

معلومات المقرر \* (Course Information):

كيمياء كهربية	اسم المقرر:
كيم 334	رقم المقرر:
فيزياء عامة -2 , PHYS213	اسم ورقم المتطلب السابق:
لا يوجد	اسم ورقم المتطلب المرافق:
السادس	مستوى المقرر:
3	الساعات المعتمدة:
<b>Module Title:</b>	<b>Electrochemistry</b>
<b>Module ID:</b>	<b>CHM334</b>
<b>Prerequisite (Co-requisite) :</b>	<b>PHYS213</b>
<b>Co-requisite :</b>	----
<b>Course Level:</b>	<b>6<sup>th</sup> level</b>
<b>Credit Hours:</b>	<b>3</b>

Module Description

وصف المقرر :

The course covered the electrochemistry and its application which includes Faraday's Laws, Electrical Conductivity, Theories of electrolytic conduction, application of conductance measurements, galvanic cells, electrochemical series, thermodynamics of redox reactions, Nernst equation, reference electrodes, classification of electrodes, classification of galvanic cells, Applications of electric force measurement and electrodes potential, Applications of Nernst equation, electrochemical energy systems.

Experimental part is designed to complement the lecture material. Emphasis is placed on experimental methodology and data acquisition by assisting computer.

Module Aims

For students undertaking this course, the aim is to:

1	Knowledge about the basics of Electrochemistry and its applications	1
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Learning Outcomes:

مخرجات التعليم:

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

1	Describe the general concepts of electrochemistry and conductance.	
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 electrochemical 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)
2	1	Faraday's Laws, Electrical Conductivity.
2	1	Ionic Mobility, Theories of electrolytic conductivity
2	1	Activity and activity coefficient, Transport Number and its determination
2	1	Application of conductance measurements
4	2	Reverse and non-inverse cells , galvanic cells , electrode and cell notation, Standard Reduction Potentials, Electrochemical series
2	1	Thermodynamics of redox reactions, Nernst equation,
2	1	Electrode potential, Reference electrodes
4	2	Classification of electrodes - Classification of galvanic cells
2	1	Applications of electric force measurement and electrodes potential
4	2	Applications of Nernst equation in estimating Thermodynamic properties and pH measurements
2	1	Electrochemical energy systems, Energy storage devices, batteries and fuel cells, Electrochemical Super capacitor
2	1	Revision



Practical	13	<p>Practical experiments for theoretical lectures.</p> <ul style="list-style-type: none"> <li>- Conductometric Determination of Solubility for calcium hydroxide.</li> <li>- Conductometric Titrations.</li> <li>- Determination of PH of solutions using Glass electrode.</li> <li>- Electromotive Force Measurements and determination of standard Electrode potential.</li> <li>- Determination of the Oxidation and reduction potential for electrode.</li> <li>- Determination of the solubility constant using e.m.f measurements.</li> <li>- Determination the Mean activity of solution using e.m.f measurements.</li> </ul>
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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
978-3-527-31069-2	2007	WILEY-VCH	Carl H. Hamann and Andrew Hamnett	Electrochemistry
	سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم المرجع Reference
0-471-04372-9	2001	John Wiley & Sons, New York	A. J. Bard and L. R. Faulkner	Electrochemical Methods: Fundamentals and Applications
0-07-351109-9	2010	McGraw-Hill	Raymond Chang	Chemistry
ISBN-13: 978- 0198769866 ISBN-10: 0198769865	2018	Oxford University Press	Peter Atkins and etc.	Physical Chemistry 11 <sup>th</sup> 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.



