Chemical basis of engineering

Academic Year: (2019 / 2020) **Review date: 28-04-2020**

Department assigned to the subject: Materials Science and Engineering and Chemical Engineering Department

Coordinating teacher: GONZALEZ BENITO, FRANCISCO JAVIER

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

OBJECTIVES

By the end of this content area, students will be able to have:
1. Knowledge and understanding of the chemical basis, organic and inorganic applied chemistry underlying the branch of industrial engineering;
2. The ability to apply their knowledge and understanding to identify, formulate and solve problems of chemical basis, organic and inorganic applied chemistry using established methods;
3. The ability to design and conduct appropriate experiments of chemistry, interpret the data and draw conclusions;
4. Workshop and laboratory skills in chemistry.
5. The ability to select and use appropriate equipment, tools and methods to solve problems of chemical basis, organic and inorganic applied chemistry;
6. The ability to combine theory and practice to solve of chemical basis, organic and inorganic applied chemistry.
7. The ability to function effectively both individually and as a team.

DESCRIPTION OF CONTENTS: PROGRAMME

IMPORTANT: the schedule will be adjusted according to the recently approved by Junta de Escuela in April / May 2013

Atoms, Molecules and Ions. Chemical bonding.
Thermochemistry and chemical equilibrium.
Chemical Equilibrium: Acid-Base and solubility equilibriums. Electrochemistry.
Chemical Kinetics
Applied Organic and Inorganic Chemistry
Basic operations in Chemical Engineering

LEARNING ACTIVITIES AND METHODOLOGY

Theoretic lessons
Lesson dedicated to solving problems and exercises
Individual and collective tutorial sessions.
Material with solved and unsolved problems (but with solutions) with the aim of directing the personal work of the student.
Laboratory practical sessions

- Before accessing the laboratories, all students should watch some videos on safety in chemistry laboratories and, after that, they have to pass some virtual questionnaires (Aula Global) in order to demonstrate the contains of the videos are understood.

ASSESSMENT SYSTEM

Continuous evaluation (40 %):
- Tests performed in class (30%)
- Attendance to practical sessions and assessed practical work paper (10%),

Final exam (60%).
Laboratory practices are mandatory for being assessed.
For being averaged with the continuos assement, marks higher than 4.0 must be obtained in the final exam.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- K. HEINZ BÜCHNER, HANS-HEINRICH MORETTO, P. WODITSCH, Industrial Inorganic Chemistry, Wiley-VCH; 2000..
- K. WEISSERMEL, HANS-JÜRGEN ARPE, Industrial Organic Chemistry, 4th Edition, Wiley & Sons; 1997..
- M.D. Reboiras Química: La Ciencia Básica, Thomson-Paraninfo, 2006
- M.D. Reboiras Problemas resueltos de Química. La ciencia básica, Paraninfo. , 2012
- P.W. ATKINS, L. JONES. Chemical Principles, W H Freeman & Co, 2001.
- R. CHANG. Chemistry,, McGraw-Hill Science, 2006..