Course Syllabus for:
Human Factors
769A19

Fall Term 2024

Course examiner: Erik Prytz

Course administrator: Anna Grabska Eklund

Version 1

1 Kursplan (svenska)

Huvudområde: Kognitionsvetenskap

Utbildningsnivå: Avancerad nivå

Fördjupningsnivå: A1X

Kursen ges för: Kognitionsvetenskap, masterprogram

Förkunskapskrav: Kandidatexamen 180 hp i huvudområdet kognitionsvetenskap, eller Kandidatexamen 180 hp i huvudområdet datalogi eller motsvarande samt godkända kurser om 30hp i något eller några av ämnena: psykologi, lingvistik, filosofi, neurovetenskap, antropologi eller motsvarande, eller Kandidatexamen 180 hp i något av huvudområdena Psykologi eller Neurovetenskap samt godkända kurser om 30hp i datavetenskap eller motsvarande.

Lärandemål

Efter avslutad kurs ska den studerande på en avancerad nivå kunna:

- redogöra för och kritiskt diskutera teorier, modeller och metoder in Human Factors både muntligen såväl som skriftligen
- tillämpa Human Factors-metoder för att studera komplexa företeelser, frågeställningar och fenomen av vetenskapligt eller samhälleligt intresse
- analysera och tolka studerade företeelser, frågeställningar och fenomen utifrån relevanta och aktuella vetenskapliga teorier och modeller inom Human Factors
- reflektera över och problematisera kring aktuell forskning inom området Human Factors utifrån vetenskapliga, samhälleliga och etiska aspekter
- generalisera aktuell Human Factors-forskning till samhällsrelevanta frågeställningar och identifiera behov av ytterligare kunskapsutveckling

Kursinnehåll

I kursen behandlas teorier, modeller och metoder inom Human Factors samt centrala begrepp kopplade till dessa. Detta kan exempelvis vara automation, fysisk ergonomi, expertis, mänskliga fel, individuella skillnader, mänsklig prestation i extrema miljöer, makrokognition, situationsmedvetenhet, stress, uppgiftsanalys, teamprestation, träning och utbildning, förstärkt kognition, vigilans, varningar och larm-design, kommunikation eller mental arbetsbelastning. I kursen behandlas även aktuell forskning inom Human Factors och dess relation till vetenskapliga, samhälleliga och etiska aspekter.

Undervisnings- och arbetsformer:

Undervisningen består av föreläsningar, seminarier och praktiska övningar. Utöver detta ska den studerande utöva självstudier.

Examination:

Kursen examineras genom:

- individuell skriftlig tentamen, betygsskala: EC
- individuella skriftliga inlämningar inför och aktivt deltagande i seminarier, betygsskala: UG
- praktiska övningar i grupp med skriftliga inlämningar, betygsskala: UG

För Godkänt (E) slutbetyg krävs Godkänt (E) på tentamen samt Godkänt på övriga moment. Högre betyg baseras på den individuella skriftliga tentamen.

Detaljerad information återfinns i studieanvisningen.

Om det finns särskilda skäl, och om det med hänsyn till det obligatoriska momentets karaktär är möjligt, får examinator besluta att ersätta det obligatoriska momentet med en annan likvärdig uppgift.

Om LiU: s koordinator för studenter med funktionsnedsättning har beviljat en student rätt till anpassad examination vid salstentamen har studenten rätt till det.

Om koordinatorn har gett studenten en rekommendation om anpassad examination eller alternativ examinationsform, får examinator besluta om detta om examinator bedömer det möjligt utifrån kursens mål.

Examinator får också besluta om anpassad examination eller alternativ examinationsform om examinator bedömer att det finns synnerliga skäl och examinator bedömer det möjligt utifrån kursens mål.

Studerande, vars examination underkänts två gånger på kursen eller del av kursen, har rätt att begära en annan examinator vid förnyat examinationstillfälle.

Den som godkänts i prov får ej delta i förnyat prov för högre betyg.

Betygsskala: ECTS, EC

Övrig information: Planering och genomförande av kurs ska utgå från kursplanens formuleringar. Den kursvärdering som ska ingå i varje kurs ska därför behandla frågan om hur kursen överensstämmer med kursplanen.

Kursen bedrivs på ett sådant sätt att både mäns och kvinnors erfarenhet och kunskaper synliggörs och utvecklas.

Om det föreligger synnerliga skäl får rektor i särskilt beslut ange förutsättningarna för, och delegera rätten att besluta om, tillfälliga avsteg från denna kursplan.

Institution: Institutionen för Datavetenskap

2 Course introduction

Welcome to 769A19, a course that centers on Human Factors theories, methods, and issues. This is an advanced, masters' level course with a student-centered learning perspective. The course offers a lot of freedom to choose topics of particular interest to the students in the course, and to focus in depth on one area of interest to you in particular. There are three main components to the course: weekly seminars, weekly team challenges, and a written individual take home exam. This document explains the course structure and format in detail.

2.1 Teachers and staff

Erik Prytz (erik.prytz@liu.se) at the Department of Computer and Information Science (IDA) is the course examiner and primary teacher in this course.

Wilhelm Brodin (wilhelm.brodin@liu.se) at the Department of Computer and Information Science (IDA) is a teaching assistant in this course.

Anna Grabska Eklund (anna.grabska.eklund@liu.se) is the course administrator.

2.2 A note on language

This course is offered to international/exchange students. Therefore, all written course information is provided in English. The course itself will be conducted in either English or Swedish, depending on the language competences of the registered students.

3 Lectures

This is an advanced level course and will not rely on lectures to convey information. The only "lecture" is the course introduction, which is intended to present the course structure and requirements, introduce content topics, and provide a fundament for the rest of the course content (including the seminars and examination). The remaining course will be a mix of primarily **seminars** and practical exercises in the form of **team challenges**. At the start of each seminar there will also be a brief in-person flipped classroom component to provide some additional insight into the readings and answer any questions you may have about the material.

4 Seminars

The course will feature seven seminars. The topics of the seminars are selected by you, the students, based on a list of suitable topics relevant to the overall course goals. The purpose of this is to allow some flexibility to pursue topics of particular interest to the students. The available topics will be provided in a separate document on Lisam, and the selection will take place online before the course introduction lecture.

4.1 Seminar structure

The structure of each seminar will be roughly as follows:

1. **Challenge review** (ca 5 minutes): The course examiner provides a review of the previous week's challenge and awards points to the teams.
2. **Flipped classroom** (ca 10 minutes): The course examiner answers the student-submitted questions about the reading material.
3. **Student-led discussion** (ca 70 minutes): The students discuss the material based on submitted questions.
4. **Presentation of next week's topic and literature** (ca 5 minutes): The course examiner present the seminar topic for next week, and the literature for the seminar.

The **challenge review** part is explained further in section 5, Team Challenges.

The **flipped classroom** part is intended to cover fundamental or basic questions about the topic, as well as to clarify the literature. The students will either submit questions in advance (more on this in the next section) or come prepared with questions for the flipped classroom part.

The **student-led discussion** portion will be conducted in smaller groups, depending on the number of students in the course. For each seminar, one student per group will be responsible to act as *seminar leader*. This will be assigned during the first lecture.

4.2 Seminar reading and questions

This course does not have a specific textbook to cover the entire course. Rather, the required readings are based on the chosen topics. The list of literature per topic is provided in a separate document on Lisam ("Seminar topics"). Please note that not all of the articles listed in that document will be included during the course. Only the topics chosen by the students will be covered.

Each topic contains a set of "Core" articles and a set of "Extra" articles. The core articles are mandatory, and it is those articles that will be discussed during the seminar. The extra articles are *not* mandatory but rather provided as additional reading for the interested student. They can serve as a useful fundament for future works such as projects, proposals, or theses, and will likely also be useful for the take-home exam in this course.

All students are responsible for reading the assigned material (*Core articles*) before the seminar and to submit 1) one to two discussion questions *per core article* and 2) two *overarching* questions spanning all assigned reading for that week. These questions will be submitted using a *Microsoft Form*. More information on this procedure is provided during the introductory lecture.

Students can also submit additional clarifying (non-discussion) questions to the course examiner prior to the seminar. These questions will be used during the flipped classroom part of the seminar.

4.3 Student seminar leaders

All students in the class will act as **seminar leaders** for at least one seminar. The role of the seminar leader is to 1) prepare a set of discussion questions before the seminar, and 2) lead the discussion in smaller groups.

The course examiner will anonymize and forward the discussion questions submitted by all students to the seminar leaders of that week. The seminar leaders will summarize the questions into a structured set of discussion topics that can be used as an aid during the seminar. This summary is intended to reduce the total number of questions to a manageable and usable set that will be a helpful guide for the discussions. The seminar leaders have full discretion in what questions they select, but should keep the following general recommendations in mind:

1. Redundant questions (i.e., multiple questions that ask more or less the same thing as other questions) should be removed or merged into one, single question.
2. Irrelevant questions should be removed. Irrelevant questions are questions that are 1) off-topic, 2) do not mention or make use of the assigned reading, or 3) are vague "standard questions" that could be applied to any reading ("What did you think of [insert article title here]?", "Did you find [insert article title here] useful?", "How can we as cognitive science students use this information?", etc).
3. The selected questions should be *meaningful to discuss in a group of students*. That is, questions should help you as a group to discuss the articles in a way that deepens your understanding of the topic.
4. Questions that other students cannot reasonably be expected to answer should be removed (e.g., "What impact did this article have on the research field?", "Has the author written anything else on this topic?", "Is this method commonly used in human factors today?", "Is there any new research on this topic?", etc). These questions are better asked to the course examiner during the flipped classroom part of the seminar. The seminar leader is welcome to forward such question to the course examiner, who will answer them in the flipped classroom portion of the seminar.
5. You may keep "clarifying" questions about the articles, if you think that it will lead to a meaningful discussion among the students. Most clarifying questions should, however, be asked to the course examiner during the flipped classroom part of the seminar.
6. The total number of questions should be small enough that the guide will be usable during the seminar – a rough guideline is 5-8 questions per article and then a few questions that concern the reading overall.

The main thing the seminar leader(s) should keep in mind when selecting the questions is essentially "will this question lead to interesting and meaningful discussions and help us learn or understand the material better?".

During the seminar, the seminar leaders are responsible for leading and facilitating the group discussions. The seminar leaders do not necessarily need to

know the material better than the other students but should come prepared with the articles and seminar questions. Keep in mind that the seminar leaders are not there to explain the material or teach the articles to the others – the seminar leaders are there to facilitate the discussions, prompt students to discuss more, and keep the discussion moving and on-topic.

Summary: responsibilities of the seminar leader

Before the seminar

- Summarize the submitted questions to a format that will support discussion during the seminar.

During the seminar

- Lead and facilitate the group discussion, supported by the submitted questions.

Summary: responsibilities of all students

Before the seminar

- Read the assigned literature.
- Submit 1-2 discussion questions per article and 2 overarching questions no later than one day (24 hours) prior to the seminar.

During the seminar

- Actively participate in the discussions.

4.4 Absence

If you are absent from a seminar you will instead complete a make-up assignment. The assignment is a ca 1-hour long individual seminar one-to-one with one of the course teachers. The seminar will cover the same assigned reading as the missed seminar. Alternatively, if approved by the course examiner, the student may opt to provide a written reflection on the same material instead of the individual seminar. This written reflection should summarize and review the core literature for the seminar and include an overall reflection connected to the topic of the seminar. The reflection should be about 1 page per core article in length. Note that all the normal requirements for written examinations, including plagiarism, apply to this written reflection.

Some absences are excused (e.g., death in the family, hospitalization, and similar) if cleared by course examiner prior to the seminar.

5 Team Challenges

The purpose of the team challenges is to provide an engaging learning activity tied to the topic discussed in the course. All students will be assigned to teams of

about 5 members. These teams will complete weekly challenges based on the previous week's topic. The challenges will be presented at the end of each seminar.

Each individual challenge is unique and will have specific goals and requirements. The way the challenge should be presented or reported is specific to each challenge. Points are awarded by the course examiner depending on how well the team meets the challenge goals and requirements. To 'pass' the challenge the team must score greater than zero. A score of zero is typically given on a "did not attempt" basis.

The teams will accumulate points by completing challenges. A weekly scoreboard will be kept and updated. The team with the highest score at the end of the course will win a v*ery special and very secret prize*.

Note that the team challenges are a mandatory part of the course, as a practical lab component of 1 hp.

6 Take-home exam

The main examination in this course is a take-home exam. The take-home exam is an individual assignment to be completed by each student. The exam will be published on Lisam in conjunction with the final seminar of the course. The exam itself will include more detailed instructions. The exam is graded on the ECTS scale.

7 Course grade

In summary, there are three course examination components in this course:

- The team challenges, or "Laboratory work", 1 credit, Pass or Fail
- The seminars, 2 credits, Pass or Fail
- Take home exam, 3 credits, ECTS scale

To receive a passing grade (E) on this course you thus need to:

- Pass each weekly team challenge (i.e., receive a score greater than 0)
- Pass the seminar component by 1) submitting questions beforehand, 2) acting as a seminar leader for one seminar, and 3) be present and actively participate during all seminars
- Receive a passing grade (E) on the take-home exam

Higher grades on the ECTS scale will be given based on the grade on the take-home exam.

7.1 Make-up work

If a student fails any of the course components, they can complete a new exam or submit make-up work twice before the next course iteration starts. The deadlines are listed under section 8.

8 Deadlines

8.1 Seminar question deadlines

The deadline for the seminar questions is always 10:00 the day before the seminar.

8.2 Question summary deadlines

The seminar leader(s) for each seminar will summarize the submitted questions into a discussion guide. This guide is to be emailed to the course examiner no later than one hour before the start of the seminar.

8.3 Team challenge deadlines

The deadline for the team challenge is always 12:00 the day before the seminar. Please note that while most of these will be submitted through Lisam, others may require other submission formats. Each challenge will specify this further.

8.4 Take-home exam deadline

The deadline for the take-home exam is January 17th, 2025, at 17:00. The take-home exam is submitted on Lisam.

8.5 Re-exam and make-up work

Seminars: A student who has failed the seminar part of the course (e.g. by not attending a seminar, not submitting questions beforehand, or not acting as a seminar leader) can complete make-up work to reach a passing grade. See section 4.4 for details.

The individual make-up seminars will be conducted during the last week of the course, in January. Individual time slots will be scheduled for each student. If the student wishes to complete written make-up assignments instead, they should notify the course examiner. The deadlines for these assignments are the same as the take-home exam (including the re-exam deadlines, if the student wishes to complete the seminar make-up work at a later date).

Take-home exam: New take-home exams will be conducted according to the schedule in the table below. **The students should notify the course examiner one week prior to the publication date if they intend to complete a make-up take-home exam.** A new exam will only be published if at least one student has notified the course examiner.

Publication Date	Deadline
16/5 2024	5/6 2025, 17:00
15/8 2024	5/9 2025, 17:00

9 Generative AI Policy

For this course, the usage of generative AI-tools (e.g., ChatGPT, Bard, and others) is generally not thought to be beneficial. Such tools may however be used for the following purposes:

- Editing suggestions and proofing of text written by the student for the take-home exam and team challenges
- Creating images for the team challenges

Such tools are **not** allowed for the following purposes:

- Generating seminar questions or text for the team challenges
- As a reference guide or "search engine" to look up information about the topics covered in this class (due to a high risk of erroneous information or "confabulations")
- Generating text for the take-home exam

All usage of generative AI tools must be documented and attached as an appendix to the assignments in which they have been used. The name of the tool, version number, date of use, and the prompts that were used must be clearly documented in this appendix. Direct links to e.g. ChatGPT chat logs are encouraged for full transparency and ease of sharing. Usage of tools for examination assignments in a manner not explicitly permitted in this syllabus is prohibited and considered a case of academic dishonesty. Failure to provide full documentation of use as described above is considered academic dishonesty. Exceptions may be granted, in writing, by the course examiner.

As a student you are the sole author for all submitted texts in this course and ultimately responsible for the content.

10 Plagiarism and academic dishonesty

As with all courses at LiU, plagiarism and academic dishonesty is not allowed. Unfortunately, there have been recent instances in this course where students have tried to cheat, e.g. copied text from articles, used google translated text without editing, or submitted ChatGPT-generated seminar questions. **All suspected instances of academic dishonesty *will* be reported to the Disciplinary Board**, and may result in a disciplinary action such as a suspension. The decision to report a suspected attempt to cheat is not made by the course examiner. The course examiner *must* report such attempts as per the university guidelines:

“Suspected attempts at cheating and disturbances of the peace *shall* be reported to the Vice-Chancellor and the matter treated by the University Disciplinary Board.” (link to source, my emphasis)

Cheating (from LiU Disciplinary Board):

According to chapter 10 in the Higher Education Ordinance, disciplinary measures can be used against a student who:

1. Uses prohibited aids and equipment, or in any other way, purposely acts inappropriately during the examination or the assessment of a study assignment.
2. Causes disturbance, prevents teaching, examinations or other university related activities from taking place.

Examples of what LiU's Disciplinary Board has judged as cheating:

- text written onto a formula sheet
- loose sheets of paper containing the student's own writing during a test
- plagiarizing an essay
- copying a programming project
- working with another group during individual projects when doing so was not allowed

Plagiarism (from LiU Library):

What is plagiarism?

To plagiarize means using somebody else's work and presenting it as your own without referring to the source. It may be a text, idea, theory, image, chart, figure, music, computer program or a product. Even reformulation, paraphrasing, text to your own words, without referencing the source is plagiarism.
Plagiarism may also violate Copyright laws.

What happens if I plagiarize?

Plagiarism is a serious offense against good academic practice and can if worse comes to worst result in temporary suspension from studies by decision of The Disciplinary Board at Linköping University. A student who is suspended may not participate in lectures, laboratory sessions, seminars, exams, tutorials, assignments, and may not access to LiU's computer labs. The suspension may also affect payment of student support.