Course guide
820464 - SCMFTTCM - Computational Fluid Mechanics and Heat Transfer

Last modified: 04/06/2026

Unit in charge: Barcelona East School of Engineering
Teaching unit: 729 - MF - Department of Fluid Mechanics.

Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2026 **ECTS Credits:** 6.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: RICARDO TORRES CAMARA

Others: Primer quadrimestre:
FRANCESC FONT MARTÍNEZ - Grup: M1
RICARDO TORRES CAMARA - Grup: M1

TEACHING METHODOLOGY

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LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	45,0	30.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

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Description:
content english

Full-or-part-time: 1h
Theory classes: 1h

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Description:
content english

Specific objectives:
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Full-or-part-time: 4h
Theory classes: 4h

title english

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content english

Specific objectives:
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Full-or-part-time: 4h
Theory classes: 4h

title english

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content english

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Theory classes: 4h

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content english

Full-or-part-time: 4h
Theory classes: 4h

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

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BIBLIOGRAPHY

Basic:

- Hirsch, Charles. Numerical computation of internal and external flows : fundamentals of computational fluid dynamics [on line]. Second edition. Oxford, England: Butterworth-Heinemann, [2007] [Consultation: 20/09/2023]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/19srfpi/cdi_askewsholts_vlebooks_9780080550022. ISBN 9786611019280.
- Versteeg, H. K.; Malalasekera, W.. An Introduction to computational fluid dynamics : the finite volume method. 2nd ed. London: Pearson Education, 2007. ISBN 9780131274983.
- Lewis, Roland Wynne; Nithiarasu, Perumal; Seetharamu, Kankanhalli N. Fundamentals of the finite element method for heat and fluid flow. Chichester: Wiley, 2004. ISBN 9780470847886.

Complementary:

- Elman, Howard C.; Silvester, David J.; Wathen, Andrew J. Finite elements and fast iterative solvers : with applications in incompressible fluid dynamics. Oxford: Oxford University Press, 2005. ISBN 019852868X.
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- Chung, T. J. Computational fluid dynamics. Cambridge, UK [etc.]: Cambridge University Press, 2002. ISBN 0521594162.
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- Durbin P. A.; Pettersson Reif; B. A. Statistical Theory and Modeling for Turbulent Flows. John Wiley & Sons, Ltd, 2011.
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- Chapra, Steven C.; Canale, Raymond P. Métodos numéricos para ingenieros [on line]. 7a edición. México: McGraw Hill, 2015 [Consultation: 20/09/2023]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/11q3oqt/alma991001706889706711. ISBN 9781456267346.
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- Ford, William. Numerical Linear Algebra with Applications : Using MATLAB. Academic Press, 2014. ISBN 9780123944351.