

## [GOA304] MATHEMATICS III

### GENERAL INFORMATION

<b>Studies</b>	DEGREE IN INDUSTRIAL ORGANIZATION ENGINEERING		<b>Subject</b>	MATHEMATICS	
<b>Semester</b>	1	<b>Course</b>	2	<b>Mention / Field of specialisation</b>	
<b>Character</b>	BASIC TRAINING				
<b>Plan</b>	2022	<b>Modality</b>	Face-to-face	<b>Language</b>	EUSKARA/CASTELLANO
<b>Credits</b>	6	<b>Hours/week</b>	4.94	<b>Total hours</b>	89 class hours + 61 non-class hours = <b>150 total hours</b>

### 2030 AGENDA GOALS



### PROFESSORS

UBARRECHENA BELANDIA, ARITZ

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
MATHEMATICAL FOUNDATIONS I	(No previous knowledge required)

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>GOR210</b> - To apply methods of integral calculus, differential calculus and Fourier series decomposition		x		5,4
<b>G-RTR1</b> - 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
<b>G-RTR2</b> - 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
<b>Total:</b>				<b>6</b>

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

#### ENAE LEARNING RESULTS

ENAAE LEARNING RESULTS	ECTS
<b>ENAE01</b> - Knowledge and understanding: Knowledge and understanding of the underlying scientific and mathematical principles in their branch of engineering.	2,03
<b>ENAE04</b> - Knowledge and understanding: To be aware of the multidisciplinary context of engineering.	0,32
<b>ENAE05</b> - Analysis in engineering: Ability to apply their knowledge and understanding in identifying, formulating and solving engineering problems using established methods.	2
<b>ENAE08</b> - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements.	0,41
<b>ENAE17</b> - Transversal competences: To work effectively, both individually and in a team.	0,41
<b>ENAE18</b> - Transversal competences: To use different methods to communicate effectively with the engineering community and society in general.	0,41
<b>ENAE19</b> - Transversal competences: Demonstrate that they are aware of the responsibility implied in the practical application of engineering, the social and environmental impact, and show commitment with professional ethics, responsibility and regulations of the practical application of engineering.	0,41
<b>Total:</b>	<b>6</b>

### SECONDARY LEARNING RESULTS

#### 1RGO291 (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	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	100%	(No mechanisms)

project, master's thesis, challenges and problems

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

**RG0222** [I] *Aplica las series de Fourier para el estudio de funciones en el dominio de la frecuencia*

**LEARNING ACTIVITIES**

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	5 h.	7 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	6 h.	5 h.	11 h.
Carrying out exercises and solving problems individually and/or in teams	2 h.	5 h.	7 h.

**EVALUATION SYSTEM**

*W*

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems  
Individual written and/or oral tests or individual coding/programming tests

20%  
80%

**MAKE-UP MECHANISMS**

Individual written and/or oral tests or individual coding/programming tests

**CH - Class hours:** 10 h.  
**NCH - Non-class hours:** 15 h.  
**TH - Total hours:** 25 h.

**1RG0292** (1 sem)

**LEARNING ACTIVITIES**

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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*

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

**MAKE-UP MECHANISMS**

(No mechanisms)

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

**1RG0290** (1 sem)

**LEARNING ACTIVITIES**

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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*

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%

**MAKE-UP MECHANISMS**

(No mechanisms)

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

### 1RGO293 (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	2 h.	1 h.	3 h.

#### EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

#### MAKE-UP MECHANISMS

(No mechanisms)

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

### 1RGO294 (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	1 h.	2 h.	3 h.

#### EVALUATION SYSTEM

W

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%

#### MAKE-UP MECHANISMS

(No mechanisms)

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

### RG0221 [!] *Utiliza el cálculo integral y diferencial de funciones de varias variables en la resolución de problemas geométricos y físicos*

#### LEARNING ACTIVITIES

	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	5 h.	10 h.	15 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	40 h.		40 h.
Carrying out exercises and solving problems individually and/or in teams	25 h.	30 h.	55 h.

#### EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

20%

Individual written and/or oral tests or individual coding/programming tests

80%

#### MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

**CH - Class hours:** 70 h.

**NCH - Non-class hours:** 40 h.  
**TH - Total hours:** 110 h.

## CONTENTS

1.- Analysis of multivariable functions 2.- Fourier series 3.- Integration in multivariable functions

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

- [!] *Plataforma Moodle*
- [!] *Apuntes de la asignatura*
- [!] *Presentaciones en clase*
- [!] *Programas*
- [!] *Realización de prácticas en ordenador*
- [!] *Software específico de la titulación*
- [!] *Transparencias de la asignatura*

### Bibliography

<https://katalogoa.mondragon.edu/janium-bin/sumario.pl?Id=20221108184928>