Instructor:  Prof. Paul Milgram  
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Meetings:  
Lectures: Tuesdays 13:00 - 14:00, WB 219  
Fridays 12:00 - 14:00, WB 219  
Labs: Wednesdays 15:00 - 18:00, RS 303  
(Some regular lectures may be held occasionally during the lab time slot. The midterm exam will be also held during the lab time slot.)

Teaching Assistants:  TBA  
Office:  TBA  
Email:  TBA


Assessment:  
Final Examination: 45%  
Mid-Term Exam: 25%  
Laboratory Projects: 30%  
*The mid-term test is (tentatively) planned for TBA. (In other words, be aware that this date will be confirmed later.)*  
All exams will be closed book, with no aids other than non-programmable calculators.

COURSE CONTENT

The aim of the course is to study, and model, the relationship between human information processing and the design of human-machine systems, especially for complex workplaces.  
Topics to be covered (in approximate order) include:  
  • Introduction to the concept of human information processing  
  • Information theoretic models of human information processing  
  • Theory of signal detection  
  • Attention in Perception and Display Space  
  • Spatial Cognition and Navigation  
  • Memory  
  • Human Decision Making  
  • Attention Sharing / Multitasking  
  • Mental Workload, Stress and Human Error  
  • Automation and Human Performance

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1 This course used to be an undergraduate course, MIE448F, that was run in parallel with MIE1407F, a graduate course with the same name. Whereas the graduate course no longer exists, the undergraduate course has ‘graduated’ to a 500 level course, but with no other changes. (This is the first year with the new course number.)

2 Note that it should be possible to take the course without owning a copy of the textbook – that is, based on only class meetings. Nevertheless, it is highly recommended to obtain a textbook ... somehow. The most recent fourth edition (2013) is unfortunately very expensive (> $200?). Consequently, if you can’t afford that but you can get a hold of a copy of the third edition (2000), that should probably be a good compromise solution.
LABORATORY PROJECTS

• The objectives of the laboratory are fourfold:
  – To expose you to some of the principles discussed in the lectures.
  – To provide you the challenge of how to design an experiment that will demonstrate a particular theoretical principle.
  – To give you some hands-on experience with some of the particular challenges of experimenting with human subjects.
  – To provide you the opportunity, where appropriate, of applying some basic statistical analysis techniques to real data.

• There will be five (5) regular experiments. These laboratory exercises comprise an integral part of the course. (This means that on exams you are responsible also for laboratory material, not just lecture material.)

• Your final lab mark will be assigned on the basis of all five lab marks. (Note that the 30% allocated to the lab component is higher than the normal maximum of 25%.)

• You are expected to have an ECF account for doing the labs. Experiments may occasionally be carried out using machines in other ECF lab. You will be informed of those experiments, and on those occasions attendance at the lab during the lab time slot is not mandatory. (However, the TAs will be in the lab only during the scheduled lab session.)

• Lab instructions will be made available on the course web page before the lab sessions. Read the lab instructions carefully and follow all procedures as described. Note, however, that a lot of latitude is going to be given to you to design your own experiments. (In other words, bring your brains with you to the lab; “cookbook” procedures will be kept to a minimum!)

• Ordinarily, lab reports must be written and submitted by 23h59 on the second Monday following the lab period – i.e. 12 days later. Reports are to be submitted electronically as a Word file. (If that is not possible, then a PDF file will be ok.)

• Under normal circumstances, each student should be able to work on one PC within the lab. For the writing up of the report, on the other hand, you are expected to work in pairs (of two); the writing up of the report should therefore be a team effort.3 Do not forget to write the names of both authors on the report; marks can not be assigned to people whose name does not appear! Each author is required to declare his/her contribution to the report (i.e. 50%/50%, or otherwise).

• During the course, you should consider making use of the services of the Engineering Communication Programme (ECP) (http://www.engineering.utoronto.ca/Directory/students/ecp.htm) to assist you in developing your technical writing skills. You are strongly encouraged to familiarise yourselves with the services of the ECP.

• You should regard the writing of a lab report as an exercise in designing an effective display system, where the user is the person reading the report. On the one hand it should be concise, since verbosity can be distracting, and thus not appreciated. (Do not, for example, rewrite the handout). On the other hand, do not neglect important fundamental points, such as objectives of the experiment, discussion of results, etc. Use your judgment in trading off between superfluity and paucity of information conveyed. In all cases, make sure to write clearly. Keep in mind that your objective is to clearly communicate what you did, why you made the decisions that you made, and what you discovered … and thereby to convince the person grading the report that you understand the material very well. (Explaining things that ‘went wrong’ is also very important!)

• Graphs should ordinarily be computer generated. Make sure to use clear symbols, label axes, keep axes consistent, and include legends and titles. Do not necessarily rely on the formatting decisions of the plotting software! (A lot of these ideas will be clarified when we get to Chapter 4 in the course.)

• Marks will be deducted for failure to demonstrate understanding of the material, lack of clarity, inappropriately drawn graphs, etc. Marks will be deducted also for late submissions.

• The writing up of the lab reports is an important practical aspect of this course (whose real-world value may not become evident until much later on in your careers). Although it is important to do a good job on the lab reports, the intention is not that hours and hours be spent on writing up the labs!! Learn to get directly to the heart of the problem and finish your reports in a 'reasonable' amount of time.

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3 In the event that not every student is able to find a partner for the lab writeup (for example due to an odd number of (odd) students in the class), volunteers for writing the report alone will be solicited, starting with the graduate students. In the absence of “volunteers”, selected grad students may be required to write up (some) reports on their own.