28952 - Utilities and process control

Syllabus Information

Academic Year:	2018/19
Subject:	28952 - Utilities and process control
Faculty / School:	201 -
Degree:	437 - Degree in Rural and Agri-Food Engineering
ECTS:	6.0
Year:	4
Semester:	First semester
Subject Type:	Compulsory
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

Learning goals

Importance of learning goals

Assessment (1st and 2nd call)

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

Methodology, learning tasks, syllabus and resources

Methodological overview

THEORY LESSONS

The theoretical academic sessions will be used to allow students to learn through exposure professor concepts and methodologies of work needed to start developing your self-employment. These sessions will be conducted mostly with

the support of computer presentations and projected; previously will be provided to the student.

PROBLEM SOLVING:

The student will be given a series of problem sets that will solve or try to solve, then the interactive sessions will address the doubts and resolutions thereof.

WORKS:

In the classroom will be In the classroom will be proposed during the course 3 or 4 works, which the students have to solve. subsequent to the delivery, they made the defense of the same.

LABORATORY PRACTICE:

The professor made an explanation of the theoretical framework necessary for understanding the theory of practice to develop.

Explanation of equipment and instruments

Students operate the equipment, take data order that they can develop the practice report.

The completion of the practices is obligatory.

Learning tasks

The achievement of a student's basic training is based on theoretical type classes (30 hours) and problems type classes (20 hours), but active participation of students will be encouraged.
Group work/activities (20 hours) are required; they allow the acquisition of general and specific competence.
Individual tutoring will be conducted to clarify particular problems of each student and mandatory tutoring to work with reduced groups specific topics.
Also, the practice program (10 hours) allows to transpose theoretical knowledge to practical application and development of scientific and technical documents.
Tools will be used to support teaching and problem solving .
The Virtual Campus of UniZar will also be used as support.

Syllabus

Theory programme

Topic 1: Introduction

Thematic block 1:

AUXILIARY EQUIPMENT IN THE FOOD PROCESSING INDUSTRY

Topic 2: Use of steam in food processing industries. Steam distribution network.Steam boilers.

Topic 3: Drive compressed air and gases. pneumatic equipment. Distribution networks of compressed air.

Topic 4: Drive liquids. Equipment and distribution networks

Thematic block 2:

PROCESS CONTROL IN THE FOOD PROCESSING INDUSTRY

Topic 5: Introduction to automatic control.

Topic 6: The Process.

Topic 7: Process characteristics

Topic 8: Control actions.

Topic 9: Tuning controllers.

Topic 10: Industrial Instrumentation (I)

Topic 11: Industrial Instrumentation (II)
Topic 12: Characteristics of typical process control loops
Topic 13: Advanced Control
Topic 14: Programmable Logic Controller.

Topic 15: Applications in the industry. typical control schemes.

Practical Programme

Practical 1: Simulating a food processing process. Dynamic response to different inputs

Practical 2: Searching for, consulting and handling information: Catalogues of boilers and burners.

Practical 3: PLC Programming.

Practical 4: Tuning a controller for a continuous process.

Practical 5: Visit to a food processing industry to discover its auxiliary installations "in situ" and to control its processes.

Course planning and calendar

Study time and individual work

Assistance to the presential sessions is mandatory in works/activities and laboratory practice.

The students must take up the subject (4-5 hours per week) to understand and carry out further issues and problems that arise in class.

Overall it is estimated that students must use a total of 90 hours of personal work to complete a total of 150 hours devoted to the subject.

Activity/Week	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
	17-23 sep	24-30 sep	1-7 oct	8-14 oct	15-21 oct	22-28 oct (1)	29-4 oct-nov	5-11 nov	12-18 nov (2)	19-25 nov	26-2 nov-dec	3-9 dec	10-16 dec (3)	17-23 dic	24-30 dic	31-6 dic-ene	7-13 jan	14-20 jan	21-27 jan	28-4 jan-feb	10 feb
															Christmas holidays	Christmas holidays	Exams, tests	Exams, tests	Exams, tests	Exams, tests	
Classroom activity																					64
Theory	4	3	1	1	4	2	1	3	1	3	2	2	1	1							29
Troubleshooting	1	3		1	1	1	1	1	2	2	1	1			2						20
Laboratory sessions					2			2				2	2		2						10
Exams, tests																			5		5
Personal study and work																					86
Individual work	4	4	3	3	3	3	3	3	2	2	3	2	4	4	4	4	6	5			66
Group work	2	2		2	2	2	2	2	2	2		2									20
TOTAL	8	10	10	7	9	8	9	9	9	8	8	7	8	8	4	4	8	6	10		150

Bibliography and recommended resources

BB — Acedo Sánchez, José. Instrumentación y control básico de procesos / José Acedo Sánchez . [Madrid] : Díaz de Santos, D.L. 2006

BB — Arbones, E., Corral, I., Gómez, J. (2005). Fundamentos termodinámicos y diseño de las instalaciones de vapor en las industrias agroalimentarias. Editorial Trymar

BB — Arbones, E., Gómez, J. Vázquez, E. (2001). Las instalaciones de aire comprimido en la industria agroalimentaria. Editorial Trymar

BB — Balcells Sendra, Josep. Autómatas programables / Josep Balcells, José Luis Romeral . Barcelona : Marcombo Boixareu, D.L. 1997

BB — Piedrafita Moreno, Ramón. Ingeniería de la automatización industrial / Ramón Piedrafita Moreno . 2a ed. amp. y act. Madrid : Ra-Ma, D.L. 2003 [cop. 2004]

BC — Bolton, W.. Instrumentación y control industrial / W. Bolton . 2ª ed. Madrid :

BC   Paraninfo, D.L.1999
Mandado Pérez, Enrique. Controladores
lógicos y autómatas programables /
Enrique Mandado Pérez, Jorge Marcos
Acevedo, Serafín Alfonso Pérez López .
Barcelona [etc.] : Marcombo boixareu, D.L.
1989

BC   Ogata, Katsuhiko. Sistemas de control en
tiempo discreto / Katsuhiko Ogata ;
traducción, José Guillermo Aranda
Pérez...[et al.] . [1a. ed. en español]
México [etc.] : Prentice Hall
Hispanoamericana, cop. 1996

The updated recommended bibliography can be consulted in:
http://psfunizar7.unizar.es/br13/egAsignaturas.php?id=8113