ECE511/PSY511 PSYCHOPHYSICS (Fall 2019)

A Joint Offering by the School of Electrical and Computer Engineering
& the Department of Psychological Sciences
Purdue University

Tuesdays:	3:00 – 4:50 pm in PHYS 110
Thursdays:	3:00 – 4:30 pm in PHYS 331
Instructor:	Prof. Hong Z. Tan, School of Electrical and Computer Engineering, School of Mechanical Engineering (courtesy), Department of Psychological Sciences (courtesy)
Office Hour:	Thursdays, 1:45 – 2:45 pm (or by appointment via email) in MSEE 272
Email:	hongtan@purdue.edu (preferred method of communication)
Course Webpage:	http://engineering.purdue.edu/~ece511/
Required Text:	N.A. Macmillan & C.D. Creelman, *Detection Theory: A User's Guide*. Additional readings are required (PDFs provided online).

COURSE DESCRIPTION

Psychophysics is the quantitative study of the relationship between a physical stimulus and perception. This course focuses on the theory and practice of assessing human performance in terms of detection, discrimination, reconstruction and identification of physical events. Furthermore, it discusses mathematical and computational modeling of the underlying psychological mechanisms. Course material will be presented in the context of visual, auditory, and haptic human-machine interfaces. The laboratory component of the course enables the students to practice designing, implementing and conducting psychophysical experiments.

COURSE OBJECTIVES

A student who successfully completes this course should be able to

- Identify a psychophysical problem;
- Formulate the problem as a detection, discrimination, reconstruction or identification experiment;
- Select an appropriate experimental paradigm;
- Determine range of physical parameters that are meaningful for the specific problem;
- Determine experimental parameters such as number of subjects and total trials with consideration for the statistical robustness of experimental data;
- Predict possible experimental outcomes based on literature survey;
- Analyze experimental data in terms of threshold or information transmission;
- Form mathematical model of the relationship between physical stimuli and perceptual judgments.

COURSE REQUIREMENTS

Homework Assignments (20%): There will be regular homework assignments.

Midterm (30%): There will be one midterm exam for this course.

Course Project (30%): There will be one team-based semester project assignment.

Attendance & Class Participation (20%): You are expected to show up for lectures and labs, and participate in class discussions. Please talk to the instructor if you expect to miss more than two lectures, as you may be asked to drop the course.

GRADE

- Your course grade will be determined from the total points that you receive from homework assignments, midterm and course project.
- There will be no extra-credit projects.
- Homework assignments are due at the **beginning** of class. No homework will be accepted after the lecture has started.
- If you do not show up for an exam, you will receive a zero, unless you made other arrangements before the exam, or unless extenuating circumstances exist.
- You are responsible for all information given in class verbally and/or in writing. Any information about the course may be superseded by the information given in class at any time. ***Check the course webpage on a regular basis for most updated information***.
- Cooperative efforts at understanding the material and the assignments of the course are encouraged. However, you are required to present only work that you have completed individually. Submitting any work that is not your own work is considered cheating.
- Grades will be assigned as "A", "B", "C", etc. The +/– grading system will not be used.

ACADEMIC HONESTY

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

If you plan to publish the course project, you need to consult with Prof. Tan regarding authorship and proper conduct with human research participants.

REGRADE POLICY

You may ask to have an assignment, project or exam re-graded, the result of which may be an increase or a decrease in your grade. To initiate a regrade, you must submit a written request (e-mail preferred) to the instructor, along with the work to be regarded **within three working days** after receiving the graded material.

COURSE PREREQUISITES BY TOPIC

Probability, random variables, Gaussian distribution, regression, matrix algebra.

Suggested book for review: Alvin W. Drake, *Fundamentals of Applied Probability Theory*, McGraw-Hill Inc., 1967/1988.

COURSE WEB PAGE

Check the course schedule page http://engineering.purdue.edu/~ece511/f19_schedule.html regularly for lecture notes, homework assignments, and other information related to this course.

CAMPUS EMERGENCY

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes. In such an event, information will be provided via email to the students.