Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2024 / 2025 - Course planning

Mondragon
Unibertsitatea
Goi Eskola
Politeknikoa
Escuela Politécnica
Superior

[GOA302] MATHEMATICS II

GENERAL INFORMATION

Studies	DEGREE IN INDUSTRIAL ORGANIZATION ENGINEERING	**Subject**	MATHEMATICS
Semester	2	**Course** 1	
Character	BASIC TRAINING	**Mention / Field of specialisation**	
Plan	2022	**Modality** Face-to-face	**Language** EUSKARA
Credits	6	**Hours/week** 5.22	**Total hours** 94 class hours + 56 non-class hours = **150 total hours**

2030 AGENDA GOALS

PROFESSORS

UBARRECHENA BELANDIA, ARITZ

ZARRAGA RIO, ONDIZ

REQUIRED PREVIOUS KNOWLEDGE

Subjects	**Knowledge**
MATHEMATICS I	*(No previous knowledge required)*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
G-RA07 - To solve mathematical problems that may arise in engineering, demonstrating the ability to apply knowledge of: linear algebra; geometry; differential geometry and differential and partial differential equations		x		5,4
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		0,36
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		0,24
			Total:	**6**

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

ENAEE LEARNING RESULTS	ECTS
ENAE01 - Knowledge and understanding: Knowledge and understanding of the underlying scientific and mathematical principles in their branch of engineering.	4,04
ENAE04 - Knowledge and understanding: To be aware of the multidisciplinary context of engineering.	0,28
ENAE05 - Analysis in engineering: Ability to apply their knowledge and understanding in identifying, formulating and solving engineering problems using established methods.	0,8
ENAE08 - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements.	0,29
ENAE17 - Transversal competences: To work effectively, both individually and in a team.	0,29
ENAE18 - Transversal competences: To use different methods to communicate effectively with the engineering community and society in general.	0,29
Total:	**6**

SECONDARY LEARNING RESULTS

2RGO190 (2 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	2 h.	1 h.	3 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)*

Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2024 / 2025 - Course planning

Mondragon
Unibertsitatea

Goi Eskola
Politeknikoa
Escuela Politécnica
Superior

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

2RGO191 (2 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	1 h.	2 h.	3 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: 1 h.
NCH - Non-class hours: 2 h.
TH - Total hours: 3 h.

2RGO192 (2 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2 h.	1 h.	3 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: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

2RGO194 (2 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	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2024 / 2025 - Course planning

Mondragon
Unibertsitatea
Goi Eskola
Politeknikoa
Escuela Politécnica
Superior

RGO113 [!] *Modeliza y resuelve los problemas geométricos, los físicos y los de ingeniería, utilizando las ecuaciones diferenciales*

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	1 h.	3 h.	4 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		2 h.	2 h.
Computer simulation exercises, individually and/or in teams	1 h.	2 h.	3 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	9 h.		9 h.
Carrying out exercises and solving problems individually and/or in teams	12 h.	6 h.	18 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	10%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	90%	

CH - Class hours: 23 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 36 h.

RGO114 [!] *Utiliza el álgebra lineal para modelizar y resolver problemas de ingeniería, utilizando software matemático*

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	3 h.	11 h.	14 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		2 h.	2 h.
Computer simulation exercises, individually and/or in teams	2 h.	2 h.	4 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	26 h.	2 h.	28 h.
Carrying out exercises and solving problems individually and/or in teams	31 h.	20 h.	51 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	10%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	90%	

CH - Class hours: 62 h.
NCH - Non-class hours: 37 h.
TH - Total hours: 99 h.

2RGO193 (2 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	2 h.	1 h.	3 h.

Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2024 / 2025 - Course planning

Mondragon
Unibertsitatea
Goi Eskola
Politeknikoa
Escuela Politécnica
Superior

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: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

CONTENTS

1. Ordinary differential equations- First-order ODEs: separable, homogeneous, linear and Bernouillian- Second and higher order ODEs- Solving physical and mathematical problems 2. Linear algebra- Systems of linear equations- Matrix algebra- Determinants- Vector spaces- Diagonalization: eigenvalues and eigenvectors- Inner product, norm and orthogonality

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
[!] *Apuntes de la asignatura* [!] *Plataforma Moodle* [!] *Presentaciones en clase* [!] *Programas* [!] *Transparencias de la asignatura*	Kalkulu diferentziala eta integrala. Piskunov, N., Sarasola, J. R. A., & Martin, P. A. (1992). Robert Smith, Roland Minton. Cálculo. Tomo 1 y Tomo 2. (McGraw-Hill, 2007) [Poole, D. Álgebra lineal: una introducción moderna. (Cengage Learning Editores, 2011). Lay, D. C. & Murrieta, J. M. Algebra lineal y sus aplicaciones. (Pearson Educación, 2007). Álgebra lineal y teoría de matrices: R. Barbolla, P. Sanz. (1998) Pearson educación.