TO: The Engineering Faculty
FROM: The Faculty of the School of Electrical and Computer Engineering
RE: New Graduate-Level Course

The faculty of the School of Electrical and Computer Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ECE/PSY 511 Psychophysics
Sem. 1. Class 2, Lab 2, cr. 3. (Offered in alternate years.)
Prerequisite: Permission of Instructor.

An examination of the relationship between physical stimuli and perception (visual, auditory, haptics, etc.). Includes a review of various methods for studying this relationship and of the mathematical and computational tools used in modeling perceptual mechanisms.

Reason:

It is becoming increasingly important for engineers to be able to design systems and products that work well with human operators in terms of ergonomics, safety and performance. There is currently no course on psychophysics that an undergraduate student at ECE can take to learn the basics of studies involving human observers. Courses exist in Psychophysical Sciences and Industrial Engineering at Purdue that touch upon psychophysical issues, but none is specifically designed to prepare engineering students with the theory and practice of psychophysical experimentation with regard to engineering systems. It is believed that this course will fill such a void and better prepare our graduates for a career in human-centered engineering. This course was offered as an experimental course ECE 595T in the Fall 2000, Fall 2001, and Fall 2002 semesters with enrollments of 9, 7, and 17 students, respectively.

Mark J. T. Smith
Professor and Head

Supporting Documentation:

1. Level: Graduate Level

2. Course Instructor: Hong Z. Tan

3. Course Outline:

	Topics	*Lectures*
1.	Introduction: Psychophysics in a Nutshell	1.0
2.	Fechnerian Psychophysics	5.0
3.	Signal Detection Theory	1.0
4.	One-Interval Paradigms	3.0
5.	Rating Experiment	1.0
6.	Two-Interval Paradigms	1.0
7.	Adaptive Methods	2.5
8.	Introduction to Information Theory	1.0
9.	Absolute Identification Paradigm	5.0
10.	Speed-Accuracy Tradeoff	1.0
11.	Perception as Inverse Problems	4.5
12.	Multidimensional Scaling	2.0
13.	Student Project Presentations	2.0
	Total	30

4. Laboratory:
Students work individually on lab assignments using web-based modules developed for this course. In a typical assignment, a student conducts a psychophysical experiment and writes up a report with full data analysis. The labs can be conducted at any time of the student's choosing. Students also perform a team-based term project towards the end of the semester. These projects are more comprehensive. Students design the experiment, perform data analysis, write a report critiquing their own work, and make a final oral presentation to the class.

5. Text: Detection Theory: A User's Guide; 2nd edition, N. A. Macmillan & C. D. Creelman, Cambridge University Press.