Syllabus for

Academic year 2013/2014 >

MPP036 - Cognitive ergonomics

Syllabus adopted 2011-02-22 by Head of Programme (or corresponding)
Owner: MPDES
7,5 Credits
Grading: TH - Five, Four, Three, Not passed
Education cycle: Second-cycle
Major subject: Industrial Design Engineering
Department: 44 - PRODUCT AND PRODUCTION DEVELOPMENT

Teaching language: English
Open for exchange students
Block schedule: D

Course module				Credit distribution Sp1	Sp2	Sp3	Sp4	Summer course	No Sp	Examination dates
0108	Written and oral assignments	7,5 c	Grading: TH		7,5 c					

In programs
MPDES INDUSTRIAL DESIGN ENGINEERING, MSC PROGR, Year 1 (compulsory elective)
MPDES INDUSTRIAL DESIGN ENGINEERING, MSC PROGR, Year 2 (elective)

Examiner:
Bitr professor Anna-Lisa Osvalder

Replaces
MPP035 Cognitive ergonomics

Theme:
MTS 7,5 hec

Eligibility:
For single subject courses within Chalmers programmes the same eligibility requirements apply, as to the programme(s) that the course is part of.

Course specific prerequisites
MTM010 Design Ergonomics, PPU060 Human-machine systems or similar courses

Aim
The purpose of the course is to develop deepened knowledge on different prerequisites and consequences of human interaction with technical products, machines and systems and the demands this impose on design. The course focuses on the human being as a decision maker and the role humans have in technical systems and what factors that affect, for example, information handling, performance, human error, motivation in work, stress etc.

Learning outcomes *(after completion of the course the student should be able to)*
- understand individual differences in cognitive capabilities
- be able to use knowledge for design, and choice of technical solutions that:
- facilitates perception and analysis of information
- minimizes use error
- increase availability and ease of learning without extensive previous knowledge, training or experience
- reduce stress in connection to monitoring tasks and decision making
- be able to practically apply methods for analysis of human-system interaction

Content
Cognitive ergonomics is an area that studies the human ability to activate, inform, feel, localize, move, calculate, speak, make insights and control various phenomena. These abilities are closely connected to perception, memory functions, emotions, awareness and decision making. This knowledge is essential to understand and analyse the interaction between humans and technical systems, with different levels of complexity, in design of user interfaces in different domains. In the course methods for systems theory, user profiling, use case, task analysis, analysis of mental workload, interaction analysis, risk analysis and requirement elicitation are presented.

The course also focuses on deepened knowledge on complex safety critical human-machine systems (e.g. cockpit, ship bridge, process monitoring, medical technology and driver environments). Examples of theory areas in these domains are expert knowledge, decision making and problem solving, use errors and risk analysis.

Organisation

The course consists of a deepening theory part made as seminars and a project assignment where the theoretical knowledge will be applied. The participants shall prepare themselves before each seminar by reading literature and work through a number of problems. The projects builds on a theoretical analysis of a safety critical complex human-machine system and discuss how the results can be applied in other domains and situations. The projects will be presented orally and in a written report.

Literature

Wickens, C.D et al. (2004) Sec. Ed. An Introduction to Human Factors Engineerin. Pearson, Prentice Hall, New Jersey.
Robinson-Riegler, G and Robinson-Riegler, B (2004). Cognitive Psychology. Applying the Science to Mind. Pearson, Prentice Hall, Boston
Compendium with reference articles, made by Division Design.

Examination

Attendance and active participation in seminars, passed assignments and a passed project report is required for examination.