



Course guide

320165 - POLENG - Polymers in Engineering

Last modified: 02/04/2024

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Xavier Cañavate

Others: Xavier Cañavate, Xavier Colom

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. IND_COMMON: Knowledge of the science principles, technology and materials . Understanding the relation between the microstructure, synthesis or processing and properties of these materials.

Transversal:

2. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	60,0	40.00

Total learning time: 150 h

CONTENTS

(ENG) Tema 1: Introducció als polímers

Full-or-part-time: 7h 30m

Theory classes: 3h

Self study : 4h 30m

(ENG) Tema 2: Síntesi de polímers

Full-or-part-time: 2h 30m

Theory classes: 1h

Self study : 1h 30m

(ENG) Tema 3: Microestructura morfologia i propietats

Full-or-part-time: 7h 30m

Theory classes: 3h

Self study : 4h 30m

(ENG) Tema 4: Propietats mecàniques

Full-or-part-time: 15h

Theory classes: 6h

Self study : 9h

(ENG) Tema 5: Propietats funcionals

Full-or-part-time: 10h

Theory classes: 4h

Self study : 6h

(ENG) Tema 6: Introducció als principals processos de transformació de polímers

Full-or-part-time: 2h 30m

Theory classes: 1h

Self study : 1h 30m

(ENG) Tema 7: Barreges de polímers

Full-or-part-time: 15h

Theory classes: 6h

Self study : 9h



(ENG) Tema 8: Biopolímers i fibres

Full-or-part-time: 15h

Theory classes: 6h

Self study : 9h

(ENG) Tema 9: Caracterització de polímers

Full-or-part-time: 25h

Theory classes: 10h

Self study : 15h

(ENG) Tema 10: Materials Compòsits

Full-or-part-time: 25h

Theory classes: 10h

Self study : 15h

(ENG) Tema 11: Introducció als criteris de selecció de materials polimèrics

Full-or-part-time: 25h

Theory classes: 10h

Self study : 15h

ACTIVITIES

(ENG) CLASSES DE TEORIA

Full-or-part-time: 60h

Theory classes: 60h

(ENG) 1ER EXAMEN

Full-or-part-time: 3h

Theory classes: 3h

(ENG) 2ON EXAMEN

Full-or-part-time: 3h

Theory classes: 3h

(ENG) ACTIVITAT AVALUACIÓ ESPECÍFICA

Full-or-part-time: 1h

Theory classes: 1h

GRADING SYSTEM

- 2 exams: 35% cada un
- 2 evaluation specific activities: 15,15%

All those students who fail, want to improve their mark or cannot attend the partial exam, they will have the opportunity to be examined the same day of the final exam. If due to the circumstances it is not viable to do it the same day of the final exam, the teacher responsible for the subject will propose, via the platform Atenea, that the mentioned recovery exam will be carried out another day, in class schedule.

The new mark of the recovery exam will substitute the previous one, unless it is lower.

BIBLIOGRAPHY

Basic:

- Painter, P.C.; Coleman, M.M. Fundamentals of polymer science: an introductory text. 2nd ed. Lancaster [etc.]: Technomic, cop. 1997. ISBN 1566765595.
- Michaeli, W. Plastics processing: an introduction. Munich: Cincinnati: Hanser; Hanser Gardner, cop. 1995. ISBN 3446175725.
- Gilbert, M. (ed.). Brydson's plastics materials. 8th ed. Oxford: Butterworth-Heinemann, 2017. ISBN 9780323358248.
- Painter, P.C.; Coleman, M.M. Essentials of polymer science and engineering. Lancaster: DEStech Publications, 2009. ISBN 9781932078756.

Complementary:

- Gruenwald, Geza. Plastics: how structure determines properties. Munich [etc.]: Hanser, cop. 1993. ISBN 3446165207.
- Young, R.J.; Lovell, P.A. Introduction to polymers. 3rd ed. Boca Raton [etc.]: CRC Press, cop. 2011. ISBN 9780849339295.
- McCrum, N.G; Buckley, C.P; Bucknall, C.B. Principles of polymer engineering. 2nd ed. Oxford, [etc.]: Oxford University Press, 1997. ISBN 0198565267.
- Osswald, T.A.; Menges, G. Materials science of polymers for engineers [on line]. 3rd ed. Munich [etc.]: Cincinnati: Hanser, 2012 [Consultation: 27/07/2022]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9781569905142/material-science-of-polymers-for-engineers>. ISBN 9787569905142.
- Ashby, M. F. Materials selection in mechanical design [on line]. 4th ed. Burlington (Massachusetts): Butterworth-Heinemann, cop. 2011 [Consultation: 20/09/2022]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9781856176637/materials-selection-in-mechanical-design>. ISBN 9781856176637.
- Hull, Derek. Materiales compuestos. Barcelona [etc.]: Reverté, cop. 1987. ISBN 8429148396.
- Michaeli, W. [et al.]. Tecnología de los composites/plásticos reforzados. Barcelona: Hanser, DL 1992. ISBN 8487454046.
- Miravete, A.; Larrodé, E. Materiales compuestos. Zaragoza: A. Miravete, 2000. ISBN 9788492134977.