Universidad del País Vasco — Euskal Herriko Unibertsitatea

COURSE GUIDE 2025/26

Faculty 363 - Faculty of Engineering - Bilbao **Cycle** .

Degree GMECAN30 - Bachelor`s Degree in Mechanical Engineering **Year** First year

COURSE

27677 - Graphic Expression **Credits, ECTS:** 9

COURSE DESCRIPTION

The syllabus of this subject has been stabilized considering having acquired the minimum established skills in the subject of Technical Drawing of Baccalaureate, which program is included in BOE No. 266 of 6-11-2007.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

Methods and techniques of representation applied to the constructive geometry.
Standardization.
Computer-assisted applications.

Theoretical and Practical Contents

INTRODUCTION TO THE STANDARDIZATION It deals with the basic elements of the standardization of the Industrial Drawing.
FUNDAMENTALS AND TECHNIQUES OF THE REPRESENTATION SYSTEMS This chapter deals with the Fundamentals of the Representation Systems and the Descriptive Geometry Procedures or techniques.
DISPLAY OF SHAPES AND FORMS This chapter is structured with the external and internal visualization of the pieces, with all the procedures, including cuts and sections.
SURFACES AND THEIR APPLICATIONS The classification of curves and surfaces is discussed. Development of the surfaces, including their intersections are studied.
ACOTATION This chapter begins with the Introduction to the dimensioning. The methodology for the dimensioning, types of dimensioning dimensions, classification of dimensions and dimension systems are studied. The dimensioning is focused in the parts according to the manufacturing and mechanization process.
MACRO AND MICROGEOMETRIC TOLERANCES In this chapter, dimensional tolerances, adjustments and surface qualities are studied. Aspects that influence the functionality and quality level of the finished parts.
NORMALIZED ELEMENTS. MECHANICAL SETS All types of joints are studied, both demountable and fixed, as well as other types of standardized elements. The aim is the cutting of mechanical assemblies.
COMPUTER ASSISTED DESIGN (DAO) The chapter begins with the introduction to DAO systems, to continue with the structure and analysis of design software. Applications.

TEACHING METHODS

The syllabus of this subject has been stabilized considering having acquired the minimum established teachings skills in the subject of Technical Drawing of Baccalaureate, which program is included in BOE No. 266 of 6-11-2007.

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	45		15		30				
Horas de Actividad No Presencial del Alumno/a	80		30		25				

Legend:
M: Lecture-based — S: Seminar — GA: Applied classroom-based groups
GL: Applied laboratory-based groups — GO: Applied computer-based groups — GCL: Applied clinical-based groups
TA: Workshop — TI: Industrial workshop — GCA: Applied fieldwork groups

Evaluation methods

- End-of-course evaluation

Evaluation tools and percentages of final mark

- Written test, open questions 70%
- Individual assignments 10%
- Teamwork assignments (problem solving, Project design) 20%

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

EVALUATION METHODS % FINAL NOTE
Partial exams 20% + 10% exercises (releasable)
Final exam 70% (30% 1stP + 40% 2ndP incl. In final)

C.A.D. Exercises 30% (10% individual work and 20% team work)

It is a necessary condition to obtain a minimum of 4/10 in the sum of the exam marks (70%). In order to average the grade, the minimum grade for each exercise will be 3.5 points. If the two conditions are not achieved, the grade for the course will be "failed" with a maximum grade of 4. January exam subject/topics 1, 2, 3 and 4 of the teaching guide. Approving the exam in January releases from taking the exam of the corresponding subject in the ordinary call and in the extraordinary call. Ordinary exam subjects: all. In the ordinary call, each approved part is released for the next calls. CAD Laboratory: The weight in the final grade is 30% and 10% is obtained by carrying out individual work and 20% by carrying out a project as a team. In the ordinary call, it is only possible to obtain CAD grade through continuous evaluation. The approved project releases from examination of the corresponding matter in the extraordinary call if it were the case.

Considerations
• To renounce a call, it is enough to not take any of the official exams (ordinary and extraordinary calls).
• Students will have the right to be evaluated through the final evaluation system, regardless of whether or not they have participated in the continuous evaluation system. For this purpose, students must submit a writing waiver to the responsible of the subject, for which they will have a period of 18 weeks, starting from the beginning of the course, in accordance with the academic calendar of the center.
• You will need to identify yourself with the UPV / EHU card or with your DNI when attending an exam.
• Drawing supplies cannot be exchanged during exams. Required drawing supplies: ruler, square, gauge, protractor, compass, two-thickness pencils, calibrated black marker.
• In the exam the statement of each exercise will be delivered, collecting each one of them in the indicated time. Whoever wishes to abandon the exam must deliver the exercise and communicate it to the teacher.
• To correct each slide, it must be identified by two surnames, first name, grade and group. All properly labeled.

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

Extraordinary call
Exam: The weight in the final grade is 70%. Subject: the entire agenda.
It is a necessary condition to obtain a minimum of 4/10 in this section to pass the course. In order to average the grade, the minimum grade for each exercise will be 3.5 points. If the two conditions are not met, the grade for the course will be "failed" with a maximum grade of 4.
Each approved part with a 5 or over (subject of 1st semester or 2nd.) in January exam or in the ordinary call is released from taking the examination of the corresponding subject in the extraordinary call.
CAD Laboratory: The weight in the final grade is 30% and is obtained by taking an exam at the end of the previous exam. Laboratory exam subject: written test on Axonometric S., assembly drawing, drawing document standards, Solid Edge operations management and the necessary data.

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MANDATORY MATERIALS

Graphic Expression Practices in Engineering. (Annual collection)
Required drawing material: ruler, square, triangle, protractor, compass, two-thickness pencils, calibrated black marker.

BIBLIOGRAPHY

Basic bibliography

URRAZA, G.; ORTEGA, J. M. y PUEYO, J. Fundamentos del Dibujo de Ingeniería. Ed. Autores 2005.
URRAZA, G.; ORTEGA, J. M.; FUENTE, J.; LÓPEZ, J.; SANTOS, J.; SERNA, A. y PUEYO, J. Expresión Gráfica en la Ingeniería. DIBUJO TÉCNICIO. Ed. Autores 2005.
SANTOS J.A. Adierazpen Sistema Grafikoak oinarriak eta Baliabideak 2008
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Prácticas de Expresión Gráfica en la Ingeniería. (Colección anual)

Detailed bibliography

GARMENDIA, M. Geometria deskribatzailea. Ed. Zarautz 2005
JENSEN. C.; HELSEL. J. y DENNIS R. SHORT. Dibujo y diseño en Ingeniería. Ed. Mec Graw Hill 2002.
RODRÍGUEZ DE ABAJO, F. J. y ALVAREZ BENGOA, V. Dibujo Técnico. Ed. Donostiarra 1994.
ZORRILLA, E. y BERMEJO, M. Dibujo de Ingeniería. Public. E.T.S.I. Ind. y Ing. Telecomunicaciones de Bilbao 1986.

Journals

"Autocad magazine" ISSN: 0934-1749; Bimestral; Editores: Edimicros (http://www.edimicros.es)

Web sites of interest

http://www.ehu.es/
http://www.dibujotecnico.com
http://miajas.com/DibujoTec/defplano.htm
http://www.gig.etsii.upm.es/gigcom/dibujo%20industrial%20I/dibujo_tecnico/index.htm

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