



Universitat de Lleida

DEGREE CURRICULUM
**WORK EQUIPMENT, FACILITIES
AND AUXILIARY MEANS**

Coordination: MASIP ORONICH, JORDI

Academic year 2019-20

Subject's general information

Subject name	WORK EQUIPMENT, FACILITIES AND AUXILIARY MEANS			
Code	101422			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Architectural Technology and Building Construction	2	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	MASIP ORONICH, JORDI			
Department	COMPUTER SCIENCE AND INDUSTRIAL ENGINEERING			
Teaching load distribution between lectures and independent student work	1 ECTS = 10 hours of lectures + 15h freelance work .			
Important information on data processing	Consult this link for more information.			
Language	Catalan			
Office and hour of attention	The professor's office: 1.05, 1.06 CREA.			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
MASIP ORONICH, JORDI	jordi.masip@udl.cat	6	

Subject's extra information

You can find the dossier of notes subject to the Copisteria Cappont Campus.

It is recommended to frequently visit the Virtual Campus space associated with the subject as it announces all the information in it. <http://cv.udl.cat>

It is **COMPULSORY** that the students bring the following elements of individual protection (EPI) to the practices at the laboratory, on the trips of the works, and on the educational outings.

- White laboratory gown from UdL (unisex)
- Protection glasses
- Mechanical protection gloves
- Security helmet
- Reflective vest
- **Safety footwear (*)**

All these items, with the exception of the safety footwear, can be purchased through the shop Údels of the UdL:

C/ Jaume II, 67 baixos
Centre the Cultures i Cooperació Transfronterera

<http://www.publicacions.udl.cat/>

(*) The safety footwear must be acquired by the student to any individual protection equipment provider, and must meet the requirements S1 + P (head and antforce template) according to what is established by EN ISO 20345

The use of other elements of protection (for example caps, masks, gloves of chemical or electrical risk, etc.) will depend on the type of practice to be done. In that case, the teacher will inform of the necessity of specific EPI.

Not bringing the EPI's described or not fulfilling the norms of general security that are detailed below imply that the student can not access to the laboratories or have to go out of them. The no realisation of the practices for this reason imply the **consequences in the evaluation** of the subject that are described in this course guide.

GENERAL NORMS OF SECURITY IN LABORATORY PRACTICES

- Keep the place of realisation of the practices clean and tidy. The table of work has to be free from backpacks, folders, coats...
- No short trousers or short skirts are allowed in the laboratory.
- Closed and covered footwear is compulsory in the laboratory.
- Long hair needs to be tied.
- Keep the laboratory gown laced in order to be protected from spills of chemicals.
- Bangles, pendants or wide sleeves are not allowed as they can be trapped.
- Avoid the use of contact lenses, since the effect of the chemical products is much bigger if they enter between the contact lense and the cornea. Protection over-glasses can be purchased.
- No food or drink is allowed in the laboratory.
- It is forbidden to smoke in the laboratories.

- Wash your hands whenever you have contact with a chemical product and before going out of the laboratory.
- Follow the instructions of the teacher and of the laboratory technicians and ask for any doubt on security.

For further information, you can check the following document of the *Servei de Prevenció de Riscos Laborals de la UdL*: <http://www.sprl.udl.cat/alumnes/index.html>

on the trips of the works and on the educational outings

Learning objectives

The main Objectives to be achieved throughout the subject are as follows:

- Select different construction equipment, facilities and auxiliary means depending on their applications and features.
- Calculate the performance of construction equipment, facilities and auxiliary means and identify the factors that influence them.
- Calculate the cost of construction equipment, facilities and auxiliary means, identify factors that influence and have an impact on the items of work.
- Acquire basic knowledge on the management of construction equipment, facilities and auxiliary means in a company.
- Identify the advantages and disadvantages of the use of certain equipment, facilities or auxiliary means for a particular task.
- Interpret technical characteristics of equipment and determine their suitability for a particular task.
- Identify the different construction equipment, facilities and auxiliary means used, as well as their components and key features.

Competences

UdL3 Mastering ICT's.

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.

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.

Subject contents

The course content will be divided into eight topics, according to the ratio specified below:

1. Introduction to construction equipment.

- 1.1. Mechanization needs of the construction sites.
- 1.2. Characteristics of construction equipment.
- 1.3. Criteria for the selection of equipment (practical example).
- 1.4. Rent or purchase of machinery.
- 1.5. Leasing.
- 1.6. Profitability of investments in machinery.

2. Construction generators and small machinery.

- 2.1. Introduction. Energy sources.
- 2.2. Electrical generators.
- 2.3. Pneumatic systems. Moto-compressors.
- 2.4. Compressed air tools.
- 2.5. MotoPumps.

3. Ground surveys.

- 3.1. Surveying equipment.
- 3.2. Types of boring.
- 3.3. Percussion surveying equipment.
- 3.4. Rotation surveying equipment.
- 3.5. Roto percussion surveying equipment.

4. Movement and handling of material.

- 4.1. Introduction.
- 4.2. Diggers.
- 4.3. Bulldozers.
- 4.4. Scrapers.
- 4.5. Motor graders.
- 4.6. Loaders.
- 4.7. Soil compaction equipment.
- 4.8. Methods for transporting materials.

5. Supply installations for the construction site.
 - 5.1. Provisional electricity supply.
 - 5.2. Water supply for the construction site.
6. Equipment for concrete and mortars.
 - 6.1. Introduction.
 - 6.2. Characteristics of concrete.
 - 6.3. Production of aggregates.
 - 6.4. Mixing and manufacture of concrete.
 - 6.5. Distribution of the concrete.
 - 6.6. Placing the concrete.
7. Vertical transportation in construction sites and other lifting devices.
 - 7.1. Introduction.
 - 7.2. Derricks and cranes.
 - 7.3. Lift Tables.
 - 7.4. Forklifts.
 - 7.5. Other lifting devices.
8. Auxiliary means.
 - 8.1. Introduction.
 - 8.2. Scaffolding.
 - 8.3. Formwork.
 - 8.4. Trusses and struts.
 - 8.5. Propping.

Methodology

The methodology used includes the following training activities:

- **Theory classes.** Explanations and Power Point presentations, made in the classroom.
- **Practical classes.** Exercises and problems. Workbook exercises and some of the most significant and relevant exercises will be solved in class during these sessions.
- The students' own self-evaluation. Attached to the virtual campus will be a dossier of exercises for the subject so that students can assess themselves and practice on their own.
- **Video sessions.** During the subject at least one video session with content directly related to the subject is expected to take place. In order to make best use of these sessions a document has been prepared with questions that oblige the students to pay the utmost attention to the important data on construction equipment that will appear in the schematic worksheet.
- **Group tutorials.** For a few minutes at the end of each class a group tutorial will be conducted, doubts from previous sessions will be resolved and the training acquired by students will be cultivated.
- **Individual tutorials.** The students will be actively reminded of the schedule for tutorials and will display a willingness to perform individual tutorials, providing an email address and the necessary means to get in

touch with the teacher.

- **Subject themed course work.** During the course, students will perform group work, which will be led by the teacher so that they achieve the minimum content level.
- **Public presentation of the course work.** During the week before the final exam, there will be public presentations of the course work, which will involve all members of the group individually and during the same presentation.
- **Examinations.** There will be two exams, one mid-term and one at the end of the semester.

Development plan

Below is explained the development plan of the subject:

Topic 1: 3 school days, two consecutive classes of 50 minutes each.

Topic 2: 2 school days, two consecutive classes of 50 minutes each.

Topic 3: 3 school days, two consecutive classes of 50 minutes each.

Unit 4: 6 school days, two consecutive classes of 50 minutes each.

Video session 1 class of 50 minutes. Resolution of doubts and exam preparation; one 50-minute class.

2nd week of November 2 hours to complete the examination of the first part (T1) topics 1 to 4.

Topic 5: 2 school days, two consecutive classes of 50 minutes each.

Topic 6: 3 school days, two consecutive classes of 50 minutes each.

Topic 7: 2 school days, two consecutive classes of 50 minutes each.

Topic 8: 3 school days, two consecutive classes of 50 minutes each.

Last day of school for December hand in course work.

2nd week of January 1 class of 50 minutes to present studies, and one 50-minute class to resolve doubts and exam preparation.

3rd week of January 2 hours to complete the examination of the second part (T2), topics 5 to 8.

1st week February 2 hours to complete recuperation examinations for both first and second part.

Evaluation

The qualification is made up of the grades obtained in the theory based exams and the course work.

Theory (T) section of the qualification

The theory section corresponds to two individual exams. The tests are independent of each other, so that the second test will not come to review sections approved in the first. One exam will be taken half way through the semester, T1, and the other at the end of the semester, T2. The final theory mark will be calculated as follows:

$$T = (0.5 \cdot T1) + (0.5 \cdot T2) \text{ if } T1 > 4 \text{ and } T2 > 4$$

$$T = \min [(0.5 T1 + 0.5 \cdot T2), 3] \text{ otherwise}$$

Course work qualification (M)

The coursework mark (M) will consist of four blocks,

60% of the course work mark comes from the writing and production of the course work (collectively).

25% from the public presentation of the course work (individually by each member of the group).

15% extra points for active participation (individually for each member of the group), both in class and in the tutorials, and also in exercises and the final evaluation.

Thus, for the final evaluation of the mark for the subject Construction Equipment, Facilities and Auxiliary Means will consider the evaluation of the theory (T) and course work (M), and will be calculated as follows:

$$NF = (0.7 \cdot T) + (0.3 \cdot M) \text{ if } T > 4 \text{ and } M > 4$$

$$NF = \min [(0.7 T + 0.3 \cdot M), 3] \text{ otherwise}$$

In all cases it is intended that each part, in order to make up the average, should achieve at least 4 out of 10.

Bibliography

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