

## Course guides

# 310070 - 310070 - Network Management, Maintenance and Dimensioning

Last modified: 02/04/2020

**Unit in charge:** Barcelona School of Building Construction  
**Teaching unit:** 753 - TA - Department of Architectural Technology.

**Degree:** BACHELOR'S DEGREE IN BUILDING CONSTRUCTION SCIENCE AND TECHNOLOGY (Syllabus 2009).  
(Optional subject).  
BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2015).  
(Optional subject).

**Academic year:** 2020    **ECTS Credits:** 3.0    **Languages:** Catalan, Spanish

## LECTURER

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**Coordinating lecturer:** ENRIQUE CAPDEVILA GASENI

**Others:** ALEJANDRO FALCONES DE SIERRA - JUSTO HERNANZ HERNANZ

## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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### Specific:

1. FB-5 Knowledge of the theoretical basis and the basic principles applied to the construction, of the fluid mechanics, the hydraulics, the electricity and electromagnetism, the calorimetry and thermal comfort, and the acoustics.
2. FE-1 Ability to understand and make the graphical documentation of a project, to do data gathering, surveying of plans and geometric control of construction units.
3. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.
4. FE-5 Ability to adapt the construction materials to the typology and use of the building, manage and run the receipt and quality control of the materials, its implementation in the construction, the control of execution of the construction units and the realization of trials and final tests.
5. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.
6. FE-8 Knowledge of specific procedures for the material execution control of the construction.
7. FE-17 Ability to schedule and organise the constructive processes, the construction teams, the technical and human means for its execution and maintenance.
8. FE-18 Knowledge of the law of the construction and the contractual relations which occur in the different phases of the construction process, as well as the specific legislation, rules and regulations of the prevention and coordination in matters of safety and occupational health in construction.
9. FE-20 Ability for the management of the quality control in the building constructions, the writing, application, implementation and updating of manuals and quality plans, realisation of audits of management of the quality in the companies, as well as for the writing of the Building Log Book.
10. FE-21 Aptitude to analyse, design and execute solutions which facilitate the universal accessibility to the buildings and their environment.
11. FE-25 Ability to analyse and fulfil projects of evacuation in buildings.
12. FE-26 Knowledge of the framework of regulation of the management and the urban discipline.
13. FE-29 Aptitude to write documents which are part of execution projects made in a multidisciplinary form
14. FE-30 Ability of analysis of the execution projects and their transfer to the execution in constructions.
15. FE-31 Knowledge of the functions and responsibilities of the agents which intervene in the construction and their professional or managerial organisation, as well as the administrative, managerial and processing procedures.

**Transversal:**

16. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
17. ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
18. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.

**TEACHING METHODOLOGY**

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The directed learning hours consist on the one hand in teaching theoretical classes (big group) where the faculty does a brief exposition to introduce the general learning objectives related with the basic concepts of the subject. Subsequently and by practical exercises, the professor tries to motivate and involve the students so that they can participate actively in their own learning. It is used support material in detailed teaching plan, by ATENEA: learning objectives by contents, concepts, examples, evaluation and directed learning activities schedules and bibliography. On the other hand, these hours also consist on doing problem classes (medium group) where the students work, generally, in groups of 3 or 4 members, by the resolution of exercises related with the specific learning objectives of each one of the subject contents. Therefore cooperative learning techniques are developed at class. Generally, after each session out of class tasks are proposed, which must be worked individually or in groups and which are the base of the directed activities. There also have to be considered the other autonomous learning hours like the ones dedicated to the oriented readings, the resolution of the proposed problems or the self-learning questionnaires of the different contents by virtual campus ATENEA.

**LEARNING OBJECTIVES OF THE SUBJECT**

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At the end of the subject, the students should be able to:

The subject expects to provide a general view related with the facilities as well as the design and calculation of the networks, its future maintenance and the management tools necessary for the finalisation of the service which the facilities must supply to the buildings.

Regarding to the writing process of a facilities project, it is pretended that the student acquires a methodology to develop efficiently the specific technical documentation for its development, which musts incorporate apart from the technical criteria, the organisation criteria of the works and economic and technical aspects.

**STUDY LOAD**

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Type	Hours	Percentage
Hours small group	9,0	12.00
Hours large group	12,0	16.00
Hours medium group	9,0	12.00
Self study	45,0	60.00

**Total learning time:** 75 h



## CONTENTS

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### C1 QUANTIFICATION OF NECESSITIES

**Description:**

In this content the students work:

From the existing regulations and the specific use of the different building types there will be done an approximation to the required contents of an intervention project in the facilities needs.

- 1.1 Application of the CTE, REBT, RITE and calculation rules.
- 1.2. Quantification of electric demands.
- 1.3 Valuation and classification of energy consumption.

**Related activities:**

Theoretical explanation class.

Activity 1. Questionnaire of basic concepts.

**Full-or-part-time:** 25h

Theory classes: 6h

Practical classes: 2h

Guided activities: 2h

Self study : 15h

### C2 MEASURING

**Description:**

In this content the students work:

There will be done a tour in the different basic techniques of calculation and measuring used habitually in the design and execution of facilities projects.

- 2.1 Basic measuring of fluid facilities.
- 2.2 Basic measuring of electrical facilities.
- 2.3 Basic measuring of energy facilities.
- 2.4 Basic measuring of additional facilities.

**Related activities:**

Theoretical explanation class.

Activity 2. Search a construction in progress with NON-residential use and audit the calculation of the facilities.

**Full-or-part-time:** 25h

Theory classes: 6h

Practical classes: 2h

Guided activities: 2h

Self study : 15h



### C3 CONTROL AND MAINTENANCE

**Description:**

In this content the students work:

There will be studied the different types of projects of buildings where must be applied viability, management and maintenance criteria in the facilities networks.

- 3.1 General maintenance of facilities.
- 3.2 Maintenance plans in construction.
- 3.3 Control and management of facilities.
- 3.4 Acoustics adapted to the energy plants.

**Related activities:**

Theoretical explanation class.

Activity 3. From the plans given by the faculty. Design and measure the facilities networks defining its components.

**Full-or-part-time:** 25h

Theory classes: 6h

Practical classes: 2h

Guided activities: 2h

Self study : 15h

## ACTIVITIES

### A1 INDIVIDUAL PROJECT OF LEARNING

**Description:**

Realisation of a questionnaire of basic concepts.

**Specific objectives:**

At the end of the practice the students should be able to:

- . Evaluate the different types of measuring of the facilities depending on the building use.
- . Connect and organise the networks and its components in construction.

**Material:**

Questionnaire with fixed answers, by ATENEA. Series of self-learning questionnaires with multiple choice and notes of the topics available in ATENEA.

Bibliography.

**Delivery:**

Questionnaire in ATENEA.

It represents a part of the continuous evaluation (10%).

**Full-or-part-time:** 12h

Guided activities: 2h

Self study: 10h



## A2 GROUP PROJECT OF AUTONOMOUS LEARNING (CONTENT 2)

### Description:

Search a construction in progress with non-residential use and audit the calculation of the facilities.

### Specific objectives:

At the end of the practice the students should be able to:

- . Understand the methodology of the facilities. Determine how the construction is executed.
- . Analyze the influence of the measuring in the distribution and the final design in the construction.

### Material:

Notes of the content available (PowerPoint) in ATENEA.

Bibliography.

Paper, pencil, photographic camera.

### Delivery:

The students must do the practical work IN PowerPoint format (6-8 slides). They must present and explain the PowerPoint made at class. Random N° of presentations.

The rest of students at class must do questions to the presenting team.

Registration by the faculty of the verification of the Directed Learning of the students.

There will be given to the professor a document with the work.

It represents a part of the continuous evaluation (15%).

**Full-or-part-time:** 15h

Practical classes: 3h

Self study: 12h

## A3 GROUP PROJECT OF AUTONOMOUS LEARNING (CONTENT 3)

### Description:

In groups of two members, the students will do an exercise from the plans given by the professor. There will be designed and calculated the facilities networks and its components.

### Specific objectives:

At the end of the activity, the students should be able to:

- . Know the elements and the facilities networks.
- . Recognize the compatibility or incompatibility in the distribution of networks and its measuring.

### Material:

Notes of the topic available (PowerPoint) in ATENEA.

Bibliography.

Regulations.

### Delivery:

A file with the work.

It represents a part of the continuous evaluation (10%).

**Full-or-part-time:** 14h

Practical classes: 3h

Guided activities: 3h

Self study: 8h



#### A4 FINAL EXAM

**Description:**

Final exam about the material given in the subject.

**Specific objectives:**

At the end of the exam, the students should be able to:

. The subject pretends to provide the students with a general view related with the real measuring of facilities in constructions, as well as in the urbanisation design, the behaviour and the processes of intervention on them, comprising the aspects of requirements of the different construction types and their uses, as starting tools for develop a definitive intervention project.

. Corresponding to the writing process of a facilities project, it is pretended that the student acquires a methodology to develop efficiently the specific technical documentation for its development, which must incorporate apart from the technical criteria, organisation criteria of the works and economic aspects.

**Material:**

Bibliography.

Theoretical classes.

**Delivery:**

Resolution of the exam. It represents the 30% of the final mark of the subject.

**Full-or-part-time:** 16h

Self study: 16h

## GRADING SYSTEM

The final mark is the addition of these partial marks:

Activity-1 10%

Activity-2 20%

Activity-3 40%

Activity-4 30%

The continuous evaluation consists on doing different activities, individually or in group, with summative or educational nature, during the course (in and out of class).

## EXAMINATION RULES.

It is a necessary requirement to pass the final exam to do the average with the rest of marks.

If some of the lab or continuous evaluation activities is not done, it will be considered as non-marked.

In any case it is possible to bring any formulary to the learning tests or exams.

## BIBLIOGRAPHY

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**Complementary:**

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