



Universitat de Lleida

DEGREE CURRICULUM
**BUDGETS AND
MEASUREMENTS**

Academic year 2015-16

Subject's general information

Subject name	Budgets and Measurements
Code	101425
Semester	1st semester
Typology	Compulsory
ECTS credits	6
Theoretical credits	2
Practical credits	4
Office and hour of attention	CREA building, 1.04. Thursday 4 PM to 5 PM.
Department	Computer and Industrial Engineering
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Catalan
Degree	Degree in Technical Architecture
Distribution of credits	Lidia Rincón Villarreal 8.4 credits
Office and hour of attention	CREA building, 1.04. Thursday 4 PM to 5 PM.
E-mail addresses	lrincon@diei.udl.cat

Lidia Rincón Villarreal

Subject's extra information

Subject from the 1st semester of the 3rd year of the degree.

Learning objectives

See competences

Competences

Degree-specific competences

- Aptitude for the development of market studies, valuations and assessments, studies of real estate viability, economical specialist's report and assessment of risks and damage during the building.

Goals

- Determining the cost of a project, the economic viability of a development plan and the clinical judgment of damages in a building.
- Ability to analyse and realise projects of building evacuation.

Goals

- Without Translate - Determinació del cost d'un projecte.
- Ability to prepare and calculate basic, auxiliary, unitary and estimated prices of the work units; analyse and control the costs during the construction process; elaborate budgets.

Goals

- Without Translate - Desglossar les diferents partides d'obra d'un pressupost en els seus preus bàsics.
- Knowledge of the regulation of management and town planning discipline.

Goals

- Without Translate - Determinació dels costos d'un desenvolupament urbanístic.

Degree-transversal competences

- Ability to reunite and interpret relevant data, inside an area of study, to express reasons which include reflecting upon relevant subjects of a social, scientific or ethical nature.

Goals

- Without Translate - Estudi, presa de decisions i extracció de conclusions a partir de diferents projectes i pressupostos per tal de determinar els mes adequats per a cada situació social.
- Ability to plan and organise the personal work.

Goals

- Without Translate - Distribució del temps personal per tal de poder abordar els diferents treballs i exercicis plantejats tant a classe com fora de les sessions.
- Ability to consider the socio-economical context as well as the criteria of sustainability in the solutions of

engineering.

Goals

- Without Translate - Decidir la millor alternativa social/sostenible entre diferents opcions amb diferents costos.
- Ability to work in situations where information is lacking or you are under pressure.

Goals

- Without Translate - Determinació dels preus de les partides d'obra d'un projecte de les que no es té informació en les bases de dades utilitzades habitualment.

Subject contents

CHAPTER 1. Project Morphology

- 1.1 Project.
- 1.2 Steps of a project.
- 1.3 Documents of the project.

CHAPTER 2. Economic prediction.

- 2.1 Objective of the budget.
- 2.2 Prediction of the cost.

CHAPTER 3. Measurement units.

- 3.1 Definition.
- 3.2 Price tables.

CHAPTER 4. Measurements.

- 4.1 Introduction.
- 4.2 Measurement units.
- 4.3 Classification and grouping of chapters.
- 4.4 Types of measurements.

CHAPTER 5. The budget.

- 5.1 Definition and basic conditions.
- 5.2 Types of budgets.
- 5.3 Budget elaboration.
- 5.4 Detailed budget.

5.5 Cost frame.

5.6 Budget types according to cost types.

CHAPTER 6. Materials cost.

6.1 Materials definition.

6.2 Classification of materials.

6.3 Consumption of materials.

6.4 Consumption tables and historical consumptions.

6.5 Price of materials, price of amortization and product subcontracting.

CHAPTER 7. Labour cost.

7.1 Salaries.

7.2 Social Security cost.

7.3 Labour cost for the company.

CHAPTER 8. Machinery cost.

8.1 Introduction.

8.2 Types of machinery.

8.3 Cost of machinery.

CHAPTER 9. Auxiliary equipment cost.

9.1 Definition of Auxiliary Equipment.

TEMA 10. Condicionament del terreny.

10.1 Condicionament del terreny.

10.2 Factors d'influència.

10.3 Neteja i esbrossada del terreny.

10.4 Excavació de terres en desmunt.

10.5 Excavació de terres en rebaix.

10.6 Terraplens.

10.7 Excavació de rases i pous.

10.8 Reomplert de rases i pous.

10.9 Compactació de terres.

10.10 Transport de terres.

10.11 Apuntament i estrebada.

10.12 Eixigades i esgotaments.

CHAPTER 10. Earthworks.

CHAPTER 11. Foundations and retaining walls.

11.1 Foundations.

11.2 Retaining walls.

CHAPTER 12. Reinforced concrete structures.

12.1 Reinforced concrete structures.

12.2 Influence factors.

12.3 Measurement criteria by separate components.

12.4 Measurement criteria by quote / average section.

CHAPTER 13. Steel structures.

13.1 Steel structures.

13.2 Influence factors.

13.3 Measurement criteria.

13.4 Supporting plates.

13.5 Beams, trusses and spatial structures.

CHAPTER 14. Wood structures.

14.1 Wooden structures.

14.2 Measurement criteria.

14.3 Frameworks, beams, columns, roof trusses, staircases and wooden floors.

CHAPTER 15. Masonry and stone.

15.1 Masonry.

15.2 Stone.

CHAPTER 16. Roofs and insulation.

16.1 Roofs.

16.2 Insulation.

CHAPTER 17. Wood and metallic closure.

17.1 Wood closure.

17.2 Metallic closure.

CHAPTER 18. Coating and glassworks.

18.1 Coatings.

18.2 Glassworks.

CHAPTER 19. Installations.

19.1 Electrical installations.

19.2 Plumbing installations.

19.3 Gas installations.

19.4 HVAC installations.

19.5 Heating installations.

19.6 Transport installations.

19.7 Especial installations.

CHAPTER 20. Urbanization.

20.1 Generalities.

20.2 Measurement criteria.

20.3 Influence factors.

CHAPTER 21. Health and Safety.

21.1 Concept, health and safety study.

21.2 Measurement units.

21.3 Measurement criteria.

CHAPTER 22. Budget development usingTCQ software.

Methodology

The subject will be taught four hours weekly over 2 hours of lecture and two hours of practical class in half group. The lectures will be considered a theoretical lecture with active student participation, where the contents of the subject will be exposed. During the same week, in practice class they will arise and solve problems related to the contents exposed during the previous theoretical session. During the course the student will be indicated in the literature and regulations that have to be based for a proper study of the issues. Given the importance of the active participation of student, the assistance is essential in both lectures and practices.

Development plan

Date	Description
15-sep	Presentation
15-sep	Chapter 1. Project morphology
16-sep	Chapter 2. Economic prediction
16-sep	Exercices chapter 2
	Chapter 3. Measurement units
22-sep	Chapter 4. Measurement Chapter 5. The budget
22-sep	Exercices chapter 2. Economic prediction
	Chapter 6. Materials cost
23-sep	Chapter 7. Labour cost Chapter 8. Machinery cost Chapter 9. Auxiliary equipment cost
30-sep	Exercices chapter 6-7-8-9
6-oct	Chapter 10. Earthworks
7-oct	Exercices chapter 10. Earthworks
13-oct	Chapter 11. Foundations and retaining walls
14-oct	Exercices chapter 11. Foundations
20-oct	Chapter 11. Foundations and retaining walls
21-oct	Exercices chapter 11. Retaining walls
27-oct	Chapter 12. Reinforced concrete structures
28-oct	Exercices chapter 12. Reinforced concrete structures
3-nov	Chapter 13. Steel structures Chapter 14. Wood structures
4-nov	Exercices chapter 13. Steel structures
10 nov	1st evaluation, chapters 1-12.
17-nov	Chapter 22. Budget development using TCQ software
18-nov	Exercices chapter 22. TCQ.
24-nov	Chapter 15. Masonry and stone Chapter 16. Roofs and insulation
25-nov	Exercices chapter 14. Wood structures + Practice

1-dec	Chapter 17. Wood and metallic closure Chapter 18. Coating and glassworks
2-dec	Exercices chapters 15-18.
9-dec	Chapter 18. Installations Chapter 19. Urbanization
15-dec	Exercices chapters 19-20.
16-dec	Chapter 21. Health and safety
22-dec	Exercices chapter 21.
12-jan	2nd evaluation, chapters 13 - 21.
1-jan	Recovery activities

Evaluation

Evaluation activities (Criteria)	%	Date
Written test Chapters 1-12 (≥ 4)	30	Week 9
Written test Chapters 13-21 (≥ 4)	30	Week 16
Practice 1 (≥ 4)	15	Week 10
Practice 2 (≥ 4)	15	Week 16
Exercices at class	10	Continuous
Recovery written test Chapters 1-21, two exams	30+30	Week 19

Bibliography

Recommended bibliography

- Ruiz Fernández, J.P. Aspectos económicos del Proceso de la Edificación. Ed. Del Autor. Cuenca, 2002.
- Andrés Baroja, B.; Baringo Sabater, P. (1998) Presupuestos de obra. Análisis y metodología. Barcelona: Departamento de Organización de Empresas. UPC. Depósito legal: B-40.147
- Andrés Baroja, B.; Baringo Sabater, P. (1997) Rendimientos de la mano de obra en la edificación. Barcelona: Departamento de Organización de Empresas. UPC.
- Andrés Baroja, B.; Baringo Sabater, P.; Vilajosana Béjat, J. (2002) Aplicación y control de presupuestos en obra. Introducción a las valoraciones inmobiliarias. Barcelona: Departamento de Organización de Empresas. UPC. Depósito legal: B-48.377.
- Ramirez de Arellano Agudo, A et al Recomendaciones sobre criterios de mediciones en construcción. Ed. Asociación Española de Profesores de Mediciones, Presupuestos y Valoraciones. Madrid, 1994.
- García Muñoz, G. (2001) Precio, tiempo y arquitectura. Madrid: Mairena/Celeste.
- Ramirez de Arellano Agudo, A. (2000) Presupuestación de obras. Sevilla: Universidad de Sevilla.
- Sanchez Rodriguez, M. (1983) Control de costos en la construcción. Barcelona: C.E.A.C.
- Quadre de Preus referència d'edificació, d'enginyeria civil, d'urbanització, rehabilitació, seguretat i salut i assaigs de control de qualitat elements simples, elements compostos, partides d'obra i conjunts d'partides d'obra (2008). Barcelona: ITEC (Institut de Tecnologia de la Construcció de Catalunya).