



Course specification

University/Academy: Damanhour University

Faculty/Institute: Science

Department: Chemistry

1. course Data:

Course code: Chem. 404	Course title: Physical Chemistry 7	Academic year/level: 2010-2011 Fourth year /2 nd term
Specialization: Special Chemistry	No. of instructional units: lecture <input type="text" value="3hrs/week"/> practical <input type="text" value="1 hrs/week"/>	

2. course Aim

This course is designed to give advanced ideas on colloid chemistry, catalysis and surface chemistry and electrochemistry that may be required by chemists in the course of their careers.

3. Intended learning outcome

a) Knowledge and understanding	At the end of this course the students should know and understand the following. a1- define Colloid chemistry a2-mention Catalysis and surface chemistry a3-define Electrochemistry
b) Intellectual skills	At the end of this course the student will be able to : b1- evaluate knowledge and understanding of essential facts, concepts, principles and theories relating to course content
c) Professional skills	At the end of this course students will have the ability to: c1- use skills that enable a harmonic working group.
d) General skills	At the end of this course students will have the ability to: d1- communicater both written and oral date d2- Interact with other people and to engage in team-working
4. course content	<u>Colloid Chemistry</u>



	<p>-Introduction -The colloidal state. Classification. Structural characteristics. -Preparation and Purification of colloidal systems. -Preparation and Purification of colloidal systems. (continued). -Kinetic properties (Brownian motion and translational diffusion -Sedimentation velocity and sedimentation equilibrium -Osmotic pressure and the Donnan membrane equilibrium. -Optical properties -The electrical properties of colloidal systems. -Electro kinetic phenomena and electro kinetic theory. Colloid stability (flocculation concentration, Schulze-Hardy rule, the DLVO theory). -Systems containing lyophiles.</p> <p><u>Catalysis and Surface Chemistry</u> -Introduction -Homogeneous, heterogeneous and enzyme catalysis). -Catalyst poisons. -Requirements for industrially useful -chemical reactions. -Some applications. Liquid-gas -Surface and interfacial tension. -Adsorption at interface -Orientation at interface -Thermodynamics of adsorption -Solid-gas interface Solid-gas interface (Physical and chemical adsorption. Adsorption isotherms) The solid-liquid interface. (Contact angle and wetting. Applications).</p> <p><u>Electrochemistry (3)</u> Introduction - Fick's law -Limiting, charging -mechanism of corrosion. -Migration currents. -Types, theories -Passivity -Pitting. Thermodynamics of corrosion -Measurement of corrosion rate. -Corrosion prevention -Inhibitors.</p>
<p>5. Teaching and learning methods</p>	<p>4.1.Lecture 4.2. Contact hours 5.3. Problem-Based Learning 4.4. Encourage students to use online and library resources</p>



6. teaching and learning methods for students with special needs	-----
7. Student Assessment	Final-Term Examination to assess the student skill in presenting facts, applications, theories and calculations
a) Procedures used:	-----
b) Schedule:	Assessment 1 Final-Term Examination Week16
c) Weighing of Assessment:	Mid-Term Examination: - Final-Term Examination: 150 Oral Examination: - Practical Examination: - Semester Work: - <hr/> Total: 150
8. List of Textbooks and References:	Modern Electrochemistry 1: Ionics, John O'M. Bockris and Amulya K.N. Reddy, Springer; 2 nd edition (1998). General Chemistry, Peter William Atkins and J. A. Beran, W.H. Freeman & Sons Company; 2 nd edition (1992)
a) Course Notes	Lecture notes of physical chemistry for 4 th year students - faculty of science – Damanhour - Alexandria University.
b) Required Books (Textbooks)	-----
c) Recommended Books	H. R. Krut, Colloid Science Elsevier publishing Co
d) Periodicals, web sites,....etc	-----

Course Instructor:

Head of Department: Dr. Medhat A. Shaker

Dr. Medhat A. Shaker

Date: ----/----/----