



**ATTACHMENT 2 (e)**

**Course Specifications**

**Kingdom of Saudi Arabia**

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

**Course Specifications  
(CS)**

# **Corrosion and Electroplating**

**4024778-2**





## 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

1. Course title and code: <b>Corrosion and Electroplating 4024778-2</b>			
2. Credit hours: <b>2 (theoretical)</b>			
3. Program(s) in which the course is offered. <b>Industrial Chemistry</b>			
4. Name of faculty member responsible for the course: <b>Professor Metwally Abdallah</b>			
5. Level/year at which this course is offered: <b>4<sup>rd</sup> level/1<sup>st</sup> year</b>			
6. Pre-requisites for this course (if any): -			
7. Co-requisites for this course (if any)---			
8. Location if not on main campus: <b>El-Abdyah</b>			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage? <b>100%</b>	
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
Comments:			

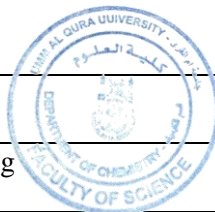
### B Objectives



<p>1. What is the main purpose for this course?</p> <p><b>1- Recognize the fundamental principles of corrosion and electroplating.</b>  <b>2. Know the fundamental of different types of corrosion and corrosion inhibitors.</b>  <b>3. Develop the passivity of metals</b>  <b>4-Describe the factors affecting on the corrosion of metals and alloys in aqueous solutions</b>  <b>5- Select the suitable inhibitors to overcome the corrosion .</b></p>
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <p><b>1-The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course</b>                  2- encourage students to make reports in the recent trends in the field of solutions chemistry, either from the library or by using the Internet.</p>

**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		
List of Topics	No. of Weeks	Contact Hours
Introduction on the corrosion science and electrode potential	1	2
Thermodynamic of corrosion	1	2
Different types of corrosion	1	2
Pitting corrosion ,theories and its measurements	1	2
Passivity, Theories of passivity	1	2
Measurements of corrosion rate by chemical and electrochemical measurements	1	2
Corrosion inhibitors,	1	2
Mid term	1	2
Introduction on the principle and the aim of electroplating	1	2





Factors affecting on the electroplating process	1	2
Effect of organic and inorganic additives on the electroplating process	1	2
Preparation of electroplating paths e.g.,copper,zinc .nickel,..	1	2
Mechanism of electroplating	1	2
General review	1	2



2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28					28
Credit	2					2

3. Additional private study/learning hours expected for students per week. 2hr

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
<b>1.0</b>	<b>Knowledge</b>		
1.1	<ul style="list-style-type: none"> <li>List the historical development (thinking back) and to acquire student skill training to choose appropriate methods of and gas liquefaction.</li> </ul>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Scientific discussion</li> <li>Library visits</li> <li>Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>Exams</li> <li>web-based student performance systems</li> <li>portfolios</li> <li>long and short essays</li> <li>posters lab manuals</li> </ul>
1.2	<ul style="list-style-type: none"> <li><b>describe the student predicating skill of equivalent conductance at infinite dilution for weak electrolyte.</b></li> </ul>		
1.3	<ul style="list-style-type: none"> <li><b>Illustrate the values of transport numbers , ionic strength and distribution of molecular velocities.</b></li> </ul>		



1.4	<ul style="list-style-type: none"> <li>mention appropriate methods of determination of ionization constant of weak electrolyte.</li> </ul>		
1.5	<ul style="list-style-type: none"> <li>Define different ways to determine Vant Hoff factor</li> </ul>		
1.6	<ul style="list-style-type: none"> <li>Explain different ideas for student innovates the studying the deviation of gases</li> </ul>		
1.7	Describe the student plans of research program in the field of solution chemistry according to organized steps.		
2.0	<b>Cognitive Skills</b>		
2.1	<ul style="list-style-type: none"> <li>Generate dialogue and debate within the classroom.</li> </ul>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Scientific discussion</li> <li>Library visits</li> <li>Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>Exams</li> <li>web-based student performance systems</li> <li>portfolios</li> <li>posters</li> <li>demonstrations</li> </ul>
2.2	<ul style="list-style-type: none"> <li>Examples given in the lecture and exercise under the supervision of teaching workshops.</li> </ul>		
2.3	<ul style="list-style-type: none"> <li>Give some practical issues and assigning students to create a strategic plan for the solution.</li> </ul>		
2.4	<ul style="list-style-type: none"> <li>Encourage the transmission of learning using analysis tools in various applications and through discussion of potential applications in other areas.</li> </ul>		
2.5	Commissioned student functions duties include open tasks designed to apply the predicating skills, analysis and problem solving.		
3.0	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	<ul style="list-style-type: none"> <li>Work in teams to conduct some joint reports.</li> </ul>	<ul style="list-style-type: none"> <li>Scientific discussion</li> <li>Web-</li> </ul>	<ul style="list-style-type: none"> <li>web-based student performance</li> </ul>



3.2	•	based study	systems
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	<ul style="list-style-type: none"> <li>Use the computer in the compilation of research that helps in writing reports on topics relevant to the course.</li> </ul>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Scientific discussion</li> <li>Library visits</li> <li>Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>web-based student performance systems</li> <li>individual and group presentations</li> </ul>
4.2	<ul style="list-style-type: none"> <li>Use the computer and the Internet to identify sources of recent research relevant to the course</li> </ul>		
<b>5.0</b>	<b>Psychomotor</b>		
5.1	NOT APPLICABLE		
5.2			

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 Academic Counseling and Support

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

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

#### E. Learning Resources

1. List Required Textbooks  
1-E.E. Stansbury and R.A. Buchanan



<p>“<i>Fundamentals of electrochemical corrosion</i>” ASM International (2000)</p> <p>2-Nasser Kanani.,Electroplating : basic principles, processes and practice, Elsevier, 2004</p> <p>3- V. S. SASTRI, EDWARD GHALI, MIMOUN ELBOUJDAINI ‘<i>Corrosion Prevention and Protection</i>’, Practical Solutions, John Wiley &amp; Sons Ltd, The Atrium, Southern Gate, Chichester,</p> <p>4.<b>Introduction to Corrosion Science, E. McCafferty, Springer, 2010</b></p> <p>5-Milan Paunovic and Mordechay Schlesinger.“<i>Fundamentals of electrochemical deposition</i>” A John Wiley &amp; Sons, Inc., 2nd ed. (2006)</p>
<p>2. List Essential References Materials (Journal s, Reports, etc.)</p> <ul style="list-style-type: none"><li>• Lecture Hand outs available on the coordinator website</li></ul>
<p>3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)</p> <p>-Nestor Pere ,“<i>Electrochemistry and Corrosion Science</i>” Kluwer Academic Publisher(2004)</p>
<p>4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)</p> <ul style="list-style-type: none"><li>• <a href="http://en.wikipedia.org/wiki/Petroleum1">http://en.wikipedia.org/wiki/Petroleum1</a>- <a href="http://www.chemhelper.com/">http://www.chemhelper.com/</a></li><li>• <a href="http://www.chemweb.com/">http://www.chemweb.com/</a></li><li>• <a href="http://www.science.uwaterloo.ca/~cchieh/cact/">http://www.science.uwaterloo.ca/~cchieh/cact/</a></li><li>• <a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a></li></ul>
<p>5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p>

## F. Facilities Required

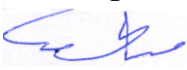
<p>Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)</p>
<p>1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p> <ul style="list-style-type: none"><li>• <b>Classrooms capacity (30) students.</b></li><li>• <b>Providing hall of teaching aids including computers and projector.</b></li></ul>
<p>2. Computing resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"><li>▪ <b>Room equipped with computer and projector and TV.</b></li></ul>
<p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"><li>• <b>No other requirements.</b></li></ul>

## G Course Evaluation and Improvement Processes




1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor <ul style="list-style-type: none"><li>• <b>Observations and the assistance of colleagues.</b></li><li>• <b>Independent evaluation for extent to achieve students the standards.</b></li><li>• <b>Independent advice of the duties and tasks.</b></li></ul>
3 Processes for Improvement of Teaching <ul style="list-style-type: none"><li>• <b>Workshops for teaching methods.</b></li><li>• <b>Continuous training of member staff.</b></li><li>• <b>Review of strategies proposed.</b></li><li>• <b>Providing new tools for learning.</b></li><li>• <b>The application of e-learning.</b></li><li>• <b>Exchange of experiences internal and external.</b></li></ul>
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) <ul style="list-style-type: none"><li>▪ <b>Check marking of a sample of exam papers, or student work.</b></li><li>▪ <b>Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.</b></li></ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none"><li>• <b>Periodic Review of the contents of the syllabus and modify the negatives.</b></li><li>• <b>Consult other staff of the course.</b></li><li>• <b>Hosting a visiting staff to evaluate of the course.</b></li><li>• <b>Workshops for teachers of the course.</b></li></ul>

Faculty or Teaching Staff: Professor Metwally Abdallah

Signature: 

Date Report Completed: 12/1/2019

Received by: Dr. Ismail Althagafi Department Head

Signature: 

Date: 20/1/2019

