

Academic Year: (2022 / 2023)

Review date: 23-05-2022

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

Coordinating teacher: SERRANO PRIETO, MARIA BERNARDA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 1

DESCRIPTION OF CONTENTS: PROGRAMME

Advanced polymer materials specific topics:

- Introduction. Polymer technology.
- Macromolecular conformations. Molecular weights
- Polymer Synthesis. Polymerization Techniques
- Solid State of Polymers. Relaxations in amorphous polymers, melting and crystallization.
- Viscoelasticity.
- Elasticity of rubber.
- Polymer Blends and multicomponent systems.
- Advanced techniques of synthesis and functionalization, polymers for advanced applications.
- Hydrogels
- Polymers for biomedical applications
- Dielectric and conductive properties of polymers and their applications
- Simulation with molecular dynamics of Polymers

ASSESSMENT SYSTEM

Participation in theoretical classes and laboratories and demonstrated critical analysis capacity on the issues raised (SE1) 5%

Completion and / or presentation of works, exercises or reports carried out individually or collectively throughout the course (SE2) 0-10%

Carrying out laboratory practices, preparation, presentation and discussion of detailed reports or questionnaires on the techniques used and the experimental results obtained. (SE3) 15- 25%

Final evaluation exam of the subject carried out individually, in writing or orally (SE4) 70%

% end-of-term-examination: 70

% of continuous assessment (assignments, laboratory, practicals...): 30

BASIC BIBLIOGRAPHY

- Dietrich Braun, Harald Cherdrón, Matthias Rehahn, Helmut Ritter, Brigitte Voit Polymer Synthesis: Theory and Practice, Springer Berlin Heidelberg, 2013
- M. Rubinstein, Ralph H. Colby Polymer Physics , OXFORD UNIVERSITY PRESS, 2003
- D.R. Paul, C.B. Bucknall, Polymer Blends, Vol. I: formulation y Vol. II: performance; Ed. Wiley-Interscience, N.Y., 2000..
- E.A. Turi Polymer Blends and Block Copolymers, en Thermal Characterization of Polymeric Materials, Vol 1, and Vol 2 Academic Press, USA, 1997..
- L.H. Sperling Physical Polymer Science, Wiley-Interscience third edition, USA, 2001.
- Montgomery T. Shaw, William J. MacKnight Hardcover \$117.25 Introduction to Polymer Viscoelasticity, 3rd edition, Wiley-Interscience, USA, 2005