PSCB90H3 Physical Sciences Research Experience – Winter 2024


This course provides an opportunity for students to work with a faculty member and carry out original research. Students will provide assistance with one of the faculty member's research projects, while also earning credit. Students will gain first-hand exposure to current research methods, and share in the excitement of discovery of knowledge acquisition. Progress will be monitored by regular meetings with the faculty member and through a reflective journal. Final results will be presented in a written report and/or a presentation at the end of the term. Approximately 120 hours of work is expected for the course.

Prerequisite: Permission of the Course Coordinator (Dr. Kris Kim, kris.kim@utoronto.ca)
Recommended Preparation: Completion of at least 4.0 credits in a relevant discipline.
Breadth Requirements: Natural Sciences
Link to UTSC Timetable: https://utsc.calendar.utoronto.ca/section/physical-sciences

Note: It is the student's responsibility to contact potential supervisors to discuss and confirm project details in advance of the Winter enrolment deadline (**December 20th**). Once students have confirmed a project with a faculty supervisor, students must reach out to the course coordinator (Dr. Kris Kim, kris.kim@utoronto.ca) to request for a supervised study form that will be submitted to the Office of the Registrar. Typically, students enrolled in a program offered by the Department of Physical and Environmental Sciences and students who have a CGPA of at least 2.5 or higher are granted admission.

Please see below for list of projects.

Chemistry Projects

Project 1 (Chemistry):

Supervisor: Prof. Shadi Dalili (sdalili@utsc.utoronto.ca)
Title: Developing New Tutorial Material for CHMB41H
Project Description: Students involved in this project will be able to develop and modify new laboratory experiments for Introductory Organic Chemistry I (CHMB41H). Students in this placement will work with the course instructor to select new experiments from the chemistry education literature, test the experiments, and prepare accompanying content material. Students will learn skills such as literature searching and analysis, as well as utilize essential lab techniques such as extraction, distillation, recrystallization, reflux, to name a few, to develop new labs for the course. Students will also develop written scientific and communication skills through developing lab manual writeups, quizzes, and TA documents for each experiment developed. Students will be expected to submit a written report and final oral or poster presentation at the end of the project.
Qualifications: Completion of CHMB42 with a minimum course grade of B+ and lab grade of A-; must be available for lab work 2 full days during the week between 9am-5pm, ideally Tue and Fri. Please send updated resume and transcript to sh.dalili@utoronto.ca
Number of Positions: 1
Additional Application Instructions: Please send updated resume and transcript to sh.dalili@utoronto.ca

Environmental Sciences Projects

Project 1 (Environmental Science)

Supervisor: Prof. Tanzina Mohsin (tanzina.mohsin@utoronto.ca)
Project Description: Scientific evidence for warming of the climate system is clear. Countries, regions, and cities will have to continuously adopt to the consequences of climate change. However, recently the landscape of climate change have been changed dramatically with the unprecedented wildfire, heat alert days flooding etc. To tackle climate change crisis, part of the solution is to provide climate information in formats tailored to fit into the planning and design decisions of a variety of industries and for different sectors of the society, which can be a baseline for making defensible climate change decisions. I offer research projects related to various aspects of climate change at different sectors of the society. These projects are tailored to train student with critical skillsets for climate data analysis, interpretation, and communication of the results through various forms including reports, posters, video clips etc. Students learn data analysis techniques through sophisticated statistical and modelling exercises that are transferable to any data analysis work. Some examples of projects are impact of climate change on extremes weather events causing flooding in cities, impact of climate change on production of wine grapes affecting the wine industries in Niagara Peninsula, or impact of climate change on occurrences of forest fire in vulnerable locations in British Columbia. Students can also propose a project of their interest and get approval before enrolling in the course. Skills developed will include literature search, critical thinking, problem-solving, climate data analysis and scientific writing skills.
Qualifications: Completion of EESB03 or equivalent with a minimum grade of B+.
Number of Students: 1
Additional Application Instructions: Please send updated CV & transcript to tanzina.mohsin@utoronto.ca