UNIVERSITY OF CALGARY

Department of Psychology

Psychology 613
Signal and Systems Analysis in Behavioral Research

Winter 2006 Course Outline

Instructor:	Jos J. Eggermont		
Office:	A216	**Time:**	Thursdays 9-12 am (lectures),
Phone:	5214/7747 (lab)		Location: A151C; lab: A37; time: TBA
E-mail:	eggermon@ucalgary.ca	**First Lecture:**	January 12, 2006

The aim of the course is to provide the student with a working knowledge of signal analysis techniques useful in the study of complex systems such as the cortex or a human subject engaged in a perception task. The emphasis of the course is on practical aspects not on mathematical proofs. However, quantitative analysis without calculus is impossible so some refreshment and retrieval of mathematical skills will be provided. Six of the following eight topics will constitute the course material: the first five are the basis for one of the three specialized items, which will be chosen in consultation with the students.

Students will do a class presentation on a special data analysis topic.
Tutorials will provide you with a working knowledge of a signal analysis software package (MATLAB).
The grades are based on 3 take home exams (30%), a class presentation (35%), and a term paper on a topic related to proposed thesis research (35%).

Course Contents:
1. Signals and Spectra: a dual world
2. Sampling and Quantization: unavoidable noise
3. Correlation and Coherence: signs of synchrony
4. Impulse- and Frequency-response: analysis of linear systems
5. Filtering and convolution: improving signal-to-noise ratio.

and one of:

6. Non-linearities and non-stationarities: dealing with the real world.
7. Non-linear dynamics: from oscillation to chaos.
8. Information theory: probability and coding.
9. Multi-dimensional signal (e.g., image) analysis

Extensive Lecture Notes (100+ pages) will be distributed.

Plagiarism and Other Academic Misconduct

Intellectual honesty is the cornerstone of the development and acquisition of knowledge and requires that the contribution of others be acknowledged. Consequently, plagiarism or cheating on any assignment is regarded as an extremely serious academic offense. Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Students should examine sections of the University Calendar that present a Statement of Intellectual honesty and definitions and penalties associated with Plagiarism/Cheating/Other Academic Misconduct.

Academic Accommodation

It is a student's responsibility to request academic accommodation. If you are a student with a disability who may require academic accommodation and **have not** registered with the Disability Resource Centre, please contact their office at 220-8237. If you are seeking academic accommodation, please notify your instructor no later than fourteen (14) days after the commencement of the course. Note that the lecturer must approve any tape recordings of lectures.

Absence From A Test

Make-up exams are NOT an option without an official University medical excuse (see the University Calendar).You must contact the instructor before the scheduled examination or you will have forfeited any right to make up the exam. At the instructor's discretion, a make-up exam may differ significantly (in form and/or content) from a regularly scheduled exam. Except in extenuating circumstances (documented by an official University medical excuse), a makeup exam is written within two (2) weeks of the missed exam.

A completed Physician/Counselor Statement will be required to confirm absence from a test for health reasons. The student will be required to pay any cost associated with the Physician Counselor Statement.

Important Dates

The last day to drop this course and **still receive a fee refund** is January 20, 2006. The last day to withdraw from this course is April 13, 2006.