

IKASTURTEA/ ACADEMIC YEAR 2025/26

IKASGAIA/SUBJECT:	MECHANICS AND MECHANISMS	KURTSOA/COURSE:	3º
MODULUA/MODULE:	Mechanical Technology	KOKAPENA/LOCATION:	5th semesterand
ESPARRUA/SCOPE:	---	IRAUPENA/DURATION:	150 h
IZAERA/CHARACTER:	Mandatory	KREDITUAK/CREDITS:	6 ECTS
KODEA/CODE:	28471	HIZKUNTZA/LANGUAGE:	English
FLAT/PLAN:	2024	IRAKASLEA/TEACHER:	Haritz Sarriegi Etxeberria
AIPAMENA/MENTION:	---		

HELBURUA/AIM:	Solve machine design and dynamics problems by applying the fundamentals of material strength and mechanical concepts.
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IKAS-PROCESSING EMAILS/LEARNING OUTCOMES

- RC1 - Develop engineering habits and skills using abilities such as systemic thinking, initiative, creativity, collaboration, communication, and ethical considerations. TYPE: Competencies
- RC3 - Solve and analyze engineering problems qualitatively and quantitatively, relating the different parts of the technological product manufacturing process. TYPE: Competencies
- RC6 - Analyze and critically evaluate conclusions drawn from the field of Engineering, including arguing solutions based on the interpretation of data and information, including social, environmental, scientific, and ethical aspects. TYPE: Competencies
- RCO3 - Understand the theories and tools of mechanical engineering to meet the technical specifications required in engineering. TYPE: Knowledge or content
- RHE3 - Work as a team, actively participating in achieving a common goal and establishing interpersonal relationships of trust and mutual support.

TYPE: Skills or abilities

RC4 - Learn basic knowledge of subjects and technological tools specific to the field of Engineering, which includes knowing how to relate this knowledge to the resolution of industrial problems. TYPE: Competencies

RHT1 - Perform the anAnalysis, formulation, modeling, and resolution of engineering problems through the use of fundamental sciences and technology. TYPE: Skills or abilities

RHT2 - Be able to design and analyze solutions for mechanical components and systems using the fundamental principles of mechanical engineering. TYPE: Skills or abilities

EDUKIAK/SYLLABUS

1. 3D kinematic analysis of mechanisms

1.1. Relative reference systems

1.2. Calculation of positions, velocities and accelerations

2. 3D kinetic analysis of mechanisms

2.1. Calculations of moments of inertia

2.2. Calculation of forces and moments in components

3. Analysis of mechanical vibrations

3.1. Modeling

3.2. Calculation of natural frequencies

IRISH ENGINEERING/TYPE OF TEACHING

	M	CP	PL	PO	SP	D
In person (hours)	20	20	0	0	20	0
Personal work (hours)	25	30	0	0	35	0

M: Master class / CP: Classroom problem-solving class / PL: Laboratory practices / PO: Computer practices / SP: Project seminars / D: Dual

BALIABIDE DIDAKTIKOAK/TEACHING METHODS

- X Explanatory and/or demonstrative sessions by the teacher.
- X Exercises carried out in the classroom with the help of the teacher.
- X Practical application through exercises, simulations, and experimentation, either individually or in groups.
- X An integrative case study representative of the skills to be acquired through the module.

LITERATURE/LITERATURE

- Vector Mechanics for Engineers. Dynamics – Beer FP and Johnston ER, McGraw-Hill Publishing, 1990, 5th Edition.
- Dynamics – Meriam JL, Editorial Reverté SA, 1980, 2nd Edition.
- Mechanical Engineering. Dynamics – Riley WF and Sturges LD, Editorial Reverté SA, 1996.
- Engineering Mechanics. Dynamics – Bedford A. and Fowler W., Editorial Addison-Wesley Iberoamericana, 1996.
- Mechanics for Engineers. Dynamics – Shames IH, Prentice Hall Iberia, 1999, 4th Edition.
- Mechanics for Engineers. Volume II. Dynamics – Huang TC, Editorial Fondo Educativo Interamericano SA – Alfaomega, 1993.
- 700 Solved Problems in Vector Mechanics for Engineers. Volume II: Dynamics – Shelley JF. Schaum Collection of Problems and Results, McGraw Hill Publishing, 1991.

EBALUAZIO METHOD ETA IRIZPIDEAK/EVALUATION METHODS AND CRITERIA

- X Continuous Evaluation System
- X Final Evaluation System

OHIKO DEIALDIA/ ORDINARY CALL

55% Written and/or oral test

Completion and/or reporting of internships

45% Report/Deliverables/Oral Presentations/Projects

Carrying out activities and/or projects in the dual entity

Argibideak/Clarifications:

The criteria for CONTINUOUS evaluation:

Board1:Activities of the continuous assessment method.

Evaluation Activity	Period	Punctuation	Observations
Class assignments and homework (Group-individual)	Throughout the four-month period	25% 0-25 points	Homework not submitted when requested 0 points. To average the remaining grades, you must obtain a minimum of 10 points out of 25.
Control (individual)	After 5-6 weeks from the start (control period).	15% 0-15 points	No matter is released. To average the rest of the grades there is no minimum grade
Final exam (individual)	Exam period	40% 0-40 points	You should get a grade of 10 a minimum of 3.5 , to average the rest of the notes
ACH Project or Unidisciplinary Project (Group-individual)	Throughout the four-month period	20% 0-20 points	It is mandatory and follows the ACH project evaluation system (Minimum grade 4 out of 10)

All activities in the evaluation system are of equal importance. The student presented to any evaluation activity of the lecture, even if all the activities are not submitted, will be given a final grade that corresponds to the average grade of the activities, with a grade of 0 for the activities not submitted. To pass the course, the student must meet the minimum requirements and obtain a grade equal to or greater than 5 out of 10 by averaging the four

blocks (50 points out of 100, see table 1)

If the minimum required has not been obtained in any section, the final grade will be calculated as follows: the average will be calculated with all the grades, and if the grade obtained on average:

average ≥ 4 → the final grade will be 4

average < 4 → the grade will be the one obtained on average

The FINAL evaluation criteria:

The final evaluation method consists of three tests:

- **Test 1:** Tasks (25 points. To average with the rest of the grades, a minimum of 10 must be obtained)points)
- **Test 2:** Exam (55 points. To average the score with the rest of the grades, a minimum of 22 must be obtained)
- **Test 3:** Project (20 points. To average the rest of the grades, a minimum of 8 must be obtained)

To pass the subject the defined minimums must be met and obtain a grade equal to or greater than 5 out of 10 by averaging the four blocks (50 points out of 100). If the minimum required score has not been obtained in any section, the final grade will be calculated as follows: the average will be calculated with all the scores, and if the grade obtained on average:

average ≥ 4 → the final grade will be 4

average < 4 → the grade will be the one obtained in the average

EZOHIKO DEIALDIA/ CALLEXTRAORDINARY

55% Written and/or oral test

Completion and/or reporting of internships

45% Report/Deliverables/Oral Presentations/Projects

Carrying out activities and/or projects in the dual entity

Argibideak/Clarifications:

CONTINUOUS evaluation criteria:

Students who have been assessed continuously during the course and have to pass the minimums for some of the sections (Tasks, Exam or Project) have the option of taking only those sections, keeping the grade for the sections with the minimum obtained.

There will also be the opportunity to sit for the improvement of the parts of the exam that the student considers appropriate. If the student sits for the improvement of the exam, he/she will have the opportunity to modify the percentage of the exam, of 40 or 55 % depending on whether the student wants to keep the mark of the control or not.

The students will have 2 days from the publication of the final ordinary call grade to communicate if they want to improve any block in which the minimum was achieved. If a review to improve any block is submitted, the previous grade will be lost.

FINAL evaluation criteria:

The evaluation criteria are the same as those applied in the regular call.