

Course Outline

MATS6109

Polymer Materials Science

Materials Science

studies to professional and disciplinary contexts

The course content is designed to incorporate both theoretical and practical concepts, where the latter is intended to be applicable to real-world situations and contexts.

3.2 Expectations of students

Students must attend at least 80% of all classes with the expectation that students only miss classes due to illness or unforeseen circumstances.

Students must read through lecture notes and lab sheets prior to class.

During class, students are expected to engage actively in class discussions.

Students should work through lecture, tutorial and textbook questions.

Students should read through the relevant chapters of the prescribed textbook.

Students should complete all assessment tasks and submit them on time.

Students are expected to participate in online discussions through the Moodle page

4. Course schedule and structure

This course consists of 36 hours of class contact hours. You are expected to take an additional 114 hours of non-class contact hours to complete assessments, readings, and exam preparation.

Week	Topics	Activity
1	Introduction to Polymers Morphology/Types of Polymers Radical Polymerisation	
2	Condensation / Ionic Polymerisation Polymer Thermodynamics I	Formative quiz
3	Polymer Thermodynamics II Characterisation of Polymers: Polymers in Solutions	
4	Characterisation of Polymers: MW, Light Scattering Elastomers	Assignment Part 1
5	Guest Lecture: Intro to spectroscopy Revision	Mid-term exam
6		
7	Mechanical properties	
8	Case study-polymer design/mechanical and thermal failure	Assignment Part 2
9	Case study-polymer design/photodegradation and chemical failure Case study-polymer design/biodegradation and electrical failure	Research Paper
10		

5. Assessment

5.1 Assessment tasks

Assessment task	Description	Weight	Due date
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7. Readings and resources

Recommended Textbook*

1st component of the course:

R.J. Young & P.A. Lovell. Introduction to Polymers, 3rd Ed. CRC Press, 2011.

2nd component of the course:

D. Wright. Failure of Plastics and Rubber Products. Causes, Effects, and Case Studies Involving Degradation. Rapra Technology Ltd., 2006

P.R. Lewis &