

## [GCT301] MACHINE AND MECHANISM THEORY

### GENERAL INFORMATION

<b>Studies</b>	DEGREE IN ENGINEERING IN ECO-TECHNOLOGY IN INDUSTRIAL PROCESS		<b>Subject</b>	?
<b>Semester</b>	2	<b>Course</b>	3	<b>Mention / Field of specialisation</b>
<b>Character</b>	COMPULSORY		<b>Language</b>	EUSKARA
<b>Plan</b>	2022	<b>Modality</b>	Face-to-face	<b>Total hours</b> 44 class hours + 68.5 non-class hours = <b>112.5 total hours</b>
<b>Credits</b>	4,5	<b>Hours/week</b>	2.44	

### 2030 AGENDA GOALS



### PROFESSORS

GALFARSORO ANDUAGA, UNAI

LASA BASTIDA, MIKEL

### REQUIRED PREVIOUS KNOWLEDGE

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

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>GCR311</b> - Applies the principles of theory of machines and mechanisms in complex mechanical systems		x		3,78
<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		0,4
<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		0,32
<b>Total:</b>				<b>4,5</b>

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

### SECONDARY LEARNING RESULTS

#### 2RGC393 (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		4 h.	4 h.

#### EVALUATION SYSTEM

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

**Comments:** Assessment of the acquired transversal skills: Followed methodology to solve the project: team work, decision making methods, conflict management... Project management: definition of objectives, planning,... Written and oral communication

#### MAKE-UP MECHANISMS

(No mechanisms)

**Comments:** Continuous assessment. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.

**CH - Class hours:** 0 h.

**NCH - Non-class hours:** 4 h.

**TH - Total hours:** 4 h.

#### RGC328 [!] Dimensiona y selecciona los componentes mecánicos óptimos

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			20 h.	20 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		15 h.		15 h.
Carrying out exercises and solving problems individually and/or in teams		12 h.	14,75 h.	26,75 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		80%	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%	Individual written and/or oral tests or individual coding/programming tests	

**CH - Class hours:** 27 h.  
**NCH - Non-class hours:** 34,75 h.  
**TH - Total hours:** 61,75 h.

**2RGC394 (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			4 h.	4 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)	
<b>Comments:</b> Assessment of the acquired transversal skills: Followed methodology to solve the project: team work, decision making methods, conflict management... Project management: definition of objectives, planning,... Written and oral communication			<b>Comments:</b> Continuous assessment. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.	

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 4 h.  
**TH - Total hours:** 4 h.

**2RGC391 (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			3 h.	3 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Self-assessment		50%	(No mechanisms)	
Co-assessment		50%	<b>Comments:</b> Continuous assessment. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.	
<b>Comments:</b> Assessment of the acquired transversal skills: Followed methodology to solve the project: team work, decision making methods, conflict management... Project management: definition of objectives, planning,... Written and oral communication				

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 3 h.  
**TH - Total hours:** 3 h.

**2RGC390 (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

4 h.

4 h.

**EVALUATION SYSTEM**

**W**

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

100%

**Comments:** Assessment of the acquired transversal skills: Followed methodology to solve the project: team work, decision making methods, conflict management... Project management: definition of objectives, planning,... Written and oral communication

**MAKE-UP MECHANISMS**

(No mechanisms)

**Comments:** Continuous assessment. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.

**CH - Class hours:** 0 h.

**NCH - Non-class hours:** 4 h.

**TH - Total hours:** 4 h.

**2RGC392 (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

3 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%

**Comments:** Assessment of the acquired transversal skills: Followed methodology to solve the project: team work, decision making methods, conflict management... Project management: definition of objectives, planning,... Written and oral communication

**MAKE-UP MECHANISMS**

(No mechanisms)

**Comments:** Continuous assessment. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.

**CH - Class hours:** 0 h.

**NCH - Non-class hours:** 3 h.

**TH - Total hours:** 3 h.

**RGC327 [I] Realiza un análisis cinemático y cinético de mecanismos**

**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

10 h.

10 h.

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

12 h.

12 h.

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

5 h.

5,75 h.

10,75 h.

**EVALUATION SYSTEM**

**W**

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

30%

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

70%

**MAKE-UP MECHANISMS**

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

**CH - Class hours:** 17 h.
   
**NCH - Non-class hours:** 15,75 h.
   
**TH - Total hours:** 32,75 h.

## CONTENTS

A. MECHANICAL ELEMENTS0. INTRODUCTION TO MECHANICAL ELEMENTS1. TOLERANCES 1.1 Dimensional 1.2 Surface 1.3 Geometrical 1.4 Geometrical2. JOINING ELEMENTS 2.1 Introduction 2.2 Screws 2.3 Rivets 2.4 Bolts 2.5 Washers 2.6 Cotter3. TRANSMISSION ELEMENTS 3.1 Introduction 3.2 Bearings 3.3 Bearings 3.4 Couplings 3.5 Belts 3.6 Chains 3.7 Gears 3.8 Cams 3.8 CamsGears 3.8 Cams 3.9 Ratchets 3.10 Exchangers and gearboxes 3.11 Gearboxes and gearboxes4. SEALING ELEMENTSB. ANALYSIS OF MECHANISMS1. KINEMATICS 1.1 Kinematics of the particle 1.2 Kinematics of the rigid solid2. KINETICS 2.1 Kinetics of the particle 2.2 Kinetics of the rigid solid 2.3.

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

- [!] *Apuntes de la asignatura*
- [!] *Consultas en páginas web relacionadas con el tema*
- [!] *Transparencias de la asignatura*

### Bibliography

[http://katalogoa.mondragon.edu/janium-bin/janium\\_login\\_opac\\_re\\_in\\_k.pl?grupo=EKOTEKNOLOGIA32&ejecuta=25&\\_ST](http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=EKOTEKNOLOGIA32&ejecuta=25&_ST)