جامعة المجمعة
Majmaah University

Course Specifications

Institution:	**Majmaah University**
Academic Department :	**Chemistry**
Programme :	**Chemistry**
Course :	**Physical Chemistry(Electro-Reversible 2)**
Course Coordinator :	**Manal Mohamd Salem**
Programme Coordinator :	Dr.Gehan Alaemary

- **Course Specification Approved Date : 28/12/ 1436 H**

A. Course Identification and General Information

1 - Course title : **Physical Chemistry(Electro-Reversible 2)** Course Code: **323 Chem**						
2. Credit hours : **4**						
3 - Program(s) in which the course is offered: **Chemistry**						
4 – Course Language : **Arabic**						
5 - Name of faculty member responsible for the course: **Manal Salem**						
6 - Level/year at which this course is offered : **Level (VI)**						
7 - Pre-requisites for this course (if any) : • **Physical Chemistry(Electro-Reversible 1)**						
8 - Co-requisites for this course (if any) : • **Practical Physical Chemistry(Electro-Reversible 2)**						
9 - Location if not on main campus : (**Faculty of Education Zulfi**)						
10 - Mode of Instruction (mark all that apply)						
A - Traditional classroom☐	√☐	☐	What percentage? ☐	**20 %**☐	☐	
B - Blended (traditional and online)☐	☐	☐	What percentage? ☐	**0 %**☐	☐	
D - e-learning☐	√☐	☐	What percentage? ☐	**60 %**☐	☐	
E - Correspondence☐	☐	☐	What percentage? ☐	**0 %**☐	☐	
F - Other	√☐	☐	What percentage? ☐	**20 %**☐	☐	
Comments : .....☐						

B Objectives

What is the main purpose for this course? **Studying the different Electro-irreversible reactions, its laws and its applications such as: corrosion and precipitation of metals.**
Briefly describe any plans for developing and improving the course that are being implemented -Adoption of the students themselves in the study to solve the homework, -Borrow references from the library , -The use of effective teaching methods and modern. -Change the content and updated

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction , comparison between reversible and irreversible processes	1	3
Definitions: Over potential, Decomposition potential , Polarization , Over potential types and the methods of measurement the over potential, and necessary precautions>	2	6
Cathodic and Anodic Processes (Tafel equation)	2	6
Factors affecting on the evolution of hydrogen and oxygen gas, theories of evolution	1	3
Concentrated over potential , Concentrated polarization -Cathodic precipitation of metals , Methods of deposition	2	6
Cathodic precipitation of metals and methods of deposition - Factors affecting the nature of the sediments - examples of deposition processes .Anodic prossese - inactivity and theories	4	12
The phenomenon of corrosion , types and factors affecting it and methods of prevention of corrosion	2	6
Review	1	3
Practical:		
Corrosion rate measurement of iron in acidic environment by chemical methods in presence and absent of inhibitors	2	4
Corrosion rate measurement of aluminum in base by chemical methods, Influence of adding organic material on the corrosion rate .	2	4
Precipitation of copper cathode from copper sulphate and calculate the percentage of precipitation, Precipitation of lead in anode	3	6
Measuring of decomposition potential for acids, bases and salt	2	4
Anodic Polarization of iron in acidic media	1	2
Anodic Polarization of aluminum in basic media	1	2
Anodic Polarization of aluminum in acidic media	1	2
Review	1	2

2. Course components (total contact hours and credits per semester):

□	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**3**	**---**	**2**	**---**	**---**	**71hr**
Credit	**3**	**---**	**1**	**---**	**---**	**58hr**

□

3. Additional private study/learning hours expected for students per week. □

□

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	By the end of the course students should be able to: -Identify the differences between the reversible and irreversible process. - multiply foundations and theories of electro chemistry reversible potential such as over-polarization .. -Know the types of over potential, the methods of measuring the overvoltage and the distinction between types -Identify the differences between cathodic and anodic polarization . - Know of foundations, scientific theories operations precipitation of metals and explain examples. -Know of the phenomenon of erosion The distinction between the types of corrosion. -Know the corrosion prevention methods. - Study of factors affecting the corrosion -	- Lectures - Discussion - Experiments - Researches	-Work activities -Field exercises -Periodic tests -Final tests
2.0	**Cognitive Skills**		
2.1	By the end of the course students should be able to: Compare between the reversible and irreversible processes and between the types of over-voltage.	-Lectures -Discussion -Experiments -Researches	- Participate in the hall - Research in the content. - solve problems - collective and individual duties. - midterm and final exams
2.2	-remmber how scientific facts and theories of irreversible chemistry in the electrical survey		
2.3	-explain the results and realize how to analyze and critique practice of analytical and creative thinking in problem-solving skills, according to the electrical studied of the reversible chemistry . - Apply the skills acquired in the academic and professional contexts connected to the electro-		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	irreversible chemistry		
3.0	**Interpersonal Skills & Responsibility**		
3.1	By the end of the course students should be able to: Collaborate by work in team in the laboratory.	-Homework to develop the skills of self-study. -The practical studies as groups. -The work of - Intramural Research -Internet search -PowerPoint Offers.	Follow up experiments in the laboratory , Effective participation within the hall - Assessment research and Review the Collective duties. - The ability to self-Study in the form of homework. Follow up experiments in the laboratory .
3.2	Conduct research work as a team.		
3.3	participate Effective in curricular activities. able to self-reliance when learning. afford individual responsibility towards the community responsibility with a commitment to professional values and ethics that are consistent with Islamic values.		
4.0	**Communication, Information Technology, Numerical**		
4.1	By the end of the course students should be able to: Communicate verbally and in writing during the lecture	Solving problems. Use of the Computer The use of a calculator. Discussion and dialogue	Discussion Monthly tests And Theoretical tests.
4.2	Use of the Internet in some of the vocabulary such as over-voltage polarization -alamilit Almassadah and the phenomenon of corrosion ...		
4.3	Use computer programs for scheduling results and also when solving problems.		
	Apply the mathematical methods when solving problems related to the equation Tafel.		
5.0	**Psychomotor**		
5.1	**Not apply**		

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Med- term First exam.	5-6	10%
2	Med- term Second exam.	10-11	10%

3	Med- term exam (practical)	11	10%
4	Participation activities students methodological Of scientific research – Entries…	Weekly	10%
5	Final test (practical)	Fourteenth	20%
6	Final test (theoretical)	Fifteenth	40%

D. Student Academic Counseling and Support

Communicate with students via email and mobile portal

E. Learning Resources

1. List Required Textbooks :

- Electro-irreversible Chemistry , Prof. Ahmed Jadallah Ibrahim Gad d. Flares Khalidi, a library of majority, the first edition 1425-2004 m
- Theoretical Electrochemistry ",L.I.Antropove,Mir,Publishers in Moscow,English
— Translation in (1977).

2. List Essential References Materials :

1-Corrosion and corrosion Control, " 2 nd Ed, by Herbert H. Uhlig and John Wilcy and Sons Inc, London 1971.

2.L.I.Antropove, "Theoretical Electrochemistry" Mir Publishers in Moscow, English Translation mir Publishers 1977".

3.G.Wranglen, " An Introduction to Corrosion and Protection of Metals" , Chapman and Hall, New York, London 1985.

4.An Introduction to Electrochemical Corrosion Testing For Practicing Engineers and Scintists,William S. Tait (1994).

4. List Recommended Textbooks and Reference Material :

1. الكيمياء الكهربية ، أ.د. أحمد عبدالعزيز العويس ،د.عبد الله المعيوف.
2. الكيمياء الكهربية أ.د. حسن أحمد شحاته.

3.Text book of physical chemistry, Samuel Glasstone.

4."An introduction to Electrochemistry", Samuel Glasstone

- "Corrosion and Corrosion Control ",Herbert H. Uhling and John Wilcy and Sons ,Inc., 2nd Ed

.London (1971)

3. List Electronic Materials :

www.sciencedirect.com

موقع أ.د. عمر هزازي، كلية العلوم التطبيقية –جامعة أم القرى

5. Other learning material :

- Processing laboratories
- Provide devices
- Provide laboratory tools

F. Facilities Required

1. Accommodation

-Lecture room is excellent,

- Lecture room contains Platform , smart board, 40 seats,
and curtains in good condition.

2. Computing resources

- Personal.

3. Other resources

-Availability of equipment relevant to the course material .

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Analysis of the results of students in decision .
- Questionnaire a faculty member for the students at the end of the semester.
- Ask a questionnaire that content course for students in the end of the semester .
- Exam Midterm .
- Assess vocabulary scheduled by analyzing workmanship skills among students.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- Peer consultation on teaching & Benefit from the expertise of the members of the section
- discuss research students with some of the members of the section ,

-Invite specialists and their discussion or Report of the expert from College matchups.

-Identify assessment for teachers

3 Processes for Improvement of Teaching :

- Review of teaching strategies recommended.
- Diversity teaching methods and activating the use of modern technologies
- The formation of the scientific in section of qualified and experienced

- Provide learning resources, especially the library and the Internet.
- Motivate and encourage students to actively participate in the research and experimentation
- Participate effectively in the training courses for the development of the capacities of Professor.

-Training and continuous development
-Courses for Faculty members
-Workshop to improve methods of evaluation

4. Processes for Verifying Standards of Student Achievement

- check marking by a faculty member of the department for a sample of students
- check marking by an independent faculty member.
- The patch is checked by faculty member

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

- Develop appropriate vocabulary and keep pace with changing times
- Reviewing Course Description
- Follow-up in the new effective teaching strategies
- benefit from the development of university courses and activated in educational performance
- Hold workshops to view the results
- feedback processes for course quality

Course Specification Approved
Department Official Meeting No (3) Date 28 / 12 / 1436 *H*

Course's Coordinator		Department Head	
Name :	Manal Salem	*Name :*	Dr.Gehan Alaemary.
Signature :	.....	*Signature*	.....
Date :	28/ 12 / 1436 *H*	*Date :*	28/ 12 / 1436 *H*