

[GJE302] MATHEMATICS II

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING	Subject	?
Semester	2	Course	1
Character	BASIC TRAINING	Mention / Field of specialisation	
Plan	2025	Modality	Face-to-face
Credits	6	Language	CASTELLANO/EUSKARA
		Total hours	90 class hours + 60 non-class hours = 150 total hours

2030 AGENDA GOALS



PROFESSORS

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REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
MATHEMATICS I	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
G-RA17 - 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-TR1 - 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-TR2 - 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

SECONDARY LEARNING RESULTS

2RGJ193 (2 sem) Write a clear and concise project report using the information sources and report structure provided, and using language that is correct, inclusive, and non-discriminatory.

LEARNING ACTIVITIES

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

CH 2 h. **NCH** 1 h. **TH** 3 h.

EVALUATION SYSTEM

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

W

100%

MAKE-UP MECHANISMS

(No mechanisms)

Comments: Revision and correction of the written report of the semester project

CH - Class hours: 2 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 3 h.

2RGJ192 (2 sem) Understand and describe the phases involved in developing engineering teams, and identify and describe the professional roles of an engineer, recognizing their contribution to the achievement of sustainable development goals (SDGs).

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

2 h.

NCH

1 h.

TH

3 h.

EVALUATION SYSTEM

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

W

100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 2 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 3 h.

2RGJ190 (2 sem) Understand and apply the phases for developing, based on defined objectives and planning, a technically complex project in line with your knowledge. Reflect on your training needs, becoming aware of your limitations.

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

1 h.

NCH

2 h.

TH

3 h.

EVALUATION SYSTEM

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

W

100%

MAKE-UP MECHANISMS

(No mechanisms)

Comments: Continuous assessment. Retake is not foreseen.

CH - Class hours: 1 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 3 h.

RGJ114 They use linear algebra to modelize and solve engineering problems using mathematical software

LEARNING ACTIVITIES

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

CH

6 h.

NCH

6 h.

TH

12 h.

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

6 h.

14 h.

20 h.

Computer simulation exercises, individually and/or in teams

3 h.

3 h.

6 h.

Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects

22 h.

22 h.

Carrying out exercises and solving problems individually and/or in teams

22 h.

17 h.

39 h.

EVALUATION SYSTEM

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

W

10%

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

10%

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

Comments: Final mark: written recovery (75%) + control point (25%). Practicals and self-assessments will be recovered through continuous assessment

CH - Class hours: 59 h.

NCH - Non-class hours: 40 h.

TH - Total hours: 99 h.

2RGJ191 (2 sem) Contribute to the team's operating strategy by prioritizing common goals, encouraging and valuing everyone's participation, and taking responsibility for individual tasks and meeting deadlines.

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	1 h.	2 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)

Comments: tinuous assessment. Retake is not foreseen.

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

2RGJ194 (2 sem) Give a clear and concise oral presentation and defense of the project, using language correctly.

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)

Comments: Continuous assessment. Retake is not foreseen.

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

RGJ113 Model and solve geometric, physical, and engineering problems using differential equations.

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.	2 h.	4 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	3 h.	3 h.	6 h.
Computer simulation exercises, individually and/or in teams	3 h.	3 h.	6 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	10 h.		10 h.
Carrying out exercises and solving problems individually and/or in teams	5 h.	5 h.	10 h.

EVALUATION SYSTEM

	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%
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	10%
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

Comments: Final mark: written recovery (75%) + control point (25%). Practicals and self-assessments will be recovered through continuous assessment

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

CONTENTS

1- Ordinary differential equations- First order differential equations- Second order differential equations- Higher order differential equations- Applications2- Linear algebra:- Vector spaces- Matrix algebra- Determinants- Systems of linear equations- Diagonalization

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Moodle Platform
 Class presentations
 Slides of the subject
 Computer practical training

Bibliography

David C. Lay, Steven R. Lay, Judi J. McDonald. Álgebra lineal y sus aplicaciones. Quinta edición. Editorial Pearson. 2016. ISBN:9786073237451
 David Poole. Álgebra lineal: una introducción moderna. Cuarta edición. Cengage Learning Editores. 2017. ISBN: 978607526311
 David Poole. Linear Algebra: a modern introduction. 4th edition. Cengage Learning. 2015. ISBN: 978128546324
 Jon Rogawski. Cálculo, una variable. 2ª edición. Editorial Reverté, 2012. ISBN: 97884291516
 Robert T. Smith, Roland B. Minton. Cálculo, volumen 2. 2ª edición. Editorial McGraw-Hill, 2003. ISBN: 978844813973
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