

DEPT. OF PHYSICAL AND  
ENVIRONMENTAL SCIENCE

# D PES

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*“I (we) wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.”*

- University of Toronto, Land Acknowledgement



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# C O N T E N T S

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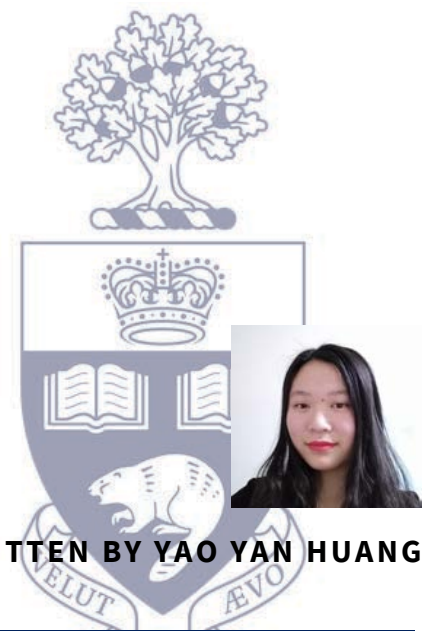
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# ADDRESSING SYSTEMIC ANTI-BLACK RACISM IN HIGHER EDUCATION



WRITTEN BY YAO YAN HUANG

On October 2nd, 2020 the trial results for Breonna Taylor, a Black medical worker who was shot and killed by Louisville Police in March, were revealed. Only one of the three officers were charged, for wanton endangerment, and none were charged for the murder of Ms. Taylor (Oppel Jr. et al., 2020). This is only one of the many high-profile cases of police brutality in the United States that have sparked protests and calls to action. The result of Ms. Taylor's case has only made it clearer that anti-Black racism is not only an issue in policing, and not restricted to the United States. In fact, it also has an underlying prevalence in the justice system and our broader society, including academia, and extends to Canada and around the world.

## U of T Institutional Anti-Black Racism Task Force

The University of Toronto has established an Institutional Anti-Black Racism Task Force to address how university policies and practices contribute to systemic anti-Black racism. The task force aims to capture experiences of community members, address barriers, and provide recommendations on how to advance Black equity and inclusion at all three U of T campuses. The focus will be on real actionable change with an ongoing discussion through feedback from the community throughout the 2020-21 academic year.

As U of T Vice-President, Human Resources (HR) and Equity Kelly Hannah-Moffat points out, "A recognition of racism is insufficient. Racism is not an issue for Black and racialized communities to address – it impacts everyone

and it is our collective responsibility to take steps to eliminate barriers and create inclusive spaces for Black students, staff and faculty and librarians" (Kalvapalle, 2020).

The task force will be led by four co-chairs, including Desma Charlemagne-Michel, Director of Human Resources at U of T Scarborough. Nominations for task force members are open to students, staff, faculty, researchers and librarians. Community members are encouraged to share their thoughts and ideas. The task force will present its final report on March 31st, 2021.

More information can be found at its website, including information on submitting feedback, further readings, and who to contact for support:

<https://www.provost.utoronto.ca/committees/u-of-t-anti-black-racism-task-force/>



## Collective Action: Scholar Strike and National Dialogues

The Scholar Strike against anti-Black and anti-Indigenous racism, police brutality, and violence occurred on September 9-10th, 2020. Initiated in the United States by Anthea Butler, Associate Professor of Religion and Africana Studies at the University of Pennsylvania, it was a labour action in the form of teach-ins, advocating for social justice. Digital teach-ins were live-streamed and can be found on the YouTube channel Scholar Strike Canada. This event was supported by the four university Faculty Associations in the Greater Toronto Area: the Ontario College of Art and Design Faculty Association, York University Faculty Association, the Executives of the University of Toronto Faculty Association, and the Ryerson Faculty Association and various others institutions across Canada.

More Information can be found at: <https://scholarstrikecanada.ca/>

Over 50 Canadian institutions also came together on October 1st and 2nd for the inaugural #NationalDialoguesAndAction forum, focused on anti-Black racism and

Black inclusion in Canadian post-secondary education. The first day consisted of nine interactive online dialogues on inclusive teaching, learning and curricula, inclusive decision-making structures, responsibilities and obligations of non-Black peers, mentorship, key barriers to Black inclusion, and more. The second day focused on developing concrete actions and accountability mechanisms for structural and systemic change. These sessions have also been recorded and are available for public viewing upon signup to the mailing list. At the end of the event, the Scarborough National Charter was signed by sector partners to guide the implementation of the identified actions and to hold institutions accountable.

For more information see:

<https://www.utsc.utoronto.ca/nationaldialogues/>

## Restore @ U of T

The Anti-Racism and Cultural Diversity Office (ARCD) is a division of HR & Equity at U of T. Serving all three campuses, it aims to provide education programming, to offer complaint resolution support, strategic initiatives, and to provide community outreach and engagement.

Screenshot from a National Dialogues session. Source: [U of T News](#)



Programming includes Race, Equity & Action Speaker Series and the Black History Month Symposium. The office has recently launched Restore @ U of T, Restoration Program for Black, Indigenous, and Racialized Community in partnership with Hill Studio by Allison Hill. Programming focuses on community, self-care, restoring and healing through open conversations and dialogues, meditations, yoga, and clinics around allyship.

Find more information and register for current online programming here:

<https://antiracism.utoronto.ca/reflect-restore-action/>

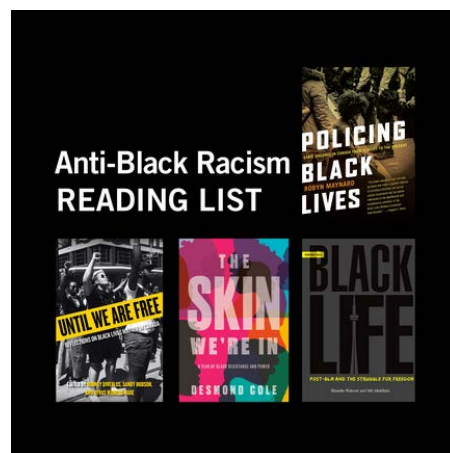


## Other Events at U of T

The Scarborough Campus Students' Union also supported the #AllOutSep30 strike started by Black and Indigenous students. This is in accordance with Canada's Orange Shirt Day to raise awareness about the history of the residential school system and its ongoing impact on Indigenous communities. The SCSU executives attended the virtual teach-in and shared a list of demands including: a free and accessible education for all, with increased targeted grants and bursaries for Indigenous, Black and Racialized students, more Black and Indigenous Faculty, Teachers and Staff, and the removal of the Egerton Ryerson statue (SCSUoft, 2020).

The Chemistry department has also been working with ACRDO to develop targeted workshops on anti-racism for the Fall and Winter semesters and established the Equity, Diversity, and Inclusion (EDI) committee with members across the department. A student-led organization Working towards Inclusivity in Chemistry Toronto (WICTO) will also be working to promote equity, diversity and inclusion within the chemistry community. Celia Ferrag is the UTSC representative and is a 3rd year Ph.D. student in Analytical Chem in the Kerman Lab.

The University of Toronto Libraries has also put out an Anti-Black Racism Reading List which can be found here: <https://onesearch.library.utoronto.ca/anti-black-racism-reading-list>. Though the libraries are currently closed, some can be borrowed as ebooks and others through the Toronto Public Library System.



## Concluding Thoughts: Racism, Education, and Action

This article was written by someone who is not Black, who is still learning about this issue and allyship. It is also by no means a comprehensive list of initiatives happening on campus and in the community. While the article focuses mostly on anti-Black and anti-Indigenous racism, many other barriers to post-secondary education must also be addressed, such as financial obstacles. In a survey following up on how the Calls to

Action, released by the Truth and Reconciliation Commission in 2015, had affected their educational experience, students reported that a large part of their financial needs go unmet and that post-secondary institutions needed to incorporate Indigenous content in program and course work requirements and have Indigenous role models at the front of the classroom (Indspire, 2018). No form of racism should be tolerated in higher education, and it will take time and consistent effort by us all to break down barriers and repair these systems.

## References

Indspire. (2018). Post-secondary experience of Indigenous students following the Truth and Reconciliation Commission. September 2018, 1-10. <https://indspire.ca/wp-content/uploads/2018/09/PSE-Experience-Indigenous-Students-Survey-Summary-Sept2018.pdf>

Kalvapalle, R. (2020). Anti-Black Racism Task Force to examine systemic racism at U of T, provide recommendations to advance Black inclusion and excellence. U of T News. [https://www.utoronto.ca/news/anti-black-racism-task-force-examine-systemic-racism-u-t-provide-recommendations-advance-black?utm\\_source=The+Bulletin+Brief&utm\\_campaign=d7e596de53-](https://www.utoronto.ca/news/anti-black-racism-task-force-examine-systemic-racism-u-t-provide-recommendations-advance-black?utm_source=The+Bulletin+Brief&utm_campaign=d7e596de53-)

EMAIL\_CAMPAIGN\_2018\_06\_13\_COPY\_01&utm\_medium=email&utm\_term=0\_b5083c0488-d7e5

Oppel Jr., R. A., Taylor, D. B., & Bogel-Burroughs, N. (2020, October 2). What We Know About Breonna Taylor's Case and Death. New York Times. <https://www.nytimes.com/article/breonna-taylor-police.html>

SCSUoft. (2020, Sep 30). The SCSU executives are at the #alloutsep30 virtual teach-in today. We stand in solidarity with our black & indigenous students who have come face to face with institutional racism too many times. Read our list of demands below: [Tweet] <https://twitter.com/SCSUuoft/status/1311380957136551938>

YasminRazarck. (2020, Oct 1). Those who are at the margins deserve equity as their human right, they should not have to seek this from those in power...replace with equity-seeking with equity deserving - Dr. Wisdom Tetty. YES! #nationaldialoguesandaction #inclusion [Tweet]. <https://twitter.com/YasminRazack/status/1311700380372398085>

tmoekepickering. (2020, Oct 2). #NationalDialoguesAndAction Day 2. Dr. Theresa Rajack-Telley "are our universities transformative or staying with the status quo". On addressing levels of racism. [Tweet] <https://twitter.com/tmoekepickering/status/1312062984823476234>

Those who are at the margins deserve equity as their human right, they should not have to seek this from those in power... replace equity-seeking with equity deserving.

Dr. Wisdom J. Tetty, Vice-President University of Toronto,  
Principal University of Toronto Scarborough

# ENVIRONMENTAL STUDIES

## PROGRAM SUMMARY

The Environmental Studies Program offers students the opportunity to closely examine environmental issues from physical, life, and social science perspectives. Students gain a strong foundation in the core sciences as well as develop knowledge reaching into other disciplines, enabling them to confidently tackle environmental management issues. The program complements majors such as Anthropology, Human Geography, Political Science, Public Policy, Sociology, Chemistry, Biochemistry, Environmental Science, Biology, Biodiversity, Ecology and Evolution, Physics and Astrophysics, and Physical Sciences.

The program is characterized by three general phases: the Introductory Phase, Core Phase, and Capstone & Application Phase. The beginning phases focus on laying down the foundation in socioeconomics and environmental science, while the latter builds upon these by delving into the different disciplines involved.

Program Requirements:

1. Core Courses (2.5 credits)
2. Foundations and Skills (4.0 credits)
3. Capstone and Applications (2.0 credits)

## EST COURSES

### CORE COURSES

ESTB01H3 Introduction to Environmental Studies

ESTB02H3/GGRB18H3 Canada, Indigenous Peoples, and the Land

### FOUNDATIONS AND SKILLS

ESTC35H3 Environmental Science and Technology in Society

ESTC36H3 Knowledge, Ethics and Environmental Decision-Making

ESTC34H3 Sustainability in Practice

### CAPSTONE AND APPLICATIONS

ESTD16H3 Project Management in Environmental Studies

ESTD19H3 Risk

ESTD17Y3 Cohort Capstone Course in Environmental Studies

ESTD18H3 Environmental Studies Seminar Series



## MEET THE FACULTY

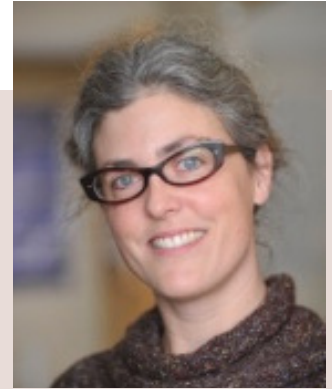


### JIM MACLELLAN

Dr. MacLellan is the Director of the Environmental Studies Program. He teaches Introduction to Environmental Studies and the Capstone and Applications courses.

### NICOLE KLENK

Dr. Klenk teaches Environmental Science and Technology in Society as well as Knowledge, Ethics and Environmental Decision-Making.



### NICOLE LATULIPPE

Dr. Latulippe teaches Canada, Indigenous Peoples, and the Land. Her research interests include Indigenous resource and environmental governance and Indigenous knowledge systems, laws, policies, justice and treaties.



### LAURA TOZER

Dr. Tozer is an Assistant Professor joining DPES in January 2021, where she will be establishing the Energy Transition Governance Lab. She will be developing new courses about climate change and energy for the program.



Can you imagine a world where birds don't sing in May?

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What are typical nitrate levels in freshwater?

ASK OUR ENVIRONMENTAL SCIENTISTS.



Interested in solving wicked environmental problems?

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Why don't we simply use electric cars?

TALK TO A POLITICIAN.



What if the climate change deniers are wrong?

WATCH INCONVENIENT TRUTH.



# FACULTY PROFILE

## DR. NICOLE KLENK

*Associate Professor, Department of Physical and Environmental Science*

*Ph.D. University of British Columbia - 2008*

### About Me:

I am an environmental governance scholar with a research program focused on the relationship between science, society, and policy-making. Environmental governance is an interdisciplinary field of study investigating how state and non-state actors and institutions (e.g., rules, social norms, ideas, and discourses) steer the policy-making process at the strategic and operational levels, and how different governance arrangements shape how people relate to one another and the environment. As a mark of the growing international recognition of my work on the science-policy interface, I serve on several editorial boards: I have recently accepted to serve as an Editor-in Chief for the *Journal of Environmental Science & Policy*, a top-tiered journal in the environmental governance field. I also serve as a Section Editor of the Integrative Sciences section with FACETS, the official journal of the Royal Society of Canada's Academy of Science and Canada's only multidisciplinary open access journal, as well as Associate Editor with the journal *Frontiers in Climate*.



*Dr. Klenk (left) at the IC Rooftop Garden*

### My Career Journey:

My research career began in the natural sciences but eventually took a turn towards interdisciplinary environmental studies. Trained as a botanist and boreal forest ecologist, my early years were greatly influenced by the 'disturbance ecology' paradigm, which characterizes ecosystems in terms of change rather than stability, or what the scientist Daniel Botkin termed "discordant harmonies," a new metaphor for ecology in the twenty-first century. I did not entirely let go of my early training in becoming a social scientist, rather I interpreted this vein of ecological thinking in my research on environmental governance. For instance, I view science, society and policy as co-constituted and in a dynamic relationship; in explaining change, I consider how individual actions matter and how they relate to larger structures and processes.

My turn towards interdisciplinary environmental studies occurred during my Ph.D., in which I conducted a study of the ethics and values underpinning the dominant scientific forest management approach in Canada at the time, the "emulation of natural disturbance". Drawing upon the fields of environmental philosophy, environmental sociology, science and technology studies and political philosophy, in my PhD I took a pragmatic perspective to critique the fact/value and nature/culture dichotomies in forestry and to argue for a more democratic approach to forestry science and policy. This work was groundbreaking because of its interpretive methodology and its challenge to the positivistic epistemology, professional elitism and closed policy networks that characterized much of forest policy development in Canada in this period.

After completing my PhD in 2008, I held five postdoctoral fellowships involving projects on the governance of collaborative research networks, the science-policy interface, the engagement of Indigenous communities in forest governance and climate change adaptation governance. Most significant to the subsequent development of my independent research program, in 2014 I was awarded a two-year Fulbright Fellowship in which I collaborated with other grantees from across the Western Hemisphere on climate change problems. My collaborators and I have: 1) critically examined troubles with the knowledge integration imperative that underpins much of global environmental change research and knowledge synthesis, and presented alternative models of research collaboration that value and respect different epistemologies and ontologies (Klenk and Meehan, 2015); 2) analyzed the ways that stakeholder knowledge is poorly valued and (un)compensated in transdisciplinary environmental research (Klenk et al., *Science*, 2015); 3) reviewed 80+ articles to determine trends in how 'local' knowledge is framed and utilized in scholarly research (Klenk et al., 2017); and, 4) examined knowledge integration, stakeholder engagement and conceptions of the science-policy interface using the Fulbright NEXUS program as a case study of transdisciplinary research. Currently, I am examining the intersection between environmental sciences and humanities in transdisciplinary research, focusing on relational practices that exemplify a politics of difference and the concept of "ethical space" as articulated by Cree philosopher and educator Willie Ermine (Ermine 2000, 2015).





"Talk on the roof" - at the IC Rooftop Garden. Source: [UTSC Edible Campus](#)

## My Work as an Educator:

As an environmental studies educator, my teaching focuses on helping students understand and navigate the complex relationship between society and nature. I do not offer simple solutions to pressing environmental problems, instead I encourage my students to learn about and critically engage with the science, ethics, and politics of environmental problems and different pathways to their resolution. *My actions in the classroom, assessment practices, and graduate student mentorship are guided by the overarching principle of 'dialogical learning.'* I encourage my students to engage with differences in disciplinary backgrounds, value systems, and modes of knowledge production to foster mutual understanding, respect, empathic listening, and critical thinking. This starts in the classroom where I use small group discussions to enable students to share their disciplinary backgrounds and perspectives with other students. My courses are attended by students from multiple disciplines which is reflected in the breath of theoretical and empirical texts I use in my courses. I interpret critical thinking as a way of learning involving 'thinking with' difference: becoming aware and responsive to individual and collective assumptions and taken-for-granted ideas and practices. My goal is to allow difference to inform science, rather than for difference to simply be an object to be explained by science. This requires an open mind and skills to balance tensions, contradictions, and ambiguity together without seeking to eliminate them.

As evidence of creative educational leadership and the development of effective and creative ways to promote students' involvement in the research process, I have facilitated the development of a campus farm at the University of Toronto Scarborough. What began as a small

collaborative project with the campus Sustainability Office to create a rooftop garden to involve undergraduate students in urban farming evolved into a larger collaborative effort with colleagues from DPES, the Department of Historical and Cultural Studies, the Department of Geography, and our former campus Indigenous Elder to envision the University of Toronto Scarborough campus as an "edible landscape." This vision seeks to demonstrate how urban agriculture, food studies, sustainability, and Indigenous knowledges can come together to make UTSC a model for interdisciplinary scholarship, education, and practice in sustainable urban agriculture. This initiative has led to the hiring of a campus farm coordinator and has developed many co-curricular educational opportunities in different campus landscape components:

- Highland Creek Ravine land: We proposed a list of edible native plants for the new trail connecting the campus to the Highland Creek Ravine.
- A multi-use floodplain: Our farm coordinator has begun a foraging initiative that is connected with a food studies course.
- UTSC rooftop gardens: The garden is being designed in collaboration with many faculty members involved in food studies who are using the space and crops in their courses.
- Campus farm: In 2018, the development of a 10-acre campus farm was approved by the campus' senior administration. The farm now provides teaching and research opportunities for UTSC faculty as well as serves as a space for community engagement, summer camps and tri-campus sustainability curriculum development.

*Click here for pictures and a link to a podcast about the IC Rooftop Garden:*

<https://www.utsct.utoronto.ca/projects/utscediblecampus/2018/06/12/radio-canada-visits-the-ic-rooftop-garden/>





# DR. NICOLE LATULIPPE COURSE SPOTLIGHT

## *Whose Land? Indigenous-Canada-Land Relations*

I am teaching the cross-listed course, GGRB18H3-ESTB02H3 *Whose Land? Indigenous-Canada-Land Relations*. Material covered in this course is foundational for anyone living on traditional territories and is especially relevant to those studying environmental studies and sciences. This course explores historic and contemporary relations between Indigenous peoples, Canada, and the land. It attends principally to Indigenous perspectives, beginning with the time before European contact and with the historic Nation-to-Nation treaty relationship. It then examines contemporary Indigenous land rights disputes. The first half of the course focuses on particular events in Ontario at the former Ipperwash provincial park, while the second half explores broader concepts, frameworks, and cases. We focus on protests, blockades, and land reclamations not to fixate on conflict and violence but to build an understanding of Indigenous land defense as a response to ongoing *non-Indigenous* occupations of land, a response that is grounded in the inherent rights and responsibilities of Indigenous peoples. Gaining familiarity with major national inquiries from the Royal Commission on Aboriginal Peoples to Missing and Murdered Indigenous Women and Girls, students will consider how ongoing land and treaty violations impact Indigenous peoples, settler society, and the land in Canada. In the spirit of coexistence, the course does not lose sight of our obligations to reduce conflict and to sustain relations with each other and with all beings of the natural world.

This course will equip students with foundational knowledge needed to grapple with more complex problems in environmental studies. Beyond the classroom, students will be prepared to contribute to work of building truth, reconciliation, and justice in Canada. Specifically, by the end of this course, students will:

1. Engage with Indigenous perspectives and gain foundational knowledge on a range of topics related to Indigenous-Canada-land relations;
2. Understand that treaties form the basis of settlement and subsequent law in Canada, and that they continue to have the full force of law today;
3. Critically analyze dominant discourses pertaining to land in Canada, including its valuation, use and governance;
4. Reflect on your relationship to Indigenous lands, peoples, and histories in the places where you live, work, and play and clearly communicate your learning process;
5. Know and apply Indigenous concepts and frameworks to issues and challenges associated with land-based conflict in Canada; and
6. Develop reading comprehension, note taking, and analysis skills.

The course is part of the program requirements for the Major Program in Environmental Studies.

# DR. NICOLE LATULIPPE RECENT PROJECT

## *Connecting Indigenous Placemakers*

We recently completed this video from a recent project. The project was called Connecting Indigenous Placemakers. It was a practitioners retreat and public symposium held on Menacing (Toronto Island, Treaty 13a), the Treaty Lands and Territory of the Mississaugas of the Credit First Nation and a gathering place of many nations. It was a collaborative project led by the Mississaugas of the Credit First Nation and the Ngā Aho Māori Designers' Network, with support from UTSC and other sponsors.

Access the video here: <https://youtu.be/TEgmLulwJFI>





# ALUMNI HIGHLIGHT THAYALAN NAGARASA

*MEnvSc Candidate, UTSC*

*Specialist in Biological Chemistry, UTSC (2015)*

*Technical Assistant at York Durham Regional Environmental Laboratory*



## **Tell us about your current role:**

As a technical assistant, I am responsible for processing of laboratory samples through Laboratory Information Management System (LIMS). I conduct financial transactions related to laboratory testing and purchasing requisitions through Financial Information Management System (FIMS). I ensure that samples are received in the appropriate containers with the required preservatives and are within holding times. I educate clients on water sampling methods as per the MECP protocols, along with providing technical advice on the testing parameters in order to find potential contaminants in drinking water.

## **What are the most rewarding aspects of your current position?**

I get to connect with people from different municipalities and corporations on a regular basis. I provide input in enhancing our laboratory's testing qualities. I am learning a lot about water treatment and waste water treatment.

## **Where do you hope to be career-wise in 10 years?**

Somewhere successful!

## **What advice would you give yourself if you can go 10 years in the past?**

It's okay if you don't have a clear goal in your life as long as you continue to seize opportunities.

## **What experiences at UTSC helped get you to where you are now?**

I believe that my undergraduate research experience with Professor Lana Mikhaylichenko has helped me develop my career outside of UTSC.

## **What courses/programs helped get you to where you are now?**

### Courses:

- CHMD90Y3 Directed Research
- BIOC17H3 Microbiology I: The Bacterial Cell
- CHMB16H3 Techniques in Analytical Chemistry

### Resources:

- Academic Advising and Career Centre
- Networking events
- Job fairs

## **Any advice for current students?**

I would say get to you know your professors and introduce yourself to them. They will be your initial reference at the early stages of your career. Also, try to figure out if you want to be in the academic environment or corporate environment and develop your skills accordingly.

## **What is something interesting the department doesn't know about you?**

I am a part time wedding videographer and I enjoy dancing.



# GRADUATE STUDENT HIGHLIGHT

## JIA YI FAN

Master of Environmental Science (MEnvSc) Candidate, UTSC  
HBS, McGill University



### Tell us about yourself (educational background, where else you had worked/taught at etc...)

I did an Honours Bachelor of Science in Environment (Renewable Resource Management), and a minor in Geographic Information Systems (GIS) and Remote Sensing at McGill. While doing my undergrad, I worked as a Research Assistant for one of my teachers and as an Environment Intern for a non-governmental organization (NGO).

### What led you to graduate school and graduate studies?

Towards the end of my bachelor degree, I felt that I still have things to learn. Even if I come from a reputable university, my past curriculum can not compare to that of even more prestigious universities, so I wanted to do a bit of catch up. Also, in Canada, your salary increases more with a higher degree such as MSc and PhD vs a BSc.

### What is your field of study? Why did you pick this field of study?

My specialization is in Terrestrial and Aquatic Systems. I picked this out of the other choices (Climate Change Impacts and Adaptation and Conservation and Biodiversity) because its broad range answered my varied interests.

### What is something interesting the department doesn't know about you?

I love watching thought-provoking movies, especially those with queer minorities in them.

### What are differences between the internship and research-based MEnvSc?

Both are 12-month programs. The Master of Environmental Science program is a twelve-month professional program that is largely course based for two sessions. Students spend their third session in a workplace internship or carrying out environmentally related research with a faculty member. A part-time option is available.

### Advice on graduate school and how to know if research is for you?

Check out your professors' research areas and projects, and get involved as a Research Assistant. This is crucial to get you the 2-3 references you need for your grad school application, and hopefully, you can get paid for it!

It is totally fine if you are unsure if grad school is for you. You can start working and return to school whenever you feel like it. Plus, some workplaces will sponsor you by partially covering your tuition.

### What advice would you give to undergraduate students?

If you want to do something, do it now! You will never know when that opportunity will rise again, whether you will have time/energy to do that or if you will still have an interest in the future. Make good use of the resources the university provides. It is totally fine if you are an introvert or do not know how to network. Being present says more about you and what you care about, as everyone's time is limited.

Contact: Jiayi Fan on LinkedIn

# GRADUATE STUDENT HIGHLIGHT

## RAÚL SALAS REYES

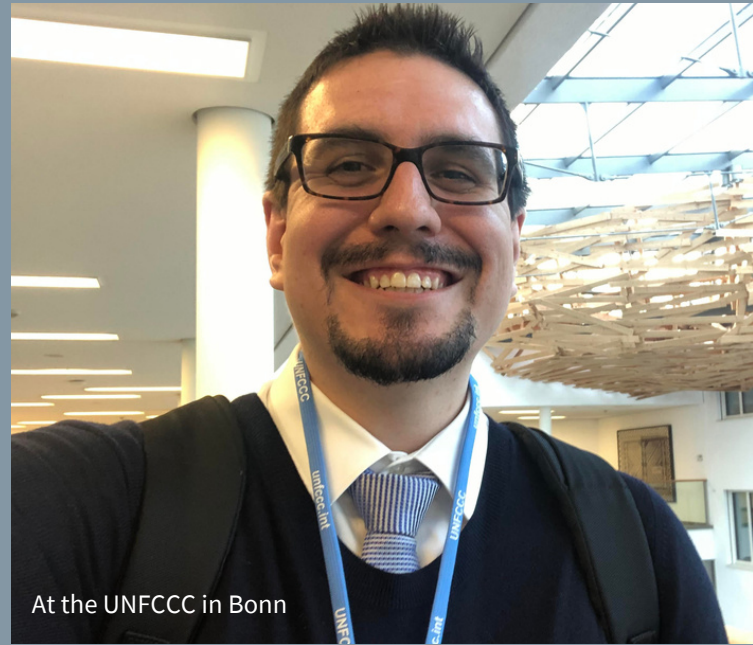
*PhD Candidate in Environmental Science, UTSC  
Master of Environmental Science, UTSC (2014)  
Masters in Renewable Energy  
Bachelors in Industrial and Systems Engineering*

### Tell us about yourself:

I am a PhD candidate working under the supervision of Dr. William Gough and Dr. Nicole Klenk. Before joining the PhD programme at DPES, I was working as a consultant in the UK assisting countries in the implementation and design of systems to estimate their national GHG emissions and understand the impacts of their climate change mitigation actions and policies. I am an alumnus of the 2013-2014 Master of Environmental Science cohort at DPES, and I also have a bachelor's degree in Industrial and Systems Engineering and a master's degree in Renewable Energy. In 2019 I had the opportunity to teach Climate Change Policy, which I deeply enjoyed.

### What is your field of study/research area/focus? Why did you pick this field of study?

I am currently studying the evolution and contestation of the principle of common but differentiated responsibilities (CBDR) in the climate regime. My research is interdisciplinary as this topic has been studied by scholars from various fields, including environmental science, political science, international relations, and climate law. I am passionate about studying the CBDR principle as countries have very unique and different understandings about how inequities of countries are going to be considered when deciding ways forward to face climate change.



At the UNFCCC in Bonn

### What are the challenges of your current project(s)?

Because of the different interpretations of the CBDR principle that have existed through more than twenty years of international climate change negotiations, one of the most challenging aspects of my research is striking a balance and fair representation of what different actors understand of the CBDR principle.

### What are the most rewarding parts of your graduate experience?

I am eager to start interviewing experts and climate negotiators to hear firsthand about the evolution of the CBDR principle, about how actors contested this principle since the adoption of the UNFCCC and through the post-Paris Agreement negotiations. Hearing from their experience and the stories of how the climate regime has been shaped through history is exciting and provides fascinating perspectives to explore. Additionally, one of the most rewarding parts of my graduate experience is to work with extremely smart colleagues from both the Environmental Science in Society Lab and the Climate lab.

### Where do you hope to be career-wise in 10 years?

I see myself as an academic doing research on climate governance and finding ways to tackle climate change. In this future I also see myself teaching students about climate change mitigation, climate governance, and bring a mix of my working and research experience into my teaching. I also see myself with a research lab that pursues research in climate governance and justice.



At COP 25 in Madrid



# MEET INDUSTRY PROFESSIONAL: ABBY WYNIA

*Aquatic Research Technician at Environment and Climate Change Canada (ECCC)  
M.A. Trent University  
B.E.S.S. Trent University*



## Tell us about your current role:

My work is composed of fieldwork, lab work as well as data entry and analysis. My lab is focused on monitoring fish health in streams and lakes. Some of our work includes monitoring walleye and white sucker health in the mainstem Athabasca River, small-bodied fishes in tributaries of the Athabasca, multi-species health in Great Lakes Areas of Concern (AOCs) and the occasional study up at the Experimental Lakes Area in northern Ontario. During the off-season, I can be found in the lab conducting assays or preparing for the next field season.

## What advice would you give to current students?

Get involved! Volunteer! Gain as much experience as you can.

## What are the challenges of your current position? What are the most rewarding aspects of your current position?

Fieldwork to both questions! There is something wonderful to be said about spending more time in your waders than in your apartment, and experiencing all of the remote and natural areas that fieldwork often takes you. There is experience gained from fieldwork that is very difficult to attain otherwise, and the comradery and sense of escapism that come from working closely with your teammates over long periods of time is what makes fieldwork the most rewarding part of my job. However, the challenging part of fieldwork is being away from your loved ones (and house plants) for extended periods of time (e.g.: 4 weeks).



## What programs or opportunities did you find helpful in getting you to where you are now?

I completed a B.E.S.S. in Environmental Science and a Master of Science in the Environmental and Life Sciences program at Trent University. I first got a summer job as a Student Fisheries Research Technician at Fisheries and Oceans Canada (DFO) through the FSWEF program, and after four summers moved internally to ECCC.

## What do you wish you had known when you first started out?

That I would be working in toxicology. My background is in ecology and studying fish communities in various habitats. However, with a willingness to learn (and great patience and trust from my colleagues) I have been able to learn a number of ecotoxicological laboratory techniques and assays.

## Where do you hope to be career-wise in 10 years?

I have thoroughly enjoyed working with both DFO and ECCC, so I only hope to move to a higher position than my current one in the coming years.

**Contact:** Abby Wynia on LinkedIn and @abbywynia on Instagram



# DPES GRADUATE HIGHLIGHTS

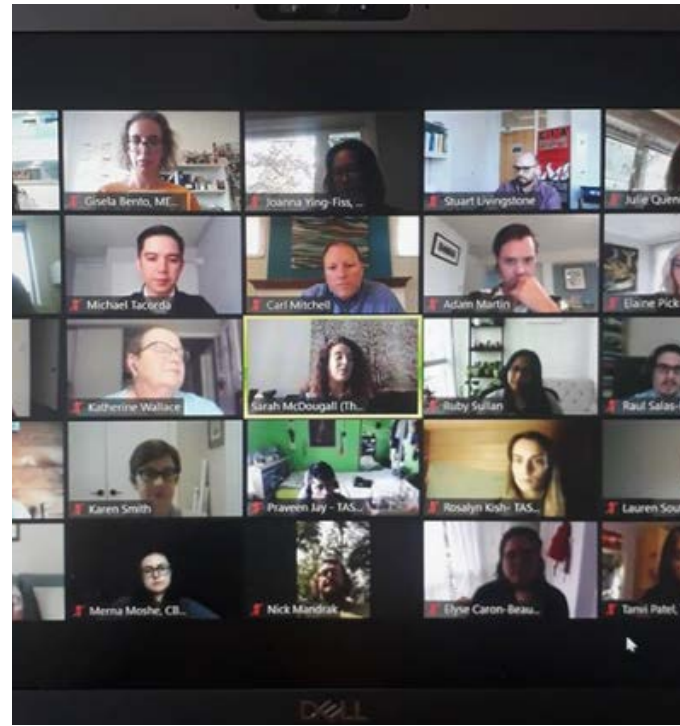
## Environmental Science Graduate Orientation

This year the Environmental Science Graduate Orientation was held virtually online on September 10th. The Orientation was very well attended by the incoming cohort of both PhD and MEnvSc students.

Attending faculty and staff were delighted to meet the students, and the students were happy to meet each other and excited to start the program.

A sincere thank you to all the faculty, student support representatives, senior graduate students, administrative and technical staff who contributed to welcoming the new cohort, and helping them to navigate the resources and opportunities available.

Finally, a special thank you goes out to Rabia Nassir who so diligently managed the behind the scenes activities of this event.



*Another Orientation, a new year. A different normal but the enthusiasm for meeting a new cohort of graduate students remains unaltered. Welcome to a new year! The best is yet to come.*

## Statistics from this academic year

### PhD STATS (SEPT 2020)

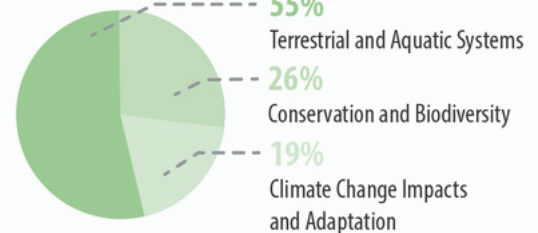


**2020-21** highest PhD student intake ever



### MEnvSc STATS (SEPT 2020)

#### Breakdown of Fields of Study Enrolment



**86** students including part-time **10**

**1 in 14** students are international

**850** alumni

**36** courses offered

Convocation

You are invited to join and cheer for our 77 MEnvSc and 7 PhD students graduating this November. U of T's Fall Convocation 2020 ceremony happens virtually on **Saturday, Nov. 21 at 12:00 p.m. EST.**  
[www.utoronto.ca/convocation](http://www.utoronto.ca/convocation)



*To all our new and continuing graduate students: Welcome! ✨ A new, exciting, and definitely different academic year - may it be filled with knowledge, advancement and health! We are here for you. ❤️*

M E n v S c  
N E W S

Internship Poster Day



September 14, 2020 marked the annual Master of Environmental Science Internship Poster Presentation Day. Through virtual connection, 66 outgoing MEnvSc students shared their internship experiences with their peers, faculty, staff, and the incoming MEnvSc cohort.

This experience was particularly beneficial for new MEnvSc students, as they were able to better understand the internship process, learn about the diversity of potential positions, and get firsthand tips on how to succeed in the program.

DPES would like to extend its sincere thanks and appreciation to this year's partner employers, many of whom were DPES faculty members, who offered impactful academic-industry internship experiences during an incredibly uncertain time for student employment across Canada. This year our employer partners included, among others:

- Metrolinx
- Environment and Climate Change Canada
- Ontario Ministry of the Environment, Conservation and Parks
- Fisheries and Oceans Canada
- City of Toronto

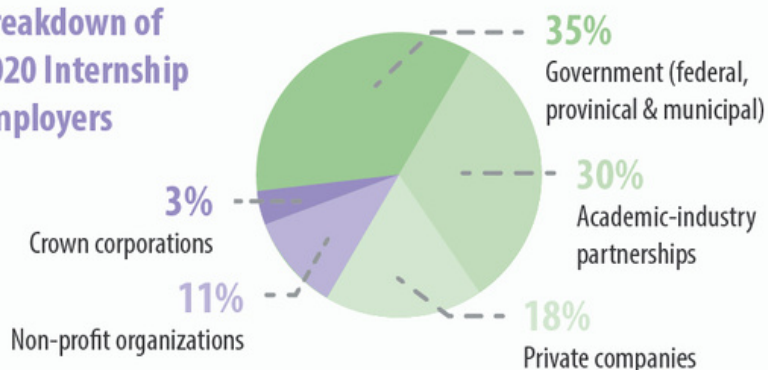
IG: @utsc\_dpesgrad

Although we were unable to gather in-person this year, the 2020 Internship Poster Presentation Day was still a huge success! Special thanks to our Teaching Assistant Wai Ying Lam for her exceptional coordination.

### Research Defense Day

This year we had 12 MEnvSc students successfully defending their research paper. Congratulations to all!

### Breakdown of 2020 Internship Employers



MEnvSc RESEARCH STUDENT	SUPERVISOR	PAPER TITLE
Franklin Perez	Ruby Sullan	Nanomechanics of Nanoparticle-Biofilm Interactions
Akunne Okoli	George Arhonditsis	Development of a mechanistic model to link planktonic dynamics with fish predators
Yasasi Fernando	George Arhonditsis	Development of a mechanistic model to link planktonic dynamics with fish predators
Rodrigo Santos Sousa	Carl Mitchell	Landscape control on the transport and fate of trace metals from forested catchments on the Precambrian Shield, Northern Ontario
Zhizhen Zhang	Frank Wania	Prioritizing data from non-target analysis through high-throughput modelling: Application to identify compounds with high human bioaccumulation potential from house dust
Samya Kazmi	Mathew Wells	Observation of Episodic Stratification and Anoxia in the Polymictic Basins of Western Lake Erie and Lake St. Clair: Implications for Formation of Cyanobacteria Blooms
Rachel Olivia Mariani	Adam Martin	Global crop diversification through the Anthropocene epoch
Nathan Beech	Micah Hewer	Climate Change Impact Assessment (CCIA) on Viticulture and Oenology in the Fraser Valley, BC (Canada)
Lukas Yin-Toh Cheung	Karen Smith	The performance evaluation of the CORDEX and CMIP5 simulations for the Great Lakes region
Mike Tredree	Carl Mitchell	Assessment of urban stormwater runoff contributions in Highland Creek, Southern Ontario
Ichha Kaur Kohli	Stuart Livingstone	Attitudes Towards the Impact and Management of Invasive Wild Pigs in Ontario: A Role for Compassionate Conservation?
Farheen Asgar Kadwa	Stuart Livingstone	Assessing Entanglement Threat to Right Whales in the Maritimes Lobster Fishery





Source: LinkedIn

**Join our exclusive University of Toronto Scarborough** | Master of Environmental Science Alumni LinkedIn Group

<https://www.linkedin.com/groups/13617507/>

## P h D N E W S

We are proud to announce that from June 1 to September 30th, the following seven PhD students successfully defended their dissertation. Six of these seven students will convocate in November and one will convocate in April 2021. Maryam Abdinejad, who defended in May, will also convocate in November.

JP Fontenelle – supervised by Nathan Lovejoy

Bryan Flood – supervised by Mathew Wells – convocating in April 2021

Ellen Gute – supervised by Jon Abbatt

Tej Heer – supervised by Nick Mandrak and co-supervised by Mathew Wells

Ye Tao – supervised by Jennifer Murphy

Yuchao Wan – supervised by Miriam Diamond and co-supervised by Jeffrey Siegel

Ana Zaknic-Catovic – supervised by William Gough

# GAS CHROMATOGRAPHY MASS SPECTROMETRY

SCIENTIFIC INSTRUMENTATION THEN AND NOW

WRITTEN BY MELANIE SNOW

## A brief introduction

Gas chromatography mass spectrometry (GC-MS) is a powerful analytical technique. During analysis, the gas chromatograph (GC) works to separate chemical mixtures into individual components. Once separated, the individual components enter the mass spectrometer (MS) where the components become charged ions, are broken apart into fragments. When these fragments reach the MS detector the instrument provides a mass spectrum, which is a characteristic chemical fingerprint.

The origins of GC and MS, as well as the hyphenation of the two, can be accredited to the work of many physicists who helped to pioneer the techniques. Initially the instrumentation was used primarily by physicists to complete fundamental scientific experiments. Today GC-MS is used in virtually every scientific field!



Photos: Tom Meulendyk

## Key moments in history

1907

Joseph John Thomson developed the first mass spectrograph.

1917

Building on the original work by J.J. Thompson, his assistant Francis Aston, built the first mass spectrometer.

1952

Anthony T. James and Archer J. P. Martin introduce the gas chromatograph.

1959

Gas chromatography-mass spectrometry (GC-MS) was introduced by Fred McLafferty and Roland Gohlke



## GC-MS at UTSC

The TRACES Centre located in the Environmental Science and Chemistry building on the UTSC campus houses GC-MS instrumentation. The facility has an Agilent 7890A GC paired with the 5975C MS detector. This system has been used across more applications than any other GC-MS system!

TRACES offers training and analysis services to undergraduate and graduate researchers at UTSC. Analysis and training services are also available for individuals external to the university.



Photo: Tom Meulendyk

## Modern day applications of GC-MS

### Environmental Monitoring

GC-MS is used to monitor and track organic pollutants in the environment.

### Food Adulteration

GC-MS is used to determine if food adulteration has occurred. This is a common practice for foods such as honey and olive oil.

### Space Exploration

Several GC-MS systems have travelled to space to study different geochemical and atmospheric properties!

### Medical Diagnostics

GC-MS is employed in many clinical settings to detect molecules present in biological media like urine and blood.

## References

- (1) Yates III, J. R. A Century of Mass Spectrometry: From Atoms to Proteomes. *Nat. Methods* 2011, 8 (8), 633–637.
- (2) James, A. T.; Martin, A. J. P. Gas-Liquid Partition Chromatography: The Separation and Micro-Estimation of Volatile Fatty Acids from Formic Acid to Dodecanoic Acid. *Biochem. J.* 1952, 50 (5), 679–690.
- (3) Hites, R. A. Development of Gas Chromatographic Mass Spectrometry. *Anal. Chem.* 2016, 88 (14), 6955–6961.
- (4) Gohlke, R. S. Time-of-Flight Mass Spectrometry and Gas-Liquid Partition Chromatography. *Anal. Chem.* 1959, 31 (4), 535–541.

# PHARMACY SEMINAR

## Join us!

- Learn about the application process and requirements

**NOVEMBER 4, 2020**

**5-7 PM ~ VIA ZOOM**

visit [www.myepsa.ca](http://www.myepsa.ca)





UNIVERSITY OF TORONTO  
LESLIE DAN FACULTY OF PHARMACY



# STUDY CENTRES ARE OPEN!

**THE CHEMISTRY HELP CENTRE**

Tutoring Hours | Fall 2020 | Via Discord





Eastern Time	Mon	Tue	Wed	Thu	Fri
9-10 AM	Christina M.	Annam I.	Christina M.	Areem S.	
10-11 AM	Christina M.	Annam I.		Areem S.	
11AM-12 PM	Fatima A.	Annam I.	Fatima A.	Anastasia C.	Charlotte W.
12-1 PM	Janani J.	Andrei C.	Matthew C.	Anastasia C.	Charlotte W.
1-2 PM	Fatima A.	Andrei C.	Matthew C.	Janani J.	Charlotte W.
2-3 PM	Anastasia C.	Andrei C.	Matthew C.	Areem S.	Janani J.

● CHMA10      ● CHMA10 & CHMB41

**PHYSICS STUDY CENTRE TUTORING**

Tutoring Hours | Fall 2020 | Via Discord



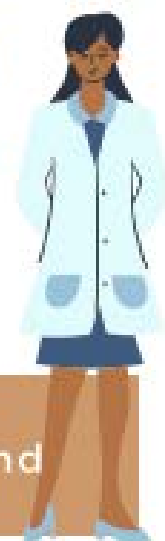
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
9-10 AM	Sepehr	Andrew	Pejvek	Andrew
10-11 AM	Sepehr	Vanessa	Andrew	Andrew
11 AM - 12 PM	Sepehr	Vanessa	Prateek	Prateek
12-1 PM	----	Vanessa	Prateek	----
1-2 PM	----	Ruth	Jane	----
2-3 PM	Pejvek	Ruth	Max	Feiyu
3-4 PM	Jane	Ruth	Max	Feiyu
4-5 PM	Jane	Pejvek	Max	Feiyu



**BECOME A  
MENTEE!**



## BECOME A PART OF CSU'S MENTORSHIP PROGRAM



CSU is looking for mentees that would be interested in being mentored by UofT alumni and upper year students

- The CSU Mentorship Program is for the 2020/2021 academic year
- Mentees can be any UofT undergrad planning to do/doing a chemistry program
- Limited spots available, apply ASAP if interested
- Visit CSU's facebook to apply





# GSAS

Graduate Students' Association  
at Scarborough

## What do we do?

Our mission is to promote the well-being of graduate students at the Scarborough campus and enhance their overall student experience. GSAS has organized a number of social, health and professional events through the academic year that is oriented towards these goals.

## Who are we?

Graduate Students' Association at Scarborough (GSAS) is a student run non-profit organization working to improve the student life for all graduate students at UTSC. Established in 1978 under the former name Scarborough College Association of Graduate Students, the purpose of GSAS is to bring graduate students from all academic departments at UTSC together and ensure all the needs of UTSC graduate students are met.

## Get involved

contact us at  
[gsas@utsc.utoronto.ca](mailto:gsas@utsc.utoronto.ca)

or check out upcoming  
events at

[www.utsc.utoronto.ca/groups/gsas/](http://www.utsc.utoronto.ca/groups/gsas/)



@gsas\_utsc



Graduate Students' Association at Scarborough (GSAS)



@utscgsas



**Announcements**  
**Questions & Answers**  
**General group work**  
**Quiet study**  
**Show & Tell**  
**Online Events**

**On**

**GSAS**



**DISCORD**

<https://discord.gg/CwH8ZmK>





# DPES PROGRAMS SUMMARY

**TOTAL PROGRAMS: 16**

**COOP PROGRAMS: 9**

## CHEMISTRY

Chemistry Specialist  
Chemistry Major  
Biochemistry Major  
Biological Chemistry Specialist  
Environmental Chemistry Specialist

**COMBINED DEGREE PROGRAMS: 3**

## PHYSICS AND ASTROPHYSICS

Physics and Astrophysics Specialist  
Physics and Astrophysics Major  
Physical and Mathematical Sciences  
Specialist  
Physical Sciences Major

## ENVIRONMENTAL SCIENCE

Environmental Biology Specialist  
Environmental Geoscience Specialist  
Environmental Physics Specialist  
Environmental Science Major  
Environmental Science Minor  
Natural Sciences and Environmental  
Management Minor

## ENVIRONMENTAL STUDIES

Environmental Studies Major

## CO - OP

Chemistry Specialist - Coop  
Chemistry Major - Coop  
Biochemistry Major - Coop  
Biological Chemistry Specialist – Coop  
Environmental Chemistry Specialist – Coop  
Environmental Biology Specialist-Coop  
Environmental Geoscience Specialist-Coop  
Environmental Physics Specialist- Coop  
Environmental Science Major-Coop

## COMBINED DEGREE PROGRAMS

HONOURS BACHELOR OF SCIENCE / MASTER OF ENGINEERING

HONOURS BACHELOR OF SCIENCE / MASTER OF ENVIRONMENTAL SCIENCE

HONOURS BACHELOR OF SCIENCE OR HONOURS BACHELOR OF ARTS / MASTER OF TEACHING



# DPES DIGEST IS LOOKING FOR YOU!

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Interested in assisting with the DPES newsletter?  
Have any great ideas you want to see come to light?  
Send us your resume!

Email: [jessiej.liu@mail.utoronto.ca](mailto:jessiej.liu@mail.utoronto.ca)

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