

Academic Year: (2019 / 2020)

Review date: 04-05-2020

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

Coordinating teacher: OLMOS DIAZ, DANIA

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

OBJECTIVES

To understand the basic principles of Chemistry: structure and properties of matter, thermochemistry and chemical equilibrium.

To understand the basic principles of Chemical Engineering: mass balances, chemical equilibrium and reaction rates.

To introduce the main inorganic and organic products and their production processes.

To explain the reactivity of the main inorganic and organic functional groups as well as their application in industrial synthesis.

To enable students to operate simple analytical equipment, to analyse and interpret their results

General skills encouraged during the duration of the course:

-Ability to solve complex problems

-Ability to search for, understand and use relevant information in a decision-making process

-Ability to apply multidisciplinary knowledge for resolving a specific problem

-Ability to work in a group and distribute the workload in order to solve complex problems

General skills acquired by the student:

- Ability to obtain the necessary information, knowledge or understanding in order to develop solutions for specific applications

DESCRIPTION OF CONTENTS: PROGRAMME

Atoms, Molecules and Ions. Chemical bonding.

Thermochemistry and chemical equilibrium.

Chemical Equilibrium: Acid-Base and solubility equilibria. Electrochemistry.

Chemical Kinetics

Applied Organic and Inorganic Chemistry

Basic operations in Chemical Engineering

LEARNING ACTIVITIES AND METHODOLOGY

Master classes, tutorial classes in small groups dedicated to resolving student questions and doubts, student presentations, individual tutorials, and individual work by the students; activities dedicated to acquisition of theoretical knowledge related to the lecture course (3 ECTS credits)

Laboratory practical sessions and classes in small groups dedicated to solving question sheets, individual tutorials and individual work by the student; activities dedicated to acquisition of practical skills related to the lecture course (3 ECTS credits)

ASSESSMENT SYSTEM

- Continuous evaluation (minimum 40 %): continuous evaluation will be based on class attendance and assessed tests performed in class (30%) and attendance to practical sessions and assessed practical work paper (10%),
- Final exam (60%).

The assistance to the laboratory sessions is MANDATORY. The entrance to the laboratory is enabled once the student has watched the general security video and the specific video for chemistry/materials lab and answered both tests correctly. THE STUDENT CAN NOT ENTER THE LABORATORY IF HE/SHE HAS NOT ANSWERED THE TESTS. THE NON-ASSISTANCE TO THE LABORATORY WITHOUT JUSTIFIED CAUSE IMPLIES SUSPENDING THE CONTINUOUS EVALUATION.

% end-of-term-examination:	60
% of continuous assessment (assignments, 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..
- P.W. ATKINS, L. JONES. Chemical Principles, W H Freeman & Co, 2001.
- R. CHANG. Chemistry,, McGraw-Hill Science, 2006..