

Course guide

310186 - 310186 - Existing Building Intervention Techniques (1)

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Unit in charge:	Barcelona School of Building Construction	
Teaching unit:	753 - TA - Department of Architectural Technology.	
Degree:	MASTER'S DEGREE IN DIAGNOSIS AND INTERVENTION TECHNIQUES IN BUILDING CONSTRUCTION (Syllabus 2020). (Compulsory subject).	
Academic year: 2023	ECTS Credits: 6.0	Languages: Catalan, Spanish

LECTURER

Coordinating lecturer:	Bosch Prat, Mireia
Others:	Pavon Garcia, Susana Rosell Amigó, Juan Ramon Bosch Prat, Mireia Galeote Moreno, Eduardo

PRIOR SKILLS

Having taken the subjects of the University Master's Degree in Diagnostics and intervention techniques in building, of the first semester

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE12MUDITI. To make decisions based on the analysis of the results.

CE13MUDITI. To acquire knowledge about the specific techniques for the correction of injuries and improvements of the existing buildings.

Generical:

CG3MUDITIE. To diagnose existing buildings, considering an approximation which involves safety, efficiency and consideration for the buildings value criteria.

CG4MUDITIE. To identify, choose and apply the intervention techniques on existing buildings for its rehabilitation or restoration.

Transversal:

CT2MUDITIE. (ENG) Sostenibilitat i compromís social. Conèixer i comprendre la complexitat dels fenòmens econòmics i socials típics de la societat del benestar; tenir capacitat per relacionar el benestar amb la globalització i la sostenibilitat; aconseguir habilitats per utilitzar de forma equilibrada i compatible la tècnica, la tecnologia, l'economia i la sostenibilitat.

Basic:

CB10MUDITI. For the students to obtain learning skills that allows them to continue studying on a mainly autonomous and self-taught way.

CB8MUDITIE. For the students to be able to integrate knowledge and face the complexity of making judgements based on some information which, being incomplete or limited, includes considerations about the social and ethical responsibilities linked to the application of their knowledge and judgement.

TEACHING METHODOLOGY

Various methodologies will be used throughout the course, combining participatory lecture classes with case studies and project-based learning.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course the student must be able to:

Understand a wide range of intervention techniques in structural elements.

Value specific techniques for the correction and improvement of performance, replacement of components and construction systems in structural elements.

Propose interventions through the application of the techniques chosen taking into account the overallity of the building.

STUDY LOAD

Type	Hours	Percentage
Self study	108,0	72.00
Hours medium group	6,0	4.00
Guided activities	12,0	8.00
Hours large group	18,0	12.00
Hours small group	6,0	4.00

Total learning time: 150 h

CONTENTS

Module I. Criteria and procedures for intervention in architectural heritage

Description:

In this module, the criteria and intervention procedures in existing buildings will be presented and discussed for different cases (heritage buildings, non-heritage buildings, partial interventions, comprehensive renovations, etc.)

Through the knowledge of the systems, elements and materials, the relationship with the environment and its state of conservation, the values of the building are established, to later define the criteria and procedures as a starting point to be able to propose a global intervention in the building.

Analysis of different cases, using a systemic method.

Specific objectives:

Interpret the performance evaluation and characterization of the building to be able to systematize the values obtained, from which the criteria and procedures for the intervention of both heritage and non-heritage buildings can be established and decided.

Related activities:

Tr-01 Procedures for intervention in architectural heritage

Activity carried out in teams of 2 people.

Full-or-part-time: 6h

Theory classes: 4h

Practical classes: 2h

Module II. Foundation-soil system intervention techniques.

Description:

In this module and from the identification of the foundations, type of terrain and characteristics of the building at a structural and formal level, the different intervention techniques will be exposed. Looking for the compatibility of the undercuts with the existing foundations, intervention techniques below grade will be exposed.

Analysis of different examples, to expose the intervention techniques.

Specific objectives:

Know and understand a wide range of intervention techniques in foundations and land.

Assess the specific techniques for the correction and improvement of performance, replacement of components and construction systems of foundations.

Related activities:

Tr-02 Intervention techniques in the foundation-soil system

Activity carried out in teams of 2 people.

Full-or-part-time: 8h

Theory classes: 4h

Practical classes: 4h

Module III. Intervention techniques in wall structures, arches and vaults.

Description:

Initially, and as a result of the characterization of the building and its state of conservation, this module will first evaluate the need to carry out emergency actions that guarantee minimum security. Once the stability of the structures is guaranteed, the different structural typologies of elements basically subjected to compressive and tensile stress (walls, arches, vaults, etc.) will be analyzed in order to propose a range of the most appropriate intervention techniques for each case.

The intervention techniques will guarantee on the one hand the resistance and also the durability depending on the needs of each case. The course will cover substitutions, reintegrations, stapling, injections, screeds, buttressing, treatment of capillary dampness, by means of real case examples.

Specific objectives:

Assess serious or extreme situations and propose emergency measures.

Know and understand a wide range of intervention techniques on elements basically subjected to compressive and tensile stress (walls, arches, vaults, etc.).

Assess the specific techniques for the correction and improvement of performance, replacement of components and construction systems of walls, arches, vaults, etc.

Related activities:

Tr-03 Intervention techniques in wall structures, arches and vaults

Activity carried out in teams of 2 people.

Full-or-part-time: 18h

Theory classes: 10h

Practical classes: 8h

Module IV. Intervention techniques in slabs.

Description:

Initially and as a result of the characterization of the building and its state of conservation, this module will first assess the needs to carry out emergency actions that guarantee a minimum security through fortune shoring. Once the stability of the structures is guaranteed, the different structural typologies of the elements basically subjected to bending stress will be analyzed in order to be able to propose a range of more appropriate intervention techniques for each case. The intervention techniques will guarantee, on the one hand, resistance and also durability depending on the needs of each case.

Physical and functional substitutions, repairs, reinforcement and substitution of floors (unidirectional, bidirectional, slabs, etc.) and large beams will be dealt with.

Specific objectives:

Assess serious or extreme situations and propose emergency measures

Know and understand a wide range of intervention techniques in elements basically subjected to bending stresses.

Assess the specific techniques for the correction and improvement of performance, replacement of the components of the elements subjected to bending.

Related activities:

Tr-04 Intervention techniques in slabs

Activity carried out in teams of 2 people.

Full-or-part-time: 16h

Theory classes: 8h

Practical classes: 8h

Module V. Case analysis.

Description:

In this module, 2 practical cases will be proposed where the student sees the global view of the building and can analyze and debate the possible interventions in the set of structural elements, with the aim of providing an overall vision.

Specific objectives:

Interpret the performance evaluation and characterization of the case studies to be able to theorize about the applied techniques. Proposing and estimating other possible interventions.

Full-or-part-time: 12h

Theory classes: 12h

GRADING SYSTEM

The subject is assessed through the 4 works carried out throughout the course, and carried out in groups and an individual final exam. The weights are detailed below:

Tr-01 Procedures for intervention in architectural heritage; 10% of the final grade

Tr-02 Intervention techniques in the soil-foundation system; 10% of the final grade

Tr-03 Intervention techniques in Mura structures, arches and vaults; 25% of the final grade

Tr-04 Roof intervention techniques, 25% of the final grade

Ex-01 Final exam; 30% of the final grade

EXAMINATION RULES.

It is essential to deliver the 4 works in the time and form established in the statement.