

0HM310 Automotive Human Factors

Lecturers:

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Industrial Engineering & Innovation Sciences
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Background

The course Automotive Human Factors addresses the relation between a car or truck, its human driver, and the dynamic environment. It is concerned with the goals of productivity (getting from A to B in a reasonable time), safety and accident prevention, and driver comfort and experience. The 'Perception-Cognition-Action' cycle is taken as a point of departure, treating basic sensory processes (vision, hearing, touch), cognitive processes (mechanisms of attention, stress and workload) and human factors (displays & controls, automation, safety).

The driver performs typically within a complex advanced multitasking environment, with multiple simultaneous goals and distracters. The majority of accidents (up to 90%) are related to human error. That does not mean that human errors are responsible for 90% of the accidents. More often than not the design of technology fails to take into account the skills and limitations of human performance. In the worst case this leads to situations where 'an accident is waiting to happen'. Automotive Human Factors pays special attention to driver-centred design and addresses the relation between perception, cognition, hazards and collisions, impaired drivers, and training and selection.

Learning Goals

- To gain a basic understanding of the human perceptual system (vision, hearing, touch) and its relevance to automotive tasks and information feedback.
- To obtain insight into the role and importance of attention mechanisms, stress, workload, control and automation in an automotive context.
- To obtain a basic understanding of transportation safety and accident prevention guidelines and legislation.
- To gain basic design knowledge regarding displays, control and navigation mechanisms.
- To study driver characteristics: motivations, age, drug effects.
- To understand the relevance of involving the user in the design process and be able to apply human-centred design methods and evaluation metrics within an automotive context.

Study materials

Study materials consist of

- *Designing for People: An Introduction to Human Factors Engineering* 3rd Edition by John D Lee, Christopher D. Wickens, Yili Liu, Linda Ng Boyle. ISBN-13: 978-1539808008, ISBN-10: 1539808009

- A number of selected papers/book chapters that will be announced in the lectures as they may change every year.

Organisation and Schedule

Five ECTS corresponds to 140 hrs or roughly 14 hrs/week. This is subdivided in

- Two hours lectures/tutorials on Tuesday and Friday
- Four hours assignment work (self study)
- Six hours self study

[[link to schedule](#)]

Exams and assignments

At the end of the course there will be a written exam. The average grade for the assignments and the grade for the exam both count for 50% of the final grade. To pass the course the **average grade must be 5,5 or higher AND** the grade for the **written exam must be 5,0 or higher to pass!** In case a student fails he or she can do a retake of the written exam and keep the average grade for the assignments in the same year. In case a student wants to retake the assignments he or she should contact the lecturers in order to find an appropriate solution. This option is only available if you passed the written exam, but failed the course.

Assignments

The assignments are carried out in groups of 4-6 students. The theme will be **How can we make use of the interior of the automated car**. You will work on this theme over the course of 8 weeks making use of the material from the lectures. A detailed roadmap and list of deliverables will be provided during the course. A rough indication of the topics is shown below:

Week 1+2: Research methods & User centred design

Week 3+4: Perception and display design

Week 5+7: Attention, Stress and Workload

Week 8: Final deliverable