**Prerequisites**
The required prerequisites for this course are any PSYCO course at the 300-level, or consent of the Department. See UAlberta Calendar section Registration: Prerequisite Course Requirements.

**Course Description & Learning Objectives**
The field of human factors psychology and ergonomics uses scientific knowledge about human perception, cognition, and behaviour in specifying the design and use of human-machine systems (such as tools, tasks, jobs, and systems) for productive, safe, comfortable, and effective human use. You will learn about the design of things that people use, intentionally taking into account human abilities and limitations; and the systems approach to understanding complex sociotechnical systems. You will explore these aspects in a range of contexts, from using everyday things (e.g., opening doors) to extraordinary systems failures (e.g., the Chernobyl nuclear disaster). You will develop the skills to be able to apply design principles and the systems approach to real-world objects and situations. Specific learning outcomes will be described in lectures for each topic.

**Assessment**

**Applied Project (worth 15%):** This project is an experiential learning assignment, designed to give you the opportunity to apply human factors principles to a real-world case. A brief paper (at least 5 pages, but no more than 10) will be required, reviewing the findings, and making critical evaluations; this paper must be written in APA style. More details are provided in the applied project document.

**Midterm Exam (worth 25%):** The midterm will test material covered in the relevant assigned readings and in class. Although there is much overlap between the readings and lectures, it is not a complete overlap. Some content is only covered in one or the other. You are responsible for all material. The midterm will consist of short- and long-answer questions. If you miss the midterm for an acceptable reason such as incapacitating illness, severe domestic affliction, or religious conviction (see The Fine Print below), then the weight of the excused exam will be added to the final exam (digitally signed statutory declaration form required), then the weight of the excused exam will be added to that of the final. Documentation must be provided within 2 working days of the missed exam. No makeup exams or assignments are accepted. Exams will not be available for review. See UAlberta Calendar sections Academic Regulation: Attendance and Examinations (Exams).

**Final Exam (worth 30%):** See the Office of the Registrar’s exam schedule for official date, time, and location. The 2-hour final exam will have short-answer questions and an essay question, and will emphasize material covered after the midterm. If you miss this exam, you must apply to your Faculty Office for a deferral of the final exam within two working days of the final exam date. See UAlberta Calendar sections Academic Regulation: Attendance and Final Examinations.
Proctoring Trial (bonus 1%): A trial of the proctoring and exam integrity software (Smart Exam Monitor and ExamLock) will be given via eClass. You will receive a bonus 1% toward your final grade if you participate in this proctoring trial before the due date; your mark will not be based on how many questions you answer correctly.

Term Paper (worth 30%): This paper is intended to immerse you in research in the field of human factors and ergonomics. This can be done in a literature review paper (e.g., a critical review and analysis of published research on a particular topic or aspect of human factors/design). However, you may go beyond the bounds of a traditional paper by also investigating the design of a particular system and talking to the designers to determine exactly how they incorporate (or fail to incorporate) human factors principles, or writing a research proposal. The paper must be written in APA style, and the body of the paper must be at least 12 full pages. This is to ensure that you cover your selected topic in sufficient breadth and depth. More details are provided in the term paper document and in the APA Style & Research lecture.

Grading
Final grades will be assigned based on the University of Alberta letter grading system. This grade translation is approximate; the instructor reserves the right to use expert judgment to adjust grades as necessary.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A+</td>
<td>87-100%</td>
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<tr>
<td>A</td>
<td>83-86%</td>
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<tr>
<td>B+</td>
<td>75-78%</td>
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<tr>
<td>B</td>
<td>70-74%</td>
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<tr>
<td>C+</td>
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<td>C</td>
<td>57-61%</td>
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<td>D+</td>
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<td>D</td>
<td>40-44%</td>
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<td>F</td>
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<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assigned readings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 12, 14</td>
<td>Introduction; History of HF/E</td>
<td>Chapter 1; Proctor &amp; Van Zandt (2018a)</td>
</tr>
<tr>
<td>Jan 19, 20</td>
<td>The systems approach; Perception &amp; Natural Design</td>
<td>Chapter 2, Gibson (2015)</td>
</tr>
<tr>
<td>Jan 26, 28</td>
<td>Emotional design; Situation awareness</td>
<td>Jordan (1997); Morpew, Balmer, &amp; Khoury (2001), Endsley &amp; Jones (2011)</td>
</tr>
<tr>
<td>Feb 2, 4</td>
<td>Driver distraction; Cognitive illusions</td>
<td>Conkle &amp; West (2008); Piattelli-Palmarini (1994), Chapter 3, Croskerry (2003)</td>
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<tr>
<td>Feb 9, 11</td>
<td>Knowledge vs. Information</td>
<td>Chapter 4, Brigham (2001)</td>
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<tr>
<td></td>
<td>Proctoring trial due: Thurs., Feb. 11</td>
<td></td>
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<tr>
<td>Feb 16, 18</td>
<td>No classes (Reading Week)</td>
<td></td>
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<tr>
<td>Feb 23, 25</td>
<td>Human error &amp; reliability</td>
<td>Chapter 5, Schmidt &amp; Young (2010)</td>
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<tr>
<td></td>
<td>Applied project due: Thurs., Feb. 25</td>
<td></td>
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<tr>
<td>Mar 2, 4</td>
<td>Human error &amp; systems</td>
<td>Proctor &amp; Van Zandt (2018b)</td>
</tr>
<tr>
<td>Mar 9, 11</td>
<td>Three Mile Island</td>
<td>Perrow (1999)</td>
</tr>
<tr>
<td>Mar 16, 18</td>
<td>Chernoby; APA Style &amp; Research</td>
<td>Reason (1987)</td>
</tr>
<tr>
<td>Mar 23, 25</td>
<td>Team, group, &amp; organizational factors; Challenger</td>
<td>Griffin (1997); Tuft (1997)</td>
</tr>
<tr>
<td>Mar 30, Apr 1</td>
<td>Accidents, safety, &amp; risk Anthropometry &amp; Universal Design</td>
<td>Parsons, Seminara, &amp; Wogalter (1999) McCauley-Bush (2012); Chapter 6</td>
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<tr>
<td>Apr 6, 8</td>
<td>Computers &amp; HCI; Y2K; The systems approach</td>
<td>Guastello (2014); Moray (1994)</td>
</tr>
</tbody>
</table>

As per the exam schedule, the final exam is scheduled for Wednesday, April 28, 2021 at 9:00 a.m. online.
You must verify this date on Bear Tracks when the final exam schedule is posted.
(Deferred final exam will be held Monday, May 10, 2021 at 12:00 p.m. online.)
Required Readings

All required readings are posted online on the eClass website for this course; almost all of the required readings are available in a print coursepack from the bookstore.


Croskerry, P. (2003). The importance of cognitive errors in diagnosis and strategies to minimize them. Academic Medicine, 78(8), 775-780. https://doi.org/10.1097/00001888-200308000-00003


Required Textbook


(Available as a free ebook on the UAlberta Library website.)
The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour and avoid any behaviour which could potentially result in suspensions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All forms of dishonesty are unacceptable at the University. Any offence will be reported to the Associate Dean of Science who will determine the disciplinary action to be taken. Cheating, plagiarism and misrepresentation of facts are serious offences. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. As well, in the Faculty of Science the sanction for cheating on any examination will include a disciplinary failing grade (no exceptions) and senior students should expect a period of suspension or expulsion from the University of Alberta.

Absences from Examinations

For an excused absence where the cause is religious belief, a student must contact the instructor(s) within two weeks of the start of Fall or Winter classes (within three days of the start of Spring or Summer classes) to request accommodation for the term (including the final exam, where relevant). Instructors may request adequate documentation to substantiate the student request.

A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for a deferred final examination. Students who failed at the start of term to request exam accommodations for religious beliefs are expected to follow the normal deferred final examination process. Such an application must be made to the student's Faculty office within two working days of the missed examination and must be supported by appropriate documentation or a Statutory Declaration (see UAlberta Calendar section Academic Regulations: Absence from Final Exams).

Deferred examinations are a privilege and not a right; there is no guarantee that a deferred examination will be granted. Misrepresentation of Facts to gain a deferred examination is a serious breach of the Code of Student Behaviour.

Term Work Policy

With the exception of term work for which students did not receive feedback before the posting of final grades, students must initiate a request for reevaluation of term work with the instructor prior to the day of the final exam or in the case of courses without final exams, before the posting of final grades.

Representative evaluative course material will be presented in class and posted on the eClass website for the course.

Support Services

Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Academic Success Centre.

Students registered with Accessibility Resources have both rights and responsibilities with regard to accessibility-related accommodations. Consequently, scheduling exam accommodations in accordance with Accessibility Resources’ deadlines and procedures is essential. Please note adherence to procedures and deadlines is required for U of A to provide accommodations. Contact Accessibility Resources for further information.

Recording Permissions Policy

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course (e.g., lecture notes) is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Other Policies

Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this syllabus.

Policy about course outlines can be found in Academic Regulations: Course Requirements, Evaluation Procedures and Grading of the University Calendar.

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Recommended Resource

The Fine Print

Academic Integrity

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Remote Teaching & Learning Appendix

Due to the COVID-19 pandemic, this course will be delivered remotely. Remote delivery is not the same as an online course that has been carefully designed from the ground up to be a fully integrated online experience. In being required to deliver this course remotely, some tradeoffs have been made to try to preserve the essential experience of the in-person course. Every effort has been made to provide a high-quality learning experience. Be aware, though, that circumstances may result in deviations from procedures in the Before Times. Your patience and understanding are appreciated.

To successfully participate in remote learning in this course, it is recommended that you have access to a computer with an internet connection that can support the tools and technologies the University uses to deliver content, engage with instructors, TAs, and fellow students, and facilitate assessment and examinations. Please refer to Technology for Remote Learning for details. If you encounter difficulty meeting the technology recommendations, please email the Dean of Students Office (dosdean@ualberta.ca) directly to explore options and support.

Please contact me by the add/drop date (Jan. 22) if you do not have access to the minimum technology recommended. I will try to make arrangements to accommodating those who contact me before this date. Failure to do so may result in a zero in any assessment that depends on the minimum technology.

Lectures
Although links to lecture videos will be posted throughout the semester on eClass, the videos themselves are hosted on YouTube. These videos are asynchronous; that is, they are not being run live at a specific day and time; this allows maximum flexibility to accommodate diverse situations (e.g., time zones, family obligations, work, etc.). Note that, technically, this course is listed as “synchronous” because Zoom meetings and exams will take place during scheduled class time.

Office Hours
It will not be possible to have in-person office hours this term. Instead, you are encouraged to post general questions to the eClass discussion forum and ask personal questions via email. If there is enough interest, I may try holding sessions periodically via Google Chat, Google Meet, or Zoom.

Synchronous Activities
Students have the right to not participate in synchronous activities and may turn off their cameras and audio. It is recommended that students remove all identifiable and personal belongings from the space in which they will be participating. Synchronous activities will not be recorded/posted online.

Online Behaviour
Students from many different backgrounds participate in courses at the University of Alberta. Sexist, racist, homophobic comments and other inflammatory remarks are not conducive to learning in our courses, and absolutely are not permitted. All participants are governed by the Code of Student Behaviour. Be mindful when discussions involve controversial topics or issues, and consider the possibility that members of our community have themselves experienced some of these issues and/or very different realities because of these issues. Participate in a respectful and considered manner.

If you are witness to or the target of abusive or offensive behaviour in any course, please inform your instructor immediately. You may also contact the Department of Psychology Undergraduate Advisor Kerry Ann Berrisford (psyscience@ualberta.ca), Associate Chair (Undergraduate) Dr Cor Baerveldt (cor@ualberta.ca), or Chair Dr Anthony Singhal (psych.chair@ualberta.ca).
Exams
You will write the exams remotely online synchronously (on a scheduled day and time) using exam integrity software (ExamLock) and proctoring software (Smart Exam Monitor); see below for technological requirements. While writing the online exams, you are **not** to refer to any notes, books, websites, people, or deities. Any use of these materials will be considered a violation of academic integrity, and will result in the matter being sent to the Associate Dean of Science (Undergraduate) and the academic discipline team. You should arrange for a place to write your exams without interruption. If you have concerns about the exam writing and/or proctoring process, please contact me as soon as possible (for example, if you have religious or other reasons that do not permit you to show your face).

You **will** be able to contact me during the exams if you encounter problems. Details to follow.

**ExamLock** is software that you download and run on your computer. It will prevent you from navigating away from the exam, and it will take screenshots of all your on-screen activity. System requirements for ExamLock are:

- ✔ macOS version 10.10 (Yosemite) or newer
- ✔ Windows 10
- ✗ iPads, tablets, and Chromebooks are **not** supported

**Smart Exam Monitor** is software that works with eClass; you do **not** have to download this to your computer. You are asked to share your screen, turn on your webcam and microphone (for the duration of the exam), show your ID, and show your face. System requirements for Smart Exam Monitor are:

- ✔ laptop, desktop, or Chromebook computer (phones, tablets, and iPads are not supported)
- ✔ operating system: macOS X, Windows, ChromeOS
- ✔ Google Chrome browser
- ✔ webcam
- ✔ microphone
- ✔ fully charged device and/or power supply

⚠️ It is important that you read the information and privacy statement regarding remote exam proctoring, as well as the documentation in the Online Exams section of the eClass page for this course.

If you have any technical questions, please contact eClass support at (780) 492-9372 or eclass@ualberta.ca.

**Student Resources**
Updates to university-related activities impacted by COVID-19 can be found on the [COVID-19 Information website](https://www.ualberta.ca/covid-19/).

General information about various services and resources for students, including academic, financial, health, safety, and career development, can be found on the website for [Current Students](https://www.ualberta.ca/student-life/).