

# 202-575 Polymer Characterization

## Course Syllabus

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1. **Faculty** Engineering

**Department** Chemical Engineering

2. **Course ID** 202-575  
3 Credits

**Course name** Polymer Characterization

Section 1 M, Tu 16.00-17.30 Room 1507

### 3. Course description

Polymer microstructure, models of polymer molecules, theory of polymer solutions, techniques for determination of polymer molecular weight, techniques for determination of comonomer composition, thermal and mechanical analysis techniques

### 4. Course objectives

After this course, students should be able to clearly describe polymer chain microstructure and meso-structure. Students should understand the principles of characterization techniques for measuring molecular weight, comonomer content, and thermal and mechanical behaviors. They should also be able to select appropriate techniques to provide specific information on chain microstructures and properties.

### 5. Course outline

- Review of key concept in polymer science and engineering
- Microstructure and meso-structure of polymer
- Techniques for determination of polymer molecular weight
- Techniques for determination of comonomer composition
- Thermal and mechanical analysis techniques
- Selected polymer characterization techniques (microscopy, spectroscopy, etc.)

### 6. Method

Lectures, Self-study, Reading group and group discussion, Term paper, Oral presentation

### 7. Lecture tools

PowerPoint slide, Overhead projector, Whiteboard, Lecture note, Handouts

### 8. Course marking scheme

Midterm	30%
Final	30%
Assigned term paper	20%
Oral presentation	20%

## 9. Course evaluation (Tentative)

Summation of adjusted marks will be used to evaluate students' performance.

A	= 80+	B+	= 72.5+
B	= 65+	C+	= 57.5+
C	= 50+	D+	= 42.5+
D	= 35+	F	= 35-

## 10. Office hour

Office: 1409-B

Office hours: M, Tu 14.30-16.00

E-mail: [fengsia@ku.ac.th](mailto:fengsia@ku.ac.th)

## 11. References

- Dealy, J.M., Larson, R.G., Structure and Rheology of Molten Polymers, Hanser, 2005.
- Campbell, C., Polymer Characterization: Physical Technique, Chapman and Hall, 1989.
- Rubinstein, M., Colby, R.H., Polymer Physics, Oxford University Press, 2003.
- Gedde, U.W., Polymer Physics, Kluwer Academic Publishers, 1995.

## 12. Tentative schedule

No	Lecture topics	Activities + deadlines
1	- Course introduction	
2	- Review of key concept in polymer science and engineering	Lecture
3-4	- Microstructure of polymer	Lecture
5-6	- Techniques for determination of polymer molecular weight	Lecture + Reading Group
7-8	- Techniques for determination of comonomer composition	Lecture + Reading Group
9	Midterm Exam	
10-11	- Meso-structure of polymer	Lecture
12-13	- Thermal and mechanical analysis techniques	Lecture + Reading Group
14-15	- Microscopy and spectroscopy for polymer	Lecture + Reading Group
16	- Selected polymer characterization techniques	Presentation
17	- Selected polymer characterization techniques	Presentation + report submission
18	Final exam	

## 13. Instructor

Asst.Prof.Dr. Siripon Anantawaraskul

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