

MIE1411H1: Design of Workplaces Syllabus

Course Description

MIE1411 covers the following topics applying research findings to the problems of workplace design and occupational health and safety. 1) Anthropometry & workstation design 2) Back anatomy, biomechanics, workplace injuries and psychophysical assessments 3) Repetitive Strain Injuries and Hand tools 4) Lighting and Office Ergonomics 5) Noise and Vibration 6) Shiftwork 7) Heat stress and work physiology 8) Ergonomics Programming and Physical Demands Analysis. Anti-requisite: MIE343.

Instructor Dr. Emily King: Emily.King@utoronto.ca

Teaching Assistants Amin Azad amin.azadarmaki@mail.utoronto.ca

Lectures Mondays 18:10 – 21:00 starting Jan 6th, 2025

Office Hours By Request

Discussion Board The discussion board has been enabled for this course and will be monitored by the teaching team. Posting your questions or comments to the discussion board also provides an opportunity to have peers answer your questions, which may be faster than waiting for the TA or instructor to respond to your email.

Email Communications The instructor and TA are primarily available by email. Emails will be answered within 2 business days. All emails to course staff should be sent to and from utoronto.ca addresses. Please use an informative subject line that includes the course code (MIE1411).

Readings No textbook is assigned for this course. Readings will be assigned from a variety of sources and made available in the course Quercus site.

A free textbook covering many but not all of the topics in this course is:
Berlin, C and Adams C (2017) Production Ergonomics: Designing Work Systems to Support Optimal Human Performance. London: Ubiquity Press. DOI: <https://doi.org/10.5334/bbe>.

Learning Objectives

By the end of this course, students should:

1. Demonstrate knowledge of physical human factors (anatomy, anthropometrics, biomechanics, physiology and sensory considerations), as well as their application to the design and analysis of work.
2. Have experience accessing and using tools to support workplace ergonomic assessments
3. Have considered common practical challenges in implementing ergonomic improvements
4. Demonstrate the ability to apply course concepts to assess workplace human factors and ergonomic challenges and develop an appropriate program to address them.

Evaluation

Component	Value (%)	Individual vs. Group Work	Learning Objectives Evaluated
Design Log	10	Individual	All
Anthropometrics Problem Set	5	Individual	1 & 2
Office Ergonomics	10	Pairs (2)	All
Back Injury Risk Assessment Problem Set	5	Individual	1 & 2
Tool Time	10	Pairs (2)	All
Final Case Study	Topic selection: 0 Interim check-in: 2 Report: 15 Presentation: 8	Group (4)	All All All
Final Exam	35	Individual	All

Late assignments: For late assignments, 10% of the total possible mark will be deducted each day, for up to five days. After this time a grade of zero will be assigned. In case of extenuating circumstances, this policy can be flexible. To seek an exception please speak with Dr. King as soon as possible.

Academic Integrity: All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism (representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program) is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the [U of T writing support website](#). Consult the [Code of Behaviour on Academic Matters](#) for a complete outline of the University's policy and expectations. For more information, please see the [U of T Academic Integrity website](#). If you are under tight time pressure and might miss a deadline, remember: it is always better to submit your own work late than to plagiarize.

Plagiarism Detection Tool: Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (<https://uoft.me/pdt-faq>).

Requirements/Regulations

Attendance and Participation: Classes are designed with active learning in mind. You will benefit most from these activities if you attend and participate synchronously.

Copyright: Course materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not copy or share any course or student materials or videos without the explicit permission of the instructor.

Cell Phones and Laptop Usage: Technology can support student learning, but it can also become a distraction. Research indicates that multi-tasking (texting, surfing the Internet, using social networks) during class time can have a negative impact on learning (Clapp, Rubens, Sabharwal & Gazzaley, 2011; Ellis, Daniels, Jauregui, 2010; Hembrooke & Gay, 2003). Out of respect for your fellow learners in this class, please refrain from using laptops or mobile phones for entertainment during class and do not display any material on a laptop which may be distracting or offensive to your fellow students.

Safety: As professional engineers and occupational hygienists in training, you have a duty of responsibility to ensure that safety is duly considered at all times. To this end, you are expected to behave with your personal safety and the safety of others in mind. If you have not yet completed the MIE online safety training course, please do so at: <https://safetytraining.engineering.utoronto.ca/>. While you will not be using labs for this course, some activities will ask you to seek examples of how human factors has been applied in practice. Always consider your safety and the safety of those around you during these activities. If it is not safe, legal or reasonable for you to complete activities described in classes or practical assignments, please speak with the instructor as soon as possible to discuss your concerns and possible accommodations.

Quercus Information This course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. The site is dynamic and new information and resources will be posted regularly as we move through the term, so please make it a habit to log in to the site on a regular basis. To access the course website, go to the U of T Quercus log-in page at <https://q.utoronto.ca>. Once you have logged in to Quercus using your UTORid and password, you should see the link or "card" for this course. You may need to scroll through other cards to find this. Click on this link to open our course area, view the latest announcements and access your course resources. There are Quercus help guides for students that you can access by clicking on the "?" icon in the left side column.

SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

Equity, Diversity and Inclusion

Looking for community? Feeling isolated? Not being understood or heard?

You are not alone. You can talk to anyone in the Faculty that you feel comfortable approaching, anytime – professors, instructors, teaching assistants, first-year or upper years academic advisors, student leaders or the Assistant Dean of Diversity, Inclusion and Professionalism.

You belong here. In this class, the participation and perspectives of everyone is invited and encouraged. The broad range of identities and the intersections of those identities are valued and create an inclusive team environment that will help you achieve academic success. You can read the evidence for this approach [here](#).

You have rights. The [University Code of Student Conduct](#) and the [Ontario Human Rights Code](#) protect you against all forms of harassment or discrimination, including but not limited to acts of racism, sexism, Islamophobia, antisemitism, homophobia, transphobia, ableism, classism and ageism. Engineering denounces unprofessionalism or intolerance in language, actions or interactions, in person or online, on- or off-campus. Engineering takes these concerns extremely seriously and you can confidentially disclose directly to the Assistant Dean for help [here](#).

Resource List:

- [Engineering Equity, Diversity & Inclusion Groups, Initiatives & Student Resources](#)
- [Engineering Positive Space Resources](#)
- Request a religious-based accommodation [here](#)
- Email Marisa Sterling, P.Eng, the Assistant Dean, Diversity, Inclusion & Professionalism [here](#)
- Make a confidential disclosure of harassment, discrimination or unprofessionalism [here](#) or email engineering@utoronto.ca or call 416.946.3986
- Email the Engineering Society Equity & Inclusivity Director [here](#)
- [U of T Equity Offices & First Nations House Resources](#)

Accommodations

The University of Toronto supports accommodations for students with diverse learning needs, which may be associated with mental health conditions, learning disabilities, autism spectrum, ADHD, mobility impairments, functional/fine motor impairments, concussion or head injury, visual impairments, chronic health conditions, addictions, D/deaf, deafened or hard of hearing, communication disorders and/or temporary disabilities, such as fractures and severe sprains, or recovery from an operation.

If you have a learning need requiring an accommodation the University of Toronto recommends that students [register with Accessibility Services](#) as soon as possible.

We know that many students may be hesitant to reach out to Accessibility Services for accommodations. The process of accommodation is private; we will not share details of your needs or condition with any instructor.

If you feel hesitant to register with us, we encourage you to reach out for further information and resources on how we can support. It may feel difficult to ask for help, but it can make all the difference during your time here.

Phone: 416-978-8060

Email: accessibility.services@utoronto.ca

Wellness and Mental Health Support

Your personal wellness and mental health are important. The University of Toronto and the Faculty of Applied Science & Engineering offer a wide range of free and confidential services that can support your well-being.

As a U of T Engineering student, you have a Departmental [Undergraduate Advisor](#) or a Departmental [Graduate Administrator](#) who can support you by advising on personal matters that impact your academics. Other resources that you may find helpful are listed on the [U of T Engineering Mental Health & Wellness webpage](#), and a small selection are also included here:

- [U of T Engineering's Student & Community Wellness Coordinator](#)
- [Health & Wellness](#) and the [On-Location Engineering Wellness Counsellor](#)
- [Health & Wellness Peer Support Program](#)
- [Accessibility Services & the On-Location Advisor](#)
- [Graduate Engineering Council of Students' Mental Wellness Commission](#)
- [SKULE™ Mental Wellness](#)
- [U of T Engineering's Learning Strategist](#) and [Centre for Learning Strategy Support](#)
- [Registrar's Office](#) and [Scholarships & Financial Aid Office & Advisor](#)

We encourage you to access these resources as soon as you feel you need support; no issue is too small. You may reach out to the counsellors at [U of T Telus Health Student Support](#) for 24/7 free and confidential counselling support.

If you find yourself feeling distressed and in need of more immediate support visit uoft.me/feelingdistressed or U of T Engineering's [Urgent Support – Talk to Someone Right Now](#).

Indigenous Students' Supports

If you are an Indigenous engineering student, you are invited to join a private Discord channel to meet other Indigenous students, professors, and staff, chat about scholarships, awards, work opportunities, Indigenous-related events, and receive mentorship. Email [Professor Bazylak](#) if you are interested.

Indigenous students at U of T are also invited to visit Nations House's (FNH) Indigenous Student Services for culturally relevant programs and services. If you want more information on how to apply for Indigenous specific funding opportunities, cultural programs, traditional medicines, academic support, monthly social events or receive the weekly newsletter, go to the FNH [website](#), [email](#) or follow FNH on social media: [Facebook](#), [Instagram](#), or [TikTok](#). A full event calendar is on the CLNX platform. Check CLNX often to see what new events are added!

Land acknowledgment

I wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land. Learn more about Canada's relationship with Indigenous Peoples [here](#).

Course Schedule: MIE 1411

Week	Date	Topics	Practical/ Lab Activities
1	Jan 6	Introductions, Course Design & Expectations, Grading Structure, Orientation to Physical Ergonomics	Design Log
2	Jan 13	Anthropometry and Workstation Design	Problem Set 1
3	Jan 20	Office Ergonomics and Lighting	Office Ergonomics
4	Jan 27	Musculoskeletal Disorders	
5	Feb 3	Musculoskeletal Disorders of the Back	Problem Set 2
6	Feb 10	Musculoskeletal Disorders of the Upper Limbs	Tool Time
7	Feb 17	FAMILY DAY/READING WEEK	
8	Feb 24	Ergonomics Programming & Physical Demands Analysis <i>In class: Form Case Study groups, select topics</i>	
9	Mar 3	Work Physiology – Heat & Cold	
10	Mar 10	Noise & Vibration	Case Study Check-ins
11	Mar 17	Circadian Rhythms & Shift Work	
12	Mar 24	Slips, Trips & Falls	
13	Mar 31	<i>Final Presentations & Course Wrap-ups</i>	Case study due
		<i>Final Exam</i>	