

Course Syllabus
SCME321 Principle of Polymer Science and Processing

Class Schedule: **Tuesday:** 9.30 a.m. – 12.20 p.m. **Room:** SC1-153

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

Teaching and learning: Onsite

Course Outline:

Week	Topic	Hours	Teaching Methods/multimedia	Instructor
1 (8 Aug. 23)	Introduction -Molecular weights and Sizes -Polymer synthesis	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Supa Wirasate
2 (15 Aug. 23)	Introduction -Molecular weights and Sizes -Polymer synthesis (cont.)	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Supa Wirasate
3 (22 Aug. 23)	Chain structure and Configuration of polymers	3	Activities: Lecture Media: PowerPoint Presentation, structure model	Dr. Supa Wirasate
4 (29 Aug. 23)	Structure of polymers -Polymer crystal -Semi-crystalline polymers -Amorphous polymers -Elastomers	3	Activities: Lecture Media: PowerPoint Presentation, Crystal structure model	Dr. Supa Wirasate
5 (5 Sep. 23)	Transition temperature of polymers -Crystallization and melting -Glass transition	3	Activities: Lecture Media: PowerPoint Presentation, VDO	Dr. Supa Wirasate
6 (12 Sep. 23)	Polymer Viscoelasticity properties -Creep -Stress relaxation	3	Activities: Lecture Media: PowerPoint Presentation, test pieces	Dr. Supa Wirasate
7 (19 Sep. 23)	Time-Temperature superposition	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Supa Wirasate
8 (26 Sep. 23)	Mechanical behaviour of polymers	3	Activities: Lecture Media: PowerPoint Presentation, Polymer samples	Dr. Supa Wirasate
9 (2-6 Oct. 23)	<i>Midterm Exam week</i>	3		
10 (10 Oct. 23)	<i>No Class due to University's graduation ceremony</i>			
11 (17 Oct. 23)	Polymer Rheology	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha

12 (24 Oct. 23)	Polymer mixing and compounding	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
13 (31 Oct. 23)	Mixing mechanism/ Characterization of mixing/ Mixing and compounding machinery Processing lab tour	3	Activities: Lab tour Media: Processing machines/VDO	Dr. Kalyanee Sirisinha
14 (7 Nov. 23)	Shaping process Extrusion process/ blown film process/extrusion coating	3	Activities: Lecture Media: PowerPoint Presentation, VDO	Dr. Kalyanee Sirisinha
15 (14 Nov. 23)	Shaping process Thermoforming/compression moulding/	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
16 (21 Nov. 23)	Shaping process blow moulding/ injection moulding	3	Activities: Lecture Media: PowerPoint Presentation/VDO	Dr. Kalyanee Sirisinha
17 (28 Nov. 23)	Polymers and the circular economy model	3	Activities: Lecture Media: PowerPoint Presentation	Dr. Kalyanee Sirisinha
18 (4-15 Dec. 23)	<i>Final Exam weeks</i>	3		

Evaluation:	Attendance, homework, quiz	30 %
	Exam (Midterm 35%, Final 35%)	70%
	<u>Total</u>	<u>100 %</u>

Evaluation of this course is performed according to Mahidol University regulations and 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, student 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.