

University of Waterloo
Department of Systems Design Engineering
SYDE 644
Human Factors Testing
Spring 2021 (Online)

Instructor

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Course Description

The focus of the course is on in-depth explorations of primary methods of data collection used in human factors engineering research and product testing. We will begin with a review of basic research knowledge and tools including experimental design, statistics, and citation management. We will discuss the applications and implications of quantitative data collection involving human participants, including performance, mental workload, and situation awareness. Students will be assigned to explore human factors literature and methods related to their own area of research interest. A seminar-discussion format will be used with the instructor serving as a discussion facilitator. Formal lectures are mixed with peer teaching and collaborative learning.

Course Goals and Learning Outcomes

Students will be given opportunities to:

1. develop their knowledge base for human factors engineering with respect to the primary measures, experimental design, and testing,
2. survey a range of research literature selected by the instructor and students,
3. conduct an in-depth review of methods and measures pertaining to their interested areas of research,
4. exercise communication skills, via in-class discussion, peer teaching, assignment, and term project paper,
5. learn independently, with a structure and guidance provided by the instructor.

Upon completion of this course, students should be able to:

- A. remember and understand important human factors measures,
- B. build a reference base of human factors primary measures and methods,
- C. conduct literature review for research and testing,
- D. apply human factors measures and design experiments for research and testing.

Textbook

Optional: Stanton, N.A., Salmon, P.M., Rafferty, L.A., Walker, G.H., Baber, C., Jenkins, D.P. (2013) Human Factors Methods: A Practical Guide for Engineering and Design. Second Edition. Surrey, UK: Ashgate. E-text option available: <https://uwaterloo-store.vitalsource.com/textbooks?sort=&term=9781409457541>

Research papers selected by the instructor and students will be posted on Learn.

Course Assessments

Assessment	Weighting
Homework (5 total, 8% each)	40%
Student Seminar Presentation (Online)	20%
Final Paper	40%
Total	100%

Weekly Seminar (Online)

As this is an advanced graduate level course, students are expected to come to class prepared to actively discuss the topics at hand. Some of the preparation will involve searching for relevant readings to share with the class. Online seminars will be recorded and posted on LEARN.

Homework

A series of questions will be asked about contents in the reading materials. These questions will guide students' reading and in-class discussion, as well as serving as an examination of knowledge understanding. See homework posted on LEARN.

Homework Submission and Late Work

Homework should be submitted electronically through LEARN by the due time on the due date of each homework (specified in each homework assignment). The system will not allow submission of any work after the due time. Work submitted directly to the instructor after the due time will be penalized 0-100% of the points scored, depending on the cause of late submission. A student must save a copy of the submitted work on his or her personal computer or personal file system in case of any LEARN website problem. The student must not make any change to the saved copy of the submitted work. If the student is not able to provide a saved copy when requested by the instructor or if the student makes any change to it after submission, that work may receive 0 credit.

Student Seminar Presentation

Each student will prepare a seminar on a topic vetted by the instructor. Instructor and peer evaluations will contribute to the grading.

Final Project Paper

Each student will prepare an individual project related to a selected human factors research or testing question and write a literature review paper (usually around 15 pages or 6000 words).

Mid-term Exam and Final Exam

None.

Course Outline (Subject to Change)

Week	Topics	Deliverables
1	Overview and background basics Course focus and purpose Outline and schedule	Reading questions (not graded) LEARN dropbox.
2	Basics review, Procedure of testing/experiment Ethics application, Experimental design Statistics, Citation management	Reading questions (not graded) LEARN dropbox.
3	Human factors measures, performance	Homework #1 LEARN dropbox. Submit by end of Monday, Week 4.
4	Mental workload, situation awareness	Presentation paper determined
5	Guest lectures Thursday, June 10 “physiological measures” by Dr. John E. Muñoz	Homework #2
6	No Class	Homework #3
7	Tuesday, June 22 “remote human factors testing” by Dr. Yeti Li Thursday, June 24 “eye tracking methods and metrics” by Prof. Siby Samuel	
8	Student presentation	Homework #4
9	Student presentation	Homework #5
10	Student presentation	
11	Student presentation	
12	Student presentation	
		Final project paper Due in mid-August

Fair Contingencies for Emergency Remote Teaching

We are facing unusual and challenging times. To provide contingency for unforeseen

circumstances, the instructor reserves the right to modify course topics and/or assessments and/or weight and/or deadlines with due notice to students. In the event of further challenges, the instructor will work with the Department/Faculty to find reasonable and fair solutions that respect rights and workloads of students, staff, and faculty.

Specific Academic Integrity Policy for This Course

Lecture notes: Students must not distribute lecture notes in public domains without written permission from the instructor.

Assignments and reports: Students should appropriately cite all referenced work, including websites, figures, and videos. If there is any question, a student needs to contact the course instructor in advance. It is each student's own responsibility to avoid **cheating**, which "includes copying from another student's work or allowing another student to copy from one's own work, submitting another person's work as one's own, fabrication of data, consultation with any unauthorized person during an examination or test, and use of unauthorized aids" (UW Policy 71) and to avoid **plagiarism**, "which is the act of presenting the ideas, words or other intellectual property of another as one's own." "Properly acknowledged use of sources is an accepted and important part of scholarship" (UW Policy 71).

Institutional-required statements for undergraduate course outlines approved by Senate Undergraduate Council, April 14, 2009

Cross-listed course

Please note that a cross-listed course will count in all respective averages no matter under which rubric it has been taken. For example, a PHIL/PSCI cross-list will count in a Philosophy major average, even if the course was taken under the Political Science rubric.

Academic Integrity

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility.

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#).

Grievance: A student who believes that a decision affecting some aspect of his/her university life has

been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70 - Student Petitions and Grievances, Section 4](#).

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read [Policy 72 - Student Appeals](#).

Other sources of information for students

[Academic integrity](#) (Arts) [Academic Integrity Office](#) (uWaterloo)

Counselling Services

Feel free to drop by our office in Needles Hall North, 2nd Floor or phone 519-888-4567 ext. 32655 to learn more about our services and register for them. Check out the [Hours](#) page for our hours of operation. Counselling Services are provided, at no charge, in a private and confidential setting to University of Waterloo students who are currently registered or on a co-op term. Learn more about [what to expect](#) when you come to Counselling Services.

Accommodation for Students with Disabilities

Note for students with disabilities: The [AccessAbility Services office](#), located in Needles Hall Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.

Regarding COVID-19 Mitigation

Guiding Principles for our SYDE-BME Community (faculty, staff, and students):

1. Be compassionate. 2. Be accountable. 3. Be patient. 4. Be safe and healthy.

Compassionate and respectful communication: Most online communication between the Department and students will be done through LEARN and/or email. Students are reminded that they should now use their email account name@uwaterloo.ca. Include an academic signature with your full name, program, student ID. We encourage you to include your preferred pronouns (he/him; she/her; they/them).

Scheduling of Synchronous (live) online course events: Due to the COVID-19 pandemic, all University of Waterloo courses components will be delivered online, until further notice. To maintain build supportive teaching environments, instructors may use the time slots (EDT) scheduled “in-class” hours to hold “live-stream” events such as lectures, tutorial help sessions, group activities, and open office hours. To accommodate different time zones, different working/studying conditions and limitations in internet access, all critical course components, including lectures and student support must be made available in asynchronous formats. Any timed component (e.g. test/quiz) must take time zone and internet availability into account.

SYDE COMMENT ON ACCOMMODATION: We respect that our SYDE students are independent adult decision-makers, with many opportunities to partake in activities that might be in time conflict with academic deadlines and deliverables. Along with the right to make adult decisions comes the responsibility and accountability for those decisions and any outcomes.

The University of Waterloo’s policy on accommodation for missed deliverables pertains to verifiable health matters, and highly unfortunate events (e.g. family tragedies). The Department of Systems Design Engineering follows UW’s general policy: students who self-elect to forgo a deliverable receive a “0” for that deliverable. It is preferred practice so that fairness is maintained for members of the same class/course by avoiding preferential treatment, and so that instructors are not burdened with having to create extra quizzes, deliverables, etc. It also reflects professional practice, as failing to show up to work and missing deadlines can be very costly to the company and individual (e.g. not submitting a contract proposal, or design review on time). **Please read the policy here: [Accommodation due to illness](#).**

SYDE Academic Priorities over Co-op Interviews: With asynchronous schedules, students should be able to arrange co-op interviews that do not conflict with major deliverables (i.e. timed course midterms, final exams). For deliverables with longer time windows (e.g. 24-48 hours or more), students must manage their time for deliverables and co-op interviews accordingly. If a co-op interview conflicts with a short deliverable time window (e.g. 1-3 hours), then students MUST follow the CECA procedure for rescheduling the interview: [CECA rescheduling co-op interviews](#).

Compassionate Accommodation: If you are facing challenges that are affecting more than one course contact the Associate Chair Undergraduate (ACUG sydeunde@uwaterloo.ca). They will review your case and coordinate a reasonable and fair plan in consultation with appropriate others (e.g. instructors, Department Undergraduate Studies Committee, Chair, AccessAbility Services, Engineering Counselling services, Registrar's Office).

Wellness Support and Contact Information

University can be a challenging environment and it is normal to need support from time-to-time. Campus Wellness services are available to students through counselling and health services. If you are struggling or need someone to talk to you, please reach out. To book an appointment or learn more about the services, call 519-888-4567 x 32655 or explore www.uwaterloo.ca/campus-wellness. If you're experiencing a crisis and feel unable to cope and Campus Wellness is closed, contact any of these after-hours supports: EmpowerMe (1-833-628-5589), Good2Talk (1-866-925-5454) or Here 24/7 (1-844-437-3247). They are available at any time of the day or night to help.

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