

Research Methodology for Software Engineering and Computer Science, 6 ECTS Course Syllabus – VT 2019

Nauman bin Ali

Course platform	(Canvas)
Course schedule	(Will be announced later)
Course responsible and Examiner	Nauman bin Ali, nal@bth.se & Michael Unterkalmsteiner, mun@bth.se

1 Overall course goals

The course intends to train and sharpen the students' ability to describe the life-cycle of a research project from inception to completion. The course ensures through a series of practical assignments that students experience several of the building blocks necessary for conducting research in the field of computer science and software engineering.

The course attempts to teach an objective approach that fosters reflective practice and ensures life-long learning for the active participants in the course.

On successful completion of the course, the students will (to a high degree) be able to identify, evaluate and bring into service scientific literature and use an objective approach to solving practical problems in both the roles as academics and researchers. More specifically after having successfully completed the course, a student should be able to:

Knowledge and understanding:

- describe how to conduct a research project from beginning to end,
- describe different methods of research, data collection and analysis,
- describe the peer-review process.

Skills and Abilities

- use scientific databases and search engines to identify relevant research articles to a specific question,
- formulate a research problem in their own words,
- summarize, relate and discuss the results presented in research articles,
- formulate research objectives and queries to solve a research problem,
- design a complete research study that is appropriate to answer given research questions,
- perform data analysis and compare the results with the literature
- discuss the implications of research for academia and practice.
- discuss threats to the validity of research,
- write a research proposal adapted to recognized academic practice,
- refer to other people's work according to recognized academic practice.

Judgement and Approach

- discuss and relate to the concept of science and relate to it in their own work,
- discuss scientific possibilities, the role of knowledge in society, people's responsibility for how knowledge is used and the ethical and societal implications a research project can bring,
- discuss and relate to the concepts of plagiarism and copyright.
- critically appraise others and own research
- present research design and results

2 Course materials

The following are the course textbooks:

1. C. Wohlin, P. Runeson, M. Fall, M. C. Ohlsson, B. Regnell, A. Wesslén, Experimentation in Software Engineering, 2nd Edition, Springer Verlag, 2012, Pages: 250, ISBN13: 9783642290435
2. C. Robson, K. McCartan, Real World Research, 4th Edition, Wiley, 2016 Pages: 560 ISBN: 9781118745236

3 Course set-up

The course comprises four mandatory assignments, four seminars and participation in a mock-academic conference (all seminars will be held via Adobe connect, we will announce later if we decide to hold the conference presentations in Karlskrona). The intention behind assignments 1 2 and 3 is to exercise some skills required to design and conduct a research study. While Assignment 4, intends to provide hands-on experience of approaching a research study from inception to detailed design.

For Assignment 1-3, there will be one intermediate deliverable and the students will receive written and oral feedback during the seminars. This will provide them an opportunity to get feedback and improve their assignments.

For Assignment 4, the students select a topic of interest relevant to their Ph.D. studies. Therefore, the outcome of Assignment 4 can be used to execute the research study in another course. In this assignment, the students will be given feedback from with their supervisors on the two intermediate deliverables.

Based on the work done in Assignment 4, the students will participate in a mock-academic conference.