



## Course guides

# 330157 - OS - Separation Operations

Last modified: 05/05/2020

**Unit in charge:** Manresa School of Engineering  
**Teaching unit:** 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

**Degree:** BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Compulsory subject).  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2016). (Compulsory subject).

**Academic year:** 2020    **ECTS Credits:** 6.0    **Languages:** Catalan

### LECTURER

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**Coordinating lecturer:** ANNA BONSFILLS PEDROS

**Others:** ANTONIO DAVID DORADO CASTAÑO

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

1. (ENG) Utilitzar balanços de matèria i energia en operacions bàsiques. Calcular i dissenyar operacions bàsiques de separació, basades en la transferència de matèria i en la transmissió de calor. Resoldre problemes i aplicar els coneixements teòrics a la pràctica. Desenvolupar la capacitat d'anàlisi i síntesi.

**Transversal:**

2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
4. 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

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### LEARNING OBJECTIVES OF THE SUBJECT

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### STUDY LOAD

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

**Total learning time:** 150 h



## CONTENTS

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### (ENG) 1. Evaporació

**Description:**

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**Full-or-part-time:** 42h

Theory classes: 9h

Practical classes: 8h

Self study : 25h

### (ENG) 2. Destil·lació

**Description:**

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**Full-or-part-time:** 62h

Theory classes: 13h

Practical classes: 11h

Self study : 38h

### (ENG) 3. Humidificació i deshumidificació

**Description:**

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**Full-or-part-time:** 23h

Theory classes: 4h

Practical classes: 5h

Self study : 14h

### (ENG) 4. Assecat de sòlids

**Description:**

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**Full-or-part-time:** 22h

Theory classes: 4h

Practical classes: 5h

Self study : 13h

## ACTIVITIES

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### (ENG) ACTIVITAT 1: RESOLUCIÓ AUTÒNOMA DE PROBLEMES

**Full-or-part-time:** 40h

Self study: 40h



### (ENG) ACTIVITAT 2: PROVES ESCRITES

**Full-or-part-time:** 46h  
Practical classes: 6h  
Self study: 40h

### (ENG) ACTIVITAT 3: PRESENTACIÓ ORAL

**Full-or-part-time:** 12h  
Practical classes: 2h  
Self study: 10h

## GRADING SYSTEM

## BIBLIOGRAPHY

### Basic:

- Henley, E. J.; Seader, J. D.; Roper, D. K. Separation process principles. 3rd ed. Chichester: John Wiley & Sons, 2011. ISBN 9780470646113.
- McCabe, W. L.; Smith, J. C.; Harriott, P. Operaciones unitarias en ingeniería química. 7ª ed. Madrid: McGraw-Hill, 2007. ISBN 9789701061749.
- Treybal, R. E. Operaciones de transferencia de masa. 2ª ed. México: McGraw-Hill, 1988. ISBN 9686046348.
- Ocón, J.; Tojo, G. Problemas de ingeniería química: operaciones básicas. 3ª ed. Madrid: Aguilar, 1968. ISBN 8403209975.
- Martínez, P. J.; Rus, E. Operaciones de separación en ingeniería química: métodos de cálculo. Madrid: Prentice Hall, 2004. ISBN 8420542504.

### Complementary:

- Górak, A.; Sorensen, E., eds. Distillation: fundamentals and principles. London: Elsevier/Academic Press, 2014. ISBN 9780123865472.
- Coulson, J. M.; Richardson, J. F. Ingeniería química: unidades SI. Barcelona: Reverté, 1979-1986. ISBN 8429171347.
- Coulson, J. M.; Richardson, J. F. Ingeniería química: unidades SI. Vol. 4, Soluciones a los problemas de ingeniería química del tomo I; vol. 5, Soluciones a los problemas de ingeniería química del tomo II. Barcelona: Reverté, 1979-1986. ISBN 8429171347.
- Backhurst, J. R.; Harker, J. H.; Porter, J. E. Problemas sobre transferencia de calor y masa. México: El Manual Moderno, 1979. ISBN 9684260644.
- Costa Novella, E. Ingeniería química. Madrid: Alhambra, 1983. ISBN 8420509892.
- Perry, R. H.; Green, D. W., eds. Manual del ingeniero químico [on line]. 4ª ed. Madrid: McGraw-Hill, 2001 [Consultation: 31/07/2020]. Available on: [http://www.ingebook.com/ib/NPcd/IB\\_BooksVis?cod\\_primaria=1000187&codigo\\_libro=6572](http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6572). ISBN 8448130081.
- Perry, R. H.; Green, D. W., eds. Perry's chemical engineers' handbook [CD-ROM]. New York: McGraw-Hill, 1999. ISBN 0071344128.
- Perry, R. H.; Green, D. W., eds. Perry's chemical engineers' handbook [on line]. 8th ed. New York: McGraw-Hill, 2008 [Consultation: 05/04/2018]. Available on: [https://discovery.upc.edu/iii/encore/record/C\\_\\_Rb1324713?lang=cat](https://discovery.upc.edu/iii/encore/record/C__Rb1324713?lang=cat). ISBN 9780071593137.
- Sinnott, R.; Towler, G. Chemical engineering design. 5th ed. Oxford: Butterworth-Heinemann, 2009. ISBN 9780750685511.
- King, C. J. Procesos de separación. México: Repla, 1988. ISBN 9686165061.