



## COURSE SYLLABUS

# Human Factors Engineering, 5 credits

*Människa-Teknik-Organisation, 5 högskolepoäng*

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<b>Course Code:</b> TMTR21	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Jun 1, 2020	<b>Disciplinary domain:</b> Technology
<b>Revised by:</b> Director of Education Nov 4, 2020	<b>Subject group:</b> AE1
<b>Valid From:</b> Jan 1, 2021	<b>Specialised in:</b> A1N
<b>Version:</b> 2	<b>Main field of study:</b> Production Systems

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- demonstrate comprehension of people's functional abilities and limitations both physically and cognitively (information processing) in technology use and at work
- display knowledge of Swedish and international work environment legislation and of the benefits for different professional roles of applying human factors engineering

Skills and abilities

- demonstrate the ability to use current methods in the field of human factors engineering to propose different alternatives for products and work processes
- demonstrate the ability to analyze the work organization and its impact regarding performance and wellbeing using a systems perspective

Judgement and approach

- demonstrate the ability to perform usability analysis including both anthropometric and cognitive interaction considerations
- demonstrate the ability to assess whether a real work situation is sustainable with a focus on relevant social and ethical aspects

### Contents

The course provides knowledge and insights on how products and industrial systems can be designed taking into consideration people's natural strengths and limitations and result in usability, efficiency and sustainability. This also means in-depth knowledge of the interaction and collaboration between people and products, people at work and how they are affected by the surrounding technology and the organization.

The course includes the following elements:

- People's abilities and limitations regarding product and work design: physiology, load, physical aspects- including anthropometrics, cognition, work organization

- Socio-technical systems: theoretical basis, system models and applications, work organization and the impact of various work organization solutions
- Design of human interface system – technology, automation and digitalization - allocation of functions human – technology, cost-benefit analysis and professional role specificity
- Swedish and international occupational health and safety legislation: framework law, regulations and system supervision

### Type of instruction

Lectures, seminars, and project work.

The teaching is conducted in English.

### Prerequisites

The applicant must hold the minimum of a bachelor's degree (ie. the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Mechanical Engineering, Industrial Engineering and Management or Civil Engineering or equivalent, and 15 credits Mathematics. English Language requirements corresponding to English 6 in the Swedish upper secondary school (or the equivalent). The applicant must also have 1 year of qualified work experience. It is possible to apply for exemption from a bachelor's degree and 15 credits Mathematics if the applicant has at least 5 years of qualified work experience.

### Examination and grades

The course is graded Fail (U) or Pass (G).

The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Project work	2 credits	U/G
Seminars	3 credits	U/G

### Course literature

The literature list for the course will be provided one month before the course starts.

Title: Production Ergonomics – Designing work systems to support optimal human performance

Authors: Berlin, C. & Adams, C. (2017)

Publisher: London - Ubiquity Press

ISBN: 978-1-911529-14-9 (available as free pdf)

Excerpts from:

Work and Technology on Human Terms

Authors: Bogard, M. et al (2009)

Publisher: Stockholm - Prentice

ISBN: 9789173650588

Compendium (digital, pdf format) and selection of articles.