



## Course Specifications

<b>Course Title:</b>	<b>Chemistry of Petroleum and Petrochemicals</b>
<b>Course Code:</b>	<b>2044203-2</b>
<b>Program:</b>	<b>Bachelor in Chemistry</b>
<b>Department:</b>	<b>Department of Chemistry</b>
<b>College:</b>	<b>College of Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b>	<b>2 (Theoretical)</b>
<b>2. Course type</b>	
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"/>
<b>3. Level/year at which this course is offered:</b>	<b>11<sup>th</sup> Level / 4<sup>th</sup> Year</b>
<b>4. Pre-requisites for this course (if any):</b>	<b>NA</b>
<b>5. Co-requisites for this course (if any):</b>	<b>NA</b>

## 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 Theoretical hours/ Week	100 %
2	Blended	-	-
3	E-learning	-	-
4	Distance learning	-	-
5	Other	-	-

## 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	-
3	Tutorial	-
4	Others (specify)	-
	<b>Total</b>	<b>30</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

The course describes the source, production, chemical composition, and classification of petroleum. Physical and chemical properties of petroleum; Petroleum refinery and petrochemicals; Application of petroleum; Petroleum manufacture; Separation of natural gas from petroleum; Analysis of natural gas; Analysis of gas and liquid fuel from petroleum; Analysis of petroleum cuts (Gasoline, Kerosene, Gas oil); Recycle of petroleum wastes.

### 2. Course Main Objective

The main objective is to study the physicochemical properties of petroleum chemistry and its application to prepare the petrochemical products.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding:</b>	
1.1	Describe the chemical composition of petroleum oil and its physicochemical properties	K1
1.2	Identify the basic methods for preparation of petrochemical compounds	K2
<b>2</b>	<b>Skills :</b>	
2.1	Evaluate physicochemical properties of some crude oils and their	S1

CLOs		Aligned PLOs
	refinery	
2.2	Use of different methods for preparation of petrochemical compounds from petroleum products.	S2
<b>3</b>	<b>Values:</b>	
3.1	Cooperate in the development of the performance of work teams	V1

## C. Course Content

No	List of Topics	Contact Hours
1	Introduction in petroleum, Source and production of petroleum	3
2	Chemical composition of petroleum oil and natural gas and classification of petroleum	3
3	Physically and chemically properties of crude oil	3
4	Petroleum refinery and Petrochemicals	3
5	Manufacture and application of petroleum	3
6	Production of natural gases and condensates	3
7	Standard methods for analysis of natural gas	3
8	Analysis of crude oil	3
9	Calorific values of gas and liquid fuel from petroleum	3
10	Analysis of petroleum cuts, Recycle of petroleum wastes	3
<b>Total</b>		<b>30</b>

## D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	Describe the chemical composition of petroleum oil and its physicochemical properties.	Lecture	Written exam
1.2	Identify the basic methods for preparation of petrochemical compounds.	Lecture	Written exam
<b>2.0</b>	<b>Skills</b>		
2.1	Evaluate physicochemical properties of some crude oils and their refinery.	Discussion	Homework Assignments
2.2	Use of different methods for preparation of petrochemical compounds from petroleum products.	Problem-Solving	Homework Assignments
<b>3.0</b>	<b>Values</b>		
3.1	Cooperate in the development of the performance of work teams	Collaborative Learning	Individual presentations

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework Assignments (Electronic)	Throughout Semester	10%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
2	Individual presentations	Throughout Semester	10%
3	Mid Term Exam	6	30%
4	Final exam	11/12	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 :

Commitment to the rules of the Academic Advising Department at the university in accordance with the academic guidance manual approved by the university and the attached forms, there are different arrangements made by teaching staff to support student consultations including;

- Office hours: 8 hours per a week for each academic member.
- Academic guidance: an academic member has a number of students to guide them throughout degree journey.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>• Handbook of Petroleum Product Analysis, James G. Speight (2015). Wiley (USA), Latest Edition. ISBN: 978-1-118-36926-5.</li> <li>• <a href="https://onlinelibrary.wiley.com/doi/book/10.1002/9781118986370">https://onlinelibrary.wiley.com/doi/book/10.1002/9781118986370</a></li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>• The Chemistry and Technology of Petroleum, James G. Speight (2014). CRC Press, Latest Edition. ISBN: 9781439873892.</li> <li>• <a href="https://tinyurl.com/2tbb9ccj">https://tinyurl.com/2tbb9ccj</a></li> </ul>
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>• Saudi Digital Library (SDL) <a href="https://apps.tu.edu.sa/sdl/default.aspx">https://apps.tu.edu.sa/sdl/default.aspx</a></li> </ul>
<b>Other Learning Materials</b>	

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	A classroom with movable tables and chairs conducive to group discussion and teamwork.
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show, smart board
<b>Other Resources</b> (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
Effectiveness of Teaching and assessment	Students	Survey (indirect method)
Extent of achievement of course learning outcomes	Program leader	Reports (Direct method)
Quality of learning resources	Peer referees Students	Reports (Direct method) Survey (indirect method)

**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 Council/ Quality assurance committee
Reference No.	2-5-1444
Date	01/11/2022