



Course Specifications

Course Title:	Industrial Products
Course Code:	315CHEM-2
Program:	Bachelor of science in chemistry
Department:	Chemistry
College:	Science
Institution:	King Khalid University

Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	3
1. Course Description	3
2. Course Main Objective.....	3
3. Course Learning Outcomes	4
C. Course Content	4
D. Teaching and Assessment	4
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods	4
2. Assessment Tasks for Students	5
E. Student Academic Counseling and Support	5
F. Learning Resources and Facilities	5
1. Learning Resources	5
2. Facilities Required.....	6
G. Course Quality Evaluation	6
H. Specification Approval Data	6

A. Course Identification

1. Credit hours: 2
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: Fourth level- second year
4. Pre-requisites for this course (if any): 313 Chem
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	100%
2	Blended	---	---
3	E-learning	---	---
4	Correspondence	---	---
5	Other	---	---

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	---
3	Tutorial	---
4	Others:	--
	Total	30
Other Learning Hours*		
1	Study	10
2	Assignments	10
3	Library	5
4	Projects/Research Essays/Theses	5
5	Others(specify)	0
	Total	30

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Industrial Chemistry: Study the crude oil refining steps and purification methods with the discussion of different applications of obtained organic compounds. This course discusses also different class of polymers and dyes as well as their preparations and utilizations.

2. Course Main Objective

- Study the crude oil refining process with the properties and utilizations of different type of petrochemicals.
- Study the differences between different kind of polymers, preparation methods and

applications.

- Study different types of dyes, preparation techniques and applications.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Describe, identify, and compare various groups of petroleum products	K.1, K.2
1.2	Describe the principle, information outcome, and limitations to modify polymeric materials	K.1, K.2, K.3
1.3	Explain disadvantage of polymeric materials using knowledge of the surrounding environment and the physical properties of the polymeric materials.	K.2-K.3
2	Skills :	
2.1	To analyze, interpret and explain physical characterization of both polymers and dyes	S1, S.2
2.2	Apply knowledge on material and environmental characteristics for given cases and suggest suitable polymer and dyes	S.3, S.4
3	Competence:	
3.1	To present an oral explanation for a subject in the area.	C.1, C.2
3.2	To interact positively with colleagues in a group work.	C.2, C.3
3.3	To contribute with colleagues to prepare and deliver a presentation and report of group work	C.1, C.4
3.4	To summarize the literature and sources for an area in the course.	C.5

C. Course Content

No	List of Topics	Contact Hours
1	Petroleum Refining Processes: Introduction, Distillation	4
2	Octane Number, Additives, Hydro treating	2
3	Cracking, Reforming, Separation of Natural Gas: Methane Production.	4
4	Basic Polymer Chemistry	4
5	Definitions and Classes, Chain Growth Polymerization	4
6	Step Growth Polymerization, Copolymerization	4
7	Polymerization Procedures, Thermoset polymers	4
8	Dyes: Nomenclatures and classifications, Preparations methods and Their Application	4
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Describe, identify, and compare various groups of petroleum products	Lecture Project presentation	Written exams, electronic quizzes

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	Describe the principle, information outcome, and limitations to modify polymeric materials	Lecture Project presentation	Presentation and discussion Written exams
1.3	Explain disadvantage of polymeric materials using knowledge of the surrounding environment and the physical properties of the polymeric materials.	Lecture Project presentation	Presentation and discussion Written exams
2.0	Skills		
2.1	To analyze, interpret and explain physical characterization of both polymers and dyes	Lecture	Written exams
2.2	Apply knowledge on material and environmental characteristics for given cases and suggest suitable polymer and dyes	Lecture	Written exams
3.0	Competence		
3.1	To present an oral explanation for a subject in the area.	Project presentation	Presentation and discussion
3.2	To interact positively with colleagues in a group work.	Project presentation	Presentation and discussion
3.3	To contribute with colleagues to prepare and deliver a presentation and report of group work	Lecture Project presentation	Presentation and discussion Written exams
3.4	To summarize the literature in a special topic related to the course.	Project presentation	Presentation and discussion

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework	3, 6, 9, 12	5%
2	Midterm exam-1	7	20%
3	Midterm exam-2	12	20%
4	Presentations and Activities	4-14	5%
5	Final exam	15	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Office hours (10 hours per week).

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1) Organic Chemistry, for John McMurry , eighth edition, 2010 2) Industrial organic Chemistry, 4 th Completely revedWeissemel, Klaus, 2005
Essential References Materials	Advanced Organic Chemistry; Michael B. Smith and Jerry March, WILEY-INTERSCIENCE, 2007
Electronic Materials	https://www.youtube.com/watch?v=4P8eMpSZ3mU&list=PL08ef9eJxtJYYHrGGCbHADsoJe3LaD0aH
Other Learning Materials	http://www.chemguide.co.uk/mechanisms/freerad/whatis.html#top

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom and computer lab
Technology Resources (AV, data show, Smart Board, software, etc.)	Accessible databases Endnote software package Authenticate software package
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-----

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course delivery (teaching methods and assessment methods)	Students	Questionnaire
	Departmental plan and curriculum committee; external reviewers	Reports and workshops
	Program leader	Meetings
Course contents (update)	Departmental plan and curriculum committee; external reviewers	Reports and workshops
Quality of learning resources	External reviewers	Reports

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department counsel
---------------------	--------------------

Reference No.	1/22/142
Date	15-9-1442