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 Outcomes
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 objectives will be given in lectures for each topic.

Assessment
Applied project (worth 15%)                          
Term paper (worth 30%)                                
Midterm exam (worth 25%)                              
Final exam (worth 30%)

Applied Project: This project is a “hands-on” case study 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: 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 (signed paper copy 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. You may be asked to show your ONECard at the exam. See UAlberta Calendar sections Academic Regulation: Attendance and Examinations (Exams).
Term Paper: 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 lecture.

Final Exam: See the Office of the Registrar’s exam schedule for official date, time, and location. The final exam will have essay questions, based on the entire course. If you miss this exam, you must apply to their Faculty Office for a deferral of the final exam within two working days of the final exam date. You may be asked to show your ONECard at the exam. See UAlberta Calendar sections Academic Regulation: Attendance and Final Examinations, and The Fine Print for more information.

Grading
Final grades in this course will be assigned as CR (credit): completed requirements, no grade point value assigned, credit provided; NC (no credit): failure, no grade point value assigned, no credit provided; IN (Incomplete): if there is insufficient information to assign CR or NC. Credit is assigned based on your overall weighted average:

- CR = 40-100%
- NC = 0-39%

Schedule of Classes

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assigned readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 7, 9</td>
<td>Introduction; History of HF/E</td>
<td>Chapter 1; Proctor &amp; Van Zandt (2018a)</td>
</tr>
<tr>
<td>Jan 14, 16</td>
<td>The systems approach; Perception &amp; Natural Design</td>
<td>Chapter 2, Gibson (2015)</td>
</tr>
<tr>
<td>Jan 21, 23</td>
<td>Emotional design; Situation awareness</td>
<td>Jordan (1997); Morphew, Balmer, &amp; Khoury (2001), Endsley &amp; Jones (2011)</td>
</tr>
<tr>
<td>Feb 4, 6</td>
<td>Knowledge vs. Information</td>
<td>Chapter 4, Brigham (2001)</td>
</tr>
<tr>
<td>Feb 11, 13</td>
<td>Human error &amp; reliability</td>
<td>Chapter 5, Schmidt &amp; Young (2010)</td>
</tr>
<tr>
<td></td>
<td><strong>Applied project due: Thurs., Feb. 13</strong></td>
<td></td>
</tr>
<tr>
<td>Feb 18, 20</td>
<td><strong>No classes (Reading Week)</strong></td>
<td></td>
</tr>
<tr>
<td>Feb 25, 27</td>
<td>Human error &amp; systems</td>
<td>Proctor &amp; Van Zandt (2018b)</td>
</tr>
<tr>
<td></td>
<td><strong>Midterm exam: Thurs., Feb. 27</strong> (based on all above readings &amp; lectures)</td>
<td></td>
</tr>
<tr>
<td>Mar 3, 5</td>
<td>Three Mile Island</td>
<td>Perrow (1999)</td>
</tr>
<tr>
<td>Mar 10, 12</td>
<td>Chernobyl; APA Style</td>
<td>Reason (1987)</td>
</tr>
<tr>
<td>Mar 17, 19</td>
<td>Team, group, &amp; organizational factors; Challenger</td>
<td>Griffin (1997); Tufte (1997)</td>
</tr>
<tr>
<td>Mar 24, 26</td>
<td>Accidents, safety, &amp; risk</td>
<td>Parsons, Seminara, &amp; Wogalter (1999)</td>
</tr>
<tr>
<td></td>
<td>Anthropometry &amp; Universal Design</td>
<td>McCauley-Bush (2012); Chapter 6</td>
</tr>
<tr>
<td>Mar 31-Apr 2</td>
<td>Computers &amp; HCI; Y2K; The systems approach</td>
<td>Guastello (2014); Moray (1994)</td>
</tr>
<tr>
<td>Apr 7</td>
<td>Health care systems</td>
<td>Bogner (1994), Reason (2001)</td>
</tr>
</tbody>
</table>

As per the exam schedule, the final exam is scheduled for **Wednesday, April 22, 2020 at 9:00 a.m. via eClass**. You must verify this date on Bear Tracks when the final exam schedule is posted.
(Deferred final exam will be held Monday, May 4, 2020 at 12:00 p.m. in BS P231.)
**Required Readings**

The required readings are available in a coursepack from the bookstore; all required readings are also available online on the eClass website for this course.


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**

Recommended Resources


The Fine Print

Academic Integrity

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 suspicions 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 University of Alberta Calendar section 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.

Final Examination

The final exam for this section of PSYCO 494 will be 2 hours in length, however, all students will be allowed up to 3 hours to complete the exam. For students registered with Accessibility Resources:

- If your **ONLY accommodation** is a 1.5 exam time multiplier, you will write your final exam with your classmates at the standard date, time, and location published by the Office of the Registrar. **You DO NOT need to register this final exam in ClockWork.**
- If you have **ANY other accommodations**, you **MUST register this exam in ClockWork by the required deadline** and write your exam in a location determined by the Accessibility Resources Exam Office.
- If you have any questions regarding this accommodation, please contact Accessibility Resources [arrec@ualberta.ca](mailto:arrec@ualberta.ca).

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 Course Requirements, Evaluation Procedures and Grading of the University Calendar.

For information on changes made to this course in light of the COVID-19 pandemic, see the Revised Amendment to Existing Syllabus document on eClass.

Copyright © 2020 by Karsten A. Loepelmann, Department of Psychology, University of Alberta. All rights reserved.

v2.01