# [GJJ302] MECHANICS AND MECHANISM THEORY

## GENERAL INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| **Studies** | DEGREE IN MECHATRONICS ENGINEERING | | | **Subject** | ? |
| **Semester** | 2 | **Course** | 1 | **Mention / Field of specialisation** | |
| **Character** | BASIC TRAINING | | | | |
| **Plan** | 2025 | **Modality** | Face-to-face | **Language** | CASTELLANO/EUSKARA |
| **Credits** | 6 | **Hours/week** | 5 | **Total hours** | 90 class hours + 60 non-class hours = **150 total hours** |

## 2030 AGENDA GOALS

## PROFESSORS

AIZPURU NAZABAL, AITZIBER
ARETXABALETA RAMOS, LAURENTZI
MENDIZABAL EIZAGUIRRE, MIKEL
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## REQUIRED PREVIOUS KNOWLEDGE

| Subjects | Knowledge |
|---|---|
| PHYSICS I | *(No previous knowledge required)* |
| MATHEMATICS I | |

## LEARNING RESULTS

| LEARNING RESULTS | KC | SK | AB | ECTS |
|---|---|---|---|---|
| **GJR112** - To understand and master the principles of mechanical physics and the theory of mechanisms to solve engineering problems | | | 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 | 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 |
|---|---|
| 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:** Revision and correction of the written report of the semester project.

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

**RGJ135 They analyze the motion of a mechanism and establish the loads that determine its motion.**

| 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 | 12 h. | 4 h. | 16 h. |
| Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning | 4 h. | 16 h. | 20 h. |
| Computer simulation exercises, individually and/or in teams | 6 h. | 10 h. | 16 h. |
| Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects | 25 h. | | 25 h. |
| Carrying out exercises and solving problems individually and/or in teams | 14 h. | 12 h. | 26 h. |
| Self-assessment tests in a context of autonomous and continuous learning | 2 h. | | 2 h. |

| EVALUATION SYSTEM | W |
|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 25% |
| 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 | 20% |
| Individual written and/or oral tests or individual coding/programming tests | 55% |

**MAKE-UP MECHANISMS**

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

**Comments:** Final mark: written second-chance exam (75%) + exam (25%). Laboratory practices and auto evaluations will be made-up by on-going evaluation. It is compulsory to submit the team-exercise, otherwise the result of the learning outcome will be 0. For marks under 5, there will be a posibility of a retake, with a maximum mark of 5.

**CH - Class hours:** 63 h.
**NCH - Non-class hours:** 42 h.
**TH - Total hours:** 105 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 | 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 |
|---|---|
| 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.

**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 | 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 |
|---|---|
| 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.

**RGJ136 Learn the basics of mechanical vibrations and analyze the vibratory motion of systems with one degree of freedom.**

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|---|---|---|
| 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 | 6 h. | 11 h. | 17 h. |
| Practical work in workshops and/or laboratories, 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**

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

**Comments:** It is compulsory to submit the team-exercise, otherwise the result of the learning outcome will be 0. For marks under 5, there will be a posibility of a retake, with a maximum mark of 5.

**CH - Class hours:** 18 h.
**NCH - Non-class hours:** 12 h.
**TH - Total hours:** 30 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 | 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.

**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.

## CONTENTS

1. Mechanisms analysis - Mechanism model - Mechanism kinematics - Mechanism kinetics2. Mechanical vibrations - Fundamentals - Systems of one degree of freedom

## LEARNING RESOURCES AND BIBLIOGRAPHY

| Learning resources |
|---|
| Subject notes |
| Moodle Platform |
| Class presentations |
| Lab practical training |

**Bibliography**

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