**Winter 2013**

**Psyc 971: Advanced Special Topics in Cognitive Science:**
*Time series analysis and the use of Matlab*

Instructor: Randy Flanagan  
Time: Monday, 13:30 -- 16:00  
Location: Watson 122  
Lab Times: Wednesday, 11:30 -- 1:00; Thursday, 11:30pm -- 1:00pm  
Lab Location: Hum 219

Focus on specific issues within the cognitive science area. The objective of this course is to (1) introduce the student to basic techniques for the quantitative analysis of time-varying signals and (2) teach the student how to apply these techniques using MATLAB, the most commonly used high-level computing language used in science and engineering. Emphasis will be placed on methods appropriate to the psychological research environment. The theoretical background for each technique will be presented briefly, but the major stress will be on the application to practical problems. This will be achieved partially by the demonstration of typical analysis procedures. More importantly, students will be required to undertake assignments involving the analysis of simulated and actual psychological data. Expertise in MATLAB or signal processing is not required.

**Psyc 935: Neurotransmitters and Behaviour**

Instructor: Janet Menard  
Time: Friday, 11:30 -- 1:30  
Location: HUM 223

This year’s class will examine peptides and behaviour. Topics include peptide regulation of food intake, cognition, learning/memory, social and affective behaviours. The potential role of peptides in developmental disorders and psychopathologies will be considered.

**Psyc 802: Multivariate Analysis**

Instructor: Tom Hollenstein  
Time: Monday, 10:00 -- 11:30; Wednesday, 8:30 -- 10:00  
Location: KINGST 306

Topics include: History of Multivariate Techniques, Matrix Algebra, Data Assumptions and Preparation, Multiple Regression, Canonical Correlation, Multivariate Analysis of Variance, and Discriminant Function Analysis.
Fall 2012

Psyc812: BBCS Graduate Seminar
Instructor: The entire BBCS faculty
Time: Tuesday 14:30 – 16:30
Location: KINGST 210

The weekly BBCS seminar brings together students and faculty involved in the BBCS program. This year, it will feature presentations from our students during which we will learn about their interests and ongoing projects. More senior students will introduce us to their particular research question and the approach they are taking to answer it, how it relates to other work in their labs, and how it is embedded into the larger scientific community. Students at the beginning of their graduate studies, will use the seminar to discuss their interests, research ideas, and potential research proposals.

Psyc801: Design of Experiments
Instructor: Mark Sabbagh
Time: Tuesday, 1:00 – 2:30; Thursday 11:30 – 1:00
Location: Hum 223
Lab Time: Wednesday, 1:00 – 2:30
Lab Location: Hum 219

Topics include: The logic of the test for significance and controversies concerning it; ANOVA and its underlying linear model for between-subject, within-subject and split-plot designs; orthogonal comparisons for trend analysis and for special contrasts; restricted randomization and the randomized-block design; partial confounding in latin-squares; balancing conditions against trend; hierarchical designs; ANOVA and multiple correlation; designs including organismic variables; random-effect models and the fixed-effect fallacy; data transformations and non-parametric tests.

Psyc 970: Advanced Special Topics in Cognitive Science I
Instructor: Niko Troje
Time: Tuesday, 8:30 – 10:30
Location: KINGST 306

This years topic: Vision and Visual Illusion
Visual illusions are an interesting, revealing and entertaining approach to studying the visual system. Some visual illusions demonstrate the constraints of the optics of your eyes. Others are based on low-level vision and help us to understand the basic principles of visual processing. Yet another class of visual illusions requires explanations which are based on top-down knowledge and heuristics about regularities of the visual world. Such visual illusions reflect smart processing mechanisms which are based on assumptions which hold true in most cases, but are violated in the specific case of the visual illusion.

We want to look at a number of areas in vision research from the perspective of visual illusions. Towards the end of the course, we will try to come up with a classification scheme for visual illusions. Eventually, you should be able to understand classic visual illusions and you should be in the position to study and discuss new ones in an educated, informed way.

**Psyc 934: Comparative Neurocognition**

Instructor: Cella Olmstead  
Time: Thursday, 9:30 -- 11:30  
Location: HUM 223

An overview of the evolution and function of cognitive processes. Emphasis will be placed on understanding how natural selection shaped cognition across species. Topics such as memory, decision making, and communication will be examined from a behavioural ecology and experimental psychology perspective. Neuroscience and developmental psychology research will complement each topic.

**Psyc 940: Structural Equation Modelling**

Instructor: Lee Fabrigar  
Time: Monday, 11:30 -- 13:30  
Location: HUM 219

The goal of this course is to provide a conceptual and practical introduction to the use of common latent variable statistical procedures. A particular emphasis will be placed on exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. Students will use of the SPSS statistical package for conducting exploratory factor analysis and the LISREL statistical package for conducting confirmatory factor analysis and structural equation modeling. Assessments of performance will be based on three homework assignments. The first homework assignment will cover exploratory factor analysis procedures and will be 25% of the course mark. The second assignment will cover confirmatory factor analysis procedures and will be 25% of the course mark. The final assignment will focus on structural equation modeling procedures and will be 50% of the course mark. No extra credit opportunities will be provided.
Winter 2012

**Psyc 931: Neuroplasticity and Behaviour**  
Instructor: Hans Dringenberg  
Time: Monday, 1:00pm-3:00pm  
Location: Hum 326

Changes at the synaptic level in structure and neurochemistry including protein synthesis associated with sensory/perceptual development, learning and memory. Coverage will include in vitro and in vivo approaches. Data from vertebrates and invertebrates will be included. Discussing the topics of metaplasticity, development, and aging; memory and plasticity; clinical and societal implications.

**Psyc 971: Advanced Special Topics in Cognitive Science: Time series analysis and the use of Matlab**  
Instructor: Randy Flanagan  
Time: Tuesday, 10:00am-11:30am  
Location: Hum 223  
Lab Times: Monday, 11:30am-1:00pm; Thursday, 1:00pm-2:30pm  
Lab Location: Hum 219

Focus on specific issues within the cognitive science area. The objective of this course is to (1) introduce the student to basic techniques for the quantitative analysis of time-varying signals and (2) teach the student how to apply these techniques using MATLAB, the most commonly used high-level computing language used in science and engineering. Emphasis will be placed on methods appropriate to the psychological research environment. The theoretical background for each technique will be presented briefly, but the major stress will be on the application to practical problems. This will be achieved partially by the demonstration of typical analysis procedures. More importantly, students will be required to undertake assignments involving the analysis of simulated and actual psychological data. Expertise in MATLAB or signal processing is not required.

Fall 2011

**Psyc811: BBCS Graduate Seminar**  
Instructor: The entire BBCS faculty
Many of the questions we are researching today are not new. They are motivated by other peoples work and they are rooted in the history of our discipline. In this year's BBCS seminar, we want to learn about a number of personalities which were particularly influential in shaping Experimental Psychology over the last century. Every student in the course will present one scientist. We want to learn about his/her work, how it was motivated, and what kind of influences it had on their scientific environment. We will provide an extensive list of personalities from which you can pick your choice.

Psyc801: Design of Experiments
Instructor: Mark Sabbagh
Time: Thursday, 11:00am-12:30pm; Friday, 9:00am-10:30am.
Location: Hum 219
Lab Time: Tuesday, 3:30pm-5:00pm
Lab Location: Hum 219

Topics include: The logic of the test for significance and controversies concerning it; ANOVA and its underlying linear model for between-subject, within-subject and split-plot designs; orthogonal comparisons for trend analysis and for special contrasts; restricted randomization and the randomized-block design; partial confounding in latin-squares; balancing conditions against trend; hierarchical designs; ANOVA and multiple correlation; designs including organismic variables; random-effect models and the fixed-effect fallacy; data transformations and non-parametric tests.

Psyc 921: Visual and Auditory Processes
Instructor: Niko Troje
Time: Thursday, 9:00am-11:00am
Location: Hum 326

We will be looking into mechanisms and computational approaches to understand a number of core low-level visual processes: Spatial vision, lightness and colour vision, visual motion and optic flow, stereopsis, shape from shading. For every one of these areas we will study the physical processes that determine how objects and events of the world project onto our sensory systems, and we will explore the inverse process, that is, how our visual system attempts to recover from these sensations properties of the objects and events that caused them. We will read a number of seminal papers in the field and we will learn about algorithms and models at a level at which we would eventually be able to implement them ourselves.

The seminar will have the format of a workshop. Topics will be introduced with a short lecture given by myself. Led by one of the participants and centred around one or two papers which everyone has to read before class, we will then work on an in-depth understanding of concepts and algorithms. Rather than listening to (or giving) PowerPoint presentations, we will have to use the black board, paper and pencil, and maybe a bit of Matlab programming to get a hands-on grasp of some of the most basic concepts in quantitative vision research.