.

4.3. Judgement and approach

- demonstrate the ability to systematically and critically examine both their own and others' work in relation to relevant scientific, technical, organizational, societal, and ethical aspects,
- demonstrate the ability to identify their need of further knowledge and to take responsibility for their learning,
- discuss the role of scientific research in software engineering education and practice

5. Learning activities

An academic supervisor at the university supervises each student. In addition to the academic supervisor, a student can have an external supervisor from the industry or another university.

The course runs for a full academic year and is structured in two modules: (a) an introduction module and (b) the applied module. The course starts with the introductory module with seminars, and (non-graded) exercises to provide formative feedback to the student. As part of the introductory module the student conducts a prestudy and develops a project plan. The project plan is graded by the examiner supported by independent peer reviews.

The remaining time (in the applied module) consists of independent work in the form of re-planning, executing, monitoring, and reporting a thesis and an opposition against another thesis. During the work, the student should maintain an e-portfolio in the course's learning platform where they regularly inform about the status and progress of their degree project.

The examiner grades the final revised academic report after oral presentation and defense. The examiner grades the academic report based on their assessment and consideration of independent peer reviews.

The presentation and defense can only be carried out when (i) there is an approved project plan and (ii) the academic report is sufficient in its current form for presentation and defense. This assessment does not mean that examiner will approve the report since the examiner does grading after the presentation and defense of the academic report.
The project plan, oral presentation and defense, written opposition, and the academic report shall follow the instructions and templates included in the Instructions for Degree Projects provided by the Faculty of Computing.
The student is expected to be available for supervision. It is the student's responsibility to conserve supervision resources. The student is not entitled to supervision time outside term time.

A student who does not complete their thesis within the term it was commenced can get continued supervision for a limited time only and no more than six months after the course ends. The examiner has the right to end supervision when all supervision time is exhausted. However, a student is always entitled to submit their independent work for grading at subsequent examination times. A student who re-registers for the course is not entitled to renewed supervision time.

6. Assessment and grading

Modes of examinations of the course

Code	Module	Credit	Grade
2305	Project plan	3.0 credits	GU
2315	Oral presentation	1.0 credits	GU
2325	Opposition	1.0 credits	GU
2335	Thesis	13.0 credits	AF

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.

The examiner performs grading after considering independent peer reviews. A student who has not submitted a project plan by the end of the introduction module of the course will be given the grade U on the component Project plan (2305) since he/she did not demonstrate adequate ability to perform tasks within specified timeframes. A student, who has not submitted an academic report of sufficient quality to be presented and defended within 14 (17, 22) months from the start of the course, can at most receive grade B (C, D), since the student did not demonstrate adequate ability to perform tasks within specified timeframes. The number of times that a student may be examined to get a passing grade on each of the examination components of the course is limited to three.

The information before a course occasion states the assessment criteria and make explicit in which modes of examination that the learning outcomes are assessed.

An examiner can, after consulting the Disability Advisor at BTH, decide on a customized examination form for a student with a long-term disability to be provided with an examination equivalent to one given to a student who is not disabled.

7. Course evaluation

The course evaluation should be carried out in line with BTH:s course evaluation template and process.

8. Restrictions regarding degree

The course can form part of a degree but not together with another course the content of which completely or partly corresponds with the contents of this course.

9. Course literature and other materials of instruction

Reference literature

1. Thesis Projects: A Guide for Students in Computer Science and Information Systems; 2nd Edition Authors: Mikael Berndtsson et al.
Publisher: Springer
Year: 2007, Pages: 162
ISBN-13: 978-1848000087

2. Experimentation in Software Engineering – An Introduction; 2nd Edition
Authors: C. Wohlin, P. Runeson, M. Höst, M.C. Ohlsson, B. Regnell, A. Wesslén
Publisher: Springer Verlag
Year: 2012, Pages: 250
ISBN-13: 978-3642290435

Other textbooks and reading material are chosen individually by the student in consultation with the supervisor.