Course Description:
This introductory course provides the fundamentals of general nanoscience, nano-characterization and nanofabrication. Discussion of (nano)scale dependent structures and properties, as well as basic quantum mechanics, statistical mechanics and molecular dynamics, as required for the understanding of nanomaterials; common microscopy techniques, including scanning tunneling, atomic force and electron microscopy; and common nanofabrication techniques, including lithography, thin film technologies, molecular beam epitaxy, focused ion beam milling and solution synthesis.

Course Objectives (Module #3):
Introduce common nanofabrication techniques, including lithography, thin film technologies, molecular beam epitaxy, focused ion beam milling and solution synthesis.

Instructor:
Ting Tsui tttsui@uwaterloo.ca
QNC 4604, x38404
Office hour: by appointment

Module #3 Week 1 (Nov 10): Introduction of Nanofabrication
Module #3 Week 2 (Nov 17): Thin film deposition, Patterning
Module #3 Week 3 (Nov 24): Etching and Chemical Mechanical Polish
Module #3 Week 4 (Dec 1): Exam

Class notes will be posted on LEARN.

The final exam of this module will be held on December 1 (lecture time) and contributes to 1/3 of the course grade. Modules 1 and 2 contribute the other 2/3 of the course grade.

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the Office of Academic Integrity for more information.]

Grievance: A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70.
Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department’s administrative assistant who will provide further assistance.

** Discipline:** A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check the Office of Academic Integrity for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties, check Guidelines for the Assessment of Penalties.

**Appeals:** A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to Policy 72, Student Appeals.

**Note for students with disabilities:** AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

**Turnitin.com:** Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.

**COVID Plan**
If the instructor is sick, we will conduct the class online. A link will be sent beforehand. The plan is to use WebEx as the meeting tool.