



# HN2017 Evaluation and Measures of the Physical and Chemical Work Environment 15.0 credits

Bedömningar och åtgärder av den fysiska och kemiska arbetsmiljön

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for HN2017 valid from Autumn 2018

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Technology and Health

## Specific prerequisites

Academic first degree, 180 higher education credits in engineering or natural sciences or equivalent education. 15 credits in mathematics or statistics.

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

The overall aim is to provide knowledge about climate and ventilation; lighting and visual ergonomics; electromagnetic radiation; and chemical and microbiological hazards at the workplace, their impact on safety, health, well-being, and performance. The objective is also to provide knowledge about how to manage these factors and reduce risks, through technical and organisational design of work, workplaces and the work environment.

By the end of the course, the students should be able to:

- describe, exemplify and explain how all the above mentioned factors affect safety, health, well-being and performance.
- find and interpret information about health hazards with chemical products and substances and use this information in risk assessment of handling of and exposure to chemicals.
- describe common microbiological risks, in what environments they occur how such risks can be assessed and how they can be controlled.
- perform measurements and risk assessments relating to all the above mentioned factors in order to assess exposure as well as understand the causes of exposure and provide a basis for control measures that eliminate or reduce the causes. Measurements include knowledge about measuring methods as well as measurement strategies.
- describe what different measuring strategies can be used for and critically analyse measuring strategies. Be able to interpret results from measurements and understand what conclusions can be made and analyse the limitations of measurements.
- propose work environment improvements according to the hierarchy of control concerning the above mentioned factors, discuss pros and cons with different control measures and strategies and identify facilitators and barriers for implementation.
- critically discuss risk assessments and work environment improvements in relation to work environment regulations and scientific literature.
- describe the EU regulations and Swedish legislation and provisions for all the the above mentioned factors.
- describe the demands on management of chemical risks and be able to support organisations and adapt the management methods to organisations needs and prerequisites.

## Course contents

Physiology and injury mechanisms

Acute and long term health effects including chemical and microbiological risks

Chemical management

Measurement methods, measurement strategies and risk assessment

Hierarchy of control including ventilation, substitution and other control measures

Intervention strategies

Legislation

## Course literature

Technology and work on human terms, Prevent

Helander, M, A guide to human factors and ergonomics, Second edition, CRC Press

Three books which can be downloaded for free from OH-learning, <https://www.ohlearning.com/>:

- W507 Health effects of hazardous substances. Student manual.
- W501 Measurement of hazardous substances. Student manual.
- W505 Control of hazardous substances. Student manual.

e-tool Dangerous substances (link will be provided when this English translation of KemiGuiden is published or in Swedish: KemiGuiden, [www.kemiguident.se](http://www.kemiguident.se))

Chemical Hazards in the Working Environment (AFS 2011:19Eng) (In Swedish: AFS 2014:43 Kemiska arbetsmiljörisker)

HSE website, information on microbiological risks, <http://www.hse.gov.uk/biosafety/information.htm> (or in Swedish: Alvarez de Davila E. Mikroorganismer i arbetsmiljön. ISBN 97-8917-365-0236, Prevent, this book can be obtained from the course leader)

EU-directives on indicative limit values (or in Swedish: AFS 2015:7 Hygieniska gränsvärden)

Scientific papers presented at the course start and listed at the course web

Complementary literature (voluntary, recommended for Swedish speaking students)

Process- och industriventilation. ISBN 91-7522-894-7, Prevent 2005

## Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F

- RED1 - Examination, 5.0 credits, grading scale: P, F
- TEN1 - Examination, 6.5 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercises, 2.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Requirements for final grade:

Active participation in laboratory and other exercises

Written presentation of assignments

Written exam 6.5 credits A-F

## Other requirements for final grade

LAB1 - Examination, 1.5, grade scale: P, F

ÖVN1 - Exercises, 2.0, grade scale: P, F

RED1 - Examination, 5.0, grade scale: P, F

TEN1 - Examination, 6.5, grade scale: A, B, C, D, E, FX, F

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.