



Universitat de Lleida

DEGREE CURRICULUM **BUILDING PROCESS**

Coordination: LORENTE MESA, FREDERIC

Academic year 2022-23

Subject's general information

Subject name	BUILDING PROCESS			
Code	101420			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION / UNDEFINED			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Architectural Technology and Building Construction	3	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA	TEORIA	
	Number of credits	3	3	
	Number of groups	1	1	
Coordination	LORENTE MESA, FREDERIC			
Department	COMPUTER SCIENCE AND INDUSTRIAL ENGINEERING			
Teaching load distribution between lectures and independent student work	40% h lectures 60% h independent student work			
Important information on data processing	Consult this link for more information.			
Language	Catalan			
Distribution of credits	Lidia Rincón: 6 credits.			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
COMA ARPON, JULIÀ	julia.coma@udl.cat	0	
LORENTE MESA, FREDERIC	frederic.lorente@udl.cat	6	

Subject's extra information

The course is run in the 2nd semester of the 3rd year of degree. It belongs to the module "Specific training", specifically in the field "management process."

The subject brings together the knowledge acquired in different subjects already taken as a prerequisite, trying to finish a trajectory throughout the race in the application of these theoretical knowledge in the execution of the work with practical.

Co-requisite:

It is imperative that you have previously passed the PLANNING, PROGRAMMING AND CONTROL (101421) assignment.

It is advisable (but not essential) to simultaneously take the course SAFETY AND HEALTH (101423).

Learning objectives

1. General aim

The subject is a theoretical and practical course that aims to provide the knowledge needed to plan and organize the construction process and be able to execute the work, so that it can ensure the fulfillment of commitments owner and builder, guaranteeing the fundamental conditions of quality, cost, time, health and safety and waste management.

2. Objectives

- To know who are the agents involved in the construction process, how the construction company is structured, and what is the role of Technical Architect.
- To get the necessary documentation in the construction process, both technical and administrative.
- To have the resources of materials, labor, machinery and auxiliary means in order to execute the terms of quality, cost, time, health and safety and waste management required.
- Understanding the determinants of the organization's work depending on the type of building, building systems and technical and human resources available.
- To analyze the activity of the construction process in order to allocate resources more appropriate in quality and quantity and establish their timing.
- Planning processes in time of execution of the work by applying its planning and programming tools.
- To implant the site machinery and installations work for each phase of the construction process.
- To coordinate the various construction trades in implementing the work plan determining planning work.
- Managing construction and demolition waste generated during the construction process.

Competences

University of Lleida strategic competences

- UdL3 Mastering ICT's.

Degree specific competences

- GEE25. Capacity to schedule and manage the building process, the work teams, and the technical and human means for maintenance and execution.
- GEE26. Knowledge of building legislation, contractual relationships in the different phases of a building process. Furthermore, knowledge of the legislation and other specific rules regarding security and occupation healthcare issues in buildings.
- GEE27. Aptitude to write studies, basic studies and security and labour health plans, and coordinate the security in a project and executive phases of a construction work.
- GEE28. Capacity for the quality management in construction works, the writing, application, implantation and update of manuals and quality plans, to perform quality management audits in companies and to edit the book of the building.
- GEE29. Aptitude to analyse, design and execute solutions that allow the universal access to buildings and surroundings.
- GEE30. Knowledge of professional work organization and studies organization, offices and professional societies, the regulation and the legislation related with the functions that develop a Building Engineer and the legal framework of responsibility associated to the activity.

Degree cross-disciplinary competences

- EPS2. Capacity to gather and interpret relevant data, within the area of study, to judge and think about relevant subjects of social, scientific and ethical nature.
- EPS7. Capacity to work in situations with a lack of information and/or under pressure.
- EPS8. Capacity of planning and organizing the personal work.
- EPS13. Capacity to consider the socioeconomic context as well as the sustainability criteria in engineering solutions.

Subject contents

The contents of the course have been set based on the skills and goals that are detailed above. Each issue aims to answer one of the aspects of the organization of the building process. Prior to the exposure of content issues, the subject is introduced explaining the context of the responsibilities and objectives for the course and how it is related to other subjects.

The first chapter presents the agents involved in the construction process and the necessary documentation. Therefore, this chapter is about who is involved in the organization of the work.

The second chapter presents theoretical concepts to analyze each activity of the construction process in order to allocate resources and perform timing. Therefore, this chapter is about what processes are discussed in the organization of the works in the building process.

The third chapter will expose the general principles of organization of technical workshops and facilities in the area of work for each phase of the construction process. Therefore, this chapter is to answer how building processes are organized on construction site.

The fourth theme will present the process of preparing the plan of activities in time to plan the implementation of the various activities of work. Therefore, this chapter is about when the processes that make possible the execution of the work are starting and finishing.

In the fifth chapter will be introduced the management of the building process with practical examples of real cases. Therefore, this issue is in response to how runs the organization's work.

Finally, the sixth chapter will deal with concepts of environmental management in the work, emphasizing the drafting of waste management plan. Therefore, this subject is to respond to which is the environmental impact of the construction process is and how to mitigate it.

The contents for each topic are:

CHAPTER I. The organizational process in the construction sector

1. Agents involved in the construction process
2. The construction company
3. The project executive building
4. Documentation, licenses and permits before
5. Contracting of the work and guidance
6. The head of work
7. Human resources and construction trades

CHAPTER II. Analysis of activity of the construction process

1. Production
2. Assets and operational resources
3. Duration
4. Amount of work
5. Rhythm and cycle
6. Performance and Productivity
7. Decomposition of an activity in elementary
8. Reference values for the amount of work and productivity
9. Amount and duration of work
10. Productivity and rhythm
11. Pace and resource allocation

CHAPTER III. Implementation of the work

1. The project organization
2. The general plan of implementation of the work
3. Elements conditions
4. Requirements
5. General principles of organization
 - 5.1. Facilities
 - 5.2. Storage areas for materials and machinery
 - 5.3. Temporary facilities services
 - 5.4. Circulation interior
 - 5.5. Location of premises

CHAPTER IV. Planning temporary work

1. Needs Planning
2. Requirements Planning
3. Planning the work
4. Process of business plan
 - 4.1. Definition of work activities
 - 4.2. Ordering activities
 - 4.3. Resource allocation
 - 4.4. Estimated time
 - 4.5. Calculating the deadline
 - 4.6. Review planning
 - 4.7. Graphical representation of planning. PERT network diagram and Gantt chart
 - 4.8. Monitoring and control planning

CHAPTER V. The operation of the work.

1. Examples of case studies.

2. The organization of the works project, based on the previous analysis of the executive project.
3. The concrete planning.

CHAPTER VI. Environmental management in the organization of work

1. Objectives of environmental management
2. Influence of the building process on the environment
 - 2.1. Resource consumption
 - 2.3. Production Waste
 - 2.3 Emissions to air, water and soil
3. Environmental measures in the implementation phase of the work
4. Deconstruction
5. Waste generated in construction
6. Waste Management Plan

Methodology

The course will be taught weekly in 4 hours divided into 2 hours of theoretical class and 2 hours of practical class. The theoretical classes will have the character of a flipped learning classroom, where the active participation of the student is fundamental. The flipped classroom aims to transfer part of the learning process outside the classroom in order to use face-to-face or virtual teaching time for the development of more complex cognitive processes that foster meaningful learning. The student will have available on the virtual campus the learning resources (theoretical notes, videos, scientific articles, regulations and practical information) and must have read and reflected on them beforehand in the face-to-face / virtual class, which will be dedicated to the deepening of the concepts and the resolution of doubts. In the practical classes, real case studies will be presented, so that the theoretical knowledge is materialized in circumstances most similar to the professional world. In these real case studies, the intensive analysis of the problem or event raised will help to know, analyze and interpret the case, while reflecting on and criticizing the conclusions of the adopted solutions. As a general rule, the exercises will be posed at the beginning of the class, a space will be left for the analysis, reflection and resolution of the same, and later it will be solved in the same class or in the immediate week. During the course, the bibliography and regulations on which the student must base themselves for a correct study of the topics will be indicated. Given the importance of student active participation in both theoretical and practical classes, it is essential to ensure attendance at them.

Development plan

Given the exceptional circumstances due to the pandemic, the face-to-face classes will be replaced by the virtual classes according to what is established by the University of Lleida.

According to the description of the subject in the curriculum, it consists of 6 ECTS credits, which corresponds to:

6 x 25 = 150 hours

60% self-employed = 90 hours

40% work with teacher = 60 hours

Development plan:

Week	Mont	Day	Monday	Wednesday	HTP/HTNP

			Contents	Contents	
1st	February	15 & 17	Chapter 1	Chapter 1	4/3
2nd		22 & 24	Chapter 3	Chapter 3	4/6
3rd	March	1 & 3	Chapter 3	Chapter 3	4/6
4th		8 & 10	Chapter 3	Chapter 2 / Practice 1	4/6
5th		15 & 17	Chapter 2	Chapter 2	4/6
6th		22 & 24	Chapter 2	Chapter 2	4/6
			HOLIDAY		
7th	April	7	HOLIDAY	Chapter 4 / Practice 2	2/3
8th		12 & 14	Chapter 4	Chapter 4	4/6
9th		19 - 23	EVALUATION WEEK		0/3
10th		26 & 28	Chapter 4	Chapter 4	4/6
11th	May	3 & 5	Chapter 4	Chapter 4 / Entrega pràctica 3	4/6
12th		12	HOLIDAY	Chapter 5	2/3
13th		17 & 19	Chapter 5	Chapter 5	4/6
14th		24 & 26	Chapter 5	Chapter 6	4/6
15th	June	31 & 2	Chapter 6	Chapter 6 / Practice 4	4/6
16th		7 - 11	EVALUATION WEEK		0/3
17th		14 - 18	EVALUATION WEEK		0/3
18th		21 - 25	Tutoring		2/3
19th		28	Recovery practices		0/3

HTP = Hours of Classroom Work

HTNP = No Face Working Hours

Evaluation

Evaluation criteria:

The evaluation of the subject is fully continued. It consists of the compulsory delivery of 4 practical works throughout the course, the first two individually and the last two in groups of 2 students. Each practice has a percentage of the total mark of the course according to Table 1. The suspended practices can be recovered according to the planned calendar, by means of the delivery of some specific practical works. Student participation in the inverted classroom will be evaluated continuously throughout the course and will have 10% of the value of the final mark.

Calculation of the final grade:

$$\text{Nota} = 0,2 \cdot P1 + 0,2 \cdot P2 + 0,25 \cdot P3 + 0,25 \cdot P4 + 0,1 \cdot T$$

Table 1. Evaluation activities.

Evaluation activities	Percentage	Dates of delivery	Group/Individual
Practice 1 (P1)	20 %	Week 4	Individual
Practice 2 (P2)	20 %	Week 8	Individual
Practice 3 (P3)	25 %	Week 12	Group
Practice 4 (P4)	25 %	Week 16	Group
Participation at class (T)	10 %	All the semester	Individual
Recovery practice 1	20 %	Week 19	Individual
Recovery practice 2	20 %	Week 19	Individual
Recovery practice 3	25 %	Week 19	Group
Recovery practice 4	25 %	Week 19	Group

Bibliography

- “Manual de dirección y organización de obras”. Antonio García, Ana Sánchez-Ostíz. Ed. CIE Dossat 2000. 2004
- “Organización de obra y control de personal”. Salvador López Álvarez & Jaime Llames Viesca. Ed. Ribera de Arriba Lex Nova 2005
- “Organización y gestión de proyectos y obras”. Germán Martínez Montes, Eugenio Pellicer Armiñana. Madrid. Ed. McGraw-Hill / Interamericana de España 2007
- “Oficina técnica. Proyectos, dirección y control de obras”. Pedro Gómez Pompa y Mónica Gómez Pérez. Ed. Manuales UNEX, nº 14. 1994
- “Manual para la dirección de obras”. Faustino Merchán Gabaldón. Ed. CIE Dossat 2000. “Organización práctica de la construcción y obras públicas”. Émile Olivier. (Versión española de Martín Llorens y J.M. Massaguer). Ed. Blume.1973
- “Manuels d'ecogestió 7. Construcció. Aspectes ambientals. Gestió ambiental en l'execució d'obres”. Construccions Rubau. S.A. Bordó Colomer, Joaquim. Departament de Medi Ambient de la Generalitat de Catalunya.
- “Organización y control de obras de edificación”. Tema V. Conceptos básicos asociados a su ejecución. José Antonio Comas. Ed. Entinema, 1995.
- “Planes de obra”. Fco. Javier Zaragoza Martínez. Editorial Club Universitario. 4ª edición. San Vicente (Alicante), 2008.