Research Practicum Projects 2024/2025

Faculty of Health Sciences

HLSC 4998/4999U

Project Title: Innovations in Pediatric Respiratory Therapy and Mechanical Ventilation at the Hospital for Sick Children
Research Preceptor: Dr. Mika Nonoyama & Shirley Quach
Number of Available Positions: 1
Location: Hospital for Sick Children (Remote and In-Person)
Project Description: The Lung Health Pathway at SickKids' comprises of: artificial airway management; initiation & weaning from mechanical ventilation (MV); extubation; and post-extubation respiratory management. A better understanding of current respiratory support clinical practices & patient outcomes is needed to optimize a child's treatment path. There are currently several potential projects for the research practicum. This includes: background research (literature review), and data collection retrospectively or prospectively on various respiratory therapy and/or mechanical ventilation interventions in the Critical Care Unit (CCU), the Emergency Department (ED), and/or in-patient hospital units.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing, Knowledge Translation, collaborate with graduate student(s), and clinical staff; developing educational resources. There may also be opportunity for students to do a buddy shift in the Critical Care Unit, ED, and/or hospital units at SickKids (together with staff respiratory therapists), depending on circumstances like workload and patient acuity levels.
Special Requirements/Eligibility: SickKids onboarding process: entry immunizations, police check, mask fit, and initial orientation e-modules and at the hospital), prior to starting must take a mechanical ventilation course (https://www.edx.org/course/mechanical-ventilation-for-covid-19). TCPS2 Core certification. Assets: Experience working with electronic information systems (hospital based preferred) & with data organization; experience in academic/research writing e.g. research proposals, peer-reviewed publications; experience working with Microsoft Office, especially Excel; knowledge of respiratory physiology and pathophysiology
Project Application Name: Nonoyama & Quach

Project Title: Applying implementation science in physiotherapy: Measuring uptake of the Bootle Blast gaming system
Research Preceptor: Dr. Taryn Eickmeier
Number of Available Positions: 1
Location: Grandview Kids (Oshawa, Dwyer, Port Perry, and Ajax) (In-Person)
Project Description: Background: Bootle Blast is the first video game for motor therapy that applies motor learning, game design, and motivation theory. Through the use of MS Kinect, Bootle Blast provides real-time feedback on MSK movements using mixed reality gamification. Grandview Kids has access to a Bootle Blast unit, though its integration into daily clinical physiotherapy sessions have not been explored. Objectives: (1) apply best practice in implementation science to develop an implementation plan for use at Grandview Kids locations; (2) trial Bootle Blast with a variety of clinicians and clients; (3) identify barriers and facilitators to uptake in clinical practice. Student role: The opportunity to co-design a comprehensive implementation plan, lead data collection, and develop an evaluation framework.
Key Roles for Students: Data Collection/Analysis, Surveying, Interviewing, Behavioural Data Collection, Knowledge Translation, Implementation science, evaluation
Special Requirements/Eligibility: Vulnerable Persons Sector Check; Proof of COVID-19 immunizations (2 doses); Grandview Kids onboarding of policies and procedures
Project Application Name: Eickmeier

Project Title: Flipped Classroom Instructional Design in Anatomy and Physiology Courses
Research Preceptor: Dr. Laura Banks
Number of Available Positions: 2
Location: Remote
Project Description: Students will work as a small team to conduct a systematic review of the literature.
Key Roles for Students: Literature Review
Special Requirements/Eligibility: Prior research and/or research related course experience (preferred); Strong academic writing experience (required); Excellent academic record (GPA of 3.8 or higher preferred).
Project Application Name: Banks 1

Project Title: Systematic Reviews of Cardiovascular Outcomes by Sex and Race: A Literature Review
Research Preceptor: Dr. Laura Banks
Number of Available Positions: 4
Location: Remote
Project Description: Students will be involved in conducting a literature review.
Key Roles for Students: Literature Review, Knowledge Translation
Special Requirements/Eligibility: Prior research and/or research related course experience (preferred); Strong academic writing experience (required); Excellent academic record (GPA of 3.8 or higher preferred).
Project Application Name: Banks 2

Project Title: Sex Differences in Cardiac Adaptations to Exercise: A Systematic Review
Research Preceptor: Dr. Laura Banks
Number of Available Positions: 2
Location: Remote
Project Description: Students will participate in the data collection/extraction for an invited systematic review with the Canadian Journal of Cardiology. The research product will be a systematic review manuscript in collaboration with Dr. Banks and an external team.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing
Special Requirements/Eligibility: Students will be expected to participate in data collection/extraction/academic writing in the spring/summer 2024 semester, however, will submit the research abstract/poster/product in alignment with the academic course schedule (2024-2025). Applicants should have an outstanding academic background (GPA of 3.8 or higher preferred). Applicable for KINE 4998/4999U or HLSC 4998/4999U, Kinesiology background preferred.
Project Application Name: Banks 3

Project Title: Development and Validation of Gamified Motor Learning Paradigms for Use in EEG and MRI Studies
Research Preceptor: Dr. Bernadette Murphy
Number of Available Positions: 2
Location: Ontario Tech North Campus (UA) (In-Person)
Project Description: This study involves the development of 2 video game tasks that can be used to measure motor learning. The tasks will be tested using electroencephalography (EEG) to measure brain activity in response to motor learning in combination with behavioural measures of motor performance. Future work will use these tasks to evaluate the effects of muscle vibration and hand dominance on motor learning and neuroplasticity. Applicable for KINE 4998/4999U or HLSC 4998/4999U.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing
Special Requirements/Eligibility: Completion of Intro to Movement Neuroscience and Motor Control and Learning with at least B+ grades
Project Application Name: Murphy 1

Project Title: Role of proprioception in virtual environments
Research Preceptor: Dr. Bernadette Murphy
Number of Available Positions: 1
Location: Ontario Tech North Campus (UA) (In-Person)
Project Description: The project will collect EEG signal while participants perform tasks in virtual reality with varying levels of proprioceptive feedback. Student will assist with data collection and analysis. Applicable for KINE 4998/4999U or HLSC 4998/4999U.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Completion of Intro to Movement Neuroscience and Motor Control and Learning with at least B+ grades
Project Application Name: Murphy 2

Project Title: Effect of concussion on eye reflexes
Research Preceptor: Dr. Bernadette Murphy & Dr. Paul Yielder
Number of Available Positions: 2
Location: Ontario Tech North Campus (In-Person)
Project Description: The practicum student will work alongside a master's student collecting eye tracking data for the vestibulo-ocular (VOR) and cervico-ocular (COR) reflexes from varsity athletes pre-season. Changes in the VOR and COR will be compared between athletes who become concussed to athletes that do not become concussed. Applicable for KINE 4998/4999U or HLSC 4998/4999U.
Key Roles for Students: Literature Review, Data Collection/Analysis, Behavioural Data Collection, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Completion of Intro to Movement Neuroscience and Motor Control and Learning with at least B+ grades
Project Application Name: Murphy & Yielder

Project Title: The role of central sensitization and sensorimotor integration in understanding the biological basis of Chiropractic
Research Preceptor: Dr. Bernadette Murphy & Dr. Nicholas Antony
Number of Available Positions: 2
Location: Ontario Tech North Campus (In-Person)
Project Description: The objectives of this project are to: 1) determine the effects of chronic pain (central sensitization) on the neural control of hand and wrist movements and 2) to study the effects of Chiropractic treatment on neural control. Participants will be asked to perform one experimental session that will last around 3 hours. In this session, arm muscle electrical activity will be recorded while participants perform a hand force matching task with the arm sensitized via the application of capsaicin cream (an over-the-counter topical pain cream similar to A535, tiger balm, biofreeze etc.) Some individuals with neck pain will receive chiropractic treatment during the trial session. Applicable for KINE 4998/4999U or HLSC 4998/4999U.
Key Roles for Students: Literature Review, Data Collection/Analysis, Behavioural Data Collection, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Completion of Intro to Movement Neuroscience and Motor Control and Leanring with at least B+ grades
Project Application Name: Murphy & Antony

Project Title: Validation of markerless motion capture for upper extremity kinematics
Research Preceptor: Dr. Nick La Delfa
Number of Available Positions: 2
Location: Ontario Tech North Campus-Occupational Neuromechanics & Ergonomics Laboratory (In-Person)
Project Description: In the last few years, major advances have been made in our ability to accurately measure human kinematics outside of the laboratory. These include: a) an optical markerless machine-learning approach that can recognize features on the human subject(s) and compute accurate joint kinematics, and b) inertial sensors that can compute segment and joint kinematics in the absence of any visual data. This project will compare these two novel motion capture approaches to gold-standard motion capture for upper limb focused work, as there is a relative lack of validation data on these systems for both upper limb movements and occupational-based tasks (e.g. overhead drilling, etc.). Several other research projects in the area of ergonomics and neuromechanics are also ongoing in the laboratory and might be suitable candidates for a research practicum project.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: A- or higher in Biomechanics (KINE 2040).
Project Application Name: La Delfa

Project Title: Training, development, and performance in ice hockey
Research Preceptor: Dr. Nick Wattie
Number of Available Positions: 3
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: The project focusses on a range of factors related to the training and development of ice hockey players. Numerous opportunities exist within this project, including performance and training evaluation/profiling, entry draft and player development analytics, and applied skill acquisition (i.e., perceptual-motor approaches to optimizing learning environments).
Key Roles for Students: Data Collection/Analysis, Surveying, Behavioural Data Collection, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Personal experience and/or in-depth familiarity with sport (emphasis on ice hockey) essential.
Project Application Name: Wattie 1

Project Title: Draft Profile Analyses
Research Preceptor: Dr. Nick Wattie
Number of Available Positions: 2
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: Draft profiles in professional sports (e.g., NHL, MLB, NBA and NFL) are common sources of information for decision makers when selecting athletes. As such, the language used in draft profiles can have a significant impact. This project will utilize a range of analytic approaches to evaluate the language and text within draft profile write-ups.
Key Roles for Students: Data Collection/Analysis, Surveying, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Experience and significant familiarity with sport is a valuable asset.
Project Application Name: Wattie 2

Project Title: Ridgeback Sport Science Support
Research Preceptors: Dr. Nick Wattie, Ben Csiernik & Scott Barker
Number of Available Positions: 4
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: This project will provide students with training and experiential learning opportunities in sport science support, including data analytics, measurement of key performance indicators, and applied skill acquisition. Each student will be assigned to one Ridgeback Varsity team, and imbedded within the multidisciplinary Integrated Support Team (IST) supporting varsity student-athletes.
Key Roles for Students: Data Collection, Data Coding, Data Analysis, Surveying, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Kinesiology background preferred; Experience and significant familiarity with sport is a valuable asset
Project Application Name: Wattie 3

Project Title: Long stay hospitalizations among people with developmental disabilities
Research Preceptor: Dr. Robert Balogh
Number of Available Positions: 1
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: Adults with developmental disabilities (e.g. Down syndrome and autism spectrum disorder) often experience hospitalizations that last longer than necessary. The Ontario government calls these Alternate Level of Care stays (ALC). This is often because existing community supports like housing are unable to meet the needs of this population in the community. The proposed study will compare the frequency of ALC stays among persons with and without developmental disabilities. The study will also evaluate the costs associated with long hospital stays. The student will be involved in accessing the necessary data from existing hospitalization databases and assist with preparing a presentation and/or manuscript for publication.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing
Special Requirements/Eligibility: Should have A- or higher in past 2 years.
Project Application Name: Balogh

Project Title: Development of Decentralized Training Modules to Improve Bag-Valve Mask Ventilations of Critically Ill Patients
Research Preceptor: Dale Button
Number of Available Positions: 3
Location: Ontario Tech North Campus and Durham College (In-Person and Remote)
Project Description: The scope of this project is to develop project that will utilize the Delphi method to determine the requirements of an educational product targeting paramedic bag-valve mask (BVM) ventilations of critically ill patients. In this project we will perform the necessary literature review, study design, research tool development, and research ethics proposal required to begin data collection. If the project progresses well, we will begin data collection.
Key Roles for Students: Grant Writing, Literature Review, Data Collection/Analysis, Surveying, Interviewing
Special Requirements/Eligibility: Experience as a paramedic is preferred.
Project Application Name: Button 1

Project Title: Effectiveness of a Decentralized Training Module in Improving Bag-Valve Mask Ventilation of Critically Ill Patients
Research Preceptor: Dale Button
Number of Available Positions: 3
Location: Ontario Tech North Campus and Durham College (In-Person and Remote)
Project Description: In this project we will perform the necessary literature review, study design, and study tool development to test the effectiveness of a decentralized learning module in improving bag-valve mask ventilation of critically ill patients by paramedic students. This project aligns with another project in the area. If project goals are met in a timely manner, this project may also include REB submission.
Key Roles for Students: Grant Writing, Literature Review, Data Collection/Analysis, Scientific Writing
Special Requirements/Eligibility: Experience as a paramedic preferred.
Project Application Name: Button 2

Project Title: Investigating ticketing as a way to discourage youth vaping
Research Preceptor: Dr. Adam Cole
Number of Available Positions: 1
Location: Ontario Tech North Campus (Remote)
Project Description: While there have been significant decreases in youth use of some substances (e.g., cigarettes), changing product availability, social norms, and public policies have results in increases in youth use of other substances (e.g., vapes). The popularity of vaping presents challenges to schools as students find ways to covertly vape at school. However, under the Smoke-Free Ontario Act, vaping and smoking are prohibited in any public or private school, outdoors on school grounds, and within 20m of school property. Schools can take many different approaches to disciplining students who vape at school, including reporting offenses to Tobacco Enforcement Officers who can fine students. There are few data for how common it is to fine youth who vape and whether this approach discourages youth vaping. This project will collect and review data for vaping fines across Ontario to investigate the frequency of this approach and the impact on youth vaping.
Key Roles for Students: Literature Review, Data Collection/Analysis
Special Requirements/Eligibility: N/A
Project Application Name: Cole

Project Title: Motor skills of children with ASD - a 5 year follow up
Research Preceptor: Dr. Meghann Lloyd
Number of Available Positions: 2
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: Children with Autism Spectrum Disorder (ASD) experience delays in their motor skills. 5 years ago we conducted a motor skill intervention. These children are now 8-10 years old. This project will bring the original cohort back to the lab for a series of assessments and also recruiting a new group of 8-10 year olds with ASD who did not get the intervention. We will be looking to see if there are any developmental differences between the two groups but also gain insight into the trajectory of development in the original cohort 5 years later
Key Roles for Students: Literature Review, Data Collection/Analysis, Behavioural Data Collection, Scientific Writing, Knowledge Translation, recruitment
Special Requirements/Eligibility: Vulnerable populations Police Check is required. Kinesiology student Experience working with children is required, working with children with disabilities is a strong asset. Must be available for data collection - which could include evenings and weekends due to family availability.
Project Application Name: Lloyd

Project Title: Food Security and IDD - A qualitative analysis
Research Preceptor: Dr. Janet McCabe
Number of Available Positions: 1
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: The project will include a qualitative analysis of previously collected data from interviews with caregivers that focused on food security and individuals with Intellectual Disability during COVID. The student will be engaged in analysis, generating themes, and participate in knowledge translation
Key Roles for Students: Grant Writing, Literature Review, Data Collection/Analysis, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: N/A
Project Application Name: McCabe

Project Title: Development and validation of a micro-learning unit for STEPS minor blueprint
Research Preceptor: Dr. Adam Dubrowski
Number of Available Positions: 3
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: The STEPS minor program is being developed as an addition to Ontario Tech's Bachelor of Health Sciences (BHSc) to provide formal training in simulation practice and scholarship for health sciences students. This program aims to prepare students for careers as Simulation Technicians or Simulation Scholars. The program is structured around three core pillars, reflecting its name: Simulation Technologies, Educational Principles, and Safety. These pillars will form the foundation of an innovative curriculum based on the infusion approach to curriculum design and competency-based education. The minor program will span three years, commencing in the second year of the BHSc degree. It will include essential core courses alongside a unique micro-learning and competency-based curriculum comprising on-line courses, micro-credentials, and experiential learning opportunities. The students selected for the research practicum placement will collaborate with the STEPS development team to create a number of micro-learning-placement modules (one per student). Each of these modules will involve a 2-hour micro-learning activity, a 7-hour experiential learning placement, and culminate in a reflective essay. The students' responsibilities will involve co-designing various elements, including the content of the micro-learning module aligned with the STEPS competency framework, incorporating quizzes and formative assessments; designing an authentic hands-on activity with assessment checklists for performance and component competencies; and developing a reflective exercise (e.g., journaling or reflection essay) for assessing cognitive knowledge. The final product will undergo validation by a panel of experts using a focus group approach. The research skills developed include: literature searches, focus group methods, qualitative data analyses, and technical report writing.
Key Roles for Students: Literature Review, Data Collection/Analysis, Interviewing, Scientific Writing
Special Requirements/Eligibility: N/A
Project Application Name: Dubrowski

Project Title: Developing and Evaluating the Canadian Handbook of Safe Sport: A Comprehensive Guide for Sport Stakeholders in Promoting Safe Sport Practices
Research Preceptor: Dr. Joseph Gurgis
Number of Available Positions: 2
Location: Remote
Project Description: Amid increasing public awareness and research on maltreatment in sport, there has been a surge in the implementation of legislative and organizational initiatives for Safe Sport in Canada. However, the lack of evaluation research on these initiatives raises doubts about their effectiveness, leading to the question: Is Canadian sport genuinely safer with Safe Sport? This project aims to evaluate the perspectives of Canadian sport stakeholders regarding the effectiveness of Safe Sport, with the goal of creating a handbook that is informed by both empirical evidence and the input of stakeholders. Situated within an integrated knowledge translation (IKT) methodology, the research team will use the Context, Input, Process, Product (CIPP) evaluation framework to conduct formative and summative evaluations over a three-year period. Combining qualitative and quantitative approaches, the evaluations will explore the perspectives of various stakeholders involved in shaping Safe Sport in Canada, aiming to pinpoint areas for enhancement.
Key Roles for Students: Literature Review, Data Collection/Analysis, Surveying
Special Requirements/Eligibility: TCPS 2 Certificate
Project Application Name: Gurgis

Project Title: Intervention Research for Girl Sport Participation and Retention
Research Preceptor: Dr. Caroline Barakat
Number of Available Positions: 1
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: This project will develop and implement an educational toolkit that promotes girl participation and retention in sports. Field work may be required.
Key Roles for Students: Grant Writing, Literature Review, Data Collection/Analysis, Surveying
Special Requirements/Eligibility: Excellent written, analytical, and communication skills
Project Application Name: Barakat 1

Project Title: Community Events and Tracing Original Child Participants for Longitudinal Environmental Health Research
Research Preceptor: Dr. Caroline Barakat
Number of Available Positions: 1
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: This research consists of creating community-based strategies to trace and recruit lost participants from the Hamilton Children Cohort to build capacity for a 45-year prospective follow-up study. Field work may be required.
Key Roles for Students: Grant Writing, Literature Review, Data Collection/Analysis, Surveying, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Excellent technological, analytical, and communication skills
Project Application Name: Barakat 2

Project Title: Paraben-focused Educational Toolkit and Indoor Air Quality
Research Preceptor: Dr. Caroline Barakat
Number of Available Positions: 1
Location: Ontario Tech North Campus (In-Person and Remote)
Project Description: This pilot project assessed indoor air quality before and after intervention research consisting of an educational toolkit targeting paraben reduction in personal care products. Field work may be required.
Key Roles for Students: Grant Writing, Literature Review, Data Collection/Analysis, Surveying, Scientific Writing, Knowledge Translation
Special Requirements/Eligibility: Excellent analytical, communication, and writing skills.
Project Application Name: Barakat 3

Project Title: Red blood cell physiology
Research Preceptor: Dr. Syed Qadri
Number of Available Positions: 1
Location: Ontario Tech North Campus (In-Person)
Project Description: Lifestyle is known to influence red blood cell (RBC) functions in circulation. This Project aims to identify cellular and biochemical characteristics in RBCs under various physiological conditions. Learning about these differences will contribute to our understanding on the changes in RBC homeostasis, which is disturbed in various clinical conditions.
Key Roles for Students: Literature Review, Data Collection/Analysis, Scientific Writing, Wet lab work
Special Requirements/Eligibility: Completion of biosafety online training modules before lab work.
Project Application Name: Qadri