<table>
<thead>
<tr>
<th>Instructor</th>
<th>Semester</th>
<th>Area</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<th>Place</th>
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<tbody>
<tr>
<td>Kim</td>
<td>Fall</td>
<td>BN</td>
<td>PSYS121H</td>
<td>Advanced Topics in Animal Behaviour and Motivation II</td>
<td>The course will survey a variety of genetic neuron manipulation methods being used in the systems neuroscience field, with a particular focus on light-induced neuron manipulation methods and their applications to study a range of cognitive and emotional behaviours and underlying neural circuitry.</td>
<td>Thu, 2-4</td>
<td>S5 560A</td>
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<tr>
<td>Bloom</td>
<td>Fall</td>
<td>DEV</td>
<td>PSYS101H</td>
<td>Advanced Topics in Development I</td>
<td>This seminar dives into the modern science of moral thought and moral action, explored through the disciplines of cognitive science, psychology, neuroscience, behavioural economics, and analytic philosophy. Topics include empathy and compassion in babies and young children; the origins of prejudice and bigotry; sexuality, disgust, and purty; punishment, revenge, and forgiveness; dehumanization, and the relationship between morality and religion. No specific requirements, but participants should be prepared to read, and discuss, articles from a wide range of intellectual disciplines.</td>
<td>Mon, 4-6</td>
<td>S5 560A</td>
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<tr>
<td>Mabbot</td>
<td>Fall</td>
<td>DEV</td>
<td>PSYS111H</td>
<td>Advanced Topics in Development I</td>
<td>The brain undergoes significant structural and functional growth during childhood and adolescence. This growth is linked to underlies the development of cognitive, social, and emotional functions. Various neuroimaging techniques allow the in vivo study of brain maturation and experience dependent brain plasticity from infancy through to adulthood. Current research in this emerging field will be presented, with a focus on the relations between brain growth and cognitive development. The course will include the presentation of a range of neuroimaging methods including MRI (e.g., fMRI, DTI, MTI, volumetric), EEG, and MEG and how neuroimaging can be used to inform our understanding of development in normal children and those with neurological compromise.</td>
<td>Tue, 2-4</td>
<td>S5 560A</td>
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<tr>
<td>Baranese</td>
<td>Fall</td>
<td>PCCN</td>
<td>PSY520SH</td>
<td>The Cognitive Neuroscience of Memory</td>
<td>Memory is one of the most complex functions performed by the human brain. In this course we will consider prominent theories regarding the nature of memory and how the brain is able to perform this remarkable feat. We will survey current research in the field, focusing on controversial areas of inquiry. The goal of this approach is to provide insight into how details of experimental design can influence how theoretical models are developed. Students will generate their own hypotheses about the organization of memory and design experiments to test these hypotheses. Beyond learning about theories of memory, the course will also focus on developing practical skills relevant for careers both in and out of academia. These include: public speaking, providing constructive feedback to peers, benefiting from feedback received from peers, and succinctly describing one's ideas and convincing others of their merit – either in the written or spoken form.</td>
<td>Wed, 10-12</td>
<td>S5 560A</td>
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<tr>
<td>Herrmann</td>
<td>Fall</td>
<td>PCCN</td>
<td>PSY522SH</td>
<td>Advanced Topics in Cognition I</td>
<td>Oscillations are ubiquitous in the brain. In this course, we will discuss theoretical, methodological, and empirical aspects of neural oscillations. This involves discussion about how neural oscillations are typically measured and analyzed, and the conceptual and methodological challenges associated with neural oscillations. We will further discuss recent empirical work investigating neural oscillations in a variety of contexts (perception, cognition, health vs. disease, etc.). We will also briefly cover background about the recording techniques typically used to measure neural oscillations in cognitive neuroscience research (EEG, MEG, electrophysiology). Students will have multiple opportunities to hone their presentation and writing skills in this course. At the end of the course, we hope the successful student will have a detailed understanding of the common measures and methods associated with neural oscillations, be able to identify potential challenges in empirical papers, have knowledge about the most common associations between neural oscillations and perceptual/cognitive functions, and be able to use this knowledge to advance their own research.</td>
<td>Tue, 12-2</td>
<td>S5 560A</td>
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<tr>
<td>Carlson</td>
<td>Fall</td>
<td>SP</td>
<td>PSY540SH</td>
<td>Social Cognition</td>
<td>Interpersonal Perception</td>
<td>Thu, 2-4</td>
<td>Online</td>
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<tr>
<td>Lee, S.</td>
<td>Fall</td>
<td>SP</td>
<td>PSY542SH</td>
<td>Advanced Topics in Social Psychology I</td>
<td>Political Psychology</td>
<td>Wed, 2-4</td>
<td>Online</td>
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<tr>
<td>Vartanian</td>
<td>Fall</td>
<td>SP</td>
<td>PSY5402H</td>
<td>Personality</td>
<td>Cognitive Neuroscience of Creativity</td>
<td>Mon, 2-4</td>
<td>S5 560A</td>
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<tr>
<td>Schimmack</td>
<td>Fall</td>
<td>SP</td>
<td>PSY1210H</td>
<td>Selected Topics in Psychology</td>
<td>Advanced Statistical Methods for Correlational Design</td>
<td>Wed, 12-2</td>
<td>Online</td>
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Fear learning is essential for survival. It is thus not surprising that fear is one of the most robust and evolutionarily conserved behavioural phenomena. In this seminar course, we will explore what is known (and not known) about the circuitry of fear and emotional learning, focusing on animal studies as a transtational and powerful model for fear and anxiety disorders in humans. We will explore questions such as how are fear memories encoded in the brain?, Can we erase fearful or traumatic memories?, Does the way we process fear and trauma change across our lifetime?, How does the passage of time change fear memories?, Can we manipulate fear circuits to treat depression, or anxiety? We will examine these questions across the synaptic, cellular, circuit and behavioral levels towards a better understanding of the biological basis of fear processing in the brain.

The brain generates various patterns of rhythmic activity. The time scale of these rhythms ranges from milliseconds-scale spiking activity to second-scale oscillatory activity. Over the past few decades, electrophysiological investigations have made remarkable progress in connecting various cognitive processes with neural activity patterns in freely behaving rodents. More recently, longitudinal single-cell imaging has uncovered novel neural activity dynamics that challenge traditional theories. In parallel, the application of this tools to animal disease models has identified pathophysiology that links molecular/histological abnormality with behavioural deficits. This seminar aims to review these rodent studies and discuss mechanisms of cognition at the neuronal ensemble level.

This course examines auditory perception across the lifespan, with a specific focus on infancy and early childhood. After briefly reviewing the basic development of the auditory system (anatomical, physiological and neural development), we will focus on the perception of socially meaningful auditory patterns such as language and music. We will also discuss the social-emotional effects of shared auditory experiences (e.g. infant’s responses to song and speech) across the lifespan.

Attention, Working Memory, and Visual Awareness

How does our brain give rise to our abilities to perceive information, act on it, think about it, and maintain it after it has been removed from view? This course examines cognitive and neurological systems capable of awareness of one’s behaviour, and mental capacity. We will review the basic facts, classic and recent research papers, theories, and methods of study in the field exploring how the processing of visual information is instantiated in neural activity. Major emphasis is placed on attentional systems, working memory, and the study of visual awareness.

Research in cognitive neuroscience, behavioral neuroscience, and neuropsychology has been converging over the past decade to study brain networks that support memory rather than focusing on single structures. In this course, we will review literature on the emergence of this line of thinking, the current data regarding canonical episodic memory networks in the healthy adult, changes in early development and later life, disruption to canonical networks in neurological diseases and disorders, and research on perturbing these networks for purposes of enhancement. Although we will focus largely on episodic memory, there is emerging understanding of how this form of memory interacts with other knowledge structures and representations such as schemas, and this will be a common thread throughout the course.

The course will explore the determinants, consequences, and policy relevance of population-level subjective well-being. Subjective well-being refers to the cognitive assessment and affective feelings about the quality of one’s life. We will review the basic facts, classic and recent research papers, theories, and methods of study in the field exploring how the processing of visual information is instantiated in neural activity. Major emphasis is placed on attentional systems, working memory, and the study of visual awareness.

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PSY510H1S - Advanced Topics in Behavioural Neuroscience I

Emotional Learning Circuits

PSY5130H1S - Advanced Topics in Neuropsychology I

Rhythms of the Brain in Cognition and Disease

Auditory Development

PSY5303H1S - Cognitive Development

Moral Cognition in Moral Development

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Fourier Winter Core SP PSY5421 - Advanced Topics in Personality II Persons in Context This course is intended to introduce students to contemporary models of personality processes and dynamics that focus on understanding how people are perceived by the social world around them. Tue, 12-2 BFC

Duncan Fall alternating weeks Module PSY3100 F1 - Psychological Science Skills, LEC 0101 Programming for Psychology 1: Introduction to Python and Experiment Programming Over recent years computer programming skills have become a requirement for conducting psychological research across many subdisciplines. We designed this module to provide new graduate students with foundational programming skills that will enable them to acquire new modeling and analysis methods. We will begin with introductory concepts and good practices (e.g., version control, logical statements, and debugging). We will then move on to experiment programming, surveying specialized software for stimulus presentation (e.g., PsychoPy, Psychtoolbox, Inquisit, and Qualtrics), with a focus on PsychoPy. No computer programming background is expected or required. Mon, 12-2 Online

Joordens Fall 6 weeks Module PSY3100 F3 - Psychological Science Skills, LEC 0103 The Science of Learning We are simply guilty of viewing our teaching as distinct from our research but, in fact, there is an ever-growing research base underlying effective teaching. Given how important our teaching role is, we should be aware of that evidence-base as well, and we should build our efforts and approaches in the classroom on that evidence. In this course we will discuss research on issues such as how to enhance student engagement, the effective use of microlearning, how learning designs can be used to deepen learning, and promote skill development, how to enhance community with a class, and how to best prepare students for a successful future. We will also consider the role of educational technologies in the future of education. Mon, 2-4 Online

Bernhardt-Walther Fall alternating weeks Module PSY3100 S2 - Psychological Science Skills, LEC 0102 Programming for Psychology 2: Introduction to R for Data Wrangling and Visualization This module builds off foundational skills developed in Programming for Psychology 1, but focuses on working with data in R. We will cover data management, re-structuring, and quality control followed by data visualization. A variety of tools will be surveyed, but most examples will be taught in R and will involve the application of tools included in Tidyverse packages. Background in computer programming is not required, but students are encouraged to take Programming for Psychology 1 before this module to become comfortable with version control and basic programming concepts. Mon, 10-12 SS 568A

Diaconescu Fall alternating weeks Module PSY3100 S4 - Psychological Science Skills, LEC 0104 Machine Learning for Psychological Research In this module I will introduce important concepts for understanding machine learning techniques. We will then work on practical, hands-on exercises for using machine learning methods in psychological research. Students are encouraged to bring data from their own research projects for the applied, hands-on component. A basic understanding of programming in Python and/or R is prerequisites. Mon, 2-4 TBC

Anderson Fall Core PSY3001 - Professional Psychology Professional Psychology This course is designed to introduce the student to the General Linear Model and two of its most common expressions: Analysis of Variance and Multiple Regression. Additionally, students will be asked to familiarize themselves with some of the current theoretical issues in realm of data analysis itself, e.g., the value of testing the null hypothesis. Mon, 10-12 Online

Cunningham Fall Core PSY2001 - Statistics I The General Linear Model This course is designed to introduce the student to the General Linear Model and two of its most common expressions: Analysis of Variance and Multiple Regression. Additionally, students will be asked to familiarize themselves with some of the current theoretical issues in realm of data analysis itself, e.g., the value of testing the null hypothesis. Tue, 10-12 Online

Page-Gould Winter Core PSY2002 - Statistics II, LEC 0101 Introduction to Advanced Statistical Methods This course will provide a practical introduction to a number of different advanced statistical methods used in psychological research. Specifically, the course will cover the following topics: (1) Path analysis and Mediation; (2) Mixed effects/multilevel modeling; (3) Non-gaussian models (e.g., logistic regression) and bootstrapping; (4) Bayesian Hypothesis Testing; (5) Factor analysis, including exploratory factor analysis/principal components analysis, confirmatory factor analysis, and cluster analysis; (6) Structural Equation Modelling; and, (7) Time-based analysis like time series, lagged regression, and latent growth curves. The course will place a strong emphasis on practical application, such that every class will include demonstrations, electronic copies of sample syntax in SPSS and R, and brief computer-based data analysis exercises. You will also learn to be an active consumer of quantitative psychology articles, as well as develop generalizable strategies for statistical reporting. You will only need to be familiar with one of the following statistical packages: R or SPSS. The course will have a final project where you will be required to use one of the analyses you learn in class to analyze your own data or public data and then write methods, results, and discussion sections that describe your findings. You will also be expected to complete lab assignments that involve conducting analyses on example datasets in the statistical software package of your choice. The goal of this course is to learn the classical methods and statistics you need. Knowledge of these modern statistical tools will increase the flexibility of your research designs and the statistical rigor with which you analyze your data. This course will cover classical and modern applications of multivariate methods for data analysis. Topics will include principal components analysis, linear discriminant analysis, MANOVA, high-dimensional regression, and neural networks. There will also be a focus on data visualization, statistical prediction and inference using non-parametric methods, and programming tools and techniques using the R statistical language. Wed, 2-4 Online

Buchsbaum, B. Winter Core PSY2002 - Statistics II, LEC 2101 Multivariate Methods and Data Science This course will survey a variety of genetic neuron manipulation methods being used in the systems neuroscience field, with a particular focus on light-induced neuron manipulation methods and their applications to study a range of cognitive and emotional behaviours and underlying neural circuitry. Wed, 4-6 Online

Williams Fall Cross-Listed CSC2558 - Topics in Multidisciplinary HCI Designing Intelligent Self-Improving Systems Through Human Computation, Randomized A/B Experiments and Statistical Machine Learning