



## COURSE SYLLABUS

### Forskningsmetodik i datavetenskap Research Methodology in Computer Science 7.5 credits (7,5 högskolepoäng)

**Course code:** DV2631  
**Main field of study:** Computer Science  
**Disciplinary domain:** Technology  
**Education level:** Second cycle  
**Specialization:** AIF - Second cycle, has second cycle course/s as entry requirements

**Language of instruction:** English  
**Applies from:** 2023-01-16  
**Approved:** 2022-11-25

#### 1. Decision

This course is established by Dean 2022-08-09. The course syllabus is approved by Head of Department of Computer Science 2022-11-25 and applies from 2023-01-16.

#### 2. Entry requirements

Admission to the course requires 120 completed credits. At least 90 of these completed credits must be within the area of Computer Science, Information System, Computer Engineering, AI and Machine Learning, Telecommunication Systems or IT Security. At least 6 of these 165 completed credits must be at advanced level in Computer Science-related topics or Object-oriented Programming. Within the 180 completed credits, at least 15 credits must be in Mathematics.

#### 3. Objective and content

##### 3.1 Objective

The aim of the course is to enable students to discuss and practise a scholarly approach, to gain knowledge of current research in a chosen field and to practice academic writing. Such fields relate to the main areas of Computer Science, Information Systems, Computer Engineering, Artificial Intelligence & Machine-Learning, Telecommunication Systems, and Computer Security. A key research issue is proposing, developing, evaluating and comparing methods, tools, languages, models/designs, algorithms etc, and their impact on different systems, organisations and people.

The course provides students with an understanding of the research methodology that enables the abovementioned research issue to be addressed. Furthermore, students will be introduced to the societal and ethical aspects of the research in question and gain experience of planning, executing and reporting a research project.

##### 3.2 Content

The course introduces a systematic way to search for, and synthesise research literature; scientific research methods, scientific writing and how to build up and strengthen a well-founded argument.

The course includes the following elements:

- Systematic Search and evaluation of literature
- Formulation of scientific questions
- Use of methods for research, data collection and analysis
- Planning of a small research project at beginner level
- Scientific writing
- Research ethics

#### 4. Learning outcomes

The following learning outcomes are examined in the course:

##### 4.1 Knowledge and understanding

On completion of the course, the student will be able to:

- prepare a basic plan to carry out a simple systematic literature review
- describe how to carry out a small research project from start to finish
- give an account of different methods for research, data collection, analysis and presentation of scientific methods

## 4.2 Competence and skills

On completion of the course, the student will be able to:

- use scientific databases and search engines to identify relevant research articles to answer specific questions
- summarize, relate and take a position on results presented in research articles
- formulate research goals and questions to solve a minor research problem
- design and present a small research study that is suitable to answer given research questions
- perform data analysis and compare the results with the literature and discuss implications for research and practice
- discuss threats to the validity of one's own research results
- write a basic scientific report adapted to recognized academic practice
- refer to others' academic work according to recognized academic practice

## 4.3 Judgement and approach

On completion of the course, the student will be able to:

- discuss the foundations for scientific thinking, and relate it to their own work
- discuss people's responsibility for how the 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 examine others' and one's own research

## 5. Learning activities

The course is organized around lectures, assignments (assignments 1-2), and a project report, which ends with a seminar. During the lectures, the student goes through theories and processes. Then well-chosen processes are applied to a project with entry-level research. Assignments 1-2 are summaries and discussions of the methods and processes described. The report discusses application of processes on a small research project, which also includes a small systematic literature review. The ability is demonstrated at the seminar of scientific communication and presentation.

## 6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
2305	Written assignment 1	1.5 credits	GU
2315	Written assignment 2	1.5 credits	GU
2325	Report [1]	3 credits	AF
2335	Seminar [1]	1.5 credits	AF

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

[1] Determines the final grade for the course, which will only be issued when all components have been approved.

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