



Course specification

University/Academy: Damanhour University

Faculty/Institute: Science

Department: Chemistry

1. course Data:

Course code: Chem 102	Course title: General Chemistry 2 (Physical Chemistry)	Academic year/level: 2007/208 1 st year/ 2 nd term
Specialization: Mathematics. Physics group and Biology group	No. of instructional units: lecture 3 hr/week tutorial 1 hrs/week practical 3 hrs/week	

2. course Aim

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

Realize some basic concepts of physical chemistry. Recognize the fundamental information about the gaseous state of matter. Familiarize intermolecular forces, liquid and solid states and phase diagram. Know the elementary thermodynamics and thermochemistry and their applications. Study the principles of chemical and ionic equilibria. Introduce the main information about the electrical conductance.

Enable the students to have an idea about types of solutions, concentration units, adsorption, fractional and steam distillations, effects of temperature and pressure on solubility and colligative properties of solutions

3. Intended learning outcome

a) Knowledge and understanding

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

A1: define the basic concepts of physical chemistry.

A2: mention the main theories and laws of thermochemistry, thermodynamics, gases and chemical equilibrium.

A3: define the electrical conductance and its applications.



b) Intellectual skills	On completing this course, students will be able to: B1: conclude the gases and thermodynamics laws. B2: compare different types of thermochemical reactions. B3: implement Le-Chatelier principle.
c) Professional skills	By the end of the course, students will be able to: C1: use procedures for determination of molecular weights of a substance and dissociation constants of weak acids. C2: examine conductance of solutions. C3: Calculate solubility and solubility product of simple inorganic salts.
d) General skills	D1: Use IT and web search engines for collecting information. D2: Work effectively in a team, and independently on solving organic chemistry problems. D3: Exchange ideas, principles and information by oral, written and visual means.
4. course content	Chemical calculations using chemical formulae and equations. The gaseous state: Gas laws, gas stoichiometry calculations, kinetic theory of gases Deviation of gases, critical constants of gases liquefaction of gases, Molecular forces, intermolecular forces, intramolecular forces., The liquid state Vapour pressure of liquids, diffusion in liquids, surface tension, viscosity, The solid state Changes relating physical properties to structure, phase diagram, Solutions Types of solutions, concentration units, solutions of gases in liquids and liquids in liquids, Fractional and steam distillations, effects of temperature and pressure on solubility, Adsorption, colligative properties of solutions, Elementary thermodynamics Zeroth, first, second and third laws, Enthalpy, heat capacity and specific heats, constant, thermochemistry heat summation, bond energies, Chemical and ionic equilibrium Le Chatelier's principle, the law of mass action, equilibria in heterogeneous systems, Electrolytic conductance
5. Teaching and learning methods	5.1. Lectures and seminars using data show and board. 5.2. Laboratory work and assignment. 5.3. Problem classes and group tutorial. 5.4. Reports and discussion groups.



<p>6. teaching and learning methods for students with special needs</p>	<p>.....</p>																
<p>7. Student Assessment</p>	<p>5.1. Quizzes. 5.2. Mid term exam. 5.3. Practical exam. 5.4. Final term exam.</p>																
<p>a) Procedures used:</p>	<p>-----</p>																
<p>b) Schedule:</p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-left: 40px;">Assessment 1: Quizzes</td> <td style="text-align: right;">Week: 4, 8, 12</td> </tr> <tr> <td style="padding-left: 40px;">Assessment 2: Mid term exam</td> <td style="text-align: right;">Week: 9</td> </tr> <tr> <td style="padding-left: 40px;">Assessment 3: Practical exam</td> <td style="text-align: right;">Week: 12</td> </tr> <tr> <td style="padding-left: 40px;">Assessment 4: Final term exam</td> <td style="text-align: right;">Week: 14</td> </tr> </table>	Assessment 1: Quizzes	Week: 4, 8, 12	Assessment 2: Mid term exam	Week: 9	Assessment 3: Practical exam	Week: 12	Assessment 4: Final term exam	Week: 14								
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<p>8. List of Textbooks and References:</p>	<p>Physical chemistry, Peter Atkins, Julio de Paula, Oxford University Press, New York, Oxford, 2006.</p>																
<p>a) Course Notes</p>	<p>Physical chemistry</p>																
<p>b) Required Books (Textbooks)</p>	<p>-----</p>																
<p>c) Recommended Books</p>	<p>Physical chemistry, Thomas Engel, Philip Reid, Publisher: Pearson Benjamin Cummings, San Francisco, 2006.</p>																



	Elements of physical chemistry, Atkins, P. W., Publisher: W.H. Freeman, Oxford University Press, New York, 2005.
d) Periodicals, web sites,...,etc	www.Elsevier.com

Course Instructor: Dr. Medhat A. Shaker

Head of Department: Dr. Medhat A. Shaker

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