

## ***Undergraduate Student Research Opportunities – 2025***

To assist undergraduate students in finding faculty supervisors for summer research, the following Engineering faculty have submitted their research positions available for undergraduate students. **Please note that this is not an exhaustive list.** Please contact faculty members directly to inquire as to their availability to support undergraduate summer research students.

Professor Name	<b>Arthur Chan</b>
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Environmental Chemistry
Description of Lab	We study atmospheric particles, including their sources, reactions and impacts on climate and human health. More information can be found on our website: <a href="https://chem-eng.utoronto.ca/faculty-staff/faculty-members/arthur-chan/">https://chem-eng.utoronto.ca/faculty-staff/faculty-members/arthur-chan/</a>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:arthurwh.chan@utoronto.ca">arthurwh.chan@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"> <li>• Unofficial Transcript</li> <li>• Cover Letter</li> </ul>
Deadline to Apply	<b>February 1, 2025</b>
Additional Comments	Lived experiences with air pollution impacts (e.g. living near major pollution sources, in densely populated urban centers) may be an asset for air quality research. We strongly encourage students who are disproportionately impacted by air pollution to apply.



Professor Name	<b>Charles Jia</b>
Number of Undergraduate Positions Available for Summer 2025	4
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Green Technology Lab
Description of Lab	More information can be found on our website: <a href="https://chem-eng.utoronto.ca/faculty-staff/faculty-members/charles-q-jia/">https://chem-eng.utoronto.ca/faculty-staff/faculty-members/charles-q-jia/</a>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:cq.jia@utoronto.ca">cq.jia@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>February 28, 2025</b>
Additional Comments	N/A



Professor Name	<b>Greg Evans</b>
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Air Quality and Climate
Description of Lab	<p>SOCAAR is an interdisciplinary centre for the study of air quality, with a focus on how pollutants impact human health and the environment. SOCAAR brings together medical personnel, atmospheric chemists and environmental engineers, and promotes collaborative research through access to state-of-the-art facilities and partnerships with government and industry. (<a href="https://www.socaar.utoronto.ca/">https://www.socaar.utoronto.ca/</a>)</p> <p>Students will support a study of the contributions on non-tailpipe emissions from vehicle brakes, tires and road dust, to air quality in Toronto. Specifically, the students will support the, collection, analysis and interpretation of air quality samples collected at 'hot spot' sites across Toronto by:</p> <ul style="list-style-type: none"><li>• Weighing filters</li><li>• Evaluating chemical composition using Xray fluorescence</li><li>• Evaluating instrument performance and resolving any issues identified</li><li>• Support pre-campaign deployment and execution of sample collection campaign</li><li>• Compiling data and creating appropriate visualizations</li><li>• Preparing and delivering presentations based on their research</li><li>• Documenting their research in a final report</li></ul>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:greg.evans@utoronto.ca">greg.evans@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 1, 2025</b>
Additional Comments	N/A



Professor Name	<b>Donald Kirk</b>
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Interfacial electrochemistry and carbon sequestration
Description of Lab	Project 1 Researching the behaviour of electrical charge storage in capacitors Project 2 Conversion of waste plastics to value added biochar
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:don.kirk@utoronto.ca">don.kirk@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Resume</li></ul>
Deadline to Apply	<b>May 1, 2025</b>
Additional Comments	N/A



Professor Name	<b>Mohamad Moosavi</b>
Number of Undergraduate Positions Available for Summer 2025	2-3
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Artificial Intelligence for Chemical Science
Description of Lab	AI for accelerated materials discovery applied to sustainability applications, such as battery thermal cooling and carbon capture.
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:mohamad.moosavi@utoronto.ca">mohamad.moosavi@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>February 28, 2025</b>
Additional Comments	Students should demonstrate interest in programming, mathematical modelling, and AI.



Professor Name	<b>Mansoor Barati Sedeh</b>
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Materials Science & Engineering (MSE)
Name of Research Area/Lab	Sustainable Materials Processing Research Group
Description of Lab	More information can be found on our website: <a href="https://mse.utoronto.ca/faculty-staff/professors/barati/">https://mse.utoronto.ca/faculty-staff/professors/barati/</a>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:mansoor.barati@utoronto.ca">mansoor.barati@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Resume</li></ul>
Deadline to Apply	<b>January 31, 2025</b>
Additional Comments	N/A



Professor Name	<b>Rana Ahmed Barghout</b>
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Laboratory for Metabolic Systems Engineering
Description of Lab	More information can be found on our website: <a href="https://lmse.utoronto.ca/">https://lmse.utoronto.ca/</a>
Research Location	Hybrid
How to Apply	Email directly ( <a href="mailto:rana.barghout@mail.utoronto.ca">rana.barghout@mail.utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 1, 2025</b>
Additional Comments	N/A



Professor Name	<b>Caitlin Maikawa</b>
Number of Undergraduate Positions Available for Summer 2025	2-3
Department/Division	Institute of Biomedical Engineering (BME)
Name of Research Area/Lab	Maikawa Lab - Biointerfacing Materials
Description of Lab	<p>Our group develops dynamic polymer materials for drug delivery and biosensing applications. We are interested in understanding how a material's chemical properties influence its functional performance in the body. One example of this, is understanding the chemical and physical properties of microgels important for mucoadhesion to inflamed sites of the intestine. It is well established that mucoadhesion to healthy mucous is dependent on a number of factors including hydrogen bonding, charge, surface roughness, and several others. However, it is not clear how these factors change in the inflamed microenvironment. We aim to test a range of chemistries to better understand the critical factors for mucoadhesion to inflamed sites. The project we are recruiting for would focus on engineering and testing tools that can be used for automated microgel fabrication to enable high-throughput synthesis and testing of a large microgel library. Skills that would be helpful for this position include: familiarity with CAD software, basic programming skills, and strong problem solving skills.</p>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:caitlin.maikawa@mail.utoronto.ca">caitlin.maikawa@mail.utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>February 5, 2025</b>
Additional Comments	N/A





Professor Name	<b>Kei Masani</b>
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Institute of Biomedical Engineering (BME)
Name of Research Area/Lab	Rehabilitation Engineering, Human Biomechanics, Human Neurophysiology
Description of Lab	<p>Our research aims to improve the mobility of people who experience neurological impairment. Our approach to investigating human movement is undertaken from a neuromechanical perspective, i.e. the union of neurophysiology and physics.</p> <p>We focus specifically on developing accurate assessments and therapeutic tools using functional electrical stimulation for standing, walking and adapted exercise.</p> <p><a href="https://www.masl.ca">https://www.masl.ca</a></p>
Research Location	Hybrid
How to Apply	Email directly ( <a href="mailto:k.masani@utoronto.ca">k.masani@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 1, 2025</b>
Additional Comments	N/A



Professor Name	<b>Kevin Golovin</b>
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Durable Repellent Engineered Advanced Materials (DREAM) Lab
Description of Lab	<p>The DREAM Lab explores novel coatings, surface interactions, and surface modification strategies to make positive impacts on the world. There are several projects open to undergraduates this year. One project involves the use of robotics in the development of anti-fingerprint coatings for smartphone screens. Another project involves exploring coatings for fabrics to minimize or eliminate the release of microplastic fibres during laundering. A third project is investigating how oils can be chemically attached to surfaces, and how the chemistry of the surface affects the amount of oil and the resultant liquid repellency. Typically the number of available spots is limited to students who have secured a fellowship supporting their summer research, such as those from UTEA, NSERC, CPE, or the MIE Department.</p>
Research Location	On-Site
How to Apply	<p>Email directly (<a href="mailto:kevin.golovin@utoronto.ca">kevin.golovin@utoronto.ca</a>) with the following items:</p> <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 31, 2025</b>
Additional Comments	N/A



Professor Name	<b>Trevor Carey</b>
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Geotechnical Earthquake Engineering
Description of Lab	Engaged in a combination of in-person lab work and computer-based tasks. Laboratory work involved preparing soil samples for engineering tests simulating earthquake loading. Computer work focused on processing high-speed camera images to track displacements during soil liquefaction caused by earthquake loading. Gained skills in Python scripting, geotechnical laboratory operations and testing procedures, and an understanding of the research process.
Research Location	Hybrid
How to Apply	Email directly ( <a href="mailto:trevor.carey@utoronto.ca">trevor.carey@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Resume</li></ul>
Deadline to Apply	<b>May 1, 2025</b>
Additional Comments	N/A



Professor Name	<b>Ali Dolatabadi</b>
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Mind Lab
Description of Lab	Mind Lab: <a href="https://dolatabadi.mie.utoronto.ca">https://dolatabadi.mie.utoronto.ca</a>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:ali.dolatabadi@utoronto.ca">ali.dolatabadi@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>May 1, 2025</b>
Additional Comments	Minimum GPA Requirement: 3.3



Professor Name	<b>Weilai Yu</b>
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	LOGICS for Energy: <a href="https://www.logics-utoronto.org/">https://www.logics-utoronto.org/</a>
Description of Lab	<p>Dr. Yu's research program at UofToronto will integrate fundamental electrochemistry, surface science, and functional material-interface design to innovate next-generation technologies for sustainable chemical and energy conversion. Researchers will work on projects that push the boundaries of current knowledge in the following areas:</p> <p>Interphase Optimization of Next-Generation Battery Materials: Developing stable and high-performance solid-electrolyte interphases (SEI) and cathode-electrolyte interphases (CEI) for next-generation batteries.</p> <p>Electrocatalytic Molecular Manufacturing for Circular Economy: Exploring new electrocatalytic processes for sustainable and efficient chemical manufacturing that supports a circular economy.</p> <p>Solar-driven Chemical Reforming for Environmental Sustainability: Utilizing solar energy to drive chemical reforming processes aimed at achieving environmental sustainability through clean energy.</p> <p>High-throughput and Autonomous Experimentation Accelerated by AI: Harnessing AI-driven autonomous experimentation platforms to rapidly discover and optimize new materials, dramatically reducing the time required for innovation.</p>
Research Location	Hybrid
How to Apply	Email directly ( <a href="mailto:weilai.yu@utoronto.ca">weilai.yu@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 31, 2025</b>
Additional Comments	N/A



Professor Name	<b>Chi-Guhn Lee</b>
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	DoRL
Description of Lab	We do research in a wide range of machine learning and reinforcement learning and apply the tools to supply chain, manufacturing, and others.
Research Location	Hybrid
How to Apply	Email directly ( <a href="mailto:chiguahn.lee@utoronto.ca">chiguahn.lee@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 31, 2025</b>
Additional Comments	Minimum GPA Requirement: 3.3



Professor Name	<b>Enid Montague</b>
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Healthcare Engineering
Description of Lab	Human subjects studies to explore automation in automation, caregiving and cardiac care. Studies involve design, evaluation and observational research.
Research Location	Hybrid
How to Apply	Email directly ( <a href="mailto:enid.montague@utoronto.ca">enid.montague@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Resume</li></ul>
Deadline to Apply	<b>March 1, 2025</b>
Additional Comments	N/A



Professor Name	<b>Axel Guenther</b>
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Engineering Science (EngSci)
Name of Research Area/Lab	Guenther Research Group
Description of Lab	Microfluidic device innovations for applications in the materials and life sciences. Organized soft materials, blood vessels on chips, biofabrication, and bioprinting. <a href="https://guentherlab.mie.utoronto.ca">https://guentherlab.mie.utoronto.ca</a>
Research Location	On-Site
How to Apply	Email directly ( <a href="mailto:axel.guenther@utoronto.ca">axel.guenther@utoronto.ca</a> ) with the following items: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>February 15, 2025</b>
Additional Comments	N/A





Professor Name	<b>Birsen Donmez Akyildiz</b>
Number of Undergraduate Positions Available for Summer 2025	4
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Human Factors and Applied Statistics Lab
Description of Lab	<p>The HFASt Lab conducts research on understanding and improving human behaviour and performance in multi-task and complex situations using various analytical techniques. Projects this summer will include surveying the most up-to-date driving automation systems, testing the effectiveness of driver drowsiness interventions, testing the effectiveness of truck driver training programs, piloting driver visual scan behaviour studies, developing interventions to change risky driving behaviours among fleet drivers, etc. Research students will work on tasks such as reviewing car owner's manuals, recruiting experiment participants, conducting experiments on the driving simulator and collecting data, processing and analyzing collected data, reviewing archival data, helping with data collection through interviews and surveys, etc.</p>
Research Location	Hybrid
How to Apply	<p>Email directly (<a href="mailto:birsen.donmez@utoronto.ca">birsen.donmez@utoronto.ca</a>) with the following items:</p> <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• Cover Letter</li><li>• Resume</li></ul>
Deadline to Apply	<b>February 10, 2025</b>
Additional Comments	N/A



Professor Name	<b>Cristina Amon, alongside Dr. Carlos Da Silva and Dr. Dipali Nayak</b>
Undergraduate Positions Available for Summer 2025	1
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Atoms Laboratory <a href="https://atoms.mie.utoronto.ca/">https://atoms.mie.utoronto.ca/</a>  Research Areas: EV thermal management system, lattice thermal conductivity, machine learning.
Description of Project	<p><i>Title: Machine-learning-derived thermal conductivity of novel materials for electrodes in EV batteries</i></p> <p>Electric vehicle (EV) batteries have demonstrated optimal performance within a temperature range of 15 to 35°C. However, during operation, the issue of overheating remains a significant challenge, leading to reduced battery performance and the risk of thermal runaway. As a result, thermal conductivity becomes a crucial parameter in the battery thermal management system (BTMS). Experimental thermal conductivity measurement is costly and time-consuming, while theoretical tools offer a valuable alternative for understanding the lattice thermal conductivity of novel electrode materials used in metal-ion batteries. Typically, thermal conductivity is calculated by solving the Boltzmann Transport Equation (BTE) using density functional theory (DFT), a computationally intensive process. To address these challenges, a machine learning approach can be adopted to predict the lattice thermal conductivity of materials. This approach offers a more efficient and cost-effective method for evaluating materials, ultimately enhancing the design and performance of EV BTMS.</p> <p>This project aims to:</p> <ul style="list-style-type: none"><li>• explore machine learning approaches to calculate the lattice thermal conductivity of novel materials</li><li>• understand the relationship between thermal conductivity and harmonic and anharmonic properties of materials</li></ul>
Research Location	On Site
How to Apply	Email directly ( <a href="mailto:cristina.amon@utoronto.ca">cristina.amon@utoronto.ca</a> ) with the following items, in a single PDF: <ul style="list-style-type: none"><li>• Unofficial Transcript</li><li>• CV</li><li>• Single Paragraph describing your interest in the project</li></ul>
Deadline to Apply	<b>Open until filled</b>
Additional Comments	Applicants should have a background knowledge of heat transfer, python, and machine learning.