Course syllabus

Cognition and Risk
Kognition och risk

EXTA90, 5.0 credits, G1 (First Cycle)

Valid for: 2026/27
Faculty: Faculty of Engineering LTH
Decided by: PLED C/D
Date of Decision: 2026-04-16
Effective: 2026-05-18

General Information

Main field: Technology **Depth of study relative to the degree requirements:** First cycle, in-depth level of the course cannot be classified
Mandatory for: R1
Language of instruction: The course will be given in Swedish

Aim

The course aims to give the student a basic understanding of how human cognition functions, and how our cognitive capabilities affect judgement and decision making in the risk domain. The course will lay the foundation for the students to be able to, in later courses and in their profession, develop and design products, processes and systems, related to risk, safety and crisis management, that take human cognition into account.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to describe basic aspects of human cognitive abilities,
- be able to describe and explain a few important mechanisms that affect probability estimates and evaluations, such as heuristics and bias,
- be familiar with a few important cognitive sources of variability in risk judgements and decisions.

Competences and skills
For a passing grade the student must

- be able to relate some of the mechanisms behind probability estimations and evaluations to human cognitive abilities and the opportunities and limitations related to these,
- be able to identify some potential biases in laymen's and professional's risk judgements,
- show ability, through teamwork, to plan and undertake project assignments with clear instructions,
- be able to present and discuss important aspects of human cognition related to judgement of risks and decision both orally and in writing.

Judgement and approach
For a passing grade the student must

- be able to argue for the relevance of taking the strengths and weaknesses of human cognition into account in the area of risk, safety and crisis management.

Contents

The course introduces some basic aspects of human cognition, such as perception, attention, and memory. This is used to introduce and explain cognitive mechanisms underlying judgements of probability (e.g. "availability bias" and "representativeness bias"), how we recall them (e.g. "hindsight bias") and evaluations (e.g. framing and sunk costs). We will also briefly address how both emotions and context affect judgements. One course objective is to make students aware of the variance in how individuals perceive and understand (for example) probability estimates and risk assessments. This is done through both practical and theoretical learning activities. We will address aspects such as numerosity, mental models and calibration (e.g. based on feedback mechanisms). We will also discuss the variability in not only laymen but also expert judgements, and how this in part can be counteracted by structured assessment templates and less information. We will discuss benefits and drawbacks of both simple and more complex ways of evaluating and deciding.

Examination details

Grading scale: TH - (U, 3, 4, 5) - (Fail, Three, Four, Five)
Assessment:

To pass, a passed exam, passed laboratory work and passed group work are required. The final grade is based on the results of the written exam.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Modules
Code: 0122. **Name:** Examination .
Credits: 3.0. **Grading scale:** TH - (U, 3, 4, 5). **Assessment:** Passed exam. **The module includes:** Written individual exam.
Code: 0222. **Name:** Laboratory Work.
Credits: 0.5. **Grading scale:** UG - (U, G). **Assessment:** Successfully completed laboratory work **The module includes:** Laboratory work
Code: 0322. **Name:** Group Work.

Credits: 1.5. **Grading scale:** UG - (U, G). **Assessment:** Successfully completed group work **The module includes:** Group work

Admission

The number of participants is limited to: No

Reading list

- Kahneman, Daniel: Tänka, snabbt och långsamt. Volante, ISBN: 789188659316.

Contact

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