Engineering Graphics

Academic Year: (2023 / 2024) **Review date: 09/01/2024 15:21:56**

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: RUBIO HERRERO, PATRICIA

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Students are supposed to have studied Technical Drawing in the High School
Students will use a CAD software that is in Spanish.

LEARNING OUTCOMES

CB1. Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.
CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.
COCIN1. Ability to draft, sign and develop projects in the area of industrial engineering for construction, renovation, repair, preservation, demolition, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy installations, electrical and electronic installations, industrial plants and installations and automation and manufacturing processes.
COCIN3. Knowledge of basic and technological subject areas that will capacitate them to acquire new methods and theories and endow them with the versatility to adapt to new situations.
COCIN4. Ability to resolve problems with initiative, decision-making, creativity, and critical reasoning skills and to communicate and transmit knowledge, skills and abilities in the Industrial Engineering field.
COCIN5. Knowledge to perform measurements, calculations, assessments, appraisals, surveys, studies, reports, work plans and other similar jobs.
CEP1. Capacity to design a system, component or process in the area of electrical engineering in compliance with required specifications.
CEP2. Knowledge and ability to apply computational and experimental tools for analysis and quantification of electrical engineering problems.
CEB5. Capacity for spatial vision and knowledge of graphic representation techniques, including traditional methods of metric geometry and descriptive geometry as well as computer assisted design applications.

RA1.1. Knowledge and understanding of representation systems, their geometric basis, normalized agreements and symbols about industrial design and computer-aided design.
RA2.1. The ability to apply their knowledge and understanding to read, interpret and perform Industrial drawings.
RA3.2. An understanding of design methodologies to express graphical ideas, designs and projects in a precise and normalized way.
RA4.3. Workshop and laboratory skills.
RA5.1. The ability to select and use appropriate tools and methods to perform industrial designs.
RA5.2. The ability to combine theory and practice to solve engineering problems.

OBJECTIVES

1. Know, interpret and use the representation systems, their geometric foundation and the conventions and standardized symbols that underlie industrial design and computer-aided design.
2. Apply your knowledge and understanding to read, interpret and correctly develop industrial drafts.

3. Understand and use different methods to graphically express ideas, designs and projects in a precise, clear, unambiguous and standardized manner.
4. Develop technical level and computer-aided design laboratory tasks.
5. Select and use appropriate tools and methods to graphically document industrial designs.
6. Combine theory and practice to solve problems of engineering graphics.
7. Work effectively both individually and as a team

DESCRIPTION OF CONTENTS: PROGRAMME

1. Standardized representation systems.
1.1. Ortographic projection
1.2. Isometric projection
2. Representation of industrial assemblies
2.1. Representation of parts
2.2. Dimensioning
2.3. Standardized representation of basic industrial elements
2.4. Representation of industrial assemblies
3. Dimensional and geometric tolerances
4. Computer Aided Design

LEARNING ACTIVITIES AND METHODOLOGY

Theoretical lectures
Drawing exercises in class
Computer exercises by CAD
Personal and group working.
Mechanical Drawings
Office hours for students

ASSESSMENT SYSTEM

% end-of-term-examination/test:	49
% of continuous assessment (assigments, laboratory, practicals…):	51

Final Exam for the course: 49%

Continuous Assessment:51%

Criteria:

¿ Continuous assesment first part (EC1): 4.5%
¿ Continuous assesment second part (EC2): 7.5%
¿ Continuous assesment third part (EC3): 9%

¿ Class work (TC):
Deliverables (L): 20%
Lab DAC (DAC): 10%

¿ Final exam, made of three parts:
- o Final exam of the first part (EF1): 10.5%
- o Final exam of the second part (EF2): 17.5%
- o Final exam of the third part (EF3): 21%

****In order to pass de course a grade >=5 points should be obtained*****
In order to pass de course a grade >=3.5 points should be obtained in DAC Laboratory.

If the student passes a part of the continuous assesment, the following must be taken account (the marks are refered to 10 points):
¿ the three continuous assesments have been passed (EC1 >= 5, EC2 >= 5 y EC3 >= 5), the final mark will be:

$$\text{NOTA FINAL} = 0{,}2\,L + 0.1\,DAC + 0.15 \times EC1 + 0.25 \times EC2 + 0.3 \times EC3$$

¿ with one or more fails in the continuous assesments the califications will be calculated as

% end-of-term-examination/test:	49
% of continuous assessment (assigments, laboratory, practicals…):	51

following:

EC1>=5; EC2<5; EC3<5: NOTA FINAL= 0,2 L +0.1 DAC+0,15*EC1+0,075*EC2+0,175*EF2+0,09*EC3+0,21*EF3

EC1>=5; EC2>=5; EC3<5: NOTA FINAL= 0,2 L +0.1 DAC+0,15*EC1+0,25*EC2+0,09*EC3+0,21*EF3

EC1>=5; EC2<5; EC3>=5: NOTA FINAL= 0,2 L +0.1 DAC+0,15*EC1+0,075*EC2+0.175*EF2+0,3*EC3

EC1<5; EC2>=5; EC3<5: NOTA FINAL= 0,3*TC+0,06*EC1+0,14*EF1+0,2*EC2+0,09*EC3+0,21*EF3

EC1<5; EC2<5; EC3>=5: NOTA FINAL= 0,3*TC+0,06*EC1+0,14*EF1+0,06*EC2+0,14*EF2+0.3*EC3

EC1<5; EC2>=5; EC3>=5: NOTA FINAL= 0,3*TC+0,06*EC1+0,14*EF1+0,2*EC2+0,3*EC3

EC1<5; EC2>=5; EC3<5: NOTA FINAL= 0,2 L +0.1 DAC+0,045*EC1+0,105*EF1+0,25*EC2+0,09*EC3+0,21*EF3

EC1<5; EC2<5; EC3>=5: NOTA FINAL= 0,2 L +0.1 DAC+0,045*EC1+0,105*EF1+0,075*EC2+0,175*EF2+0.3*EC3

EC1<5; EC2>=5; EC3>=5: NOTA FINAL= 0,2 L +0.1 DAC+0,045*EC1+0,105*EF1+0,25*EC2+0,3*EC3

EC1<5; EC2<5; EC3<5 : NOTA FINAL=0,2 L+0.1 DAC+0,045*EC1+0,105*EF1+0,075*EC2+0,175*EF2+0,09*EC3+0,21*EF3

To pass the course a minimum of 35% of the calification of each exam is needed.

For the retake, the student will examine the whole course and the final mark will be calculated:
1. If the student followed the continuous assesment, the calculation is as in the ordinary call. Following the expression:

NOTA FINAL=0,2 L +0.1 DAC+0,045*EC1+0,075*EC2+0,09*EC3+0,49*mark final assesement

To pass the course a minimum of 35% of the calification of the exam as a whole is needed.

2. If the student did not follow the continuous assesment, the mark will be over the 100% of the exam.

Nevertheless, the mark will be calculated as in point number 1 or number 2, that that suits best.

BASIC BIBLIOGRAPHY

- Jesús Félez; Mª Luisa Martínez Dibujo Industrial, Síntesis, 1996

- Meneses, Álvarez, Rodríguez Introducción al Solid Edge, Thomson Paraninfo, 2007

ADDITIONAL BIBLIOGRAPHY

- B. Ramos Barbero y E. García Maté Dibujo Técnico, AENOR.

- C. Preciado y F.J. Moral Normalización del dibujo técnico, Ed. Donostiarra.

- F. J. Rodríguez de Abajo y R. Galarraga Normalización del dibujo industrial, Ed. Donostiarra, 1993

- Izquierdo Asensi Geometría descriptiva, Autor.

- Varios autores Normas UNE, UNE.