Learning Objectives & Learning Outcomes
In completing the term paper, you will:

1. Learn about research done in an area of human factors/ergonomics that interests you.
2. Potentially apply Moray’s (1994) systems approach (depending on your topic), which can help you learn and remember this foundational knowledge in the course.
3. Exercise your critical thinking and writing skills, which are important abilities that are highly valued by employers.

Important Dates
• you must submit the topic of your paper for approval by the class following the midterm, **Tuesday, October 22**
• term paper is due in class on **Tuesday, December 3**; late papers are penalized 10% per day

Structure
Your term paper may be written in the traditional format of a review of the research literature addressing a particular topic in the area of human factors and ergonomics. However, you are not limited to this approach in your paper. Below, several different possible formats are described, or you may see the instructor if you would like to try something else. Please note that an original research project (i.e., doing your own experiment) is usually not appropriate. The body of the paper (i.e., not including title page, references, figures, tables, appendices, or quotations) must be at least **12 full pages**. If your paper is too short, you are not covering your topic in enough depth, and you will be deducted marks. No abstract is required.

Literature Review: This format of paper describes, summarizes, compares, and evaluates the findings of primary research in a topic in human factors and ergonomics. Your paper should not be a review of opinion papers; although you may include some descriptive research (e.g., surveys, interviews, questionnaires, etc.), it is recommended that you include some empirical research, which should be used to evaluate particular theories. Any important theoretical or practical issues should be described and critically analyzed, in the context of what you have learned in the course. Using references from websites like Wikipedia is not acceptable. Generally, these sources are “secondary,” meaning they do not describe the research itself (e.g., in terms of methods, subjects, hypotheses, etc.); secondary sources are like a summary of research. If you write a paper based only on secondary sources, you are writing a summary of a summary. This is not a good way to familiarize yourself with the research itself; your mark will reflect this fact. A better approach is to try and find peer-reviewed journal articles on your chosen topic, using the online PsycINFO database, for example (online databases of research articles can be found at University of Alberta Libraries: A-Z Databases). Do not use PSYCO 494 lecture notes as a reference. You are not required to write a comprehensive review or systematic review, which critically analyzes all research papers on a given topic; however, your review should be representative of the literature.
**Research Proposal**: If you have an interest in a particular topic, but you cannot find enough published research for a whole review paper, you may write a research proposal. The first part of your paper would consist of an introduction, in which the available literature is reviewed. In the second part, you would describe the design of an experiment (or experiments) to try and test a particular theory, fill a significant gap in what is known about your topic, or apply the principles of the systems approach. Don't worry—you aren't expected to actually carry out the research. Details on the content and organization of a manuscript are provided in the APA manual. Be sure to include **all** important sections of a research paper, including participants, procedure, design, etc.

**Interview/Case Study**: You may wish to choose this format if you are having difficulty finding literature on your chosen topic, or if you wish to write on a case study. Human factors and ergonomics is a very applied field, meaning that, as part of their job, professionals are given “real-world” problems to solve. You may wish to examine a particular problem in detail, by interviewing those involved. Then, evaluate their approach in the light of known research and theories—do not simply submit a transcript of your interview. Examples of people you may wish to interview include designers, architects, physicians, or ergonomists. Note that your paper must consist of a literature review and an assessment of how your Subject Matter Expert applies what is known/best practices. A transcript of your interview will not suffice as a term paper.

**Format**
Your term paper **must** be written in **APA style**. If your term paper does not conform to APA style, you will lose marks. APA style guidelines apply to the format of your paper (e.g., size of the margins), but also the style of writing, use of the first person (“I” should not be used), and quoting source material (do **not** do so; paraphrase--write it in your own words--instead). Even more importantly, the use of APA style ensures that you support all claims or opinions with proper citation of evidence; failure to do so will cost you marks. Further requirements will be presented in the APA style lecture.

**Resources**
In addition to the recommended resources listed in the syllabus, the following websites also give helpful information on writing a critical research review and APA style:

- The Literature Review: A Few Tips On Conducting It
- Writing a Psychology Literature Review
- UAlberta Libraries Foundational Research Tutorials
- UAlberta Libraries APA Style Guides
- Purdue Online Writing Lab: APA Style
- Indiana Wesleyan University: APA Style Checklist

It is unpleasant to read a paper in which every sentence has structural or grammatical errors. In the worst case, if what you have written is incomprehensible, you will lose marks. In the best case, you will still lose marks for poor spelling, grammar, and writing style. If you are not fluent in English, or have difficulty writing, you are strongly recommended to obtain help from the Centre for Writers, located in 1-42 Assiniboia Hall. They offer free tutoring and workshops to all students. See the [Centre for Writers' website](http://example.com) for more information, and hours of operation.
Topic Ideas
The following topics are merely suggestions; you are free to choose your own topic. (However, you may not choose a topic that is part of the course, such as Three Mile Island, Chernobyl, Air Transat 236, etc.) Your paper topic must be approved by the instructor.

- **physical ergonomics** -- What are some of the capacities of the human body? Are designers creating products (e.g., chairs, desks) that meet these requirements?
- **rehabilitation medicine** -- Are some tasks prone to causing injury to the low back, and is the weight of the lifted object the only contributing factor?
- **health care/medicine** -- What factors contribute to the new strains of bacteria that are resistant to antibiotics? What is the biopsychosocial model of whiplash, and what evidence supports it?
- **technostress** -- What is technostress, and what are its causes?
- **“Facebook depression”** -- Why do some people experience depression due to social media? Explore the evidence on this topic from an HF/E perspective.
- **cybersecurity** -- How can individuals, corporations, and nations maintain computer security and privacy?
- **disasters** -- Review published scientific literature and official investigation reports on a large-scale disaster like Bhopal, the *Titanic*, or the *Exxon Valdez*, and analyze it using the systems approach. What happened? What has been learned? What changes resulted from it?
- **sick building syndrome** -- What are the causes of SBS, as analyzed by the systems approach? Why do modern buildings suffer SBS more than older ones?
- **auto safety** -- Are airbags a more of a hazard than a safety device? What factors affect driver safety and driving performance?
- **traffic psychology** -- What considerations must be made of people when they are driving a vehicle? How does this relate to safety?
- **aviation** -- What factors contributed to a particular crash of an aircraft? What is the role of human error? What are mode errors, how common are they, and why do they happen?
- **aging** -- How do driving abilities change as people age? How can devices like automated teller machines be better designed for usability by an aging population?
- **food safety** -- How does HACCP work, and what are its pros and cons? How does the systems approach help in understanding a breakdown in food safety?
- **signs and symbols** -- What factors contribute to the effectiveness of traffic signs? Are symbols in common usage effective? What makes some symbols more effective?
- **maps** -- What things influence human wayfinding? Why are some maps better than others?
- **handedness** -- Are left-handed people more likely to die sooner, due to accidents caused by using tools designed by a right-handed world? Or is this just a statistical misinterpretation?
- **architecture, urban design, and environmental design:** How is productivity and wellbeing affected by open-plan office design vs. traditional closed office layout? How does the built environment of workspaces, rooms, and buildings affect performance?

Still having a hard time? An excellent place to start is the HFES magazine *Ergonomics in Design*. You may want to look through journals like *Human Factors, Ergonomics, Applied Ergonomics, Journal of Usability Studies, Journal of Cognitive Engineering and Decision Making, Journal of Experimental Psychology: Applied, Accident Analysis & Prevention, Aviation Psychology and Applied Human Factors*, or *IIE Transactions on Occupational Ergonomics and Human Factors* to get some more ideas. The recommended readings listed on the PSYCO 494 class website are also a good starting point.
**Submitting Papers**
You are required to hand in a **paper** copy of your paper, and submit an **electronic** copy via eClass. Both copies must be identical. To avoid late penalties, at least one copy (paper or electronic) must be handed in before the deadline. For electronic copies, Microsoft Word format is preferred, but PDF is also acceptable.

**Late Policy**
Paper copies of late papers must be handed in to the Department of Psychology office (BS P217, open 8:30-12:00 and 1:00-4:30); electronic versions may be submitted late via eClass. Late assignments will lose 10% per 24-hour period, starting immediately after class is over. That is, if you submit your assignment 1 minute after class is over, you will lose 10%. If you submit your assignment 23 hours and 59 minutes after class is over, you will still lose only 10%. But if you submit your assignment 24 hours and 1 minute after class is over, you will lose 20%, etc.

**The Fine Print**
The University of Alberta is committed to the highest standards of **academic integrity**. 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. These resources from Student Conduct and Accountability, and the University of Alberta Libraries can help:
- [Academic Integrity: Introduction to Academic Culture](#) - videos on citing, quoting, summarizing, and paraphrasing
- [Plagiarism](#) - plagiarism definition, and tips for avoiding plagiarism
- [Citing, Quoting, Paraphrasing & Summarizing](#) - how-to document from the UAlberta Centre for Writers
- [Foundational Tutorials: Citing](#) - interactive tutorials on citing, plagiarism, and paraphrasing, with examples