

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation &  
Assessment**

**COURSE SPECIFICATION**

# **Petrochemicals Industries**

4024776-2



## Course Specifications

Institution: <b>Umm Al-qura University</b> Date of Report: <b>2017</b>
College/Department : <b>Faculty of Applied Science/ department of chemistry</b>

### A. Course Identification and General Information

Course title and code: <b>Petrochemicals Industries, 4024776-2</b>
Credit hours: 2 hrs ( <b>theoretical</b> )
<b>3. Program(s) in which the course is offered.</b> <b>(If general elective available in many programs indicate this rather than list programs)</b> <b>Industrial Chemistry</b>
4. Name of faculty member responsible for the course <b>Dr. Refaat Alsayed</b>
5. Level/year at which this course is offered : <b>7th / 4th semester (1436-1437)</b>
6. Pre-requisites for this course (if any) <b>Petroleum Chemistry</b>
7. Co-requisites for this course (if any)
8. Location if not on main campus: El-Abdyah

## B Objectives

1. Summary of the main learning outcomes for students enrolled in the course. <b>Theoretical Study of petrochemical Technology and petroleum industries based on the petroleum products.</b>
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field). <b>The use of smart teaching halls for lectures. Encouraging students to do reports as a self-education for natural gas and its use, Methane hydrate and alternative fuels whether using the library or the Internet.</b>

**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>Introduction of petrochemical industries</b>	<b>1</b>	<b>2</b>
<b>Raw materials for the petrochemical industry</b>	<b>2</b>	<b>4</b>
<b>Fundamental processes of petrochemical industry</b>	<b>1</b>	<b>2</b>
<b>Ethylene production of thermal cracking</b>	<b>1</b>	<b>2</b>
<b>Petrochemical production of ethylene</b>	<b>1</b>	<b>2</b>
<b>Petrochemical production of propylene</b>	<b>2</b>	<b>4</b>
<b>Petrochemical butenes and butadienes</b>	<b>1</b>	<b>2</b>
<b>The production of benzene, toluene and xylene</b>	<b>1</b>	<b>2</b>
<b>The steam reforming process and its industrial uses</b>	<b>1</b>	<b>2</b>
<b>Fischer-Tropsch process</b>	<b>1</b>	<b>2</b>
<b>Other Petroleum industries technology</b>	<b>2</b>	<b>4</b>

2 Course components (total contact hours per semester):			
Lecture: <b>28</b>	Tutorial: -	Practical/Fieldwork/Internship: -	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)  <b>Almost two hours per week spent by students to prepare reports, discuss and resolve questions, addition to the hours of theoretical lecture basic process.</b>
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<p>4. Development of Learning Outcomes in Domains of Learning  For each of the domains of learning shown below indicate:  A brief summary of the knowledge or skill the course is intended to develop;  A description of the teaching strategies to be used in the course to develop that knowledge or skill;  The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</p>
<p><b>a. Knowledge</b></p>
<p>(i) Description of the knowledge to be acquired  - <b>Know the date of the beginning of the petrochemical industries</b>  - <b>Know the importance of petrochemical industries</b>  - <b>Knowledge of raw materials for the petrochemical industry</b>  - <b>Learn methods of converting raw materials to final products, industrial</b>  - <b>Know the different techniques Petrochemical Industries</b></p>
<p>(ii) Teaching strategies to be used to develop that knowledge  <b>Scientific discussions and work in small groups.</b>  <b>Use the library to do some research.</b>  <b>Use of the Internet to do some public reports.</b></p>
<p>(iii) Methods of assessment of knowledge acquired  <b>The final written examinations and mid-semester.</b>  <b>Oral exams.</b>  <b>Discussions.</b>  <b>Systematic research on the relevant subjects.</b></p>
<p><b>b. Cognitive Skills</b></p>
<p>(i) Cognitive skills to be developed  <b>The student acquires the skill of thinking in trying to find the relation between the crude oil products and its use in industry and the development in our lifestyle.</b>  <b>Knowledge of the formulation of the chemical compositions of industrial petrochemical products.</b>  <b>Methods of chemical transformation of crude oil products to petrochemical industrial material.</b>  <b>Think of trying to find the best and green ways to get on petrochemical products.</b></p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills  <b>Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course.</b>  <b>Enhancing open discussion during the lecture.</b></p>
<p>(iii) Methods of assessment of students cognitive skills  <b>Through assignments and homework.</b></p>

<b>c. Interpersonal Skills and Responsibility</b>
(i) Description of the interpersonal skills and capacity to carry responsibility to be developed <b>Take the personality and responsibility for their own learning</b> <b>Working effectively in groups and exercise leadership when appropriate</b> <b>Act ethically and consistently with high molar standards in personal and public forms.</b> <b>Community linked thinking</b>
(ii) Teaching strategies to be used to develop these skills and abilities <b>Using the computer lab.</b> <b>Visit the Central Library.</b> <b>Visit research centres.</b> <b>The use of international information network.</b>
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility <b>Put in the test questions explanation of the simple. Statistical information.</b> <b>Evaluation of the duties associated with the proper use of communication skills and numerical mathematical skills.</b> <b>The allocation of part of the grades to assess the level of use of ICT in the presentation.</b>
<b>d. Communication, Information Technology and Numerical Skills</b>
(i) Description of the skills to be developed in this domain. <b>Use IT and communication technology in gathering and interpreting information and ideas.</b>
(ii) Teaching strategies to be used to develop these skills <b>Lectures</b> <b>Scientific discussion</b> <b>Library visits</b> <b>Web-based study</b>
(iii) Methods of assessment of students numerical and communication skills <b>web-based student performance systems</b> <b>individual and group presentations</b>
<b>e. Psychomotor Skills (if applicable)</b>
(i) Description of the psychomotor skills to be developed and the level of performance required <b>- Not a requirement for this decision.</b>
(ii) Teaching strategies to be used to develop these skills <b>- Not a requirement for this decision.</b>
(iii) Methods of assessment of students psychomotor skills <b>- Not a requirement for this decision.</b>

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	<b>Total</b>		<b>100 %</b>

#### D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

**Presence of faculty members to provide counseling and means.**

**Office Hours: weekly during working hours, and to create appropriate means**

**Academic Advising for students to those who need it.**

#### E Learning Resources

1. Required Text(s) <b>Petroleum and petrochemical course presented by the lecturer.</b>
2. Essential References U. R. Chaudhuri, Fundamentals of Petroleum and Petrochemical Engineering, CRC Press, 2010, P. 411, ISBN 9781439851609. S. Matar, L. F. Hatch, Chemistry of Petrochemical Processes, 2nd ed. 2001, P. 392, ISBN 9780884153153. D. S. J. Jones, Elements of Petroleum Processing, 1996, John Wiley & Sons. P. Wiseman, Petrochemicals, Ellis Horwood Limited 1986.  I.D. Mall. Petrochemical Process Technology Paperback – 1 Sep 2017 Laxmi Publications Private Limited; Second edition (1 September 2017)  Lisa Kaaki. New book documents history of GCC petrochemical industry Wednesday 16 March 2016
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) International petroleum encyclopedia, Tulsa, Oklahoma: Pennwell, Corporation, 2007.
4- Electronic Materials, Web Sites etc

<a href="https://en.wikipedia.org/wiki/Petrochemical">https://en.wikipedia.org/wiki/Petrochemical</a> <a href="http://www.chemhelper.com/">http://www.chemhelper.com/</a> <a href="http://www.chemweb.com/">http://www.chemweb.com/</a> <a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a>
5- Other learning material such as computer-based programs/CD, professional standards/regulations <b>Microsoft Power Point, Microsoft Word.</b> <b>Video show on thermodynamics.</b> <b>Learning CD on thermodynamics.</b>

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in <b>classrooms and laboratories, extent of computer access etc.</b> )
1. Accommodation (Lecture rooms, laboratories, etc.) <b>Classroom capacity (30) students.</b> <b>Processing of the classroom with appropriate educational means, including computers</b>
2. Computing resources  <b>Classroom is equipped with a computer, Data Show and TV.</b>
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) <b>There is no other requirement</b>

## G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching  <b>Complete the questionnaire assessment due in particular.</b> <b>Focus group discussions with small groups of students.</b>
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department  <b>Observations and the assistance of colleagues.</b> <b>Independent evaluation of the extent to which students of the standards.</b> <b>Independent advice to the duties and tasks.</b>
3 Processes for Improvement of Teaching <b>Workshops to teaching methods.</b> <b>Ongoing training of faculty member.</b> <b>Review the proposed strategies.</b>

**Providing modern tools necessary for learning.**  
**Application of the means of e-learning.**  
**The exchange of internal and external expertise**

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

**Examination of a sample of the patch test papers, or student work by an independent faculty member.**  
**Periodic exchange and remarking of a sample of assignments or tests with a faculty member to last the same decision in other educational institution.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

**Consultation among professors .**  
**Host a visiting professor to evaluate the course.**  
**Workshops for teachers of the course.**  
**Periodic review of the contents of the course and amend the negatives.**

Faculty or Teaching Staff: Dr. Refaat Alsayed

Signature:

Date Report Completed: 12/1/2019

Received by: Dr Ismail I. Althagafi Department Head

Signature:

Date: 20/1/2019

