



Universitat de Lleida

DEGREE CURRICULUM **CHEMISTRY**

Coordination: Jordi Casanovas

Academic year 2013-14

Subject's general information

Subject name	Chemistry
Code	102107
Semester	1r Q Avaluació Continuada
Typology	Troncal
ECTS credits	6
Groups	2 Grups Grans, 4 Grups Mitjans
Theoretical credits	0
Practical credits	0
Coordination	Jordi Casanovas
Department	Química
Important information on data processing	Consult this link for more information.
Language	Catalan
Office and hour of attention	Jordi Casanovas DII. 17-19h / Despatx 2.14 (EPS) Marià Torrent DII. 15-17h / Despatx 2.14 (EPS)

Jordi Casanovas Salas (grups matí)
Maria Torrent Mezcuca (grups tarda)

Subject's extra information

Continuous work of students throughout the semester, reading basic references and solving exercises. Visit the Virtual Campus frequently, since there will be uploading useful material: backup of the theoretical presentations, collections of exercises, instructions for the practices ... Take advantage of office hours / tutoring with teachers.

Learning objectives

see competences

Competences

?Degree-specific competences

- Ability to understand and apply the principles of a basic knowledge of general chemistry, organic and inorganic chemistry and their applications in engineering.

Goals

- Reviewing basic concepts of chemistry (Chapter 1)
- Understanding the internal structure of atoms, its electronic configuration and the information contained in the Periodic Table (Chapter 2)
- Understanding the concept of chemical bonding, predict the types of bond present in any substance. In covalent molecules, knowing how to draw Lewis structures and predict their geometry (Chapter 3)
- Understanding basic concepts of crystallography, evaluate magnitudes that characterize structurally the crystals, known of common crystal structures (Chapter 4)
- Interpreting phase equilibrium diagrams (Chapter 5)

Degree-transversal competences

- Ability to resolve problems and elaborate and defend arguments inside their field of study

Goals

- Learning to think, solve and explain correctly a chemistry problem.

Subject contents

Chapter 1: Introduction to Chemistry

- 1.1 Matter and chemical reactions
- 1.2 Atomic and Molecular Masses
- 1.3 Composition
- 1.4 Mol concept
- 1.5 Stoichiometric calculations
- 1.6 Mixtures and solutions
- 1.7 Gases

Chapter 2: Atomic Structure

- 2.1 Atomic Theory
 - 2.1.1 Limitations of classical physics
 - 2.1.2 Monoelectronic atoms
 - 2.1.3 Polyelectronic atoms
- 2.2 Periodic Table
- 2.3 Periodic Properties

Tema3: Chemical Bonding. Intermolecular forces

- 3.1 The chemical bond
- 3.2 Ionic bond
- 3.3 Covalent bond
 - 3.1.1. Lewis structures
 - 3.1.2. VSEPR method

3.4 Metallic bond

3.5 Hydrogen bond and van der Waals forces

Chapter 4: Structure of crystalline solids

4.1 Physical States of Matter

4.2 Structure of Crystals

4.2.1. Crystal structure

4.2.2. Unit cell

4.2.3. Notation of points, directions and plans

4.2.4. Determination of the crystal structure: X-ray

4.3 Metallic solids

4.4 Ionic solids

4.5 Covalent solids

4.6. Molecular solids

Chapter 5: Phase equilibria

5.1 Definitions

5.2 Gibbs rule

5.3 Phase diagram for a single component

5.4 Phase equilibria in binary systems

5.4.1. Miscibility between solids

5.4.2. Miscibility in liquid and solid phases

5.4.3. Miscibility in liquid phase and immiscibility in solid phase

5.4.4. Partial miscibility

5.4.5. Three phases reactions

5.5 Iron-carbon system

Evaluation

Without translate-

Activitat d'Avaluació 1 (AA1). Prova escrita, Temes 1-3, Percentatge de la Qualificació Final: 25%

Activitat d'Avaluació 2 (AA2). Prova escrita, Temes 1-5, Percentatge de la Qualificació Final: 50%

Activitats Pràctiques. Percentatge de la Qualificació Final: 10%

Altres Activitats. Tests. Percentatge de la Qualificació Final: 15%

Activitat de Recuperació. Permet recuperar el 75% de la qualificació final (Equivalent a AA1+AA2)

Bibliography

Basic bibliography:

P. Atkins y L. Jones, "*Principios de química*", 3ª Ed., Editorial Medica Panamericana, Buenos Aires, 2006

J. Casabó, "*Estructura atómica y enlace químico*", Editorial Reverté. Barcelona, 1996

J. Casanovas y C. Alemán, "*Introducción a la Ciencia de los Materiales*", Cálamo Producciones Editoriales, Colección Manuales Básicos, Barcelona, 2002

R. Petrucci y W.S. Harwood, "*Química general*", Prentice Hall. Madrid, 1998

K.W. Whitten, R.E. Davis y M.L. Peck, "*Química general*", 5ª Ed., McGraw Hill. Madrid, 1998

Recommended bibliography:

W.D. Callister Jr., "*Introducción a la Ciencia e Ingeniería de los Materiales*", 3ª Ed., Ed. Reverté S.A., Barcelona, 1995

J.F. Shackelford, "*Introducción a la Ciencia de Materiales para Ingenieros*", 4ª Ed., Prentice Hall Iberia, Madrid, 1998

W.F. Smith, "*Fundamentos de la Ciencia e Ingeniería de Materiales*", 3ª Ed., McGraw-Hill, Madrid, 1998

Altres material didàctic s'anirà penjant al Campus Virtual: <http://cv.udl.cat>