

## **Department of Materials Science and Engineering –Emergency Posting**

**Position:** Sessional Lecturer I/II

**Course Title and Code:** MSE 1022H1 F: Assemblage Mechanics.

**Course Description:** Materials are assemblages of component parts and assemblage mechanics defines a multi-scaled framework for rationalizing the interactions of those component parts: first at the level of nuclide (nuclear physics), then at the level of molecule (chemistry), then upwards to the ultra-molecular. Different types of physics unfold at each organizational scale and of the three it is the ultra-molecular that is the most complicated and the least formalized and it is the focus of this course. Our starting points are the crystal physics of Nye [Nye, 1957], which offers a tensor-based framework to describe reversible material thermodynamics, and the kinetic gas theory, which offers the simplest dynamical machinery for rationalizing assemblage behavior. Reversible thermodynamics, however, represents only a very limited range of material behavior and the components of a gas only interact discontinuously, with no structurally encoded memory of previous collisions. The general case involves thermodynamically irreversible assemblage dynamics unfolding over a multiplicity of organizational scales and this is what the course is looking to define. First we start with those material systems occupying the intersectionality between simplest molecular configuration and greatest extent of physical understanding. We then move on to look at the question of relative material complication in several steps: first the hard condensed materials, then the soft condensed materials, and finally the living materials. In particular, we look at how/why one type of material assemblage is more difficult to model than another. Student projects will be defined as case studies examining more detailed aspects of the above questions.

**Estimated Enrolment:** 13

**Estimated TA support:** none

**Class schedule:** Lectures: 2 hours/week; Wednesday 5 p.m.-7 p.m.

**Sessional date of appointment:** Fall Session, September-December 2018

**Salary:** Successful candidate will be teaching 1/3 of the course. Minimum level of pay is 1/3 of \$7,359.07 (Sessional Lecturer I) and 1/3 of \$7,823.85 (Sessional Lecturer II), and may increase depending on applicant's level of experience and suitability for the position.

**Qualifications:** A Ph.D. in Materials Science and Engineering (Sessional Lecturer I) and in the Social Sciences (Sessional Lecturer II), or closely related fields are essential. Experience lecturing and/or coordinating laboratories at the university level are preferred.

Faculty with Assemblage Theory in the context of Materials Science, semantic meaning, and material modelling, material information, communication, epistemology, and interdisciplinary science studies.

**Please note:** Undergraduate or graduate students and postdoctoral fellows of the University of Toronto are covered by the CUPE Unit 1 collective agreement rather than the Unit 3 collective agreement, and should not apply for positions posted under the Unit 3 collective agreement.

**Brief description of duties:**

The Department of Materials Science and Engineering requires a lecturer to teach MSE 1022H1 F- Assemblage Mechanics during the Fall 2018-2019 semester. The successful applicant will be responsible for effectively delivering the course with all of the attendant organizational issues of lecture preparation and delivery, setting, supervision and marking of exams, final course marks, course evaluations, and so forth.

To indicate interest in this position, please send an updated CV and completed application form electronically download from <http://dlrssywz8ozqw.cloudfront.net/wp-content/uploads/sites/27/2016/04/19-Unit-3-Application-Format.doc>.

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**Posting Date: Wednesday September 12, 2018**

**Closing date: Friday September 14, 2018**

“This notice is posted in accordance with the CUPE 3902 Unit 3 Collective Agreement.” “Preference in hiring is given to qualified individuals advanced to rank of Sessional Lecturer II and Sessional Lecturer III in accordance with Article 14:12.” It is understood that some announcements of vacancies are tentative pending final course determination and enrolment.

<http://dlrssywz8ozqw.cloudfront.net/wp-content/uploads/sites/27/2016/04/19-Unit-3-Application-Format.doc>