

The University of Western Ontario  
Chemistry 9653, Winter 2022

Polymers: Synthesis to Function

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\*Note – This course outline is subject to change with the evolving COVID-19 pandemic.

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**Description**

This 0.25 course will explore modern approaches to polymer synthesis (*e.g.*, ionic, radical, and ring-opening polymerization) and characterization methods (*e.g.*, NMR spectroscopy, Gel Permeation Chromatography, Thermal Analysis). Through the discussion of recent examples from the literature, the ability of these techniques to provide custom functional materials for various applications will be explored.

**Course-Based Learning Outcomes**

*Upon completion of Chem 9653, students will be able to....*

- describe the scientific principles governing polymer synthesis and characterization and apply these principles to problems.
- use their knowledge of polymer chemistry to predict and rationalize properties, mechanisms, and patterns of reactivity.
- apply methodologies in order to conduct polymer synthesis, analyses, or other chemical investigations.

**Outline (tentative)**

1. Introduction to polymers - basic terms and concepts
2. Free radical polymerization - conventional and controlled/living
3. Ionic polymerization
4. Ring-opening polymerization
5. Metal-catalyzed polymerization
6. Common polymer characterization techniques

**Lectures** Tentatively: M-W-F, 9:30-10:30, MSA 3204 (Feb. 14 – March 25)

**Evaluation (tentative)**

Assignments (2 × 30%, due dates tba)	60%
Final Examination (date tba)	40%

## **Course Materials**

There is no required textbook. Course notes and electronic supplements will be provided during the course.

## **Course attendance and missed tests/exams**

Course attendance is mandatory for Chem 9653. Information missed due to course absences will not be considered for the basis of a grade appeal.

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. The weight of missed course material will be transferred to the final examination in cases where medical accommodation has been granted.

## **Late Policy**

Work will be penalized 20% per day (one day of a weekend will count) that an assignment is late. Due dates/times will always be at the BEGINNING of a lecture period. The penalty will be applied until either 80% credit has been lost at which point no credit will be given, or no credit will be given after the material has been returned to the rest of the class (whichever comes first).

## **Notes on Academic Honesty**

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_grad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf)

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system.

## **Health and Wellness**

As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. For example, please check out the Faculty of Music

web page <http://www.music.uwo.ca/>, and our own McIntosh Gallery <http://www.mcintoshgallery.ca/>. Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>. Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at [http://www.health.uwo.ca/mental\\_health/resources.html](http://www.health.uwo.ca/mental_health/resources.html).