COURSE DESCRIPTION
Technological design for architecture

SSD: TECNOLOGIA DELL'ARCHITETTURA (ICAR/12)

DEGREE PROGRAMME: ARCHITECTURE AND HERITAGE (P53)
ACADEMIC YEAR 2022/2023

COURSE DESCRIPTION

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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: U3991 - DESIGN STUDIO FOR ARCHITECTURAL HERITAGE
MODULE: U3995 - Technological design for architecture
CHANNEL: A-Z
YEAR OF THE DEGREE PROGRAMME: I
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 4

REQUIRED PRELIMINARY COURSES
no propaedeutic course

PREREQUISITES
no prerequisites

LEARNING GOALS
The course is aimed at providing criteria, methods and tools to design, evaluate and control technological alternatives for interventions on the existing heritage.
Through an approach that sees the settlement context as a complex dynamic system, "an archive of the traces of the history of man and nature, evidence of the evolving relationship of communities, individuals and their environment", the course addresses the issues related to the processes of intervention on the built environment, to ensure the satisfaction of the needs of users, respecting resources, values and constraints of the pre-existing, within a horizon of sustainability.

The expected results concern the acquisition of methodological tools for the control of technological choices related to the project of reuse, rehabilitation and maintenance of the built environment.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must understand the problems related to the project of intervention in the built environment;

understand and manage the variables that influence the quality of the project on the existing heritage;

control the relationship between performance offered and technologies, to manage the life cycles of settlement systems and prefigure new ones, starting from the relationships between the behaviour of the built environment and the conditions of use;

analysing the potential of innovation in relation to compatible technological choices in the design of reuse, rehabilitation and maintenance of the built environment;

assess the compatibility and integrability with pre-existing technological solutions in the project of the existing heritage.

Applying knowledge and understanding

The student must be able to apply knowledge to:

- orientate and control technological choices in relation to demand frameworks, resources and constraints of a different nature;

- prefigure design scenarios for the conservation, extension and improvement of performance levels of the built environment, in relation to the demand for environmental, cultural, social and economic sustainability, and interacting with a plurality of actors, needs, competencies and objectives;

- assess the compatibility and integrability with pre-existing technological solutions in the project of reuse, rehabilitation and maintenance of the existing heritage.

COURSE CONTENT/SYLLABUS

The course focuses on the following topics:

- the framing of architectural technology in the current scientific panorama;

- the knowledge of the principles, methods and tools governing the recovery of the settlement systems;

- the definition of the actors and phases of the processes of reuse, rehabilitation and maintenance of the built environment;

- the definition of the role and needs of the community in the process of intervention on the pre-existences;

- the preservation/transformation relationship of the pre-existence: values of the built environment and constraints on transformation;

- the definition of design scenarios based on the needs of users while respecting the resources, values and constraints of the pre-existence;

- the control of project results, also in relation to the life cycle of the pre-existence and the maintenance strategies.

READINGS/BIBLIOGRAPHY

Pinto M.R., De Medici S., Senia C., Fabbricatti K., De Toro P. (2017), *Building reuse: multi-criteria assessment for compatible design*, International Journal of Design Sciences &Technology (ISSN: 1630-7267), 22: 165-193

De Medici S., Pinto M.R., *Public cultural heritage properties enhancement and reuse strategies*, Techne Journal of Technology for Architecture and Environment, 03/2012, Firenze University Press, Firenze 2012.

Fabbricatti K., Boissenin L., Citoni M. (2020), *Heritage Community Resilience: towards new approaches for urban resilience and sustainability*, City Territ Archit CITA, 7:17 https://doi.org/10.1186/s40410-020-00126-7

Viola S., Diano D., *Repurposing the Built Environment: Emerging Challenges and Key Entry Points for Future Research*, Sustainability, 11(17), 2019, 46- 69; https://doi.org/10.3390/su11174669

TEACHING METHODS OF THE COURSE (OR MODULE)

The Technological design for architecture module consists of theoretical lectures, with exercises aimed at verifying the practical application of theoretical approaches.

The teacher will use: a) lectures for approximately 30% of the total hours; b) exercises for approximately 40% of the total hours; d) seminars for an in-depth study of specific themes for approximately 15% of the total hours; e) joint meetings with the lecturers of the integrated courses for approximately 15% of the total hours.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

☐ Written

☑ Oral

☑ Project discussion

☐ Other

In case of a written exam, questions refer to

☐ Multiple choice answers

☐ Open answers

☐ Numerical exercises

b) Evaluation pattern

The final grade, on the basis of the results and abilities demonstrated in the discussion of the elaborated project as well as of the themes and elaborations of the different modules, will be weighted on the CFUs of each teaching and thus composed as follows: Architectural design for heritage 25%; Architectural conservation and construction aspects of historical buildings 17%;

Statics and stability of historical buildings 17%; Technological design for architecture 17%; Energy optimisation for built heritage use 25%.