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Introduction to Technology, Work and Health, 7.5 credits

COURSE MEMO

Study Period 1 2024



Figure 1. Photo from KTH.

Welcome to the course!

This course gives an introduction to how work-related factors effect health, and how ergonomists and work environment engineers can work to improve work environments, especially in the field of musculoskeletal loading in the workplace.

During the course, we will review central terms and concepts related to Ergonomics, such as: *HTO (Human, Technology & Organization)*, *Participatory Ergonomics*, and *Hierarchy of Control*, as well as learn about health hazards in the workplace, do basic assessments of risks related to musculoskeletal loading, and discuss and reflect on professional skills needed in the field. The course also has a particular focus on the set-up and managing of a *Systematic work environment management system* – A system and a way to systematically prevent ill health and accidents as well as to promote favorable work environments.

In this course memo, you will find general information about the course, the intended learning outcomes (ILOs), learning activities, the mandatory course literature, and examination criteria. In the detailed schedule in Canvas you can find more information about the learning activities and how to prepare for them.

Malin Håkansson, PhD, is responsible for the course. You are welcome to make contact via email, but you are encouraged to use the discussion forum in Canvas for general questions regarding the course, literature, or assignments where the answer may be of interest for all students.

The course is given during the first study period and you are expected to allocate about *20 hours* weekly for the course for lectures, workshops, seminars, and self-study activities. Please make it a habit to check in to Canvas regularly to stay informed of any changes. Notifications about important updates will also be sent through ‘Announcements’ in Canvas. Make sure to set up your notifications to suit your needs. Here is [KTH guide](#) on how to do that.

The course consists of lectures, *7 mandatory seminars* with related assignments, a mandatory *Lab day*, and a group project where you are expected to summarize an overall picture of health hazards and ways to systematically identify and prevent risks in a chosen work setting.

Reading connected course literature, and doing assignments prior to or after the seminars, are required to be able to take an active part in the seminars and for you as students to get the most out of the course.

Please plan time for your studies to make the most of the course and to balance your own workload. The course is based on constructive alignment. This means that the course objectives run like a red thread through the learning activities, and what is assessed at the examinations is whether you as a student have achieved the learning objectives for the course.

We look forward to the course and we hope that you will enjoy, learn, and have some new insights during the course.

/The Teaching Team

The Teaching Team

Course Coordinator

[Malin Håkansson](#), PhD and Lecturer, KTH, malinhak@kth.se

Examiner

[Catherine Trask](#), Associate Professor, KTH, ctrask@kth.se

Teachers & Guest Teachers

Malin Håkansson, PhD, Lecturer

Catherine Trask, Associate Professor, KTH

Jörgen Eklund, PhD, Professor, jorekl@kth.se

[Ann-Beth Antonsson](#), Professor KTH, antonss@kth.se

Per Nylén, Associate Professor, pernylen@kth.se

Lena-Nord Nilsson, Senior Ergonomist

Bengt Sahlin, senior OSH consultant

Kerstin Tegbrandt, Ergonomist [Scania](#)

Jessica Fagerlönn, Work Environment Engineer, [Scania](#)

Teaching Assistants

Course Literature

A list of the mandatory course literature is attached as an appendix in this course memo. All material is available online either as links or as files on the learning platform Canvas. Some of the course material is connected to the MOOC (Massive Open Online Course) [Work and Technology on Human Terms](#). Be sure to have checked the literature list in advance and to have created an online account for the MOOC (with your KTH email address) to get access to the book chapters in the MOOC.

Venue

The schedule is divided into *Campus weeks* (weeks 35, 38, and 41) and *Online/hybrid weeks*. The lectures and seminars on campus weeks will mostly be “live” at Campus Flemingsberg, *Hälsovägen 11C, in Huddinge, Sweden*.

Learning activities in the non-campus week will be offered online or as *hybrid teaching*, see the detailed schedule in Canvas for more information. When there is an opportunity to join online it will show up as ‘*Digital*’ in the scheduling program [TimeEdit](#) and as ‘*Zoom*’ in the detailed schedule. The Zoom link for the course is published in Canvas.

Whenever there is a room booked for the class we encourage you to show up in person to get the most out of the class and be able to interact with the teachers and other students in a better way. You can look up where the room/facility is located through the [KTH Facility Location tool](#).

To get attendance for the seminars you need to log in using your KTH account, by signing in via SSO. Instructions about how to login can be found via [this link](#). More instructions and tips about Zoom is published in the first module in Canvas.

Intended Learning Outcomes (ILOs)

1. Reflect on and exemplify interactions between work and health using a systems (human, technological and organizational, HTO) perspective.
2. Describe and reflect on laws, regulations, and standards in the subject area, and how they are used by ergonomists and work environment engineers to promote systematic work environment management.
3. Exemplify and describe different types of health hazards in the workplace and how these hazards may affect workers' health and performance.
4. Recognize musculoskeletal loading hazards in the workplace and be able to perform basic risk assessments.
5. Discuss and reflect on professional skills in the field of occupational safety and health, including project management, professional ethics, and collaboration competencies.
6. Reflect on how healthy and sustainable work environments contribute to the achievement of the UN Sustainability Goals.

[Link](#) to the course syllabus.

Examination and Completion

Examinations

- LAB1 - Laboratory work, 2.0 credits, Grading scale: P, F
- PRJ1 - Project work, 1.5 credits, Grading scale: P, F
- SEM1 - Seminars, 4.0 credits, Grading scale: P, F

Table 1. What intended learning outcomes (ILO) each course module examine

	ILO 1 HTO	ILO 2 Regulations	ILO 3 Hazards	ILO 4 Risk Assessment	ILO 5 Professional Skills	ILO 6 Sustainability Goals
LAB1	X	X	X	X		
PRJ1		X	X		X	
SEM1	X	X	X		X	X

Seminars (SEM1, 4.0 credits)

The mandatory seminars in the course require in-person participation as well as approved hand-ins in order to fulfill the course requirements. Active participation throughout each seminar is expected. The seminars are graded *Pass/Fail*.

Here is some advice to help you approach the seminars:

- Check the detailed schedule and instructions on Canvas to see if you are expected to do any preparatory work before the seminar, such as completing a specific assignment, reading a text or noting down questions on a topic. Also check the assignment dates for the course work.
- In the room, pick a seat that enables you to contribute to the discussion. We want to sit together. Unfortunately, the room is not always very suitable for round-table discussion but together we can make the most of it.
- Be prepared to talk. Seminars are places where questions are explored, topics are debated and analyzed. You are expected to actively contribute to the seminar discussions.
- Be prepared to listen. Pay attention to and respect the views of other students. You do not have to agree with your teacher and fellow students but listen first, then you are encouraged to clarify any points that need clarification and articulate your view.
- In addition to what is stated above: To be able to actively participate in *online seminars* it is your responsibility to *secure a quiet space* with a good internet connection. We expect that you have your *camera on*, that you are audible, that you monitor the chat, and that you take part in polls in Zoom. See tips about how to use Zoom in Canvas.

In case of absence, one seminar can be substituted with an alternate assignment corresponding to the content of the seminar, including interviewing one student who participated in the seminar. The student needs to email the course coordinator to sign up for an alternate assignment. Typically, the alternate assignment will be published after all the seminars are completed at the end of the course. Students need to hand in the written alternate assignment in Canvas no later than *two weeks after the course has ended*.

If the student misses more than one seminar the student needs to wait until the following year when the seminar is offered again. It is important that you come prepared for seminars. You are expected to read the literature and do any preparatory work before the seminar, so that our discussions are based on a solid understanding of concepts and theory. You can make the preparation in groups, but the hand-ins before or after the seminars are individual assignments.

PRJ1 –Project work (1.5 credits)

The project work consists of a group project where you are expected to summarize health hazards and ways to systematically identify and prevent risks in a chosen work setting using a framework for systematic work environment management. The project is individually examined using grade *Pass/Fail*.

The examination consists of a written report and an oral presentation by each project group on campus. All group members are expected to participate actively in the project meetings, the *two mandatory supervisions*, the writing of the report, and the oral presentation on Zoom. On Presentation Day you need to have the camera on to promote interaction between participants.

The groups will be formed by the teaching team during the first study week. Groups will be assembled with an effort to form teams with diverse educational backgrounds and to include one with Swedish language skills to facilitate interviews during worksite data gathering.

The report should be written in the students' own words with support from the mandatory course literature and relevant sources about the chosen occupation/work setting, see more under the heading *Referencing & Academic integrity* on the next page.

Detailed instructions about the project, including the content and structure for the report and submission dates are presented in a separate instruction file in Canvas.

Workshops Academic Writing, Reading & Learning

Since this is the introductory course in the program, we have designed some voluntary workshops that we hope will help reinforce your skills for academic writing, reading, and learning. The workshops are voluntary, but we think they will give you a head start in the program. Visit the detailed schedule on Canvas to find out more about them.

We can also recommend that you take the [guided Library tour](#) at our main campus in the beginning of September and that you check the KTH [Main Library calendar](#) to find lectures and workshops that can help you in your studies.

Referencing & Academic Integrity

Assignments and the report in the course should be written in the student's own words with support from the mandatory course literature and relevant sources. To pass the students must, where required, relate to concepts/models/theories described in the mandatory course literature, supported by references in the text and in a reference list at the end according to an accepted reference system. We recommend you use [APA 7th](#) as the reference system for the report.

All hand-ins in the course will be checked for plagiarism. Failure to cite references in a correct manner can be interpreted as plagiarism and lead to negative consequences for you as a student. To learn more about how to steer away from plagiarism we recommend that you watch the film *Avoid plagiarism and cheating* [<4 min] about how to make a reference to your sources and avoid plagiarism from the [KTH Centre for Academic Writing](#).

You can find more tips in the KTH handbook [Guiding students away from plagiarism](#) on how to avoid plagiarism. [Note that the English version of the book starts at Adobe page 86]. In the TTAHM Program Canvas you can also find more tips about writing and referencing.

Writing Resources: General information about [writing references](#) from KTH.

If you struggle with academic writing or want to improve your writing, we suggest you make an appointment with a writing tutor at KTH's *Centre for Academic Writing & Rhetoric*. You can schedule a meeting on Zoom, click here to learn more about how to [set up an appointment](#).

An informative guide to referencing, called [Refero](#), from Linnaeus University.

If you want to start to refresh your academic writing skills this pdf-book about [Academic Writing for Second Language Writers from Lund University](#) can be a good start.

Generative AI: Students must honestly disclose the use of any assistance, tools, resources, and references. For this course, the use of unedited text produced by generative AI (such as ChatGPT) is not allowed. Generative AI is digital technology that can generate novel text (e.g. Chat GPT and other chat bots), images (e.g. Dall E), as well as video and audio, but AI cannot take the responsibility to stand as an author. The use of AI language translation tools (such as Google Translate or [DeepL Translate](#)) and basic text editing software (such as [Grammarly](#)) is permitted provided that you add it to your contribution statement. If you are in doubt about what type of AI tools are allowed, please ask your teachers.

Support for Students with Disabilities

In case you have a disability, you can apply for compensatory support through Funka, see more information about how to apply [on the FUNKA website](#).

We hope you will enjoy the course and learn a lot!

Appendix 1 - Mandatory Course Literature

Instructions about the mandatory course literature will be given during the introduction. The literature is available in Canvas either as direct links, links to KTH Library or files. Instructions about how to prepare for each learning activity are provided in the detailed schedule in Canvas.

- AFS 2015:4. *Organisational and social work environment*. Swedish Work Environment Authority. <https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/organisational-and-social-work-environment-afs2015-4.pdf>
- AFS 2001:1. *Systematic Work Environment Management*. Swedish Work Environment Authority. <https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/systematic-work-environment-management-provisions-afs2001-1.pdf>
- Akselsson, R. (2015). Safety and Risk. In M. Bohgard et al. (Eds.), *Work and technology on human terms* (pp. 435-471). Prevent.
- Berglund, M., Karlton, A., Karlton, J. & Eklund, J. (2015). HTO – A Concept on Humans, Technology, and Organisation in Interaction. In M. Bohgard et al. (Eds.), *Work and technology on human terms* (pp. 1-22). Prevent.
- Bohgard, M. et al. (2015). Designing work and Technology on human terms. In M. Bohgard et al. (Eds.), *Work and technology on human terms* (pp. 9-18). Prevent.
- Eklund, J. (2003). An extended framework for humans, technology, and organization in interaction. In H. Luczak & K.J. Zink (Eds.) *Human Factors in Organizational Design and Management VII. Re-Designing Work and Macroergonomics - Future Perspectives and Challenges*. IEA Press.
- Fischer, K., Thatcher, A., & Zink, K. J. (2021). Human factors and ergonomics for sustainability. In Salvendy G. & Karwowski, W. (Eds.), *Handbook of Human Factors and Ergonomics*, (5th ed., pp. 1512-1527). John Wiley & Sons. <https://app.knovel.com/hotlink/toc/id:kpHHFEE028/handbook-human-factors/handbook-human-factors>
- Gyi, D., Shalloe, S., & Wilson, J. (2015). Participatory Ergonomics. In J. Wilson & S. Sharples (Eds.), *Evaluation of Human Work* (4th ed, pp. 884-906.). CRC Press.
- Harms-Ringdahl, K. (2012). Work in Awkward Postures. In A. Toomingas, S. E. Mathiassen & E. Wigaeus Tornqvist (Eds.), *Occupational Physiology* (pp. 99-116). CRC Press.
- Hellström, F. (2012). Work with Highly Repetitive Movements. In A. Toomingas, S. E. Mathiassen & E. Wigaeus Tornqvist (Eds.), *Occupational Physiology* (pp. 117-140). CRC Press.
- Human Factors and Ergonomics Society. (2020). Code of Ethics. <https://www.hfes.org/about-hfes/code-of-ethics>
- Hydén, H. (2015). Work Environment Legislation. In M. Bohgard et al. (Eds.), *Work and technology on human terms* (pp. 667 – 702). Prevent.
- IEA (2006). *Code of Conduct for Human Factors/Ergonomics (HFE) Practitioners*. <https://iea.cc/wp-content/uploads/2014/10/IEA-Code-of-Conduct.pdf>
- ILO (2014). A 5-step guide for employers, workers, and their representatives on conducting workplace risk assessments. International Labour Office. https://www.ilo.org/safework/info/publications/WCMS_232886/lang--en/index.htm
- ILO & IEA (2021). *Principles and Guidelines for Human Factors/Ergonomics (HFE) Design and Management of Work Systems*. Joint Document by the International Ergonomics Association and the International Labour Organization (ILO).

- Ouimet, T. C., Bracker, A., Leibowitz, A., Roskelley, D. C., & Throckmorton, J. V. (2011). Industrial Hygiene Professional Ethics. In D. H. Anna, (Ed.), *Occupational Environment - Its Evaluation, Control, and Management* (3rd ed., pp. 25-40). American Industrial Hygiene Association (AIHA).
- Rose, L., & Mikaelsson, L-Å. (2015). Occupational Injuries. In M. Bohgard et al. (Eds.), *Work and technology on human terms* (pp. 619-638). Prevent.
- Karlton, A., Karlton, J., Berglund, M., & Eklund, J. (2017). HTO – A complementary ergonomics approach. *Applied Ergonomics*, 59(PA), 182-190. <https://doi.org/10.1016/j.apergo.2016.08.024>.
- SFS 1977:1160. *Work Environment Act (Arbetsmiljölagen)*. <https://www.government.se/government-policy/labour-law-and-work-environment/19771160-work-environment-act-arbetsmiljolagen/>
- Swedish Work Environment Authority. (2016). *The organisation makes a difference: Why the work environment looks different for women and men* [Video]. Swedish Work Environment Authority. <https://www.youtube.com/watch?v=xurUalBMa8Y>
- Swedish Work Environment Authority. (n.d.) *Guide to improving the work environment*. ADI 683. <https://www.av.se/globalassets/filer/publikationer/broschyren/english/guide-to-improving-the-work-environment-adi683eng.pdf>
- Swedish Work Environment Authority. (2018). *How to improve the work environment for both women and men*. ADI 690. <https://www.av.se/globalassets/filer/publikationer/broschyren/english/how-can-the-work-environment-be-better-for-both-women-and-men-broschyr-adi-690eng.pdf>
- United Nations (n.d). *The 17 Goals*. Department of Economic and Social Affairs Sustainable Development. <https://sdgs.un.org/goals>

The list of course literature will be updated in Canvas where you can also find additional readings and more resources.