Syllabus for

Academic year 2013/2014 >

PPU185 - Ergonomics design for all

Syllabus adopted 2012-02-15 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
0112	Written and oral assignments	7,5 c	Grading: TH	7,5 c						

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

Examiner:
Bitr professor Anna-Lisa Osvalder

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 Ergonomics, PPU060 Human-machine systems, or comparable courses

Aim
The purpose of the course is to gain deeper knowledge and understanding of how human physical and mental prerequisites can vary by for example functional disorder or age, and how products and systems should be designed to interact with human characteristics and especially fit these groups of the population as well as people with functional limitations. The students should also gain deeper knowledge about a number of methods and tools that can be used to analyse design solutions from an anthropometric, biomechanical, physiological and cognitive perspective.

Learning outcomes *(after completion of the course the student should be able to)*
- Explain and use theoretical knowledge in physiology and cognition to characterise how different human abilities change by age
- Explain and use theoretical knowledge about human senses to understand different functional disorders such as decreased vision and hearing
- Explain and use advanced knowledge in anthropometrics and biomechanics for ergonomic design
- Identify and relate to how ergonomic design affects human physical working conditions and performance in everyday systems, especially for older and disabled people
- Distinguish, compare and assess contradicting demands for ergonomic design
- Use and reflect on advanced methods for load measurements, such as EMG
- Use and reflect on methods for assessment of comfort in a product system
- Use and reflect on computer aided working posture analysis (e.g. manikin programs such as JACK) to design a product system concerning work load, field of vision, reach etc.

Content
The course includes theoretical lectures regarding human abilities related to different abilities such as age, anthropometry, biomechanics and comfort. Furthermore guest lectures are given about ergonomic design for different user groups, needs for disabled, and the latest research about elderly and common disabilities in the

society. Also a computer assignment with JACK and a workshop about EMG (electromyography) are included. A number of extended exercises containing theoretical tasks as well as practical method and design tasks are given throughout the course, all related to user interaction, with focus on elderly and disabled, in a chosen product system (everyday systems such as work in kitchen, use of bathroom or working in the garden, or travelling with public transports, car driving or grocery shopping). The outcome of the exercises are presented and discussed in seminars and handed in for evaluation. In the end, a final individual task is given as home examination.

Literature

- Work and technology on human terms. Prevent (2009).
- Bridger, R.S. (2003). Introduction to Ergonomics, Taylor & Francis, London.
- Pheasant, S. (2002). Bodyspace: Anthropometry, Ergonomics and the Design of Work, Taylor & Francis.
- Reference literature.

Examination

The grades are: not passed, 3, 4 and 5.
The following parts are mandatory to perform to pass the course:
- participation at lectures (pass)
- JACK assignment (pass)
- participation in EMG workshop (pass)
- oral presentation and activity during seminars (pass)
- hand in exercises (graded)
- home exam (graded)