The University of British Columbia  
School of Kinesiology

Kinesiology 489T

The Neurophysiology of Human Movement Control

**Co-Instructor:** Dr. J. Timothy Inglis  
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**Location and Time:**  
Tues: 1:00 pm to 3:00 pm, War Memorial Gym, Room 100

**Summary**  
An examination of the neuroanatomical and functional neurophysiological processes involved in the sensory and motor control of voluntary movement. Emphasis is placed on peer teaching during single and/or group presentations, a critical analysis of the pertinent scientific literature, as well as the writing of a term paper on a topic determined by the student and the course instructors. This is a small seminar based course combining graduate and undergraduate student instruction. Course limited to a maximum of 10 undergraduate students, and a strong academic performance in KIN 389 definitely required.

**Global Learning Objectives**
1. To explore the basic neurophysiological processes underlying the control of Human voluntary movement, locomotion, 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 motor 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 manuscript as a term paper.

**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 movement.

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 term paper writing skills associated with drafting a scientific manuscript on an area of interest to the student within the cognate area of this course.
**Prerequisites:** Excellent performance in KIN 389 (A to A+), 3rd year standing and permission of the instructor. Candidates must *want to pursue this course* and have a strong willingness to be prepared for its commitment.

**Course Evaluation**

A. *Manuscript/term paper;*
   Maximum 20 pages (double spaced, 12 point font), excluding the references (Experimental Brain Research journal format). Students will draft a term paper with an introduction (review of pertinent literature), statement of objectives/hypothesis, a brief but accurate description of the methodology to be used in designing the experiment, and finally expected results if the hypothesis is correct (i.e. what the fictional results might look like).
   **Value:** - 35% *(Due, Friday April 1st, 4:00 pm, 2016.)*

B. *Review Article Teaching Presentations;*
   Content presentation of assigned sections from the target Review Journal Article. The duration of and total number of the student presentations will depend on the total number of students enrolled in the combined KIN 489T/KIN 500D classes. See below for presentation sections.
   Students are required to **Present** (PowerPoint), **review content** & **Lead** discussion on material. This includes going to the original articles cited in the review to accent the work presented in each particular subsection of the review article. A projector and computer will be available for presentation use by the students if required.
   **Value:** - 40%

C. *Research Term Paper Presentation:*
   Students will be required to do a 30-minute summary presentation of the term paper to the combined KIN 489T/KIN 500D classes.
   **Value:** - 15% *(-- Friday April 5th, 1:00 pm, 2016.)*

D. *Participation;*
   Students will be evaluated on a 10 point scale for the extent of their participation in discussions during the presentations of the term papers/grants and of the review article presentations.
   **Value:** - 10%

**Required Reading:**

**Outline of Lectured Topics**

Week #1 (Jan. 12) – Introduction to course. Assignments. Introduction.
Week #2 (Jan. 19) – Preparation week.
Week #3 (Jan. 26) – I. A/B Kinesthetic Sensors (pages 1651-1658).
Week #4 (Feb. 2) – II. C/D/E Kinesthetic Sensors (pages 1658-1661).
Week #5 (Feb. 9) – III. What do Proprioceptors signal? (1661-1665).
Week #6 (Feb. 16) – Reading week – class cancelled.
Week #7 (Feb. 23) – IV. Body Schemas and Images. (1665-1671).
Week #8 (March 1) – V. Effort, Force, and Heaviness. (1671-1677).
Weeks #9 (March 8) – VI. Proprioception and Exercise (1677-1682).
Weeks #10 (March 15) – VII/VIII. Proprioception “Plus” (1682-1686).
Weeks #11 (March 22) – IX. Wrapping it up/concluding remarks (1686-).
Week #12 (March 29) – Preparation week for Paper/Grant – NO Class.
Week #13 (April 5) – Term Paper Presentation.