JÖNKÖPING UNIVERSITY
School of Engineering

COURSE INFORMATION

Theory of science and research methodology, 4 higher education credits (FTVFM38)

Vetenskapsteori och forskningsmetodik, 4 högskolepoäng

Introduction

This course aims at providing a foundation in theory of science and research methodology for all doctoral students admitted to third-cycle programmes at School of Engineering, Jönköping University. Traditional scientific traditions relevant to the field industrial product realisation are presented, together with a number of research methods. The course also includes fundamentals in research quality and discussions on possibilities and limitations of science.

The course includes a brief common part concerning theory of science and research methods, and a possibility for each student to deepen their studies into the most relevant method/s for their own research project.

Learning outcome

On completion of the course the student should:

Knowledge and understanding

- demonstrate basic understanding of various scientific traditions relevant to the field industrial product realisation
- demonstrate deeper knowledge of scientific methods in general and of methods in the specific field of research in particular

Skills and abilities

- demonstrate an ability to identify and formulate issues and to plan with appropriate methods a limited research task

Judgement and approach

- demonstrate insight into quality in research
- demonstrate insight into the possibilities and limitations of science

Content

The course includes:

- Basics within theory of science
- Different research designs
- Case study, design science/design research, experiment, action/interactive research, modelling/simulation, etc. based on the needs in the group
- Techniques for data collection (of empirical material)
- Data management
- Quality in research

Type of instruction

Lecture and seminars. Teaching is conducted in English or Swedish dependent on the requirements.

Prerequisites

Admitted to third-cycle programme or equivalent.

Examination and grades

The course is graded Fail or Pass. Examination includes oral and written parts within two assignments, of which one is individual and one is a group assignment.

Name of the test	Value	Grading
Assignments	4 hec	U/G

Assignment 1: Specialisation on selected research method

The students are responsible for a seminar where a selected research method is addressed in depth. The preparation is carried out in small groups, formed based on research interest/research questions. A detailed description of what is to be handled for each method is handed out separately. The result is presented at a seminar.

Assignment 2: Method chapter in licentiate thesis

Throughout the course, the students shall individually work on a draft methodology section of the licentiate thesis. The draft should in addition to the description of the method chosen also contain clear arguments for the method selected and a data management plan. This assignment is carried out with the support of from the tutors. The result is presented at a concluding seminar.

Course literature (preliminary)

Williamson, K. (2002) *Research methods for students and professionals*, 2nd ed., Centre for Information Studies, Wagga wagga, NSW. (still OK despite being old)

Säfsten, K.

Karlsson, C. (2016) *Researching Operations Management*, Taylor & Francis, Inc.

Additional literature according to the descriptions related to Theory of science.

Additional material is handed out.

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Schedule fall 2021

Week	Date	Time	Place (TBD)	Topic	Teacher
40	7/10	10-11.45		Introduction, presentation of participants and forming groups	Kristina Säfsten
		13-15.30		The Box - Exercise	Kristina Säfsten
41	13/10	13-17		Lecture 1: Theory of science	Sverker Johansson
	14/10	9-12		Lecture 2: Science or non-science	Sverker Johansson
43	27/10	9-12		Lecture 3: Examination seminar (course book)	Kristina Säfsten
45	10/11	10-15		Lecture 4: Data collection	Exercise RISE om mätning
46	17/11	9-12		Seminar a (assignment 1)	Guest
	17/11	13-16		Seminar b (assignment 1)	Guest
	18/11	13-16		Seminar c (assignment 1)	Guest
	?/11	9-12		Seminar d (assignment 1)	Guest
47	25/11			Lecture 5: Data management	Gunnarsson/Westergren
50	15/12	9-17		Seminar 1 (assignment 2)	Kristina Säfsten
	16/12	13-17		Seminar 2 (assignment 2)	Kristina Säfsten
	17/12	9-12		Seminar 3 (assignment 2)	Kristina Säfsten
	January			Seminar 4 (assignment 2)	Kristina Säfsten

Teachers

Course responsible and examiner is Professor Kristina Säfsten, kristina.safsten@ju.se, School of Engineering, Jönköping University.
Assistant Professor Sverker Johansson, Dalarna University.
Daniel Gunnarsson, Research Support, University Library, Jönköping University.
Oskar Westergren, Records Manager, University Services, Jönköping University.

And some more to be decided by the doctoral students as part of assignment 1.