

## Course guide

# 820444 - TCIIM - Building Technology and Industrial Facilities

**Last modified:** 27/05/2024

**Unit in charge:** Barcelona East School of Engineering  
**Teaching unit:** 737 - RMEE - Department of Strength of Materials and Structural Engineering.

**Degree:** BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Optional subject).

**Academic year:** 2024    **ECTS Credits:** 6.0    **Languages:** Catalan

### LECTURER

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**Coordinating lecturer:** JUAN DANIEL GARCÍA RUEDA

**Others:** Primer quadrimestre:  
JUAN DANIEL GARCÍA RUEDA - T11

### PRIOR SKILLS

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Use of CAD programmes.  
Use of office applications (Word and Excel).  
Subjects "Fluid Mechanics" and "Electrical Systems"

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Transversal:**

1. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
2. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

### TEACHING METHODOLOGY

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Methodology applied consists in theoretical exposition and problem solving in large groups, and use of tools for problem solving in the field of Building Constructions and Installations at Practice groups.

Using knowledges and tools acquired during the sessions will be taken as the basis for the Non-presential work. (40%).

Directed activities related to each item will establish guidelines for non-presential work.

## LEARNING OBJECTIVES OF THE SUBJECT

- 1 - Acquire knowledge in the field of engineering projects aimed at buildings and industrial facilities.
- 2 - Acquire ability to manage specifications, regulations and mandatory standards.
- 3 - Representing simple industrial processes.
- 4 - Distinguish constraints involved in industrial buildings.
- 5 - Designing industrial buildings and establishing location of industrial plants.
- 6 - Analyze and design elements of basic industrial facilities.
- 7 - Establish construction systems involved in industrial building.
- 8 - Design Implementation alternatives.
- 9 - Distinguish between different instruments of urban planning and its functions.
- 10 - Select the most appropriate structural system in industrial building.
- 11 - Select the most appropriate building systems in industrial building.
- 12 - Analyze and assess the environmental impact of proposed solutions.

## STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	30.00
Self study	90,0	60.00
Hours small group	15,0	10.00

**Total learning time:** 150 h

## CONTENTS

### 1. Introduction to industrial building and facilities projects.

**Description:**

Introduction to projects redaction. Parts project. Minimum content. Applying rules. Appendices and complementary documentation. Guidelines for quality management in projects.

**Full-or-part-time:** 6h

Theory classes: 2h

Self study : 4h

### 2. Engineer's competences in industrial building.

**Description:**

Competences of the engineer in building processes. Agents of building: roles and responsibilities. Project Management. Timing. Health and safety.

**Full-or-part-time:** 4h

Theory classes: 2h

Self study : 2h

### 3. Relation between architecture and industry.

**Description:**

Function and objectives of architecture. General Introduction to architectural design. Industrial architecture: characteristics and solutions. Type structural in industrial building: evolution since classic times to nowadays. Sizing of spaces: modular construction.

**Full-or-part-time:** 9h

Theory classes: 3h

Self study : 6h

### 4. Common services in industrial buildings.

**Description:**

Lighting. Fire protection: detection, Manual / Automatic Discharge Fire Extinguishers, Air conditioning and ventilation. Telecommunication networks. Security systems: Physical security, electronic systems for intrusion detection and CCTV.

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

Theory classes: 3h

Practical classes: 2h

Self study : 10h

### 5. Plant layout: Systematic Layout Planning

**Description:**

Definition of industrial process: process diagram. List of activities and operating conditions. Distribution in space. Systematic Layout Planning. Proposal and evaluation of solutions.

**Full-or-part-time:** 7h

Theory classes: 2h

Self study : 5h

### 6. Auxiliary services in manufacturing processes

**Description:**

Water networks. Sanitation networks. Electrical installations: LT and HT. Generation of heat and cold. CHP. Other required services.

**Full-or-part-time:** 28h

Theory classes: 9h

Practical classes: 5h

Self study : 14h

### 7. Essential characteristics in industrial building.

**Description:**

Main requirements: industrial safety. Determinants of design. Process-oriented requirements: Functional Plan. Minimum safety and health requirements.

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

Theory classes: 4h

Practical classes: 2h

Self study : 10h

## 8. Basics of industrial location.

### Description:

Regional policies and location. Classical theories and new trends. Industrial districts. Delocalization.

### Full-or-part-time: 7h

Theory classes: 2h

Self study : 5h

## 9. Introduction to soil planning

### Description:

Purpose of soil planning. Soil planning and land classification. Basic urban services. Urban systems. Land use. General planning. Special Plans.

### Full-or-part-time: 7h

Theory classes: 2h

Self study : 5h

## 10. Introduction to industrial soil planning.

### Description:

Planning for industrial land. Current trends in industrial soil planning. Characteristics of great industrial areas. Location of activities.

### Full-or-part-time: 7h

Theory classes: 2h

Self study : 5h

## 11. Systems and subsystems in building.

### Description:

Building systems and subsystems. Basic conditions. Structural system. Envelope system. System of compartmentalization and sectorization. Conditioning system and facilities. System finishes.

### Full-or-part-time: 29h

Theory classes: 10h

Practical classes: 4h

Self study : 15h

## 12. Environment and industry.

### Description:

Objectives of sustainability. Characterization of the environment. Environmental impact of industrial activity. Energy Planning: Renewable energy and other eco-efficiency measures. Environmental legislation and administrative procedures.

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

Theory classes: 4h

Practical classes: 2h

Self study : 9h

## GRADING SYSTEM

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Non-presential work 40%  
Final exam 35%  
Practices 15%  
Generic competencies 10%

## EXAMINATION RULES.

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To carry out the exams is allowed the use of any documentation.

## BIBLIOGRAPHY

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### Basic:

- Espanya. Código Técnico de la Edificación : (C.T.E.). Madrid: Ministerio de Vivienda : Boletín Oficial del Estado, 2006. ISBN 8434016311.
- Espanya. Reglamento de instalaciones térmicas en los edificios : RITE. Madrid: Paraninfo, 2008. ISBN 9788428330206.

## RESOURCES

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### Other resources:

Information downloaded from ATENEA