PERSONA CIÈNCIA EMPRESA
UNIVERSITAT RAMON LLULL

COURSE: GRAPHIC EXPRESSION

SUBJECT MATTER: Graphic Expression
MODULE: Basic Formation
PROGRAM: Degree in Chemical Engineering

GENERAL CHARACTERISTICS

Type: ☑ Basic Formation, ☐ Compulsory, ☐ Elective
☐ Final Degree Project, ☐ Internship

Duration: Semestral **Semester/s**: 3
Number of ECTS credits: 6
Language/s: Spanish, Catalan

DESCRIPTION

SHORT DESCRIPTION AND JUSTIFICATION

It is an eminently practical subject that will provide the necessary tools so that the future graduated or graduated in Chemical Engineering can project and interpret technical diagrams used in the chemical industry and solve the graphic problems that arise in the exercise of their activity. The objectives of the subject are to transmit to the students those concepts that allow them to understand the principles and techniques of the most common graphic expression, of geometric constructions and representation systems, to initiate students in the use of computer tools for industrial drawing design through computer-aided design (DAO / CAD) and transmit knowledge of regulations and applications of technical drawing in industrial environments.

COMPETENCES

- Be able to understand and apply basic knowledge of Graphic Expression for application in the field of Chemical Engineering. (→**CB1, E1**)
- Be able to identify, formulate and solve basic problems in Graphic Expression and problems in the fields of Chemical Engineering and Chemistry. (→**CB2, E7**).
- That students are able to convey information, ideas, problems and solutions to both specialized and non-specialized audiences. (→**CB4**)
- Spatial vision capability and knowledge of graphical representation techniques, both through traditional methods of metric geometry and descriptive geometry, and through computer-aided design applications. (→**BF5**)

PREREQUISITES

According to the program planning and academic regulations.

CONTENTS

METHODOLOGY

LEARNING ACTIVITIES

Learning Activities	Hours	ECTS Credits	Competences
Lectures	20	0,7	CB1, E1, FB5
Case and Problem-Solving Sessions	5	0,2	CB1, E1, CB2, E7, FB5
Seminars	2	0,1	CB1, E1
Practical & Lab Work	23	0,9	CB1, E1, CB2, E7, FB5
Presentations	12	0,4	CB2, E7, CB4
Personal study	94	3,5	CB1, E1, CB2, E7, FB5
Assessment Tasks (Exams, Continuous Assessment...)	6	0,2	CB1, E1, CB2, E7, FB5
TOTAL	**162**	**6**	

TEACHING METHODOLOGY

The subject consists of mainly two types of classes: theoretical classes and practical sessions. During the theoretical classes the content of the subject will be presented. In addition, in practical sessions the student will receive work to be done during these sessions. With these practical sessions we try to consolidate the knowledge received in the theoretical classes. There will be 3 practical assignments with the aim of reinforcing and checking that the student evolves correctly acquiring the necessary knowledge.

The contents of the course are divided into three blocks. A first block focused on introducing students to concepts related to industrial drawing. Once this first block is finished, blocks 2 and 3 will be made in parallel. In block 2 it will be explained what types of diagrams and plans can be made while in block 3 we will explain how computer-aided design works.

A small Project will also be programmed during the course. It will be presented in class in order to learn how to make presentations and communicate results using the concepts explained in class.

The necessary computer programs, collections of problems, documents corresponding to the face-to-face sessions and bibliographic resources are provided, for the personal study of the student.

ASSESSMENT

ASSESSMENT METHODS

Assessment Methods	Weight	Competences
Final Exam	40%	CB1, E1, CB2, E7, FB5
Midterm Exam/s	30%	CB1, E1, CB2, E7, FB5
Follow-up Activities	15%	CB2, E7 FB5
Reports and Presentations		
Lab or Field Work		
Projects	15%	CB2, E7, CB4
Host Student Evaluation	-	
Participation	-	

LEARNING OUTCOMES

- The student must demonstrate the ability to understand and apply the basic knowledge of graphic expression, necessary for the practice of chemistry and engineering. (→CB1, E1, FB5).
- The student must demonstrate the ability to communicate effectively, graphically, to transmit knowledge, skills and abilities in the field of chemistry and engineering. (→CB4).
- The student must demonstrate ability of spatial vision and knowledge of graphic representation techniques, both by traditional methods of metric geometry and descriptive geometry, and by computer-aided design applications. (→CB2, E7, FB5).

QUALIFICATION

PR: Project (15% Final Mark). Teamworking to construct an Engineering Diagram.
CA: Continuous Assessment Activities (15% Final Mark). Exercises related with the topics of the course.
ME: Midterm Exams (30% Final Mark). Control exams to evaluate the knowledge of the course.
FE: Final Exam (40% Final Mark). The final mark of the exam must be higher than 4.

The final qualification (FQ) will be calculated as follows:
FQ= 0.15*PR +0.15*CA + 0.30*ME + 0.40*FE.

The no presentation of some of these items will led to lose the right for the final exam.

ASSESSMENT OF THE COMPETENCES

For the evaluation of each competence, the next indicators will be used:
Competence CB1: FE + ME
Competence E1: FE + ME
Competence FB5: FE + ME + CA
Competence CB2: FE + ME + CA + PR
Competence E7: FE + ME + CA + PR
Competence CB4: PR

BIBLIOGRAPHY

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- Prácticas de Dibujo Técnico. Editorial Donostiarra. 14 tomos.
- FÉLEZ, J, MARTÍNEZ, M.L. Ingeniería gráfica y diseño. Ed. Síntesis. 2008
- TAJADURA ZAPIRAIN, J.A. AUTOCAD Avanzado 2013 - 2014. Ed. MCGRAW-HILL / INTERAMERICANA DE ESPAÑA, S.A., 2013
- TURTON R. Analysis, Synthesis and Design of Chemical Processes. Ed. Prentice Hall. 2012
- AUSTIN D.G. Chemical Engineering Drawing Symbols. Ed. John Wiley and Sons. 1979
- IZQUIERDO ASENSIO, F Geometría Descriptiva. Ed. Dossat.
- RODRIGUEZ DE ABAJO, FJ. Geometría descriptiva. Tomo I. Sistema diedrico. Ed. Donostiarra.
- RODRIGUEZ DE ABAJO, FJ. Geometría descriptiva Tomo II, Sistema de planos acotados. Ed. Donostiarra. 1992

DOCUMENT HISTORY

PREVIOUS REVISIONS
September 5, 2017, Dr. Rafael González Olmos
September 5, 2016, Dr. Rafael González Olmos

CURRENT REVISION
February 20, 2019, Damià Palmer Comas