اسم المقرر:	كيمياء السطوح والحفز والغرويات
رقم المقرر:	CHM333
اسم ورقم المتطلب السابق:	CHM232
اسم ورقم المتطلب المرافق:	----
مستوى المقرر:	الخامس
الساعات المعتمدة:	3

Module Title:	**Surface, colloids and catalysis chemistry**
Module ID:	**CHM333**
Prerequisite (Co-requisite) :	**CEM232**
Co-requisite :	---
Course Level:	**5th level**
Credit Hours:	**3**

معلومات المقرر * (Course Information):

Module Description **وصف المقرر :**

The course covered the Surface, colloids and catalysis chemistry which includes an introduction to Surface tension and surface free energy (theory and measurement methods). Capillarity, Contact angle (theory and measurement methods), wetting, Surface forces. Surface films on liquid substrates (surface potential, monomolecular films). The solid-gas interface (physical and chemical adsorption, adsorption isotherms. Monolayers and multilayers adsorptions
Introduction to Colloid state. Characterization Methods, Kinetic and Optical Properties of Colloids. Colloid stability. Emulsions, foams and aerosols. Fundamental Equations in Colloid and Surface Science. Applications of colloid and surface science in petroleum recovery, coating and painting, food, pharmaceutical and cosmetic industry.
Introduction to Catalysis. Types and properties of catalysts. Introduction to homogeneous catalysis. -Specific acid and base catalysis -Catalysis by general acid and bases. Introduction to heterogeneous catalysis.

Experimental part is designed to complement the lecture material. Emphasis is placed on experimental methodology.

Module Aims **أهداف المقرر :**

For students undertaking this course, the aim is to:

1	Knowledge about the basics of Surface Chemistry, Colloid and catalysts and its applications..	1

Learning Outcomes: مخرجات التعليم:

By the end of this course, the students will be able to

1	Describe the general concepts of surface, collide and catalyst chemistry.	
2	Outline of the general procedure of laboratory experiments.	
3	Apply the appropriate mathematical formula to solve problems relating to course concept	
4	Explain the results of data obtain from Laboratory experiments.	
5	Work independently and as part of a team.	
6	Demonstrate the ability to use the library resources and scientific data base to obtain information about topic, chemical, chemical technique or an issue relating to chemistry.	
7	Demonstrate a good and safe handling of laboratory chemicals, glassware and equipment during experiments.	

Course Contents: محتوى المقرر:

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
4	2	introduction to Surface tension and surface free energy (theory and measurement methods). Capillarity. Contact angle (theory and measurement methods),
2	1	wetting, Surface forces. Surface films on liquid substrates (surface potential, monomolecular films).
4	2	The solid-gas interface (physical and chemical adsorption, adsorption isotherms).
4	2	Introduction to Colloid state. Characterization Methods, Kinetic and Optical Properties of Colloids. Colloid stability. Emulsions, foams and aerosols.
2	1	Fundamental Equations in Colloid and Surface Science.
2	1	Applications of colloid and surface science in petroleum recovery, coating and painting, food, pharmaceutical and cosmetic industry.
4	2	Introduction to Catalysis. Types and properties of catalysts.

4	2	Introduction to homogeneous catalysis. -Specific acid and base catalysis -Catalysis by general acid and bases.
2	1	Introduction to heterogeneous catalysis.
2	1	Revision
Practical	13	Practical experiments for theoretical lectures. - Study the effect of solution concentration on the density. -Determination of relative and absolute Viscosities of different liquids using water as standard liquid. - Determination of surface tension of liquid using rise in capillary tube method. - Determination of surface tension of liquid using different capillary tube. - Determination of the adsorption isotherm of Oxalic acid on activated charcoal. - Determination of the adsorption isotherm of acetic acid on activated charcoal. - Colloidal state (preparation of sulfur sol and ferric hydroxide sol) - Compare the precipitation ability of colloid on some electrolyte solution. - study the protection ability of lyophobic sol. - revision

Textbook and References: **الكتاب المقرر والمراجع المساندة:**

ISBN	سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم الكتاب المقرر Textbook title
9781118881187	**2016**	**John Wiley & Sons**	**GEORGIOS M. KONTOGEORGIS AND SØREN KIIL**	**Introduction to Applied Colloid and Surface Chemistry**
	سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم المرجع Reference
978-0-470-50823-7	**2010**	**John Wiley & Sons**	**Gabor A. Somorjai, Yimin Li**	**Introduction to Surface Chemistry and Catalysis**
ISBN-13: 978-0198769866 **ISBN-10:** 0198769865	**2018**	Oxford University Press	**Peter Atkins and etc.**	**Physical Chemistry 11th ed.**

* يتم تعبئة معلومات المقرر فقط باللغتين العربية والانجليزية وباقي المعلومات بلغة التدريس المعتمدة ويكرر لكل مقرر في الخطة الدراسية

*** Course Information should be filled in Arabic and English. Other information should be filled using the approved teaching language at the college.**

جامعة المجمعة
Majmaah University
قسم الكيمياء
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College of Science
in Zulfi