Tamkang University Academic Year 106, 1st Semester Course Syllabus

Course Title	INTRODUCTION TO POLYMERIC MATERIALS	Instructor	CHEN, TENG-HAO
Course Class	TSAXB3A BACHELOR'S PROGRAM IN ADVANCED MATERIAL SCIENCES, 3A	Details	◆ Selective ◆ One Semester ◆ 3 Credits

Departmental Aim of Education

Ⅰ. Enrich the fundamental knowledge of advanced material sciences.

Ⅱ. Emphasize the ability of self-expression.

Ⅲ. Strengthen the ability to experiment and team spirit.

Ⅳ. Develop an international perspective and international exchanges.

Departmental core competences

A. Possess a fundamental knowledge of mathematics, physics, chemistry and biology.

B. Cultivate professional knowledge, experimental skills and the applications of nano, optoelectronic, biomedical and macromolecular materials.

Course Introduction	In this course, the basic knowledge of polymer chemistry will be introduced, and that includes applications, material analysis, and various advanced organic, inorganic, and organic/inorganic polymer materials.

The Relevance among Teaching Objectives, Objective Levels and Departmental core competences

I.Objective Levels (select applicable ones) :

(i) Cognitive Domain : C1-Remembering, C2-Understanding, C3-Applying, C4-Analyzing, C5-Evaluating, C6-Creating

(ii) Psychomotor Domain : P1-Imitation, P2-Mechanism, P3-Independent Operation, P4-Linked Operation, P5-Automation, P6-Origination

(iii) Affective Domain : A1-Receiving, A2-Responding, A3-Valuing, A4-Organizing, A5-Charaterizing, A6-Implementing

II.The Relevance among Teaching Objectives, Objective Levels and Departmental core competences :

(i) Determine the objective level(s) in any one of the three learning domains (cognitive, psychomotor, and affective) corresponding to the teaching objective. Each objective should correspond to the objective level(s) of ONLY ONE of the three domains.

(ii) If more than one objective levels are applicable for each learning domain, select the highest one only. (For example, if the objective levels for Cognitive Domain include C3,C5,and C6, select C6 only and fill it in the boxes below. The same rule applies to Psychomotor Domain and Affective Domain.)

(iii) Determine the Departmental core competences that correspond to each teaching objective. Each objective may correspond to one or more Departmental core competences at a time. (For example, if one objective corresponds to three Departmental core competences: A,AD, and BEF, list all of the three in the box.)

No.	Teaching Objectives	Relevance	
		Objective Levels	Departmental core competences
1	1. In this course, the applications of polymer in advanced materials, and their synthesis and analysis will be introduced. The latest developments of polymer materials will also be realized through the discussion and presentation.	C2	AB

Teaching Objectives, Teaching Methods and Assessment

No.	Teaching Objectives	Teaching Methods	Assessment
1	1. In this course, the applications of polymer in advanced materials, and their synthesis and analysis will be introduced. The latest developments of polymer materials will also be realized through the discussion and presentation.	Lecture, Discussion, Problem solving	Written test, Participation

This course has been designed to cultivate the following essential qualities in TKU students

Essential Qualities of TKU Students	Description
◆ A global perspective	Helping students develop a broader perspective from which to understand international affairs and global development.
◆ Information literacy	Becoming adept at using information technology and learning the proper way to process information.
◆ A vision for the future	Understanding self-growth, social change, and technological development so as to gain the skills necessary to bring about one's future vision.
◇ Moral integrity	Learning how to interact with others, practicing empathy and caring for others, and constructing moral principles with which to solve ethical problems.
◆ Independent thinking	Encouraging students to keenly observe and seek out the source of their problems, and to think logically and critically.
◇ A cheerful attitude and healthy lifestyle	Raising an awareness of the fine balance between one's body and soul and the environment; helping students live a meaningful life.
◇ A spirit of teamwork and dedication	Improving one's ability to communicate and cooperate so as to integrate resources, collaborate with others, and solve problems.
◇ A sense of aesthetic appreciation	Equipping students with the ability to sense and appreciate aesthetic beauty, to express themselves clearly, and to enjoy the creative process.

Course Schedule

Week	Date	Subject/Topics	Note
1	106/09/18 ~ 106/09/24	Introduction to polymers	
2	106/09/25 ~ 106/10/01	Polymer structure	
3	106/10/02 ~ 106/10/08	Molecular weight of polymers	中秋節10/04
4	106/10/09 ~ 106/10/15	Natural occurring polymers	國慶日10/10
5	106/10/16 ~ 106/10/22	Step-reaction polymerization	
6	106/10/23 ~ 106/10/29	Addition polymerization	
7	106/10/30 ~ 106/11/05	Free radical chain polymerization	
8	106/11/06 ~ 106/11/12	Copolymerization	
9	106/11/13 ~ 106/11/19	Organometallic polymers	
10	106/11/20 ~ 106/11/26	Midterm Exam Week	
11	106/11/27 ~ 106/12/03	Inorganic polymers	
12	106/12/04 ~ 106/12/10	Reactions of polymers	

13	106/12/11 ~ 106/12/17	Characterization of polymers	
14	106/12/18 ~ 106/12/24	Rheology and physical tests	
15	106/12/25 ~ 106/12/31	Additives	
16	107/01/01 ~ 107/01/07	Synthesis of reactants and intermediates for polymers	元旦01/01
17	107/01/08 ~ 107/01/14	Polymer technology	
18	107/01/15 ~ 107/01/21	Final Exam Week	

Requirement	English listening and reading skill is required.
Teaching Facility	Computer, Projector
Textbook(s)	Introduction to Polymer Chemistry, CRC Press, 4th Edition by Charles E. Carraher Jr.
Reference(s)	
Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual：20.0 % ◆ Midterm Exam： 35.0 % ◆ Final Exam： 35.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**