

National Commission for Academic Accreditation & Assessment

Course Specification

Institution: King Khaled University
College/Department: Faculty of Science-Chemistry Department

A Course Identification and General Information

1. Course title and code: Corrosion-435
2. Credit hours: 3 (2-Theoretical + 1-Experimental).
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course Dr/Mohamed Abdel hay Ahmed
5. Level/year at which this course is offered: 7/4
6. Pre-requisites for this course (if any):233
7. Co-requisites for this course (if any)
8. Location if not on main campus:

B Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <p>-Studying the main basic principles of metal corrosion, thermodynamics and kinetic of corrosion- Methods of preventing corrosion.</p>
<p>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)</p> <p>-----</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
1-Basic principles of corrosion	1	2
2-Measurements of metal corrosion.	1	2
3-Types of corrosion cells.	1	2
4-Thermodynamics of corrosion.	2	4
5-Kinetics of corrosion.	2	4
6-Example of metal corrosion (Evan curves).	3	3
7-Metal protection	2	4
8-Corrosions problems	2	4
<u>Practical Part</u>		
1. Introduction for corrosion and the importance of corrosion study in our life	1	2
2. Determination of corrosion of Aluminium in alkaline medium by weight loss method	1	2
3. Electrochemical Corrosion cell composition and the role for each part	1	2

4. Setup the electrochemical corrosion cell in acidic medium and plotting the polarization graph by potentiostate	1	2		
5. Determination the corrosion potential ($E_{corr.}$) and corrosion current ($I_{corr.}$) for iron in acidic medium by potentiostate method	1	2		
6. Determination of corrosion Rate for iron in aqueous medium by potentiostate	1	2		
7. Determination of corrosion rate of Aluminium in basic medium by Gasometric method	1	2		
8. Effect of Glycerol as Adsorbed Inhibitor on the rate of corrosion of Aluminium	1	2		
9. Effect of pH on the corrosion rate of iron using Tafle plot	1	2		
10. Determination of corrosion rate of Aluminium in acidic medium by measuring the amount of evolved heat	1	2		
11. Pitting corrosion study and determination of Pitting corrosion Potential for some ions	1	2		
12. Passivity study for Zinc metal in alkaline medium	1	2		
13. Practical final Exam				
2 Course components (total contact hours per semester):				
Lecture 28	Tutorial: -----	Laboratory 12	Practical/Field work/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) -----

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.

a. Knowledge

(i) Description of the knowledge to be acquired

-A student can investigate the origin of various types of corrosions.

-A student can investigate the methods of preventing corrosions.

(ii) Teaching strategies to be used to develop that knowledge

-Connect the scientific principles of corrosions with the courses taught in the previous years.

-Relate the main subject in the course with various industrial processes.

(iii) Methods of assessment of knowledge acquired

- Oral questions and discussions during the lectures.

- Mid-term and final examination.

- Periodic quizzes.

- Conducting some reports on the course subjects and discussing them with the students.

b. Cognitive Skills

(i) Description of cognitive skills to be developed

-A student can understand a basic principle, thermodynamics and kinetics of corrosions.

-A student can connect between the theoretical studies and the industrial applications.

-A student can resolve any problems in the industrial fields in the future.

(ii) Teaching strategies to be used to develop these cognitive skills

-Allow the student to solve some problems exist in the industrial fields.

-Allow the student to search on some course subject from internet sites.
(iii) Methods of assessment of students cognitive skills -Oral discussions. -Seminars. -Some small projects.
c. Interpersonal Skills and Responsibility
(i) Description of the interpersonal skills and capacity to carry responsibility to be developed -Allow the students to give their opinion of the course subjects. -Make some small projects with the students and every one of the student must explain his role in the project.
(ii) Teaching strategies to be used to develop these skills and abilities -Allow the students to do some experiments, some projects and write the reports with each other in groups.
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility -Oral discussions between students.
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain. -Allow the student to explain some course subjects on the students and his ability in communicate with other.
(ii) Teaching strategies to be used to develop these skills -Each student must take a chance to make a seminar.
(iii) Methods of assessment of students numerical and communication skills - The whiteboard. - The projector. - Using some tools with relation to the course.

e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1			
2			
3			
4			
5			
6			
7			
8			

D. Student Support

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

E Learning Resources

1. Required Text(s) -----
2. Essential References 1) The Corrosion and oxidation of metals, U.R. Evans. 2) The Anodic Behaviour of Metals. T.P. Hoar. 3) Corrosion, N.D. Greene.
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc www.sciencedirect.com
5- Other learning material such as computer-based programs/CD, professional standards/regulations -----

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) -Lecture rooms and Laboratories.
2. Computing resources -Computer lab.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) -----

G Course Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none">-The results of final and Mid-term exams.-Results of oral discussions.-Results of internet quizzes.
<p>2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none">-Investigate the students marks-Follow up the level of student through several discussions.
<p>3 Processes for Improvement of Teaching</p> <ul style="list-style-type: none">-Using electronic sites in the course subject.
<p>4. Processes for Verifying Standards of Student Achievement (eg. 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)</p> <ul style="list-style-type: none">-Follow up the students answer with other professors and discuss the student results through the chemistry meeting.
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none">-Follow up the capability of students to understanding every points in the course subjects.