



Course guide

820523 - EPQ - Chemical Process Engineering

Last modified: 27/05/2024

Unit in charge: Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer: ANTONIO ESPUÑA CAMARASA

Others: Primer quadrimestre:
ANTONIO ESPUÑA CAMARASA - Grup: M11, Grup: M12
ANNA PALLARÉS LÓPEZ - Grup: M11, Grup: M12

Segon quadrimestre:
ANTONIO ESPUÑA CAMARASA - Grup: T11

PRIOR SKILLS

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REQUIREMENTS

OPERACIONS BàSIQUES II - Prerequisit
SIMULACIÓ I OPTIMITZACIÓ DE PROCESSOS QUÍMICS - Prerequisit

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

2. Analyse, design, simulate and optimise processes and products.
CEQUI-22. Design, manage and run simulation, control and instrumentation procedures in chemical processes.
CEQUI-26. Study the feasibility of a proposed project.
CEQUI-27. Understand spatial vision and graphic representation techniques, whether using traditional metric and descriptive geometry methods or computer assisted design applications.
12. Understand mass and energy balances, biotechnology, mass transfer, separation operations, chemical reaction engineering, the design of reactors, and the recovery and processing of raw materials and energy resources.

General:

CG-04. (ENG) Capacidad de resolver problemas con iniciativa, toma de decisiones, creatividad, razonamiento crítico y de comunicar y transmitir conocimientos, habilidades y destrezas en el campo de la Ingeniería Industrial.
CG-07. (ENG) Capacidad de analizar y valorar el impacto social y medioambiental de las soluciones técnicas.

Transversal:

14. 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.
19. ENTREPRENEURSHIP AND INNOVATION - Level 3. Using knowledge and strategic skills to set up and manage projects. Applying systemic solutions to complex problems. Devising and managing innovation in organizations.
22. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
25. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

TEACHING METHODOLOGY

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LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	30,0	20.00
Hours small group	30,0	20.00

Total learning time: 150 h

CONTENTS

Introduction

Description:

Please check the Spanish version.

Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 11h

Theory classes: 1h

Laboratory classes: 2h

Guided activities: 6h

Self study : 2h



Computational tools (Simulation and optimization)

Description:

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Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 16h

Theory classes: 1h

Laboratory classes: 5h

Guided activities: 8h

Self study : 2h

Process Synthesis

Description:

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Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

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

Theory classes: 0h 30m

Self study : 2h

Process Analysis

Description:

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Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

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

Theory classes: 0h 30m

Self study : 2h



Product Engineering

Description:

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Specific objectives:

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Related activities:

Please check the Spanish version.

Related competencies :

CEQUI-20. Analyse, design, simulate and optimise processes and products.

Full-or-part-time: 5h

Theory classes: 1h

Self study : 4h

Separation systems engineering

Description:

Please check the Spanish version.

Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 18h

Theory classes: 4h

Laboratory classes: 4h

Guided activities: 8h

Self study : 2h

Reaction Systems engineering

Description:

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Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 14h

Theory classes: 4h

Laboratory classes: 2h

Guided activities: 6h

Self study : 2h



Control Systems Engineering

Description:

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Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 4h

Guided activities: 2h

Self study : 2h

Process Integration

Description:

Please check the Spanish version.

Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 26h

Theory classes: 4h

Laboratory classes: 6h

Guided activities: 14h

Self study : 2h

Process Systems Engineering - complete case study

Description:

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Specific objectives:

Please check the Spanish version.

Related activities:

Please check the Spanish version.

Full-or-part-time: 51h

Laboratory classes: 15h

Guided activities: 30h

Self study : 6h

GRADING SYSTEM

Please check the Spanish version

EXAMINATION RULES.

Please check the Spanish version



BIBLIOGRAPHY

Basic:

- Seider, Warren D. Product and process design principles : synthesis, analysis, and evaluation. 4rd ed. Hoboken: John Wiley & Sons, cop. 2017. ISBN 9781119588009.
- Biegler, Lorenz T.; Grossmann, Ignacio E.; Westerberg, Arthur W. Systematic methods of chemical process design. Upper Saddle River (New Jersey): Prentice Hall PTR, cop. 1997. ISBN 0134924223.
- Smith, Robin. Chemical process design and integration. Chichester, UK: John Wiley & Sons, cop. 2005. ISBN 0471486817.
- Douglas, James M. Conceptual design of chemical processes. New York [etc.]: McGraw-Hill, cop. 1988. ISBN 0070177627.
- Ulrich, Gael D. A Guide to chemical engineering process design and economics. New York [etc.]: Wiley, cop. 1984. ISBN 0471082677.
- Edgar, Thomas F.; Himmelblau, David Mautner; Lasdon, Leon S. Optimization of chemical processes. 2nd ed. Boston [etc.]: McGraw-Hill, cop. 2001. ISBN 0070393591.

Complementary:

- CAPE : computer aided process and product engineering. Weinheim: Wiley-VCH, cop. 2006. ISBN 9783527308040.

RESOURCES

Other resources:

Please check the Spanish version