DEEP Spring Seminar Series 2019
DEEP Summer Academy 2019
U of T Engineering Academy 2019
Request for Proposals - Instructions

Deadline: 12:00 PM on December 3, 2018

Primary Contact:
Claire Heymans
Outreach Coordinator, DEEP and High School programs
University of Toronto
T: 416-946-7029
W: outreach.engineering.utoronto.ca

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Description of Role

To provide high school students students with a unique and challenging learning experience during the program, it is preferred that all DEEP instructors are currently in pursuit of either a Masters or PhD degree at the University of Toronto and have previous teaching experience. Instructors generally come from the Faculty of Applied Science & Engineering at the University of Toronto; however, previous instructors have also come from other professional faculties including the Faculty of Pharmacy and the Faculty of Medicine, and other universities.

NEW! U of T Engineering Academy instructors are current high school teachers (OCT is an asset) who have a strong STEM background (Masters degree or higher).

Instructors of this calibre serve as an inspiration for high school students while providing them with a taste of the university experience. The Engineering Outreach Office also welcomes proposal submissions from recent alumni.

Details

Campus: St George Campus
Salary: SGS I/II - $45.33/hour (+4% vacation pay)
Course Enrollment: up to 25 students per course (one instructor)
Number of Positions: up to 45 positions available

Please note the following:

- If an offer of employment is extended, it will be conditional upon the submission of a police records check clearance letter AND proof of WHMIS certification.
- With very few exceptions, the Engineering Outreach Office will not be accepting course proposals from instructors who wish to co-teach a course. If you wish to co-teach a course, your cover letters must clearly state what each applicant brings to the table and how co-instructing would be beneficial for the students in your class. Please note that courses with two instructors will have an increased capacity of up to 40 participants.
- There are no marking or evaluation assignments/duties in DEEP; however, the instructor may choose to produce problem sets, non-marked mini-assignments, or reading for the class depending upon the nature of the particular course.

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Expectations

Training

All instructors must attend training. One training day is tentatively scheduled for Winter 2019 Reading Week (February 16-25, 2019). Training will cover program details, curriculum development, safety protocol, safety standards, classroom management, student issues and approaches to teaching and learning. Full details will be shared with successful candidates.

Preparation

The instructor is responsible for course preparation, including the preparation of and modification to the course outline, lesson plans and lecture notes/handouts, and field trips for each course as necessary. Successful applicants will receive all the required documents and forms to collect course information. These materials and equipment requests, as well as lessons and activity plans, must be submitted to the Program Coordinator by the specified dates, which occur prior to start of the course. It is the responsibility of the instructor to adjust any activities that are not approved by the department's safety officer. The instructor is responsible for preparing audiovisual items to be used in class and will also set up any audiovisual equipment required (such as laptops and projectors). Lastly, the instructor is required to meet with the course counsellors prior to the specified date set by the Program Coordinator, and remain in close communication with the counsellors until the delivery of the course.

The instructor is responsible for conceptualizing, designing and preparing any hands-on activities and experiments to be conducted in the course; this includes demos, prototypes, etc. The instructor is also responsible for finding any guest speakers, tours, etc. (Maximum 1 guest speaker per day.) Finally, the instructor should seek assistance from the Program Coordinator, as needed, in developing curriculum and hands-on activities. The instructor acknowledges that the content of the course will conform to the description of the course on the Outreach website and any other publications.

Contact

The instructor (both, if team teaching) will be present in class at all times and will facilitate the entire course. The instructor is responsible for conducting lessons, facilitating class discussion and/or debate, conducting/demonstrating laboratory and design activities, and providing in-class assistance to the participants. Additionally, the instructor will lead any applicable course field trips. Finally, the instructor will mentor and engage course counsellors in meaningful tasks throughout the program.

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Other

- Each instructor is required to meet with an Academic Team Leader at least once in May or June to go over logistics specific to their course(s).
- Instructors are required to be part of the opening and closing ceremonies as directed by the Program Coordinator.
- Instructors are required comply with any safety procedures outlined in training.
- Instructors are expected to communicate any and all concerns and incidents to the Program Coordinator immediately. Documentation related to any incidents will be promptly completed by instructors.
- Instructors are required to complete all course feedback forms in a timely fashion and submit them to the Program Coordinator at the completion of each course.
- Instructors are encouraged to offer support and guidance, and demonstrate leadership to all program participants being mindful that they are representing the Faculty of Applied Science & Engineering and the University of Toronto.
- Instructors may be asked to engage in digital or social media activities, including but not limited to, taking photos, posting videos, creating content for channels such as Facebook, Instagram, and Twitter, etc.

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Dates to Remember

- December 3, 2018: Requests for proposals close
- December 6, 2018: Interviews start for selected applicants
- January 7, 2019: Conditional offers begin to be extended
- January 2019: Course Description Clinic *
- March 15, 2019: Course schedules confirmed

Course Preparation:

- February 2019: Instructor Training *
- April 15, 2019: All final course documents due
- May-June 2019: Counsellor Meet&Greet
- June 2019: One-on-one meetings (Academic Team Leaders and Materials Team)
- June 2019: Meeting(s) with course counsellors

* Attendance at instructor training is required. Successful applicants will be advised of the date when it is finalized. Training is tentatively scheduled for Winter 2019 Reading Week (February 16-25, 2019).

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Application Guide

Before you fill out the Proposal Submission Form, you should gather all the required documents and information. This guide provides detailed instruction for each section of the form.

Part I: Application Information

Please enter your information (legal name, permanent address) as it should appear on your Offer of Employment.

Employment Information

If you are unsure of your eligibility to work in Canada, please contact claire.heymans@utoronto.ca.

In addition to the six weeks of DEEP (Summer Academy and Spring Seminar Series) and two weeks of U of T Engineering Academy, the Engineering Outreach Office may offer similar programs in May-June or August. Availability of instructors will be reviewed prior to scheduling any additional programs.

Part II: Cover Letter, Résumé/Curriculum vitae

Please combine your résume/CV and cover letter in one PDF file. Ensure that your name appears on every page of the document.

If you have a graduate studies supervisor, you are encouraged to discuss your interest in teaching with them and to let them know that you will be out of your lab or office during business hours for the week(s) that you are teaching.

Three references will be requested if you are selected for an interview. Ideally, these references should be able to speak to your ability to convey complex information in an instructional setting and your ability to showcase your research while making it relevant to youth. If applicable, one of your references should be your graduate studies supervisor.

Part III: Activity Proposal

Instructors will develop and offer courses that are intellectually challenging, engaging and serve to encourage interest in the various Engineering disciplines offered by the Faculty of Applied

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Science & Engineering at the University of Toronto. DEEP courses focus on showcasing innovative research that is currently being conducted at the U of T and demonstrating how it is being applied to solve real world problems. Meanwhile, U of T Engineering Academy courses should enable high-achieving students to dig deeper into the Ontario high school curriculum.

NEW! Using the Activity Proposal Template provided, upload your own proposal for 2.5 hours of educational programming. Save the file as a single PDF file for upload.

1. Be sure to include the procedure, materials/equipment, and instructional strategy for the activity you are submitting. The sample outline includes sections for you to provide details about the types of hands-on activities you plan to facilitate, the learning outcomes, contingency plans, etc. If your proposal is accepted, you will be asked for to create a comprehensive 5-day course plan with additional information regarding the specifics of what you require to effectively deliver your course(s)— materials, a.v. equipment, etc.
2. Every course is assigned 1 to 3 undergraduate counsellors depending on course need. Please indicate in your proposal how you will engage these counsellors during the proposed activity. The goal of our office is to provide both an enriching experience for the students attending courses and all those working and teaching in the classrooms.
3. In your activity proposal, be sure to indicate how you might integrate or showcase either your own research or a research project (past or present) from another researcher at the University of Toronto into your course.

Appendix: Example Activity Proposal

Jane Doe

Session 1 | 9:30 AM - 12:00 PM
Learning Outcomes for the Session:
This session will introduce students to drinking water filtration, how it is applied, and filter design considerations. By the end of the session, students will be able to design a drinking water filter, understand the mechanisms required for particulate removal and know the limitations of the filtration process.
Agenda for the Session:
1. Introduction and Expectations 2. Introduction to Filtration Lab and Safety Talk 3. Students perform Filtration Lab 4. Consolidation discussion on water filtration
Instructional Strategy:
A demonstration using a lab-scale granular filter media will be conducted. The students will be able to "see" how a filter works at a municipal water treatment facility to remove particulate. Examples of other filters (cartridge, membrane) will be brought in so that students are able to visualize the treatment processes being discussed. A discussion of the treatment objectives and process will also be completed in small groups, and later as a large group. Finally, slides will accompany the discussion to ensure that visuals are available to demonstrate the application of filters at full-scale treatment plants.
Evaluating Effectiveness
If the concept of filtration is too easy, I would ask the student to think about how they would implement each of the different types of filtration into a municipal and small-scale system. They could then look at the contrasts between the two applications to ensure that they can fully understand. Finally, I would ask how filtration is impacted by treatment processes that occur before and after filtration, as significant challenges can be faced if pre-treatment is not optimized with filtration in mind, and following treatments can be ineffective if filtration is not successful.
Contingency Plan/ Adapting based on Student Need
I will use the lab-scale demonstration to help to better illustrate the processes that are occurring in a drinking water filter. I will also have the student describe their observations, so that I can better understand what difficulties they may be having with the material. A counsellor will be asked to join any lab group that does not feel comfortable performing the experiment themselves.

Details: Activity One	
Name of Activity:	Introduction to Filtration Lab and Safety Talk
Preparation required before class time:	N/A
Procedure:	1. Handout (CIV342 “Lab 3: Filtration”) is distributed to students 2. In groups, students read through the lab and identify safety measures that they will need to take 3. Full class discussion to consolidate safety measures, explain any new vocabulary, establish clean up procedures 4. In groups, students prepare their Engineering Notebook to record relevant measurements during lab activity

Details: Activity Two	
Name of Activity:	Filtration Lab
Preparation required before class time:	Prepare an "un-treated" water sample by adding kaolinite clay particles to tap water. This will provide solids for the filters to remove, and allow the students to make visual observations pertaining to the effectiveness of filtration.
Procedure:	1. Ensure pump is operating and providing clean water to the filter. 2. Record initial manometer readings (M1, M2, and overflow level) at time zero. 3. Stir feed water and then measure the raw water turbidity 4. Transfer the intake hose from the clean water tank to the feed water tank and begin timer. 5. Adjust the control valve to maintain a target flow rate of 0.2 L/min. 6. Record manometer readings every 5 minutes. 7. Measure effluent turbidity every 5 minutes. 8. Stir feed water every 5 minutes. 9. Continue recording manometer and effluent turbidity readings for a total of 30 minutes. Backwash Procedure 1. After 60 minutes, stop the pump and then close the effluent valve. 2. Close both monometers. 3. Transfer the intake hose from the feed water tank to the clean water tank 4. Turn both 3-way valves by 180°. 5. Open the effluent valve and start the pump to initiate backwash of the filter. Clean water will now flow from the base to the top of the filter. 6. Begin with a low backwash flowrate and observe changes as flowrate increases. 7. Observe fluidization of media bed. 8. Continue backwash for 3 minutes or until water is clean, then slowly reduce the flowrate to zero and observe settling of filter media in the column. Turbidity Measurement 1. Fill the glass sample vial with sample and screw on the cap. Ensure that there are no bubbles as they will interfere with the measurement. 2. Wipe all smudges and water off the vial. Please use a Kimwipe for this; paper towels will scratch the surface of the vial affect the reading. 3. Place the sample in the turbidimeter. Record the turbidity reading (units are NTU).

Materials							
Activity	**Item**	**Quantity**	**Purpose in Activity**	**Estimated Cost**	**Vendor**	**Safety Concerns and Precautions**	**Notes/ Additional Information**
1	Handouts	1 per student	Instructions for completing the lab	$0.20/handout	N/A	N/A	Link to handout (Double-sided, Black&white)
1	Post its	1 set	Identifying safety measures	$2.00	Staples	N/A	3” x 3” or larger
1	Engineering Notebooks	1 per student	Recording lab results	Provided by DEEP Office	N/A	N/A	N/A
1	Pens and pencils	1 per student	Recording lab results	Provided by DEEP Office	N/A	N/A	N/A
2	Turbid feed water	20 L	Water to be filtered	Prepared by lab manager	N/A	Slipping hazard if spilled. Appropriate use of materials, spill clean-up kit	kaolinite clay particles added to tap water
2	Filtration apparatus	1 set per group of students	Filter water	Borrow from CIV342		N/A	
2	Pump	1 per group of students	Pump water	Borrow from CIV342		N/A	
2	Timer	1 per group of students	Keep time for measurments	Borrow from CIV342		N/A	Students could also use their cell phones
2	Turbidimeter	1 per group of students	Measure sample turbidity	Borrow from CIV342		N/A	
2	Glass turbidimeter vial	1 per group of students	Hold turbidity sample	Borrow from CIV342		N/A	
2	20 L buckets	3	Hold feed, filtered and clean water	Borrow from CIV342		Heavy Correct lifting technique	

Identifying Safety and Hazards		
Check if applicable	**Hazard**	**Why is it required?**
	Electricity	
	Open Flame	
	Projectiles	
	Natural Gas	
	Compressed Air	
x	Glassware	
	Dissection Equipment	
	Biological Material/Specimen	
	Chemicals	
	Tools (ex. soldering iron, hacksaw, drill) Please specify in the materials list	
	Other:	

Check if Required	**Safety Material/Personal Protective Equipment (P.P.E.)**	**Explanation (Specify when this is required i.e. is this during preparation and/or while the activity is taking place and who wears/uses the piece of P.P.E. i.e. Instructor, student etc. please be explicit)**
x	Goggles	Instructors and students at all times they are in the laboratory
x	Lab Coats	Instructors and students at all times they are in the laboratory
x	Nitrile Gloves	Instructors and students at all times they are in the laboratory
	Table Covering	
	Fume Hood	
	Biosafety Cabinets	
	Spill Kits	
x	Disposal Mechanisms (ex. broken glass, biologics, chemicals)	Broken glass containers are present in the lab. Instructor will explain disposal to students.
	Hard Hats	
	N95 Masks	
	Other:	

Acknowledgement to Mike McKie for development of this activity!