820532 - SOPQ - Simulation and Optimisation of Chemical Processes

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering
Academic year: 2017
Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, English

Teaching staff
Coordinator: Moisés Graells Sobré,
Others: Moisés Graells Sobré, Francesc Estrany Coda, Montserrat Pérez, Margarita Sánchez

Opening hours
Timetable: Generally, the hour before the beginning of the class and the hour later of that class.

Prior skills

Requirements
Chemical Engineering
Industrial Control and Automatitzación
Physical chemistry
Heat Transfer Operations
Chemical Engineering Laboratory I

Degree competences to which the subject contributes

Specific:
2. Analyse, design, simulate and optimise processes and products.

Transversal:
1. 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
The course uses the narrative method by 20%, group work in the laboratory at 5%, individual work 45%, work in groups by 30%.
Competition in solvent use information resource, which is the rate that corresponds to this subject will be assessed in the work of the student to perform exercises that will be commissioned during the quarter, as well as in the final examination.

Learning objectives of the subject
Learn simulate processes and industrial operations.
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Ability to use commercial simulators processes.
Use modern engineering tools most appropriate in each case.
Understand and analyze the dynamics of chemical processes.
Understand, learn typing and learn to predict the response of chemical processes in the disturbances and control actions.
Dynamic process modeling and proceed to the basic design of automation and control systems.
Understand and apply methods to adjust control systems.

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<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>30h</th>
<th>20.00%</th>
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<tbody>
<tr>
<td>Total learning time: 150h</td>
<td>Hours medium group:</td>
<td>0h</td>
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<td>Guided activities:</td>
<td>Hours small group:</td>
<td>30h</td>
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<td>Self study:</td>
<td>Guided activities:</td>
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<td>Self study:</td>
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| **(ENG) Tema 1. Introducció** | Theory classes: 3h  
Self study : 5h |

**Description:**  

**Related activities:**  
Exercicis de supòsits relacionats amb el contingut del tema, realitzats amb suport Excel.

**Specific objectives:**  
Aprendre a modelitzar, analitzar i a simular processos químics en estat estacionari. Aprendre a programar funcions d'usuari per a la resolució numèrica de les equacions dels models i per al càlcul de propietats termodinàmiques. Aprendre a ajustar els paràmetres d'un model.

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<tr>
<th><strong>(ENG) Tema 2.</strong></th>
<th>Learning time: 8h</th>
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| **Description:**  

**Related activities:**  
Practical case exercises related to the content of this chapter, made on Excel.

**Specific objectives:**  
Learning to model, analyze and simulate chemical processes in steady state. Learn to program user functions for the numerical solution of the equations and models to calculate thermodynamic properties. Learn to adjust the parameters of a model.

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<th><strong>(ENG) Tema 3.</strong></th>
<th>Learning time: 8h</th>
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| **Description:**  

**Related activities:**  
Practical case exercises related to the content of this chapter, made on Excel.

**Specific objectives:**  
Learning to model, analyze and simulate chemical processes in steady state. Learn to program user functions for the numerical solution of the equations and models to calculate thermodynamic properties. Learn to adjust the parameters of a model.
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<td>Self study: 5h</td>
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<td>Self study: 5h</td>
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| (ENG) - | **Learning time:** 8h  
Theory classes: 2h  
Self study: 6h |
| (ENG) - | **Learning time:** 7h 30m  
Theory classes: 2h  
Laboratory classes: 2h 30m  
Self study: 3h |
| (ENG) - | **Learning time:** 7h 30m  
Theory classes: 2h  
Laboratory classes: 2h 30m  
Self study: 3h |
| **(ENG) Tema 14. Simuladors comercials per processos dinàmics - II** | **Learning time:** 7h 30m  
Theory classes: 2h  
Laboratory classes: 2h 30m  
Self study: 3h |
| (ENG) Tema 15. Accions de Conctrol | **Learning time:** 8h  
Theory classes: 3h  
Self study: 5h |
| **Related activities:**  
(ENG) Exercicis de supòsits relacionats amb el contingut del tema, realitzats amb suport Excel. |
| (ENG) Tema 16. Simuladors comercials aplicats als Sistemes de Control | **Learning time:** 8h  
Theory classes: 3h  
Self study: 5h |
Regulations for carrying out activities

Students will be tested individually in a computer classroom. Consist in developing proposed solutions to a simulation exercise and regulation of a process and must be submitted in computer readable form as an exercise program developed with the relevant simulation within the time limit fixed by the teachers.

Bibliography

Basic:


Complementary: