Humans in Complex Systems

Människan i komplexa system
9 credits

Single subject and programme course

729G84

Valid from: 2022 Autumn semester

Determined by	Main field of study	
Course and Programme Syllabus Board at the Faculty of Arts and Sciences	Cognitive Science	
Date determined	**Course level**	**Progressive specialisation**
2019-12-03	First cycle	G2F
Revised by	**Disciplinary domain**	
Course and Programme Syllabus Board at the Faculty of Arts and Sciences	Technology	
Revision date	**Subject group**	
2022-04-29	Work Science and Ergonomics	
Offered first time	**Offered for the last time**	
Autumn semester 2020		
Department	**Replaced by**	
Institutionen för datavetenskap		

Entry requirements

General entry requirements for undergraduate studies
and
Social Studies, English and Mathematics corresponding to the level in Swedish upper secondary education (Samhällskunskap 1b or 1a2, Engelska 6, Matematik 3b/3c or Matematik C)
and
At least 90 ECTS credits passed from the Cognitive Science bachelor's program semester 1 to 4, including the courses Cognitive Science Introductory Course 9 ECTS credits, Information Technology and Programming 12 ECTS credits, and Research Methodology and Statistics 9 ECTS credits, or equivalent.

Intended learning outcomes

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

- Account for and contrast the context and historical development of central theories connected to the study of human behaviour in complex systems, such as cybernetics, systems science, human factors, cognitive systems engineering and naturalistic "cognition in the wild"-perspectives.
- Apply theories and methods from the field of human factors and cognitive systems engineering to analyse and evaluate human–machine systems and joint cognitive systems.
- Describe the role of central human factors concepts in the study of human–machine systems.
- Critically reflect on perspectives and theoretical foundations of system complexity, cognitive systems design, and control of cognitive systems.
- Analyse how a cognitive system can be delimited from a control perspective.
- Explain central concepts and perspectives on safety in human-machine systems.
- Describe common risk and accident analysis approaches and models in human–machine systems.

Course content

The following aspects are covered:

- An introduction to systems science, systems theory, cybernetics, cognitive systems engineering, and resilience engineering
- An elaboration on central, theoretical constructs from cognitive psychology and human factors and their function in the context of complex sociotechnical and cognitive systems.
- How to apply fundamental assessment and measurement methods of concepts central to human factors to study complex systems.
- How to analyse human-machine systems, complex systems, and joint cognitive systems from micro and macro perspectives.
- An overview of different risk and accident analysis methods.

Teaching and working methods

This course includes lectures, seminars, practical exercises, and study visits. The student is expected to study independently, individually or in groups.

Examination

The course is examined by:

- Assignments (individual and in groups), grading scale: UG
- Written examination, grading scale: EC

Final grades for the course are based on the written examination, assuming that the assignments have been passed.

If special circumstances prevail, and if it is possible with consideration of the nature of the compulsory component, the examiner may decide to replace the compulsory component with another equivalent component.

If the LiU coordinator for students with disabilities has granted a student the right to an adapted examination for a written examination in an examination hall, the student has the right to it.

If the coordinator has recommended for the student an adapted examination or alternative form of examination, the examiner may grant this if the examiner assesses that it is possible, based on consideration of the course objectives.

An examiner may also decide that an adapted examination or alternative form of examination if the examiner assessed that special circumstances prevail, and the examiner assesses that it is possible while maintaining the objectives of the course.

Students failing an exam covering either the entire course or part of the course twice are entitled to have a new examiner appointed for the reexamination.

Students who have passed an examination may not retake it in order to improve their grades.

Grades

ECTS, EC

Other information

Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus.

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly, or as a whole, in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.