# Chemical Engineering 3Q03 Introduction to Polymer Science Term II 2017

Instructor:	Dr. Emily Cranston JHE A412 Extension 24369 <u>ecranst@mcmaster.ca</u>		
Teaching Assistants:	Michael Reid JHE A407 Extension 27247 <u>reidms@mcmaster.ca</u>	Stephanie Kedzior JHE A407 Extension 27247 <u>kedziosa@mcmaster.ca</u>	
Mandatory Textbook:	Introduction to Polymer Science and Chemistry: A Problem-Solving Approach, 2 <sup>nd</sup> edition, by Manas Chanda, CRC Press (available in Titles)		
Class Day & Time:	Monday, 12:30-13:20 (Lecture) Tuesday, 13:30-14:20 (Demos, workshops, activities, tutorials) Thursday, 12:30-13:20 (Lecture)		
Class Location:	T13 127		
Office Hours:	Tuesday, 10:30-11:30 in JHE A412 and by email appointment		
TA Office Hours:	Mike: Monday, 10:00-11:00 in JHE A407 Stephanie: Friday, 13:00-14:00 in JHE A407 (or email either Stephanie or Mike for an appointment)		

## **Course Objectives:**

- Introduce polymer science for advanced polymer courses (Polymer Processing, Polymer Reaction Engineering...)
- Develop a toolbox of polymer knowledge for the workplace.
- Reinforce industrially important organic and physical chemistry within the context of polymer science.
- Acquire an intuition for how polymer structure relates to material properties.

**Website:** This course has an Avenue to Learn site which will be used as the primary location for posting lecture notes (notes only – solutions to in-class example problems will *not* be posted), practice problems (questions only), assignments, and solutions to both assignments and midterm tests. Marks will also be disseminated through Avenue to Learn. A discussion board is available to post questions about the course and will be monitored regularly by the TAs and the instructor. Questions regarding course material should be posted on the discussion board, *not* e-mailed individually to the professor, so the entire class can benefit from the answers given.

Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor. **You are responsible for checking Avenue to Learn and your McMaster email** as the instructors may communicate with you through these means and often the content is time sensitive.

## **Course Schedule (tentative)**

Assignments are always <u>due in class on Mondays</u>. When reports are to be submitted electronically the deadline is 11:59 pm, the day of the class. A penalty of 20% per day (including weekends) applies, i.e., an assignment due Monday, handed in Wednesday would receive 40% off. In exceptional circumstances, please discuss with the instructor directly for alternate accommodation in advance of deadlines.

Week	Торіс	Chapter	Assignment due (Monday)	
1 (Jan. 5)	Introduction	1		
2 (Jan. 9, 10, 12)	Polymer Basics	1		
3 (Jan. 16, 17, 19)	Polymer Classification	1	Avenue Quiz 1: Midterm Date	
4 (Jan. 23, 24, 26)	Polymer Molecular Weight	4	Assignment 1	
5 (Jan. 30, 31, 2)	Polymer Thermodynamics: Polymer Size and Solubility	2, 3	• Avenue Quiz 2: Chemistry Review	
6 (Feb. 6, 7, 9)	Step Growth Polymerization	5	<ul> <li>Project Groups &amp; Polymer Chosen</li> </ul>	
7 (Feb. 13, 14, 16)	Step Growth Kinetics Nano-pompom Activity	5	<ul> <li>Assignment 2</li> <li>Avenue Quiz 3: Nano-pompoms reading</li> </ul>	
NO CLASSES READING WEEK (Feb. 20-24)				
8 (Feb. 27, 28, 2)	Chain Growth Polymerization	6		
9 (Mar. 6, 7, 9)	Copolymerization	7	Assignment 3	
10 (Mar. 13, 14, 16)	Ionic, Coordination, Living, and Ring-opening Polymerization	8, 9, 10, 11	Avenue Quiz 4: Pre-reading on     Advanced Polymerization	
11 (Mar. 20, 21, 23)	Polymerization Methods	6		
12 (March 27, 28, 30)	Polymer Morphology Viscoelasticity Thermal Properties	2	<ul> <li>Group Project Report &amp; Video (Thursday)</li> <li>Avenue Quiz 5: Pre-reading on Thermal Properties</li> </ul>	
13 (April 3, 4, 6)	Group Project Presentations		<ul> <li>Assignment 4</li> </ul>	

Assessment: The final mark in the course will be calculated as follows:

- Avenue Quizzes 5%
- Participation 3%
- Assignments 12%
- Group Project 15%
- Midterm 25%
- Final Exam 40%
- Alternate (if results in higher grade): midterm 15% + final 50%
- Assignments that are late will be reduced in mark by 20% for every day late, including weekends.
- Assignments or midterms written in pencil will not be considered for re-grading.
- Absence without a valid excuse will result in a grade of zero for a test, exam or class presentation. If you have a
  legitimate medical/personal reason you *must* complete the McMaster Student Absence Form and forward it to
  the instructor to receive consideration for waived tests. Please follow up with the instructor after submitting an
  MSAF to be sure you understand any extended deadlines and changes to your grading.
- Statistical adjustment of final grades will not normally be used; however, the instructor reserves the right to adjust the grades using statistical methods if appropriate. The final numeric grades will be converted to letter grades as per the Registrar's recommended procedure.

## Midterm and Final Exam:

- Midterms will be 2 hours in the evening (based on students' schedule/availability) please complete Avenue Quiz #1 by January 16 regarding your preferred date and availability.
- Each student may bring a one-page "cheat sheet" into the midterm, and two pages to the final exam. One page is defined as maximum letter-sized (8.5 x 11 inches) with content on front and back and may be typed or handwritten. There is no restriction on the content which may include equations, text, chemical structures, plots, derivations, etc.
- No textbooks are permitted during the midterm and final exam.
- No handwritten notes, no presentation slides, no assignments or old tests will be permitted during the midterm and final exam.
- Any calculator may be used.
- NO make-up midterm exams will be arranged and the midterm marks will be shifted to the final exam.
- Final exam papers will not be returned.

**Electronic Communication:** Each class member is expected to have a McMaster e-mail address. Occasionally, important information to the class will be transmitted by e-mail or by announcement postings on Avenue to Learn under NEWS. Hotmail, yahoo, and other e-mail services are often blocked by university servers due to spam/virus filters – you are responsible for regularly checking your e-mail and Avenue for important announcements issued to the class. <u>Please set up Avenue notifications to let you know when news, grades, etc. have been posted.</u>

## No recording devices are allowed in the lecture hall and use of phones (including texting) during class is prohibited.

### **Policy Reminders:**

- 1. The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem that cannot be resolved by discussion among the persons concerned, individuals are reminded that they should contact the Departmental Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.
- 2. Students are reminded that they should read and comply with the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available in the Senate Office.

#### Academic Integrity:

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <a href="http://www.mcmaster.ca/academicintegrity">http://www.mcmaster.ca/academicintegrity</a>.

The following illustrates only three forms of academic dishonesty:

- 1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- 2. Improper collaboration in group work.
- 3. Copying or using unauthorized aids in tests and examinations.

In this course we also will be using the web-based service Turnitin.com to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must hire a professional and have it certified that it has been checked for plagiarism, before the due date. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line searches, etc.). **[Class ID: 14326965, Password: cellulose]**