

DEGREE CURRICULUM AGRICULTURAL BUILDINGS AND FACILITIES

Coordination: FERNANDEZ SERRANO, ALVARO

Academic year 2022-23

Subject's general information

Subject name	AGRICULTURAL BUILDINGS AND FACILITIES								
Code	102560								
Semester	1st Q(SEMESTE	1st Q(SEMESTER) CONTINUED EVALUATION							
Туроlоду	Degree	Degree Course Character M							
	Bachelor's De Agricultural a Engineering	3	COMPULSORY		Attendance- based				
Course number of credits (ECTS)	6								
Type of activity, credits, and groups	Activity type	PRACAMP	PRALA	PRALAB PRAL		TEORIA			
	Number of credits	0.3	1.2		1.3	3.2			
	Number of groups	1			1	1			
Coordination	FERNANDEZ SE	RRANO, ALVARO							
Department	AGRICULTURAL	AND FOREST ENG	INEERING	ì					
Teaching load distribution between lectures and independent student work	Face-to-face hours: 60 Non-presential hours: 90								
Important information on data processing	Consult <u>this link</u> f	or more information.							
Language	catalan / spanish								

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
FERNANDEZ SERRANO, ALVARO	alvaro.fernandezserrano@udl.cat	3	
ROSELL POLO, JOAN RAMON	joanramon.rosell@udl.cat	3	

Subject's extra information

Requisite

Prerrequisite: Fonaments de l'Enginyeria Rural i Construcció

Notice

It's strongly recommended to check regularly the information given in 'Campus Virtual'

Learning objectives

Learning objectives and outcomes

The student, on passing the subject, must be able to:

- R1: Know the components of concrete and their properties.
- R2: Calculate the dosage of a concrete.
- R3: Calculate simple elements of reinforced concrete.
- R4: Calculate simple steel elements.
- R5: Know the typologies and structural materials of the commercial greenhouses.
- R6: Know and understand the Regulations, the components and characteristics of a
- Low Voltage Electrical Installation.
- R7: Design and calculate an electrical installation of a fruit and vegetable farm.
- R8: Know the operation of electrical machines and calculate their characteristic parameters.
- R9: Know and measure the main systems for Rural Electrification: conventional and alternative.
- R10: Know and apply techniques for optimizing electricity consumption and the Regulations on Electricity Tariffs.

Competences

General competences

At least the following basic competencies will be guaranteed:

CG1. Ability to prepare, design, draft and sign projects for the construction, refurbishment, repair, conservation, demolition, manufacture, installation, assembly or operation of movable or immovable property which, by its nature and characteristics are included in the technique of agricultural and livestock production (facilities or buildings, farms, infrastructure and rural roads), the agri-food industry (extractive industries, fermentation, dairy, canning, fruit and vegetables, meat, fishing, salting and in general, any other dedicated to the elaboration and / or transformation, conservation, manipulation and distribution of food products) and gardening and landscaping (urban and / or rural green spaces –parks, gardens, nurseries, urban trees, etc.–, public or private sports facilities and environments subject to landscape recovery).

CG2. Adequate knowledge of physical problems, technologies, machinery and water and energy supply systems, the limits imposed by budgetary factors and construction regulations, and the relationships between facilities or buildings and farms, agri-food industries and areas related to gardening and landscaping with their social and environmental environment, as well as the need to relate those and this environment to human needs and the preservation of the environment.

CG8. Ability to solve problems with creativity, initiative, methodology and critical reasoning.

CG10. Ability to research and use the rules and regulations relating to their field of action.

CG12. Ability to work in multidisciplinary and multicultural teams.

CG13. Correction in oral and written expression.

Specific competences

Ability to know, understand and use the principles of:

CEHJ2. Engineering of green areas, sports areas and fruit and vegetable farms. Civil works, facilities and infrastructures of green areas and protected areas.

Electrification. Irrigation and drainage. Machinery for horticulture and gardening.

Subject contents

Syllabus

Unit 1: Actions in the building. Combinations of actions. CTE. Ultimate Limit State. Serviceability Limit State.

Unit 2: Sizing steel structural members. I-beams. Internal forces. Compression and tension stress. Elastic limit. Shear force. Buckling.

Unit 3: Concrete. Standards (*Código Estructural*). Composition. Durability. Dosage. Sizing structural members of reinforced concrete.

Unit 4: Low Voltage Electrical Installations (LVEI). Review of alternating currents. Regulations for LVEI. Elements and characteristics of an LVEI. Security of the LVEI. LVEI design and calculation. The electrical project in Low Voltage. Documentation.

Unit 5: Electrical machines (EM). General principles of EM. Transformers. Rotary direct current EM. Rotary alternating current EM. Special EM. Protection of EMs. Principles of EM automation.

Unit 6: Systems for Rural Electrification. Optimization of electricity consumption. Electricity rates. Power lines. Transformation Centers. Generators. Renewable energies. Photovoltaic installations. Guidelines and techniques for saving and optimizing electricity consumption. Pricing and economic cost of electricity.

Practical activities

Solving case studies with a computer.

Solving exercises and examples in the classroom.

Methodology

Learning activities

		Lectur prob solv (hou	es and ems ring urs)	Practices with the computer (hours)		Evaluation (hours)	ation TOTAL urs) (hours)	
	BLOCS	Classro	om /	Classr	room /			
		Homework		Home	work	Classroom	Classroo Homew	om / ork
1	Introduction	1					1	
2	Unit 1						6	12
	Theory and problems solving	4	7					
	Calculation with computer			2	5			
	Exam unit 1					1		
3	Unit 2						17	28
	Theory and problems solving	9	14					
	Calculation with computer			8	14			
4	Unit 3						3	5
	Theory and problems solving	3	5					
	Exam units 2 & 3					2		
5	Unit 4						14	21
	Content development	14	21					
6	Unit 5						7	12
	Content development	7	12					
7	Unit 6						7	12
	Content development	7	12					
	Exam units 4, 5 & 6					2		

TOTAL			60	90
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Type of activity	Presencial activity of the student	Not Presencial activity of the student
Lectures and problems volving	Introduction and exposition of the concepts and theoretical foundations. Introduction and application of concepts through problem solving.	Study of the theoretical concepts that allow solving problems. Problems solving.
Computer	Problems solving with professional structural design software	Problems solving with professional structural design software

Development plan

Type of Activity	Content	Object	Classroom hours	Accumulated hours	Evaluation	
					Unit	Time (h)
Lecture	Introduction	General overview.	1	1		
Lecture. Problems solving	Unit 1. Review of reactions, internal stresses and stresses in beams	R4	1	2		
Lecture. Problems solving	Unit 1. Calculation of actions in the building (CTE)	R2, R3	3	5		
Computer practices	Unit 1. Combination of actions (CTE)	R2, R3, R5	2	7		
Exam		R2, R3		8	Unit 1	1
Lecture. Problems solving	Unit 2. Calculation of steel members without buckling	R4	2	10		
Lecture. Problems solving	Unit 2. Calculation of steel members in compression with buckling	R4	2	12		

Lecture. Problems solving	Unit 2. Calculation of steel members in bending with buckling	R4	3	15		
Lecture. Problems solving	Unit 2. Calculation of steel members in compression and bending with buckling	R4	2	17		
Computer practices	Unit 2. Calculation of steel members.	R4, R5	8	25		
Lecture. Problems solving	Unit 3 Concrete	R1	3	28		
Exam		R1, R4		30	Units 2 and 3	2
Lecture	Unit 4. Review of alternating currents	R5, R6	1	31		
Lecture	Unit 4. Regulations for Low voltage electrical installations, LVEI. Elements and characteristics of an LVEI	R5, R6	4	35		
Lecture. Problems solving	Unit 4. LVEI design and calculation. Section of conductors.	R5, R6	4	39		
Lecture. Problems solving	Unit 4. Security of the LVEI. The electrical project in LV. Documentation.	R5, R6	5	44		
Lecture	Unit 5. General principles of Electrical machines.	R7	1	45		
Lecture	Unit 5. Electric power converters Transformers	R7	1	46		
Lecture	Unit 5. DC and AC rotary electrical machines.	R7	3	49		

Laboratory practices	Unit 5.Electrical machines	R7	2	51		
Lecture	Unit 6. Power lines.	R8	1,5	52,5		
Lecture	Unit 6. Transformation Centers. Generators.	R8	1	53,5		
Lecture	Unit 6. Renewable energies.	R8	2,5	56		
Lecture	Unit 6. Electricity efficiency and savings. Electricity rates.	R9	2	58		
				60	Units 4, 5 & 6	2
					final recovery Exam	2

Evaluation

	Type of activity	results of	Procedure	Qualification
		lite rearring		weight (%)
CONSTRUCTIONS	Unit 1	R2, R3	Exam	10
CONSTRUCTIONS	Units 2 and 3	R1, R4	Exam	25
CONSTRUCTIONS	Units 1 and 2	R2, R3, R4	Practice	15
INSTALLATIONS	Unit 4	R6, R7	Work presentation	10
INSTALLATIONS	Units 4, 5 and 6	R6, R7, R8, R9, R10	Exam	40
	Total			100

Pass criteria:

- The final grade must be equal to or greater than 5

- The note of each of the two parts (Constructions and Electrification) must be equal to or greater than 5

Exams

- The exams of units 1, 2 and 3 may be carried out with the documentation indicated

- In the exams of units 4, 5 and 6, the only documentation that can be consulted is a form prepared by the student himself.

- During the exams it is not allowed to use computers, mobile phones, watches or any other type of device that allows connection to the internet or with other people.

Recovery:

Constructions:

- If the Construction grade is less than 5, a recovery exam of topics 1,2 and 3 will be carried out..
- The practice cannot be recovered.

Installations:

- If the Installations (electrifications) grade is less than 5, a recovery exam of topics 4,5 and 6 will be carried

out.

- The presentation of the work cannot be recovered.

Practices

- Any practice delivered after the deadline will be considered as not delivered.

General criteria

- The formal correctness of the documents submitted by students, whether in exams or problems, is demanded. It is not possible to pass the course if this requirement is not fulfilled. Special attention about the spelling must be paid.

- When correcting exams and practices, the absence or incorrectness of the units in the numerical results, the misconceptions, errors or rude contradictions will be especially penalized. The presence of some of the error described here may be enough to cause an examination to be qualified as not passed.

Bibliography

Basic bibliography

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