

Course guide

295022 - FP - Fundamentals of Polymers

Last modified: 14/06/2023

Unit in charge: Barcelona East School of Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.
Degree: BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Compulsory subject).
Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: MARIA LLUÏSA MASPOCH RULDUA

Others:

Primer quadrimestre:
TOBIAS MARTIN ABT - Grup: M21, Grup: M22
NICOLAS CANDAU - Grup: M21, Grup: M22
NOEL LEÓN ALBITER - Grup: M21, Grup: M22
ALFONSO DAVID LOAEZA BECERRIL - Grup: M21, Grup: M22
MARIA LLUÏSA MASPOCH RULDUA - Grup: M21, Grup: M22
ORLANDO ONOFRE SANTANA PEREZ - Grup: M21, Grup: M22

Segon quadrimestre:
TOBIAS MARTIN ABT - Grup: M11
NICOLAS CANDAU - Grup: M11
NOEL LEÓN ALBITER - Grup: M11
ALFONSO DAVID LOAEZA BECERRIL - Grup: M11
MARIA LLUÏSA MASPOCH RULDUA - Grup: M11
ORLANDO ONOFRE SANTANA PEREZ - Grup: M11

PRIOR SKILLS

General knowledge of chemistry

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CEB-04. Understand the fundamental principles of general, organic and inorganic chemistry and apply them in engineering.
CEI-09. Understand the fundamentals of materials science, technology and chemistry. Understand the relationship between the microstructure, synthesis or processing and the properties of materials.

Transversal:

07 AAT N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.

TEACHING METHODOLOGY

MD1: Expository class with material available in digital campus
MD2: Seminars and activities deliverables
MD3: Conducting laboratory practices



LEARNING OBJECTIVES OF THE SUBJECT

1. Review the basic concepts of organic chemistry
2. Know the main reactions of polymerization
3. Learn how to calculate and determine the average molecular mass of polymers
4. Know the polymer identification techniques

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	45,0	30.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

Principios de Química Orgánica

Description:

Introduction
Main reactive groups
Attractive forces
Isomerías
Main reactions

Related activities:

Practices with molecular models

Full-or-part-time: 49h 40m

Practical classes: 15h
Laboratory classes: 2h
Guided activities: 1h
Self study : 31h 40m



Polymers

Description:

Basic definitions
Polymerization reactions
Molecular structure
Polymerization systems
Dimensions of the chain
Identification of polymers
Main reactions
Dimensions of the chain
Identification of polymers

Related activities:

1. Viscosymmetry
2. Obtaining thermoplastics (PA6.10)
3. Preparation PU foams
- 4 Identification by flame behavior
5. IR identification

Full-or-part-time: 105h 20m

Practical classes: 30h

Laboratory classes: 10h

Guided activities: 2h

Self study : 63h 20m

GRADING SYSTEM

The final mark (Nf) will be calculated according to the following table:

Type of evaluation: Continuous evaluation

Note deliverable activities (A) = 10%

Lab note (P) = 20%

Final Exam (EF) = 70%

Final mark (Nf): $0.1 A + 0.2 P + 0.7 EF$

The re-evaluation replaces the final exam grade. To be able to submit to the re-evaluation, it is necessary to have attended all the laboratory practices and submitted the corresponding reports.

BIBLIOGRAPHY

Basic:

- Bruice, Paula Yurkanis. Organic chemistry : study guide and solutions manual. Harlow, England: Pearson, 2017. ISBN 9781292160436.

- Callister, William D. Introducción a la ciencia e ingeniería de los materiales [on line]. 2a ed. Barcelona [etc.]: Reverté, 1995-1996 [Consultation : 24/11/2021]. Available on : <https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2616389>. ISBN 9786070500251.

RESOURCES

Other resources:

Presentations of the classes available in atenea

Practice script available at atenea

Script of the activities available in atenea