UNIVERSITY OF
CALGARY
Department of Psychology

Psychology 613
Signal and Systems Analysis in Behavioral Research

Session and Year (Winter Session 2009)

Instructor:	Jos J. Eggermont	**Lecture Location:**	**A135A**
Phone:	5214/7747 (lab)	**Lecture Days/Time:**	Thursdays 9-12 am
Email:	eggermon@ucalgary.ca	**Tutorial**	TBA
Office:	A216		
Office Hours:	When door is open		

Course Description and Goals
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).

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

Required Text

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

Reading material (methodological neuroscience papers) will be assigned.

Evaluation

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%). Take home exams are due 2 weeks after the assignment, and in printed form. The term paper is due at last day of exams (printed form).

Grading Scale

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

"As stated in the University Calendar, it is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades."

"To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (i.e., 89.5% will be rounded up to 90%; 89.4% will be rounded down to 89%, etc.)."

Lecture Schedule

Will be discussed in class.

Reappraisal of Grades

A student who feels that a piece of graded term work (term paper, essay, test, etc.) has been unfairly graded, may have the work re-graded as follows. The student shall discuss the work with the instructor within fifteen days of being notified about the mark or of the item's return to the class. If not satisfied, the student shall immediately take the matter to the Head of the department offering the course, who will arrange for a reassessment of the work within the next fifteen days. The reappraisal of term work may cause the grade to be raised, lowered, or to remain the same.

If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the Dean of the faculty offering the course within fifteen days of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal, and the remedies being sought, along with any special circumstances that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

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 the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and **have not** registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course.

Important Dates

The last day to drop this course and still receive a fee refund is **January 23, 2009**. The last day to withdraw from this course is **April 17, 2009**.