Course Title: Topics in Engineering Psychology: Temporal Awareness and Human Performance (0514.788.01)

Meeting Times: Mondays and Wednesdays 12:00—1:50 pm, at 06-A269.

Instructor: Esa M. Rantanen, Ph.D. <esa.rantanen@rit.edu>

Office: 01-3140 Eastman Bldg.; Tel. (585) 475-4412

Office Hours: Wednesdays, 10:00 a.m.—12:00 noon or by appointment

Textbook: Please see separate readings list.

Other Readings: See course schedule.

Course Description: The course will have three intertwined themes. The first theme is the theoretical underpinnings of temporal cognitive processes, including prospective memory, time estimation and perception, and time pressure and stress. We will read and discuss a number of papers on these topics during about the first half of the quarter. The second theme is measurement of human performance in time-critical tasks and settings, and this theme is closely linked with the third one, which is research methods in engineering psychology and experimental design. In addition to classroom discussions of assigned papers, each student will choose a particular aspect of temporal cognition of special interest to them, individually delve deeper into the research literature, share their findings with the class, and design an experiment to test their hypothesis (-es). The main deliverable for the course will be a term paper describing the experimental design and the theoretical research questions it is intended to examine.

Prerequisites: N/A.

Expectations: Class participation. Active class participation is expected. Much of the material will be presented only in lectures and discussions and will not be available in textbooks or other readings. You are also expected to make presentations on the assigned materials and share your questions, comments, ideas, and critique with the class at all times.

Homework: Homework will be assigned on an ad hoc basis to supplement materials covered during class meetings. Exact instructions and due dates for each assignment will be provided. No late homework will be accepted.

Presentations: Short presentations will be assigned to each student, including a written outline. The presentations will be graded on their accuracy and information content and the student’s level of preparedness.

Exams: There will be an in-class, closed book, closed notes comprehensive final exam.

Term paper: A term paper is the main deliverable for this course and it should consider a relevant topic of your choice, but delve into it much more in detail than has been possible in the class discussions. Please start planning your project early in the semester, and see me for help in formulating your approach and identifying references and other materials.

Grading:

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<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Class participation</td>
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<td>Homework</td>
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<td>Presentations</td>
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<td>Final Exam</td>
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<td>Term Paper</td>
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A: ≥ 90 %   B: 80-89 %   C: 70-79 %   D: 60-69 %   F: < 60 %
Class Policies:
Documented medical, bereavement, or religious reasons are valid excuses for absence. Any other absences must be approved and arrangements for make-up assignments made prior to the class in question.

Cheating: This includes plagiarism; the Institute and College of Liberal Arts policies on cheating will be followed and most severe sanctions permitted advocated.

Course Website:
https://mycourses.rit.edu

Course Schedule: Topics and Readings (papers chosen and presented by students are indicated by *)

1. Mon., Sep. 3: Introductions, course organization; syllabus.

2. Wed., Sep. 5: Time in engineering psychology;

3. Mon., Sep. 10: Mental models;


5. Mon., Sep. 17: Attention


7. Mon., Sep. 24: Queuing model of visual sampling;

8. Wed., Sep 26: Queuing model of visual sampling;

Tulga, M. K., & Sheridan, T. B. (1980). Dynamic decisions and work load in multitask supervisory control. IEEE Transactions on Systems, Man, and Cybernetics, SMC-10, 217-
232.

10. Wed., Oct. 10: Prospective memory;


11. Mon., Oct. 15: Prospective memory models;


18. Wed., Nov. 7: General discussion.
Directions for the research paper assignment:

(1) **Topic**: You have much latitude in your choice of the topic for your papers. The only ‘hard’ requirement is that it is relevant to the class, which is titled *Temporal Awareness and Human Performance*. It is your responsibility to clearly demonstrate the relevance.

(2) **Structure**: Because of time- and other constraints, your papers will primarily consist of a review of relevant literature. In addition to reviewing others’ work, however, your individual contribution will be a suggestion for an experiment to test a hypothesis you have formulated or to resolve a controversy you have discovered in the literature. Be very clear in stating the particular research problem and how it is based on the reviewed literature, and describe the independent variables you propose to manipulate and the dependent variables you plan to measure in great detail. Also include a brief section on the anticipated results.

(3) **Depth**: The treatment of your topic should be in-depth, from which it follows that you must carefully narrow it into something that is practical for this sort of an assignment. I will use your reference list as one measure of depth, and hence it should include a *minimum* of 12 relevant references. Note that reviewing and referencing only papers we have discussed in class will not do; the purpose of in-class discussions is to achieve sufficient *breadth* for the course, the purpose of the paper is to meet the *depth* requirement for the course.

(4) **Length**: I hesitate to set rigid criteria for the length of the paper, for it will depend on your individual writing styles &c. Perhaps a reasonable minimum length for your papers is six single-spaced pages using 12-point Times or Times New Roman font, excluding the reference list. Please pay attention to your writing; be to-the-point, accurate in your choice of words, and strive for utmost clarity and ‘crispness’ of your presentation.

(5) **Format**: Electronic, an MS Word document (Word 2004 or earlier), single-spaced, 12-point Times or Times New Roman font.

(6) **Due date**: TBD (I have not been able to find a deadline for grade submission yet, but I will make the paper due date 48 hours before the grades are due).

(7) **Submission**: Electronic submission to the myCourses dropbox.

(8) **Grading criteria**: Clearly expressed understanding of the topic, well-reasoned synthesis of the reviewed literature, understanding of the factors influencing the phenomenon in question in the choice and description of the independent variables, understanding of the relationship between the chosen independent and dependent variables, correct grammar and spelling (proofread, proofread, proofread!).
Please answer ALL questions. Limit your answer to 200 words per question (i.e., really think what you say, be to-the-point, and absolutely clear in your meaning without wasting words). Make sure you accurately cite all sources you use in your answers and include a complete reference list in the end of your exam. You may use any sources available to you in the course readings and lecture notes and handouts, library resources, as well as the internet; you must, however, carefully reference all sources used. You also must work individually and independently. No collaboration with other people on this assignment is permitted.

1. Define ‘temporal awareness’ in your own words. You may rely on definitions you find in the literature (in which case make sure you cite the sources properly), but simply repeating an existing definition is not acceptable. You should express your understanding of the construct. Also, be as complete and comprehensive as possible so that your definition captures all processes and situations relevant to temporal awareness as you define it.

2. We read papers from both engineering and cognitive psychology traditions in the class. Compare and contrast the modeling approaches to time and human performance in these different traditions.

3. Describe the role of temporal awareness in the context of human-system interaction. Clearly define the relationships between time and other relevant constructs such as attention, memory, mental workload, situation awareness, and both human and system performance.

4. We discussed also the detrimental effects of interruptions on human performance. Relate task interruptions to time, temporal awareness, and the cognitive processes involved in such multi-task settings. Choose a cognitive model of psychological time discussed in the class (or propose your own model) and show how it might explain the observable human performance during task interruptions.

5. Describe a real-world task in which you deem good human performance would be particularly dependent on good temporal awareness. Then describe how you would examine a set of relevant factors of your choice in an experimental setting in a laboratory. (Note: You need to identify independent variables, operationalize them and define their levels of manipulation, and define dependent measures you would record).

You may use this document as a template and type your answers after each question. Follow the same format, that is, MS Word 2004 or earlier, 11- or 12-point Times or Times New Roman font, single-spaced. Also type your name in your answer document.

This exam is due on Monday, November 12, by 6:00 pm EST, in the dropbox created for it in the myCourses website.