THE UNIVERSITY OF BRITISH COLUMBIA

School of Kinesiology

Course Outline

Program: Kinesiology **Course #: KIN 568**, Section 001 **Day/Time:** Tuesdays 11:00am – 1:00pm **Instructor:** Dr. Romeo Chua **Phone:** 604-822-1624 **Email:** romeo.chua@ubc.ca	**Term/Year:** Jan – April 2018 **Course Title:** Seminar in Human Sensorimotor Control **Location:** IBLC 460

Course Description:

The focus of this seminar is upon the *mechanisms and principles in human sensorimotor control* as well as the research methods commonly used in motor control research. KIN 568 draws primarily upon the frameworks offered by human motor behaviour, experimental psychology, cognitive neuroscience, and neuroscience. It is assumed that students have an undergraduate background in motor control and learning or related area in experimental psychology, cognitive neuroscience, or neurophysiology. Emphasis is placed on a critical analysis of the scientific literature, seminar presentations, and on the development of a research proposal.

The theme for KIN 568 – 2018W will be ***Computational Principles and Approaches to Human Sensorimotor Control*** *and* ***Sensorimotor Transformations in Human Motor Control***. We will be covering research issues pertaining to the computational framework – e.g., the reafference principle, inverse and forward models, sensorimotor adaptation, sensorimotor transformations, sensory prediction, error correction, multi-sensory integration, motor learning and adaptation, etc.

Objectives:

1. Review historical and recent research on issues pertaining to human sensorimotor control.
2. Develop the background and tools to critically analyze and assess the research.
3. Allow students to present their ideas on a topic and have these ideas subjected to evaluation and feedback by their peers.
4. Develop a study proposal for an in-depth investigation into a specific research topic.

Course Evaluation:

A. Seminar Presentations: 40%

Critically review and present research. Students will lead 20-minute seminar presentations on a current research topic fitting the theme of the course and the articles selected. (Seminars must include presentations in PowerPoint).

B. Presentation of Research Proposal: 15%

A 20 minute oral presentation of the proposal.
(This would be similar to an actual thesis proposal as required of graduate students in the School).

C. Research Proposal: 35% (Due Date: April 15, 2019)

A document that provides a detailed proposal for a research study. The proposal should include a review of relevant literature, a clear statement and rationale for the purpose of the study, a clear hypothesis, a detailed description of the study methods and procedures, as well as hypothesized results and a discussion of the implications of potential results of the proposed study.

Maximum: 20 pages (excluding references, figures, tables etc.), double-spaced, in APA format.

D. Participation: 10%

Students will be evaluated on a 10-point scale for the extent of their participation in discussions during presentations.

Readings:

1st Set of Required Readings: These reviews are intended to provide a background and non-exhaustive sample of the research themes and concepts for the course. Students will facilitate discussions of the topics within these review articles.

1. Cameron, BD (2010). Visuomotor adaptation: contributions of awareness, online correction, and sense of agency. PhD Thesis, University of British Columbia. (*Read the Introduction – Chapter 1*).
2. Desmurget M & Grafton S (1999). Forward modeling allows feedback control for fast reaching movements. *Trends in Cognitive Sciences*, *4*, 423-431.
3. Scott, SH (2016). A functional taxonomy of bottom-up sensory feedback processing for motor actions. *Trends in Neurosciences*, *39*, 512-526.
4. Shadmehr R et al (2010). Error correction, sensory prediction, and adaptation in motor control. *Annual Review of Neurocience*, *33*, 89-108.
5. Wolpert DM & Ghahramani Z (2000). Computational principles of movement neuroscience. *Nature Neuroscience*, *3*, 1212-1217.

Additional readings will consist of research articles from peer-reviewed journals. Students will be the ones to select these readings for their presentations.

Research and presentation topics must be selected from the research themes covered in the 1st set of readings.

Schedule **(Tentative – subject to updates)**

Jan 8	Course Overview and Introduction
Jan 15	Review of Core Concepts and Readings
Jan 22	Review of Core Concepts and Readings, Prep for 1st set of presentations, etc.
Jan 29	**Presentations**
Feb 5	**Presentations**
Feb 12	***Review***
Feb 18-22	***Reading Week***
Feb 26	**Presentations**
Mar 5	**Presentations**
Mar 12	**Presentations**
Mar 19	**Presentations**
Mar 26	***Review***
Apr 2	**Research Proposal Presentations**
Apr 2-15	***Write, write, write …***
April 15	Research Proposals Due