Course Specification
(Bachelor)

Course Title: :	**Polymers & Petrochemicals Chemistry**
Course Code:	**CEM210**
Program: :	**Chemistry**
Department:	**Department of Chemistry**
College:	**College of Science**
Institution:	**Majmaah University**
Version:	*Course Specification Version Number*
Last Revision Date:	*Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (…2……)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☐Required		☐Elective		
3. Level/year at which this course is offered: (……3….)					
4. Course General Description:					
The course provides an introduction to polymer chemistry based on synthesis mechanisms associated with chain-growth and step-growth polymerization, including advanced mechanisms such as NMP, ATRP and RAFT.					
5. Pre-requirements for this course (if any)**:**					
CEM130					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
Recognize the outline definition of polymer chemistry and polymer technology. Demonstrate the basic principles of the polymerization process and the technical conditions used in the polymerization processes. Identify the physical, chemical, and thermal properties of polymers.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Know the concepts and principles of polymer chemistry and related sciences, along with the ability to evaluate and interpret polymer chemistry principals**	**K1**	• **Lectures.** • **Conduct scientific research.** • **Seminars. Discussions Brainstorming**	• **Final exam** • **Midterm exam - Short tests -Quizzes.** • **Homework** • **Class exercises** • **Evaluation of research**
...				
2.0	**Skills**			
2.2	**Communicate effectively orally and written using appropriate presentation formats for different issues with recipients of different types.**	**S2**	• **Lectures** • **Laboratories** • **Active learning** • **- E-learning** • **-Self-learning** • **-Cooperative Education** • **-Examinations**	• **Final exam** • **Midterm exam** • **Short tests** • **Quizzes.** • **Homework** • **Class exercises** • **Evaluation of research**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
				• Practical tests
2.3	Demonstrate the ability to use modern technology and statistical applications that are used in the various fields of chemistry	S3	• Lectures • Laboratories • Active learning • - E-learning • -Self-learning • -Cooperative Education • -Examinations	• Final exam • Midterm exam • Short tests • Quizzes. • Homework • Class exercises • Evaluation of research • Practical tests
...				
3.0	Values, autonomy, and responsibility			
3.2	Solving some of the exercises in groups	V2	-Simulation programs - Cooperative work - Working in groups	• -Practical tests • - Practical reports • - Note card • - Research papers
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction of polymers, Molecular Weight of polymers	6
2.	Physical and Mechanical properties of polymers	4
3.	Step-growth polymerization	4
4.	Chain-growth polymerization	8
5.	Physical forms of polymerisations	2
6.	Controlled/living free radical polymerization	4
7.	Advanced polymer architectures	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	6-7	30%
2.	Quizes	Continues	5%
3.	Final Exam	16-17	40%
4.	Electronic Exam	9-10	10%
5.	Participation	Continuous	10%
6.	Homework	Continuous	5%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. G. Odian, Principle of Polymerization, A JOHN WILEY & SONS, INC., Fourth Edi., 2004. 2. R. Young and P. Lovell, Introduction to Polymers, Taylor & Francis Group, Third Edit., 2011. 3. G. Moad and D. Solomon, The Chemistry of Radical Polymerization, Elesevier, Second Edi., 2005.
Supportive References	N. Hadjichristidis, H. Iatrou, S. Pispas and M. Pitsikalis, J. Polym. Sci. Part A Polym. Chem., 2000, 38, 3211–3234.
Electronic Materials	A variety of reviews and articles are available on ACS & RSC journals. Access can be obtained via Saudi Digital Library
Other Learning Materials	Darren Lipomi YouTube Channel

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, smart board
Technology equipment (projector, smart board, software)	Blackboard
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Holding a general meeting between the faculty members and all students to discuss all kind of problems facing them regarding the teaching process
Effectiveness of Students assessment	Students	The feedback from the personal interview of the student with his academic advisor
Quality of learning resources		
The extent to which CLOs have been achieved	Quality Gate	The statistics obtained from the students final results
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	