

IKASGAIA/ASIGNATURA/ SUBJECT: Materials for Engineering

MODULUA/MÓDULO/MODULE: Engineering Science and Techniques

KODEA/CÓDIGO/CODE: MI 03-2026/2027

KURTSOA/CURSO/COURSE: 3

KOKAPENA/UBICACIÓN/PERIOD: 5th semester

IRAUPENA/DURACIÓN/DURATION: 150 h

KREDITUAK/CRÉDITOS/CREDITS: 6 ECTS

MOTA/TIPO/TYPE: Compulsory

IRAKASLEA/PROFESOR/LECTURER: Maitane Gabilondo Nieto

HIZKUNTZA/IDIOMA/LANGUAGE: English

HELBURUA/OBJETIVO/PURPOSE: The subject Materials for Engineering studies the microstructure and properties of materials in engineering linked to treatment and testing techniques. This provides future engineering graduates the basic knowledge to understand, classify and select the most suitable materials for each industrial application.

IKAS-PROZESUAREN EMAITZAK/ RESULTADOS DE APRENDIZAJE/ LEARNING OUTCOMES	ASOZIATUTAKO GAITASUNAK / COMPETENCIAS ASOCIADAS/ ASSOCIATED COMPETENCIES	EDUKIAK/ CONTENIDOS/ CONTENTS
- Characterize the mechanical and thermal behaviour of materials by performing tests. - Analyse the structure and properties of the material and predict its behaviour in different environments. - Select the most suitable materials for any type of part, based on the requirements of use and design, in order to identify the manufacturing processes and the parameters to be controlled. - Relate the characteristics of materials (metal, polymers, ceramics...) with their structure and the variables on which they depend.	- CB1 - CB5 - CE1 - CE1.2	- CHAPTER 1: Atomic structure - CHAPTER 2: Crystalline structure and its imperfections - CHAPTER 3: Diffusion - CHAPTER 4: Mechanical properties of metals - CHAPTER 5: Dislocations and strengthening processes - CHAPTER 6: Phase diagrams - CHAPTER 7: Heat treatments - CHAPTER 8: Classification of materials - CHAPTER 9: Degradation mechanisms in service - CHAPTER 10: Selection of materials

BALIABIDE /METODOLOGI PEDAGOGIKOAK - MEDIOS/MÉTODOS PEDAGÓGICOS – PEDAGOGICAL METHODS:

- Presentation, explanation and/or demonstration by the teacher.
- Exercises done in the classroom under supervision of the teacher.
- Practical application through exercises, simulations and tests carried out individually or in groups.
- Copy of the transparencies used by the teacher during the classes (available in Moodle).
- List of problems (available in Moodle).
- Laboratory equipment and software for practical exercises.

BIBLIOGRAFIA – BIBLIOGRAFÍA - BIBLIOGRAPHY:

- W.D. Callister Jr., "Materials Science and Engineering: An Introduction". 8^o Edition, John Wiley & Sons, 2010.
- D.R. Askeland, "Ciencia e Ingeniería de los Materiales", 3^a Edición, International Thomson Editores, Madrid, 1998.
- W.S. Smith, H. Jasemi, "Fundamentos de la Ciencia e Ingeniería de los Materiales", 4^a Edición, Ed. Mc Graw Hill, 2004.
- J. F. Shackelford, "Introducción a la ciencia de materiales para ingenieros", 6^a Edición, Ed. Pearson/Prentice Hall, México, 2005.
- M. F. Ashby, "Materials Selection in Mechanical Design", 4^a Edición, Ed. Butterworth-Heinemann, China, 2011.

IRAKASKUNTZA MOTA -TIPO DE DOCENCIA – TYPE OF TEACHING

Irakaskuntza mota/Tipos de docencia/Teaching types:

M=Magistrala/Magistral/Master; **S**=Mintegia/Seminario/Seminar; **GA**=Gelako praktikak/Prácticas de Aula/Practical testing in classroom; **GL**=Laborategiko praktikak/Prácticas de Laboratorio/Laboratory Tests; **GO**=Ordenagailuko praktikak/Prácticas de ordenador/Computer Tests; **TA**=Tailerra/Taller/Workshop; **TI**=Tailer industria/Taller Industrial/Industrial workshop;

Irakaskuntza mota / Tipo de docencia / Type of teaching	M	S	GA	GL	GO	TA	TI
Ikasgelako eskola-orduak /Horas de docencia presencial / Face-to-face class hours	41	8	18	8			
Ikasgelaz kanpoko ikaslearen orduak / Horas de actividad no presencial del alumno/ Student hours outside the classroom	41	6	20	8			

EBALUAZIO METODO ETA IRIZPIDEAK – MÉTODOS Y CRITERIOS DE EVALUACIÓN – EVALUATION METHODS AND CRITERIA

The assessment tests and activities for this subject will be carried out in accordance with the principles of academic integrity, honesty, and ethical behavior established in the regulations of the Elgoibar Dual Engineering School and the EHU. Upon entering the University, students signed the Declaration of Commitment to Ethical Behavior and Academic Honesty, pledging not to engage in plagiarism, academic fraud, or the use of unauthorized materials or devices (including artificial intelligence tools when not expressly permitted) in academic tests and assignments. Failure to comply with these obligations may lead to the academic and disciplinary consequences provided for in the university regulations in force.

ETENGABEKO EBALUAZIOA - EVALUACIÓN CONTINUA – CONTINUOUS EVALUATION

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AZKEN EBALUAZIOA - EVALUACIÓN FINAL – FINAL EVALUATION

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Ebaluazio probetan erabili ahal izango diren baliabide eta bitartekoak / Medios y recursos que se podrán utilizar en las pruebas de evaluación / **Resources that can be used in the evaluation tests**

Summary sheet with formulas
Calculator



FABRIKAZIO AURRERATUAREN
UNIBERTSITATEA
LA UNIVERSIDAD DE
LA FABRICACIÓN AVANZADA

Irakaskuntza gida / Guía docente /

Teaching guide

Kod. - Cod:F 04.20

Erreb. – Rev.: 2



OHIKO DEIALDIA - CONVOCATORIA ORDINARIA – REGULAR CALL

- Final exam 100 %

EZOHIKO DEIALDIA - CONVOCATORIA EXTRAORDINARIA – EXTRAORDINARY CALL

- Final exam 100 %