The University of British Columbia  
School of Kinesiology  

Kinesiology 500D  

The Neurophysiology of Human Postural Control

Instructor: Dr. Mark Carpenter  
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Location and Time:  
Mondays: 5:00 PM to 8:00 PM in SCRF-206 (Lectures with Kin 489s)  
Fridays (alternate): 1:00 to 4:00 pm; Osborne Unit 2 – Rm 124 (Group discussions and presentations)

Summary
An examination of the neuro-mechanical and functional neurophysiological processes involved in the sensori-motor control of human balance. Emphasis is placed on peer teaching during presentations, a critical analysis of the pertinent scientific literature, as well as the writing of a NSERC formatted research grant. This is a small seminar-based course combining graduate and undergraduate student instruction. The Kin 500D grad course, will be supplemented with the lectures taught through the 4th year elective (Kin489s) on "Sensori-motor control of Human Balance". The lectures will be designed to provide you with the fundamental knowledge on the topic, that we will then explore more deeply and critically in our 500D grad seminar meetings.

Global Learning Objectives
1. To explore the basic neurophysiological processes underlying the control of human posture and balance.  
2. To explore the functional roles of the various peripheral and central nervous system (CNS) structures known to be involved in human balance control.  
3. To further develop the presentation skills of the student, to advance critical thinking and evaluation of the current neurophysiological literature, and to introduce the student to drafting a research grant.

Course Learning Objectives:  
By the end of this course, you will be expected to:
1) Think critically about the neurophysiological processes as they pertain to the control of human balance.  
2) Be able to discuss critically the current scientific literature that uses neurophysiological techniques discussed within the lectures.  
3) Demonstrate a professional behaviour within a small seminar setting, and toward class participation and involvement.  
4) To work on oral presentation skills, and develop NSERC research grant writing skills in an area of interest to the student within the cognate area of this course.
Course Evaluation

A. **Midterm examination:**
   Each graduate student will be required to write the midterm exam based on the material covered in the Lectures from Kin 489s. The exam will be held as per the 489s class schedule.
   Value: - 30%

B. **Grant Proposal:**
   Each graduate student will be required to draft a 5-page, single spaced NSERC grant, with a budget page.
   **Example handout of an NSERC format grant will be provided by the instructor.**
   Value: - 30%

C. **Research Grant Presentation:**
   Each graduate student will be required to do a 15-minute oral presentation of their research grant to the group at the end of the term, usually within the final meeting of the class.
   Value: - 10%

D. **Presentations:**
   i) **Class Teaching Presentation:**
      Content presentation of assigned sections research articles. The duration of the student presentations will depend on the total number of graduate and undergraduate students enrolled in the class. Present (PowerPoint), **review content & lead** discussion on material. A projector and computer will be available for presentation use by the students if required.
      Value: - 30%

**Required Readings:**
Individual research articles will be assigned each week to be read and summarized during the discussion and presentation sections.

**Outline of Lectured Topics**

- Introduction to human balance
- Static balance control
- Anticipatory balance control
- Reactive balance control
- Aging effects on balance
- Cognitive and emotional influences on balance
- Balance Disorders I
- Balance Disorders II
- Treatment & Intervention approaches for balance deficits and falls