Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2025 / 2026 - Course planning

Mondragon
Unibertsitatea
Goi Eskola
Politeknikoa
Escuela Politécnica
Superior

[GH8308] OP S1. COMPUTATIONAL MATHEMATICS LABORATORY

GENERAL INFORMATION

Studies	DEGREE IN MECHANICAL ENGINEERING			**Subject**	?
Semester	1	**Course**	3	**Mention / Field of specialisation**	
Character	OPTIONAL				
Plan	2022	**Modality**	Face-to-face	**Language**	ENGLISH
Credits	4,5	**Hours/week**	1.06	**Total hours**	19 class hours + 93.5 non-class hours = **112.5 total hours**

PROFESSORS

FRAILE SANTAMARIA, ITZIAR

REQUIRED PREVIOUS KNOWLEDGE

Subjects	**Knowledge**
(No specific previous subjects required)	*(No previous knowledge required)*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
G-RTR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and/or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		x		1,04
G-RTR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		x		1,06
G-RTR4 - To know and understand the concepts, techniques, methods, technologies, standards, etc. of the elective subjects of their specialty and other elective subjects transversal to the field of engineering		x		2,4
			Total:	4,5

KC: Knowledge or Content / SK: Skills / AB: Abilities

LEARNING OUTCOMES OF THE QUALITY SEAL

(No learning results)

SECONDARY LEARNING RESULTS

1RGM391 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		13 h.	13 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 0 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 13 h.

1RGM397 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		22 h.	22 h.
Computer simulation exercises, individually and/or in teams		19 h.	19 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	19 h.		19 h.

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EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 19 h.
NCH - Non-class hours: 41 h.
TH - Total hours: 60 h.

1RGM394 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		13 h.	13 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 0 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 13 h.

1RGM390 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		13 h.	13 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 0 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 13 h.

1RGM393 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		13,5 h.	13,5 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 0 h.

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NCH - Non-class hours: 13,5 h.
TH - Total hours: 13,5 h.

CONTENTS

[!]

1. *Introducción.*

2. *Resolución de ecuaciones no lineales.*

3. *Resolución de sistemas de ecuaciones*

4. *Interpolación y ajuste de curvas.*

5. *Derivación e integración numérica.*

6. *Resolución de ecuaciones y sistemas de ecuaciones diferenciales.*

7. *Optimización*

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
[!] *Apuntes de la asignatura* [!] *Consultas en páginas web relacionadas con el tema* [!] *Plataforma Moodle* [!] *Presentaciones en clase*	Gerald F., Wheatley O.; Análisis numérico con aplicaciones, 6a edición. Pearson Educación, México, 2000 Chapra S., Canale R.; Métodos numéricos para ingenieros, 5a edición. McGraw-Hill Interamericana, México, 2007. Sánchez J., Souto A.; Problemas de cálculo numérico para ingenieros con aplicaciones Matlab (Serie Schaum). 1ra edición. McGraw-Hill Interamericana, Madrid, 2005. Mathews J., Fink K.; Métodos Numéricos con Matlab. 3ra Edición. Prentice Hall, Madrid, 2000. Pérez C.; Matlab y sus aplicaciones en las Ciencias y la Ingeniería. Prentice Hall, Madrid, 2002.