YORK UNIVERSITY
KINESIOLOGY AND HEALTH SCIENCE
AS/SC KINE 4500 3.0 Neural Control of Movement
Winter 2023: IN-PERSON DELIVERY

Course learning objectives: The purpose of this course is to provide students with an overview of the fundamental concepts and current issues in how the brain controls movement, and the effects of dysfunction and disease on this control.

Specific learning objectives:

- *be able to describe the basic issues facing the nervous system in terms of movement control*
- *apply these issues to different types of movement such as walking, looking, reaching, writing, and complex skill coordination*
- *understand and critically examine recent approaches to the treatment of brain damage and disease*
- *demonstrate the ability to apply theory to practice in the context of clinical case studies*
- *develop the ability to discuss and write about current movement disorder research*

Prerequisites: AS/SC/KINE 3020 Skilled Performance and Motor Learning **or** permission of the course director

Course Director: Nicole Smeha, nsmeha@yorku.ca, 2010 Sherman Building
Office hours: By appointment/at end of Wednesday class
Course Website: This course is run through eClass

Lectures: Monday/Wednesday 10h00 -11h20, January 9th – April 10th, 2023
Location
Monday: Victor Phillip Dahdaleh Building (DB), Room 0005
Wednesday: Victor Phillip Dahdaleh Building (DB), Room 1004
Note: If needed, delivery via Zoom, link on eClass. Accommodations in place for those who cannot be on campus on a given day for in-person classes.

Course reader: Course lectures and readings are available on eClass.

Course Evaluation:

Participation (in class – research papers, n=8)	24%
Motor Control Poster project, see schedule for due date.	12%
Term Paper Outline, see schedule for due date.	4%
Term Paper, see schedule for due date.	20%
In-class quizzes on lectures (4 total, see schedule)	40%

*Note: Any extensions for projects must be approved by the instructor **PRIOR** to the due date. Late assignments will be penalised 2% per day up to 10% max reduction.*

***IN CASE OF RETURN TO REMOTE CLASS DELIVERY:** Research paper discussions will be via zoom and a forum for posting research paper material will be made available; quizzes will be held remotely **only** if there is a return to remote course delivery mandated by the University.*

***ACCOMODATION IF UNABLE TO BE ON CAMPUS THE DAY OF THE CLASS:** If you are unable to make **one** particular research paper discussion class, you may write a 1 page summary of the article addressing the questions discussed in class (contact me for the discussion points).* This option will be available once per term. *If you miss a quiz, you can write a make-up during the final exam period (date TBD).*

***Structure of class** (TIMES ARE APPROXIMATE, MAY VARY DEPENDING ON TOPIC):*
Lecture class (Mondays W23):10h00-11h20: lecture, q&a, individual meetings. Research paper discussion class (Wednesdays W23): 10h00-10h15: lecture q&a, 10h15-10h45: research paper breakout groups, 10h45-11h20 research paper discussion

CLASS SCHEDULE - Winter 2023 (subject to revision)

January 9	Introduction, course overview/design Topic 1:Introduction to the neural control of movement
January 11	Show and tell group activity Discussion 1: Critical analysis of scientific information!
January 16	Topic 2:Locomotion
January 18	Discussion 2: *Spinal cord injury & VR*
January 23	Topic 3: Eye movements
January 25	**Quiz 1 on topics 1-3**
January 30	Topic 4:Posture
February 1	Discussion 3: *Posture in space*
February 6	Topic 5,6:Reach and grasp, eye-hand coordination
February 8	Discussion 4: *Film - The baby's brain*
February 13	Topic 7:Skill acquisition
February 15	**Quiz 2 on topics 4-7**
February 27	Topic 8:Sequential movements
March 1	Discussion 5: *Film - The child's brain*
March 6	Topic 9,10:Bimanual movements, Rhythm and timing
March 8	Discussion 6: *Music therapy & Parkinson's disease*
March 13	Topic 11:Effects of aging on performance *Suggested film - the aging brain*
March 15	**Quiz 3 on topics 8-11** ***Last day to drop course without receiving a grade: March 17, 2023***
March 20	Topic 12,13:Motor dysfunction I: Motor unit and myopathic disease Motor dysfunction II: Spinal cord injury and subcortical motor disorders
March 23	Discussion 7: *Physical activity & ALS*
March 27	Topic 14:Motor dysfunction III: Concussion, acquired brain injury, epilepsy
March 29	Discussion 8: *Sport experience & concussion*

April 3	Topic 15:Motor dysfunction IV: Stroke, parietal syndromes, movement and dementia
April 5	**Quiz 4, topics 12-15**

Quizzes are closed book and held in class, on paper*

DUE DATES FOR ASSIGNMENTS

Poster Due Friday March 3, 5:00 pm
Term Paper Outline Due Friday March 10, 5:00 pm via email
Term Paper Due Friday March 31, 5:00 pm to Turnitin on eClass
Final exam (if required) during exam period

INSTRUCTIONS FOR COURSE ESSAY

LIST OF POSSIBLE TOPICS FOR TERM PAPER

1. Any topic covered in the lectures

2. Any topic in the readings of the textbook, not covered in the lectures

3. Gender differences in skilled performance and visuospatial abilities

4. Effect of aging on motor performance

5. Motor (procedural) memory

6. Effects of stressors on performance

7. Handedness

8. Current research on spinal injury recovery

9. Current research on the role of any **one** of the following brain areas on voluntary movement, and the consequences of damage to the area: motor cortex, premotor cortex, basal ganglia, cerebellum, supplementary motor area, parietal cortex

10. Drugs (including alcohol, caffeine, cannabis, and nicotine) and performance

11. Neural control of speech / neural basis of speech disorders

Any other topic is negotiable. The paper should be 10-15 pages, ***excluding*** references and figures. Use 1" margins with double spacing.

- The deadline for handing in the term paper is before midnight on the due date listed on page 1. *Late reports/assignments will be penalised (**5% per day**) without documentation.*
- Papers are submitted to Turnitin through the eClass site
- The paper should comprise a general review of the area (from either a review article or a published book) and a discussion of current research on the topic, using at least two articles from **peer-reviewed journals**. At least two articles must be original research papers (i.e., not opinion or review pieces). You will be assessed on the thoroughness with which you have researched the topic, the organization of the paper, the cogency of your arguments, and your writing style.
- Follow the American Psychological Association reference system, and include an APA style abstract at the beginning of the paper.

References:

- References must be from ESTABLISHED sources such as books or **peer-reviewed** scientific journals. Uncredited internet sources are NOT acceptable (however online scientific journals are).
- Follow the guidelines established by the APA when citing internet sources, found at: http://www.apa.org/journals/webref.html

INSTRUCTIONS FOR ESSAY OUTLINE

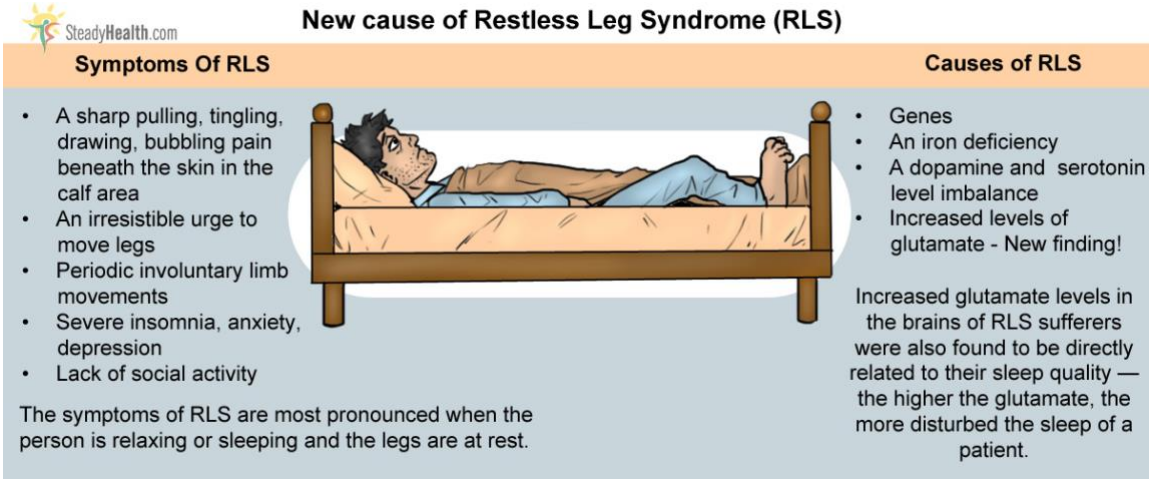
Please provide a 1 page (max) double-spaced outline of your paper including a brief introduction to your topic and what aspects of the topic your essay will cover. It can be bullet point. Last day to submit is listed below on the class schedule (but I'll take them earlier) to be returned a week later with feedback. You can submit this as an email attachment to nsmeha@yorku.ca . Make sure to put '4505 essay outline' in the subject line.

INSTRUCTIONS FOR CLINICAL POSTER PROJECT

In this project, you need to design an informative poster, similar to one you may see in a physician's office. You may use any image processing software you would like (powerpoint, canveo, pixlr, etc.). The poster must explain ***concisely*** the nature of the disease or the condition in a few points, signs that may be present, and potential treatments that may be available. Your poster will be evaluated on 1) accuracy of the material, 2) brevity of the presentation, and 3) artistic quality of the design (not too busy, not too many design elements, nice balance of text and images, presented in a way that can be taken in and understood by potential person affected by the disorder!)

THE POSTER TOPIC AND THE ESSAY TOPIC MUST BE *DIFFERENT*.

Example (this one is a bit light on images, but you get the idea):



RE-EVALUATION POLICY

During the term:

Any requests for remarking of assignments or quizzes must be received by the course instructor within 7 days of the item's mark being posted, along with the "Evaluation item remark request" form, which can be found on the course website. Please note that your mark may be ***raised, lowered, or confirmed.***

Re-appraisal of a final grade:

Any requests for re-appraisal of a final mark must be received by the course instructors within 7 days of the final grade posting, along with the "Evaluation item remark request" form, which can be found on the course website. Please note that your mark may be ***raised, lowered, or confirmed.*** If the result is still unsatisfactory, requests for a reappraisal of the final grade for a completed course are the responsibility of the Undergraduate Director. You must submit in writing a formal request for a **final grade reappraisal** to the KINE undergraduate Office. The 'Reappraisal of Final Grades' form can be picked up at the KINE Undergraduate Office.
For further details: **www.registrar.yorku.ca/policies/grade.htm**

IMPORTANT GENERAL COURSE INFORMATION FOR STUDENTS

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (Policies, procedures, and regulations) - **https://secretariat-policies.info.yorku.ca/**

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.) to aiding and abetting (helping someone else to cheat). All breaches in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on Academic Honesty.

Faculty of Health Academic Honestly resources: https://www.yorku.ca/health/academic-honesty-3/

To promote academic integrity in this course, students will be normally required to submit their written assignments to Turnitin for a review of textual similarity and the detection of possible plagiarism. In so doing, students will allow their material to be included as source documents in the Turnitin.com reference database, where they will be used only for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin service are described on the Turnitin.com website.

TECHNOLOGY REQUIREMENT FOR THIS COURSE

This course will be run through eClass and may use zoom. It is designed as an in-person class, which may have a ***synchronous*** component if required. Thus, you are expected to be present during class time, or able to be present/logged on for zoom components. A camera is not required if we are interacting remotely, you may interact during group and class discussions via the chat.

STUDENT SUPPORT RESOURCE

Calumet and Stong Colleges' Student Success Programming:
Calumet and Stong Colleges aim to support the success of Faculty of Health students through a variety of **free programs** throughout their university career:

- Orientation helps new students transition into university, discover campus resources, and establish social and academic networks.
- Peer Mentoring connects well-trained upper-year students with first year and transfer students to help them transition into university.
- Course Representative Program supports the academic success and resourcefulness of students in core program courses through in-class announcements.

- Peer-Assisted Study Sessions (PASS) involve upper-level academically successful and well-trained students who facilitate study sessions in courses that are historically challenging.
- Peer Tutoring offers one-on-one academic support by well-trained Peer Tutors.
- Please connect with your Course Director about any specific academic resources for this class.
- Calumet and Stong Colleges also support students' Health & Wellness, leadership and professional skills development, student/community engagement and wellbeing, Career Exploration, Indigenous Circle, awards and recognition, and provide opportunities to students to work or volunteer.
- For additional resources/information about Calumet and Stong Colleges' Student Success Programs, please consult our websites (Calumet College; Stong College), email scchelp@yorku.ca, and/or follow us on Instagram (Calumet College; Stong College), Facebook (Calumet College; Stong College) and LinkedIn