Universidad Zaragoza

Year : 2020/21

28908 - Graphic expression

Syllabus Information

Academic Year: 2020/21
Subject: 28908 - Graphic expression
Faculty / School: 201 - Escuela Politécnica Superior
Degree: 583 - Degree in Rural and Agri-Food Engineering
437 - Degree in Rural and Agri-Food Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject Type: Basic Education
Module: ---

1.General information

1.1.Aims of the course

The course aims that the student:

- Understands the versatility of technical drawing as global interdisciplinary language to convey information.
- Understand the usefulness and necessity of standardization as a means to structure and simplify the transmission of graphic information.
- Acquire the basic skills necessary to translate in a plane, on paper or computer format, a job or engineering project.
- Properly use the tools of technical drawing and acquiring the capacity to Sketching with the agility and precision necessary for the transmission of graphic information.
- Be able to point to different references to the technical contents studied.
- Develop the ability to work individually and in teams.

These approaches and objectives are aligned with some of the Sustainable Development Goals (SDGs) of the 2030 schedule and certain specific goals (https://www.un.org/sustainabledevelopment/en/), contributing to some extent to their achievement:

OBJETIVOS	METAS
GOAL 4 Education	4.3 By 2030, ensure equal access for all men and women to quality technical, professional and higher education, including university education 4.4 By 2030, significantly increase the number of young people and adults who have the necessary skills, in particular technical and professional skills, to access employment, decent work and entrepreneurship 4.7 By 2030, ensure that all students acquire the theoretical and practical knowledge necessary to promote sustainable development, including through education for sustainable development and sustainable lifestyles, human rights, gender equality, promoting a culture of peace and non-violence, world citizenship and valuing cultural diversity and the contribution of culture to sustainable development
GOAL 8 Sustainable economy	8.2 Achieve higher levels of economic productivity through diversification, technological modernization and innovation, inter alia by focusing on sectors with high added value and intensive use of labor
GOAL 9 Infrastructures	9.4 By 2030, modernize infrastructure and reconvert industries to be sustainable, using resources more efficiently and promoting the adoption of clean and environmentally sound industrial technologies and processes, and ensuring that all countries take action in accordance with their respective capacities
GOAL 12 Consumption and sustainable products	12.2 By 2030, achieve sustainable management and efficient use of natural resources 12.8 By 2030, ensure that people around the world have the relevant information and knowledge for sustainable development and lifestyles in harmony with nature

1.2.Context and importance of this course in the degree

The subject is taught in the second semester of the first year of the degree.

Knowledge of Graphic Expression is needed to study the contents of other scientific and technical subjects.

In purely scientific subjects is required to develop a spatial vision that allows understanding of certain concepts such as Euclidean space, vector analysis, molecular structure, etc.

In technical subjects, using the learned scientific concepts, the result of work should include an analysis and transfer of information that will necessarily include graphic contents.

1.3.Recommendations to take this course

- The subject has a basic character. Any student of first cycle of a scientific- technician degree will be able to pursue their contents with profit.

However, it is advisable to have knowledge of plane geometry and descriptive geometry (dihedral system). Also it is advisable to know the basics of Technical Drawing (systems of representation) and running a PC user level.

- There are notes on the subject in the EPS Reprographics and material available (theoretical issues, problems, solved exercises, tests other courses related topics, CAD manuals, etc.) in the Moodle UZ (https://moodle.unizar.es/).

2.Learning goals

2.1.Competences

- To study scientific- technical subjects which demanding a spatial vision and analysis of spaces and / or three-dimensional structures.
- To develop a technical drawing of a mechanical design
- To understand and to operate on a topographical map.
- Acquiring knowledge of spatial vision and graphic representation technique.
- To apply basic knowledge of technical drawing.

2.2.Learning goals

- To draw existing geometric relationships among basic elements (point, line, plane and polyhedron) in three dimensional space.
- To represent on a two-dimensional format a three-dimensional polyhedron.
- To perform and understand a technical level in which is embodied a real mechanical design.
- To represent in a two dimensional format topographical works.

2.3.Importance of learning goals

A professional engineering develops his work in a three-dimensional physical space, for which he needs a spatial vision that allows him to analyze the spatial framework which will develop their work.

Also, in a multidisciplinary and global environment, it is necessary to have a technical language that allows communication between different professionals.

Graphic Expression combines these skills, so it can be said to be the "language engineering".

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The subject can be overcome in two non-exclusive ways:

- A system of continuous evaluation, conducted over the course of a series of controls specified content areas that cover the whole subject.
- By conducting a global test (two official calls) covering the whole subject.

The test shall consist of the following thematic contents:

- Metric and projective geometry: homologies
- Descriptive Geometry: dihedral system.
- Descriptive Geometry: topography applications.
- 3D Design. Perspectives.

- Standardization of industrial design.
- CAD tools.
- Search information (bibliography)

4.2 Evaluation criteria

In these tests will be considered:

- The student may use any appropriate information.
- The contents of the questions are known in advance, within a limited range.

To pass the subject is necessary to overcome all the exposed contents. The thematic contents are saved overcome in the same course, but not from one course to another.

Who on continuous evaluation has approved a specific content, will not have to examine it in the global test.

	Points	**Score**	**weigh**
Metric and projective geometry: homologies	10	1	10%
Descriptive Geometry: dihedral system	10	2	20%
Descriptive Geometry: topography applications	10	2	20%
3D Design. Perspectives	10	1	10%
Standardization of industrial design	10	2	20%
CAD tools.	10	1	10%
Search information (bibliography)	10	1	10%
Total		10	1

All content must be overcome; there will be no trade-off among them. A thematic content is approved when obtained a score equal to or greater than 5. If one of the topics is suspended, the exam will be suspended in full.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

In each of the topics to work it is intended that students acquire not only basic knowledge, but be able to search, analyze and structure the information needed to develop the theme.

For this, the teacher responsible for the course will present basic contents and guidelines by which will analyze and solve a number of problems and exercises, individually or in groups (not very numerous).

During the course, a series of tests in which students individually solve the exercises will be conducted.

As part of the learning process, these exercises will be discussed individually with the teacher of the subject so that the student must assess the work of correction, prosecuting the results.

At all times the student's attitude toward learning is valued.

4.2.Learning tasks

The course includes the following learning tasks:

- CAD Systems
- Metric and projective geometry: homologies.
- Descriptive Geometry: dihedral system
- Descriptive Geometry: topography applications
- 3D Design. Perspectives
- Standardization of Industrial Drawing: representation of parts (views, sections, sketches).
- Search information (bibliography)
- Dimensional and geometric tolerances. Settings. Measurement uncertainty.

4.3.Syllabus

The course will address the following topics:

Theory program

- CAD Systems (AutoCAD)
- Metric and projective geometry: homologies.
- Descriptive Geometry: dihedral system (classical and direct methods)
- Descriptive Geometry: topography applications (roads).
- 3D Design. Perspectives
- Standardization of Industrial Drawing: representation of parts (views, sections, sketches).
- Search information (bibliography)
- Dimensional and geometric tolerances. Settings. Measurement uncertainty.

Practice program

- CAD Systems (AutoCAD)
- Metric and projective geometry: homologies.
- Descriptive Geometry: dihedral system (classical and direct methods)
- Descriptive Geometry: topography applications (roads).
- 3D Design. Perspectives
- Standardization of Industrial Drawing: representation of parts (views, sections, sketches).
- Search information (bibliography)
- Dimensional and geometric tolerances. Settings. Measurement uncertainty.
- Search information (bibliography)

4.4.Course planning and calendar

Detailed schedule: https://moodle.unizar.es/

The subject is taught in the 2nd semester with a total of 18 weeks (including non-school periods). The student workload is 150 hours (6 ECTS credits). Each credit represents a work of 10 contact hours and 15 non-contact hours. In the course is organized as follows:

Activity name	ECTS credits	contact hours	non-contact hours	Total
Interactive classes. Individual study and work / group	2	20	30	50
Exercises. Individual study and work / group	2	20	30	50
CAD systems. Individual study and work / group	1,5	15	22,5	37,5
Search information	0,5	5	7,5	12,5
	Total	60	90	150

- classes: see website EPS: times

http://www.unizar.es/centros/eps/

- Controls (midterms): at the end of each unit

Final exams: see website EPS: http://www.unizar.es/centros/eps/

June

September

4.5.Bibliography and recommended resources

In the Moodle UZ there are a collection of books available to students. https://moodle.unizar.es/

BB Félez, Jesús. Dibujo industrial / Jesús Félez, Mª Luisa Martínez . 2a. ed. rev. Madrid : Síntesis, 1996

BB Fernández Sora, Alberto. Expresión gráfica / Alberto Fernández Sora . 1ª ed. Zaragoza : Mira Editores, 2003

BB Fernández Sora, Alberto. Geometría descriptiva : sistema diédrico / Alberto Fernández Sora . 2ª ed.

Zaragoza : Prensas Universitarias de Zaragoza, 1995

BB Giménez Peris, Vicente. Diédrico directo. Tomo I, Teoría y 190 ejercicios de aplicación / Vicente Giménez Peris . Los Barrios (Cádiz) : [s. n.], D. L. 2007

BB Giménez Peris, Vicente. Diédrico directo. Tomo II, Superficies, intersecciones entre superficies, conductos de transición, diseño asistido por ordenador, sombras / Vicente Giménez Peris . Algeciras : Regina Cabello, D.L.2014

BC Aldabas García, Luis. Geometría descriptiva. Diédrico : problemas de exámenes resueltos y comentados, propuestos en centros politécnicos de ingeniería y arquitectura / Luis Aldabas García . Zaragoza : Mira, D.L. 1996

BC Alvaro González, José Ignacio. Ejercicios del sistema de planos acotados y su aplicación al dibujo topográfico / José Ignacio Alvaro González . [Madrid] : Dossat 2000, D.L.1994

BC Bas Vivancos, Cesáreo. Topografía agrícola / Cesáreo Bas Vivancos . Valencia : E.U.I.T Agrícola de Orihuela, Universidad Politécnica, D.L. 1991

BC Bertran Guasp, J. (2005). Sistema diédrico directo. Editorial Donostiarra

BC Calvo Lalanza, Manuel. Dibujo industrial : normalización / M. Calvo Lalanza . [s.l.] : [s.n.], D.L. 2003

BC Collado Sánchez-Capuchino, Vicente. Sistema de planos acotados : sus aplicaciones en ingeniería / Vicente Collado Sánchez Capuchino . [1a. ed.] Madrid : Tebar Flores, D.L. 1988

BC Domínguez García-Tejero, Francisco. Topografía general y aplicada / Francisco Domínguez García-Tejero . 13ª ed. corr. y act. Madrid [etc] : Mundi-Prensa, 1998

BC Esteban Royo, Andrés. Interpretación de planos / Andrés Esteban Royo . 2ª ed. Madrid : Fundación Confemetal, D.L. 2006

BC García Ricart, José Manuel. Apuntes de normalización / José Manuel García Ricart . Valencia : Universidad Politécnica, Servicio de Publicaciones, D.L. 2006

BC García Ricart, José Manuel. Ejercicios de dibujo técnico : piezas aisladas y conjuntos / José Manuel García Ricart . Valencia : Universidad Politécnica, Servicio de Publicaciones, D.L. 2006

BC Gómez Jiménez, Francisco. Geometría descriptiva : sistema diédrico y acotado. Problemas/ Francisco Gómez Jiménez, Mario Fernández González . 1ª ed. Barcelona : Edicions UPC, 2005

BC Gonzalez Monsalve, Mario. Dibujo técnico. Tomo II, Geometría descriptiva : sistema diédrico, sistema acotado, sistema axonomético, perspectiva caballera, sistema cónico / Mario Gonzalez Monsalve, Julián Palencia Cortés . Sevilla : Los autores, 1992

BC Izquierdo Asensi, Fernando. Geometría descriptiva / Fernando Izquierdo Asensi . 23ª ed. Madrid : [s.l.](Fernández Ciudad S.L.), D.L.1997

BC López-Cuervo y Estevez, Serafín. Topografía / Serafín López-Cuervo y Estévez . 2a. ed. rev. y act. Madrid : Mundi-Prensa, 1996

BC Manual de normas UNE sobre dibujo . 2a. ed. Madrid : IRANOR, D.L. 1983

BC Mira Llosá, José Ramón. Ejercicios de dibujo técnico : ?sistemas de representación?. José Ramón Mira Llosá, José María Gomis Martí . Valencia : Universidad Politécnica, Servicio de Publicaciones, D.L.1993

BC Nieto Oñate, M.. Representación de superficies, aplicación al dibujo técnico / M. Nieto Oñate, J. Arribas González, E. Reboto Rodríguez . Valladolid : Secretariado de Publicaciones e Intercambio Editorial, Universidad de Valladolid, 1999

BC Rodríguez de Abajo, F. Javier. Dibujo técnico / F.Javier Rodríguez de Abajo, Víctor Alvarez Bengoa . San Sebastián : Editorial Donostiarra, D.L.1990

BC Rodríguez de Abajo, F. Javier. Geometría descriptiva. T. 1, Sistema diédrico / F. Javier Rodríguez de Abajo . - 25ª. ed. San Sebastián : Editorial Donostiarra, D.L. 2006

BC Zorita Carrero, I (2014). 100 ejercicios resueltos de diédrico directo. Universidad de Extremadura

The updated recommended bibliography can be consulted in:
http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28908