

COURSE NAME

Name: **PREFABRICATION**

Code: 101143

Curriculum: **DEGREE IN CIVIL ENGINEERING**

Year: 3

Name of the module to which it belongs: SPECIFIC CIVIL CONSTRUCTION TECHNOLOGY MODULE

Subject: BUILDING AND PREFABRICATION

Nature: OBRIGATORY Duration: SECOND SEMESTER

ECTS Credits: 4.5

Classroom hours: 45

Face-to-face classroom percentage: 40%

Non-contact hours: 67.5

FACULTY DETAILS

Name: ZURERA DIAZ, JAVIER

Department: RURAL ENGINEERING

Area: CONSTRUCTION ENGINEERING

Location of the office: Aulario Emilio Iznerdi (EPSBelmez)

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SKILLS

- CB1 Have and understand specific knowledge of the study area of the Degree that gives skills for the exercise of the profession of Technical Civil Engineering.
- CB2 Have and understand current and cutting-edge knowledge of the field of mining engineering.
- CB3 Be able to apply the knowledge acquired to their work or vocation in a professional manner. Prepare and defend arguments in the relevant knowledge area.
- CB7 Possess the learning skills necessary to undertake studies with a high degree of autonomy.
- CU2 Know and refine the user level of ITs.
- CECC1 Knowledge of the typology and calculation bases of precast elements and how they are applied in manufacturing processes

OBJECTIVES

Understand the fundamentals of industrialisation and prefabrication in civil engineering and building, as well as the behaviour of elements manufactured with pre-stressed concrete in structural systems.

CONTENTS:

1. Theoretical contents

I. PRECAST CONCRETE IN CIVIL ENGINEERING

TOPIC 1. INDUSTRIALISATION AND PREFABRICATION IN CIVIL ENGINEERING AND CONSTRUCTION.

TOPIC 2. PROCESS ENGINEERING OF PRECAST REINFORCED AND PRESTRESSED CONCRETE ELEMENTS.

II. ANALYSIS OF PRECAST CONCRETE SYSTEMS

TOPIC 3. TECHNICAL BASICS OF PRESTRESSED CONCRETE. GENERAL CONCEPT OF PRESTRESSED CONCRETE

TOPIC 4. STRUCTURAL CONCEPTS OF PRESTRESSED CONCRETE: STRESSES AND DEFORMATIONS: PRESTRESSED CONCRETE AS AN ALTERNATIVE TO REINFORCED CONCRETE: MAIN DIFFERENCES. STRESS COMPENSATION, DEFORMATION COMPENSATION

TOPIC 5. STRUCTURAL CONCEPTS OF PRESTRESSED CONCRETE: STRESSES AND DEFORMATIONS: STRESS COMPENSATION AND DEFORMATION COMPENSATION IN CENTRED AND ECCENTRIC PRESTRESSING.

TOPIC 6. MATERIALS AND EQUIPMENT FOR PRESTRESSED CONCRETE WITH PRESTRESSED REINFORCEMENT.

TOPIC 7. MATERIALS AND EQUIPMENT FOR PRESTRESSED CONCRETE WITH POST-TENSIONED REINFORCEMENT. GENERAL POINTS.

TOPIC 8. GEOMETRY OF POST-TENSIONING AND LOSS CALCULATION. STUDY AND CALCULATION OF THE GEOMETRY OF THE ACTIVE REINFORCEMENT IN HP WITH POST-TENSIONED REINFORCEMENT ACCORDING TO EHE-08.

TOPIC 9. GEOMETRY OF THE POST-TENSIONING AND LOSS CALCULATION.

TOPIC 10. LIMIT STATES IN STRUCTURAL PRESTRESSED CONCRETE.

TOPIC 11. APPLICATION OF THE LIMIT STATE METHOD IN STRUCTURAL PRESTRESSED CONCRETE.

III. TYPOLOGY OF STRUCTURAL PRESTRESSED CONCRETE ELEMENTS.

TOPIC 12. PRESTRESSED HOLLOW CORE SLABS. GENERAL POINTS.

TOPIC 13. CALCULATING PRESTRESSED HOLLOW CORE SLABS. DESIGN AND CALCULATION OF PRESTRESSED HOLLOW CORE SLABS USING A COMMERCIAL TECHNICAL CALCULATION SOFTWARE.

TOPIC 14. PREFABRICATED ELEMENTS IN CIVIL ENGINEERING.

TOPIC 15. INNOVATION IN CONTAINMENT STRUCTURES MADE OF RECYCLED CONCRETE. BIM IN CIVIL ENGINEERING AND THE PREFABRICATION SECTOR.

IV. TYPOLOGY OF STRUCTURAL PRESTRESSED CONCRETE ELEMENTS

TOPIC 16. NON-STRUCTURAL PREFABRICATED ELEMENTS.

2. Practical contents.

Practical classes involving exercises and case studies related to the PRACTICAL BLOCK indicated in "Theoretical Content".

Holding of Technical Conferences on Concrete Prefabrication in Civil Engineering including the participation of companies and business people from the sector.

Complemented with classroom exercises based on the concepts described in the previous block.