

Course Syllabus
SCME321 Principle of Polymer Science and Processing

Class Schedule: Tuesday: 9.30 a.m. – 12.30 p.m. **Room:** SC1-161

Instructors: Assoc. Prof. Dr. Supa Wirasate / Prof. Dr. Kalyanee Sirisinha

Teaching and learning: Onsite

Course Outline:

Week	Topic	Hours	Teaching Methods/multimedia	Instructor
1 (6 Aug. 24)	Introduction -Molecular weights and Sizes -Polymer synthesis	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Supa Wirasate
2 (13 Aug. 24)	Introduction -Molecular weights and Sizes -Polymer synthesis (cont.)	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Supa Wirasate
3 (20 Aug. 24)	Chain structure and Configuration of polymers	3	Activities: Lecture Media: PowerPoint Presentation, structure model	Dr. Supa Wirasate
4 (27 Aug. 24)	Structure of polymers -Polymer crystal -Semi-crystalline polymers -Amorphous polymers -Elastomers	3	Activities: Lecture Media: PowerPoint Presentation, Crystal structure model	Dr. Supa Wirasate
5 (3 Sep. 24)	Transition temperature of polymers -Crystallization and melting -Glass transition	3	Activities: Lecture Media: PowerPoint Presentation, VDO	Dr. Supa Wirasate
6 (10 Sep. 24)	Polymer Viscoelasticity properties -Creep -Stress relaxation	3	Activities: Lecture Media: PowerPoint Presentation, test pieces	Dr. Supa Wirasate
7 (17 Sep. 24)	Time-Temperature superposition	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Supa Wirasate
8 (24 Sep. 24)	Mechanical behaviour of polymers	3	Activities: Lecture Media: PowerPoint Presentation, Polymer samples	Dr. Supa Wirasate
9 (30 Sep-4 Oct. 24)	<i>Midterm Exam week</i>	3		
10 (8 Oct. 24)	<i>No Class due to the University's graduation ceremony</i>			

11 (15 Oct. 24)	Polymer Rheology	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
12 (22 Oct. 24)	Polymer mixing and compounding	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
13 (29 Oct. 24)	Mixing mechanism/ Characterization of mixing/ Mixing and compounding machinery Processing lab tour	3	Activities: Lab tour Media: Processing machines/VDO	Dr. Kalyanee Sirisinha
14 (5 Nov. 24)	Shaping process Extrusion process/ blown film process/extrusion coating	3	Activities: Lecture Media: PowerPoint Presentation, VDO	Dr. Kalyanee Sirisinha
15 (12 Nov. 24)	Shaping process Thermoforming/compression moulding/	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
16 (19 Nov. 24)	Shaping process blow moulding/ injection moulding	3	Activities: Lecture Media: PowerPoint Presentation/VDO	Dr. Kalyanee Sirisinha
17 (26 Nov. 24)	Polymers and the circular economy model	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
18 (2-13 Dec. 24)	<i>Final Exam weeks</i>	3		

Evaluation: Attendance, homework, quiz 30 %

Exam (Midterm 35%, Final 35%) 70%

Total 100 %

This course is evaluated according to Mahidol University regulations and the Faculty of Science announcement related to bachelor's degree education. The following grade symbols, A, B+, B, C+, C, D+, D, and F, with criteria are given in the below Table:

Score (%)	Grade
75-100	A
70-74	B+
64-69	B
58-63	C+
52-57	C
46-51	D+
40-45	D
0-39	F

To pass this course, students must earn a grade of at least D.

References:

1. W. Michaeli, *Plastics Processing*, Hanser, 1992.
2. S. Franssila, *Introduction to Microfabrication*, John Wiley & Sons, 2010.
3. L. H. Sperling, *Introduction to Physical Polymer Science*, 1993.
4. R. J. Young and P. A. Lovell, *Introduction to Polymers*, Chapman & Hall, 1991.