COURSE DESCRIPTION
ARCHITECTURAL AND URBAN DESIGN

SSD: COMPOSIZIONE ARCHITETTONICA E URBANA (ICAR/14)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: GIAMMETTI MARIATERESA
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20076 - LABORATORIO DI PROGETTAZIONE ARCHITETTONICA 3
MODULE: 15587 - PROGETTAZIONE ARCHITETTONICA E URBANA
TEACHING LANGUAGE: ITALIANO
CHANNEL: 01 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 8

REQUIRED PRELIMINARY COURSES

Architectural Design Workshop 2

PREREQUISITES

There are no prerequisites.

LEARNING GOALS

The objective of the third-year design workshop is to introduce students to the theories of urban design combined with cost-related issues.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student addresses the compositional issues (distributive, typological, morphological and linguistic) that underlie the architectural project and its various thematic articulations. The course is developed through theoretical lectures, seminars, on-site visits and laboratory activities that direct

the student to understand the relationships between architecture and the other disciplines that contribute to the shaping of the architectural project with regard to aspects of architectural and urban design evaluation.

Applying knowledge and understanding

The student develops the ability to theoretically and methodologically organise design activity and to create projects with different degrees of complexity in relation to the different scales of architectural design. The student also develops the ability to apply economic and evaluative knowledge to the design activity, in its various articulations, confronting the different degrees of complexity and the different fields of application of architectural design and urban design.

COURSE CONTENT/SYLLABUS

The main goal of the course is to orient students to the understanding and controlling a system of closed and open spaces that will contribute to design a building for residences and spaces intended for sociality and sharing; it will be located in one of the "unresolved" areas of the urban texture in the city of Naples. Students will acquire a critical method useful for questioning, choosing and constructing design themes based on the character of architecture, i.e. its ability to build space around man, relating that same space to its purpose: its ability to be inhabited. Critical practice will search for the most appropriate solution starting from an in-depth investigation of the theme, which by encountering the rules of architecture will lead the project to define its form. In this process, method and critical spirit - the two key words of "modernity" - destabilise each other, again and again aiming at the task at hand. The different scales of the proposed theme will offer the didactic opportunity to delve into the design down to the small scale in order to measure its congruence with the whole of the choices made. The issues of drawing, as of any other form of representation and modelling of space, will be addressed by defining a communication strategy that overcomes the gap between graphic abstraction and the real physical configuration of architecture. The didactic activity will be organised in exercises (each concluded by a collegial assessment) that will cover the main moments identifiable in the design process and among which the number of CFUs of the final exam will be divided:

- context analysis and identification of the design theme through the study of section hypotheses; (1 CFU)
- first morphological type choices; (1 CFU)
- thematisation of the theme: the ordering paths and components, the rules, the exceptions, the moments of singularity, i.e. marking the character that each theme can express; (1 CFU)
- verifications: critical/design exercises on functional, constructive, compositional and estimative aspects; (1 CFU)
- recomposition of the project idea due to the maturation of the project activated through the verifications and drafting of the examination papers. (4 CFU)

The project activity will be carried out in the classroom according to the timetable scheduled for each exercise, in order to complete the year's theme by the end of the course. The majority of the course hours will be devoted to laboratory work, the activities of which will be supported by theoretical lectures given by the course's reference professor and by external professionals and

lecturers.

READINGS/BIBLIOGRAPHY

In addition to a handbook such as USIS-CNR or Neufert and an illustrated book on the history of architecture, here are some brief bibliographical indications. Further specific readings will be indicated by the needs and developments of the course, however, it will be the responsibility of each student to learn how to build their own personal library as their operational interests and cultural input grows.

1. A. Campo Baeza, *Light is much more*, disponibile in: https://oa.upm.es/38937/1/INVE_MEM_2014_215223.pdf
2. A. Loos, *Parole nel Vuoto*, Adelphi, Milano 1992.
3. A. Rossi, *Introduzione a E-L. Boullée, Architettura. Saggio sull'arte*, Einaudi, Torino 2005.
4. Le Corbusier, *Verso un'architettura*, Longanesi, Milano 2003.
5. L. I. Kahn, *Architettura è*, M. Bonaiti (ed.), Electa, Milano 2002.

TEACHING METHODS OF THE COURSE (OR MODULE)

The didactic activity will be organised in exercises (each concluded by a collective verification) that will concern the main moments identifiable in the design process:
- analysis of the context and identification of the programme;
- first morphological type choices;
- the ordering paths and components, rules, exceptions, moments of singularity.
- verifications: critical/design exercises on the functional, constructive and compositional aspects and the recomposition of the design idea for the examination.

The design activity will be carried out in the classroom in accordance with the timetable scheduled for each exercise, in order to complete the year's theme by the end of the course. The majority of the course hours will be dedicated to the workshop, whose activities will be supported by theoretical lectures given by the course's reference professor and external professionals and professors.

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 evaluation will take into account not only the quality of the project and its graphic rendering, but also the student's growth path with respect to the products rendered for each exercise, his or her ability to acquire a critical method useful for working on design issues and the skills acquired in the use of construction principles as the main tools for the composition of space. The evaluation will take into account, together with the results of the design experimentation, the skills and knowledge acquired thanks to the disciplinary contributions deriving from the Integrative Module of Quantity Surveying. The examination will take the form of an exhibition of the course projects. In addition to the professor and tutors, external professors and professionals will be involved in the final critique of the project experiments. During the examination, the students will present the work carried out by means of graphs, models and digital models useful for describing the choices that guided the design process and the result achieved. The didactic activity will be organised in exercise-tests (each concluded by a collegial assessment) that will cover the main moments identifiable in the design process and between which the number of CFUs of the final examination will be divided:

- Context analysis and identification of the design theme through the study of section hypotheses; Time location: beginning of the course (1 CFU)
- First morphological type choices; (1 CFU) Temporal collocation: beginning of the course (1 CFU)
- Theme thematisation: the ordering paths and components, rules, exceptions, moments of singularity, i.e. marking the character that each theme can express; Timing: mid-course (1 CFU)
- Tests: critical/design exercises on functional, constructive, compositional and estimative aspects; Time allocation: mid-course (1 CFU)
- Recomposition of the project idea due to the maturation of the project activated through the verifications and drafting of the examination papers; Time allocation: end of course (4 CFU)

COURSE DESCRIPTION
ARCHITECTURAL AND URBAN DESIGN

SSD: COMPOSIZIONE ARCHITETTONICA E URBANA (ICAR/14)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20076 - LABORATORIO DI PROGETTAZIONE ARCHITETTONICA 3
MODULE: 15587 - PROGETTAZIONE ARCHITETTONICA E URBANA
TEACHING LANGUAGE: ITALIANO
CHANNEL: 02 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 8

REQUIRED PRELIMINARY COURSES

Architectural Design Workshop 2

PREREQUISITES

Not required.

LEARNING GOALS

Architectural Design Studio 3 Course aims to provide students with the cultural and technical tools to deal with an architectural project, also through the contribution of the Estimation and cost appraisal Course, which is integrating part of Architecture Design Studio teaching. The main expected result is the acquisition by the student of a critical and in-depth ability to interpret the architectural project design process. At the end of the Course, students are supposed to: - know cultural and technical materials and the essential tools (also in relation to the contents of the Estimation and cost appraisal Course) to deal with the complexity of contemporary architectural

transformation project; - demonstrate that they aware of the close relationship that links the architectural and urban design issues and requests from the community; - be aware of the need to consider all the social, economic, political, environmental aspects of the architectural design process, which are leading elements to guide design development of cities and territories; - demonstrate critical skills in the interpretation of the design question and in developing of an appropriate project answer that can explain the relationships between architectural and urban space, through the compositional, distributive and constructive articulation at different scales; - to use tools and techniques in order to organize documents of different types and at different scales, from the urban to the technoligal detail one (two-dimensional and three-dimensional drawings, diagrams, collages, models, etc.); - be aware that the different levels of complexity of the degree course constitute an knowledge and skills progress in relation to the previous course of study.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student addresses the compositional issues (distributive, typological, morphological and linguistic) that underlie the architectural project and its various thematic articulations. The course is developed through theoretical lectures, seminars, on-site visits and laboratory activities that direct the student to understand the relationships between architecture and the other disciplines that contribute to the shaping of the architectural project with regard to aspects of architectural and urban design evaluation.

Applying knowledge and understanding

The student develops the ability to theoretically and methodologically organise design activity and to create projects with different degrees of complexity in relation to the different scales of architectural design. The student also develops the ability to apply economic and evaluative knowledge to the design activity, in its various articulations, confronting the different degrees of complexity and the different fields of application of architectural design and urban design.

COURSE CONTENT/SYLLABUS

The Architectural Design Studio course aims to address the complexities of architectural design as a tool for knowledge and refinement of technical and construction skills, promoting a dialogue between historical stratification, modernist poetics and the contributions of contemporary research on the language of architecture. The complex articulation of the urban layout of Naples, which has always represented an opportunity of great cultural interest for the architectural project, is the main theme of the course, which, in particular, will be explained through the design of an urban complex that will provide, from a functional point of view, both residences and other functions of a public nature. The area of intervention will be determined following the overtaking and reading of urban conditions that determine the need for new plants. The project proposal will be determined by actions that precede and condition the formal result, namely the correct interpretation of the aims of the project, the analysis of the specificities of the area and the context and the dialogue between modernist language and identity of the place. A further key element of the course's didactic structure is the adoption of the analysis of architecture belonging to different eras - in

particular from the 15th and 16th centuries - as a design tool, in search of design solutions that transcend time. Architecture interprets social, historical and cultural dynamics and, through the project, returns a subjective and synthetic vision of the city, then determining, through the act of construction, an action full of great civil responsibility. Consolidating this awareness and contributing to the maturation of the disciplinary tools that students already possess are goals that the project to be developed during the course aims to achieve.

READINGS/BIBLIOGRAPHY

G. Foti, C. Pagliaro, D. Peruzzo, L.Semerani, Progetto eloquente, Marsilio editori, Venezia, 1981;
R. De Fusco, L'Architettura del Cinquecento, Utet, 1981;
K.Frampton, Storia dell'architettura moderna, Zanichelli, quarta edizione, 2008;
B. Zevi, Saper vedere l'architettura. Saggio sull'interpretazione spaziale dell'architettura, Einaudi, ed. 2009;
S. Holl, Urbanism. Working with doubt, Princeton Architectural Press, 2009;
A. Rossi, Scritti scelti sull'architettura e la città 1956-1972, Quodlibet, Macerata, 2012;
R. Clark, M. Pause, Precedents in Architecture: Analytic Diagrams, Formative Ideas and Partis, John Wiley &Sons, 2012;
C. Diener, J. Herzog, M. Meili, P. de Meuron, M. Herz, C. Schmid, M. Topalovic, The Inevitable Specificity of Cities. ETH Studio Basel, 2015
B. Zevi, Architectura in nuce, Quodlibet, Macerata, 2018;
B. Zevi, Architettura e storiografia, Quodlibet, Macerata, 2018.

TEACHING METHODS OF THE COURSE (OR MODULE)

In addition to the design activity to be carried out in the classroom, the hours of the laboratory will be administered in such a way as to guarantee an adequate number of lessons that will address critical and theoretical issues. Among these, a first group will deal with the reading of the study area and the project needs; the second will retrace the analysis of the elements of architectural and urban composition; finally, the third group of lessons, parallel to the second, will have as its purpose the critical analysis of works related to the different declinations of modern poetics in the project of contemporary architecture, assumed as possible references for the project of the Architecture Design Studio Course. In fact, during the theoretical and design process, constant attention will always be paid to similar themes but differently declined for historical and geographical conditions.

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 evaluation will be weighted on the credits of the Architectural Design Studio module corresponding to 8 credits and of the Estimation and Cost Appraisal module corresponding to 4 credits.

COURSE DESCRIPTION ESTIMATE

SSD: ESTIMO (ICAR/22)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: DE TORO PASQUALE
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20076 - LABORATORIO DI PROGETTAZIONE ARCHITETTONICA 3
MODULE: 04650 - ESTIMO
TEACHING LANGUAGE: ITALIANO
CHANNEL: 01 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 4

REQUIRED PRELIMINARY COURSES

Architectural design studio 2.

PREREQUISITES

There are no prerequisites.

LEARNING GOALS

The objective of the third-year architectural design studio is to introduce the student to urban design theories and to combine the proposed design themes with cost-related aspects.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

Through theoretical lectures, seminars, site visits and laboratory activities, the student is acquainted with the compositional issues (distributive, typological, morphological and linguistic) that underlie the architectural design and its various thematic articulations, and he/she

understands its relationships with the other disciplines that contribute to the formation of the architectural project, in particular with regards to the evaluation aspects of the architectural and urban design.

Applying knowledge and understanding

The student develops the ability to theoretically and methodologically structure the design activity and to produce design work confronting the different degrees of complexity of the architectural project at different scales. The student also develops the ability to apply economic and evaluative knowledge to the design activity, in its different articulations, confronting the different degrees of complexity and the different fields of application of architectural and urban design.

COURSE CONTENT/SYLLABUS

1. Estimation and valuation (1 CFU): The principles of estimation theory. Economic aspects of assets. Use value, market value, cost value, complementary value, transformation value, subrogation value. Sustainable development and valuations. Total Economic Value and Complex Social Value.
2. Elements of microeconomics and financial mathematics (1 CFU): Production cost theory, market models, consumer and producer surplus, company equilibrium, financial mathematics.
3. Appraisal Procedures (2 CFU): Analytical procedures for estimating the market value of a properties, agricultural lands, and building areas. Synthetic and intermediate procedures for estimating the market value of a property. Analytical, synthetic and intermediate procedures for estimating the cost value of building, urban and infrastructure interventions. International valuation standards.

READINGS/BIBLIOGRAPHY

Lecturer’s teaching materials posted on the teacher’s webpage.

TEACHING METHODS OF THE COURSE (OR MODULE)

Lectures and exercises. Laboratory design activities.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [x] Written
- [x] Oral
- [x] Project discussion
- [ ] Other

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [x] Open answers
- [ ] Numerical exercises

b) Evaluation pattern

The outcome of the written test is not binding for the purpose of the admission the oral exam; the number of answers will not be evaluated but their general correctness.

The final grade will be weighted on the CFUs of each teaching and thus composed as follows: Architectural Design Module 8CFU 66%, Estimation and Appraisal Module 4CFU 33%.

COURSE DESCRIPTION ESTIMATE

SSD: ESTIMO (ICAR/22)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: BOSONE MARTINA
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20076 - LABORATORIO DI PROGETTAZIONE ARCHITETTONICA 3
MODULE: 04650 - ESTIMO
TEACHING LANGUAGE: ITALIANO
CHANNEL: 02 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 4

REQUIRED PRELIMINARY COURSES

Architectural design studio 2.

PREREQUISITES

There are no prerequisites.

LEARNING GOALS

The objective of the third-year architectural design studio is to introduce the student to urban design theories and to combine the proposed design themes with cost-related aspects.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

Through theoretical lectures, seminars, site visits and laboratory activities, the student is acquainted with the compositional issues (distributive, typological, morphological and linguistic) that underlie the architectural design and its various thematic articulations, and he/she

understands its relationships with the other disciplines that contribute to the formation of the architectural project, in particular with regards to the evaluation aspects of the architectural and urban design.

Applying knowledge and understanding

The student develops the ability to theoretically and methodologically structure the design activity and to produce design work confronting the different degrees of complexity of the architectural project at different scales. The student also develops the ability to apply economic and evaluative knowledge to the design activity, in its different articulations, confronting the different degrees of complexity and the different fields of application of architectural and urban design.

COURSE CONTENT/SYLLABUS

1. Estimation and valuation (1 CFU): The principles of estimation theory. Economic aspects of assets. Use value, market value, cost value, complementary value, transformation value, subrogation value. Sustainable development and valuations. Total Economic Value and Complex Social Value.
2. Elements of microeconomics and financial mathematics (1 CFU): Production cost theory, market models, consumer and producer surplus, company equilibrium, financial mathematics.
3. Appraisal Procedures (2 CFU): Analytical procedures for estimating the market value of a properties, agricultural lands, and building areas. Synthetic and intermediate procedures for estimating the market value of a property. Analytical, synthetic and intermediate procedures for estimating the cost value of building, urban and infrastructure interventions. International valuation standards.

READINGS/BIBLIOGRAPHY

Lecturer’s teaching materials posted on the teacher’s webpage.

TEACHING METHODS OF THE COURSE (OR MODULE)

Lectures and exercises. Laboratory design activities.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [x] Written
- [x] Oral
- [x] Project discussion
- [ ] Other

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [x] Open answers
- [ ] Numerical exercises

b) Evaluation pattern

The outcome of the written test is not binding for the purpose of the admission the oral exam; the number of answers will not be evaluated but their general correctness.

The final grade will be weighted on the CFUs of each teaching and thus composed as follows: Architectural Design Module 8CFU 66%, Estimation and Appraisal Module 4CFU 33%.

COURSE DESCRIPTION
TECHNIQUE OF CONSTRUCTIONS

SSD: TECNICA DELLE COSTRUZIONI (ICAR/09)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: PORTIOLI FRANCESCO PAOLO ANTONIO
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 01 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 6

REQUIRED PRELIMINARY COURSES

Theory of structures

PREREQUISITES

None

LEARNING GOALS

Attainment of operative tools for verification and design of structural elements.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

On the basis of face-to-face lectures and classroom exercises, the student will get knowledge of the issues related to conceptual design and verification of structures within the elaboration of the architectural project in the various fields of its application. The student will also understand the relationships with the other disciplines that contribute to the development of the architectural

project.

Applying knowledge and understanding
The student will develop the ability to apply theoretical and methodological knowledge related to the structural aspects of the architectural project

COURSE CONTENT/SYLLABUS

The course programme is organized as follows:
- Design approach and verification methods of structural systems;
- The geometric model, the mechanical and the load model;
- Measurement methods of structural safety: random variables, characteristic values of material strength and loads;
- The semi-probabilistic limit state method;
- Actions on structures and load combinations;
- Steel structures: structural types, material properties and constitutive models;
Verification of tensile, bending and shear strength of steel elements
Stability of compressed members;
Verifications for combined resultant forces;
Connections and joints;
Displacement verification at service limit state;
- Software tools for the structural analysis of beam systems;
- Reinforced concrete structures: structural types, materials properties and constitutive models;
Verification of axial strength;
Verification of flexural strength with and without axial forces;
Shear strength mechanisms;
Verification of normal stresses at service limit state;
- Seismic actions;
- Fundamentals and tools for safety assessment of existing masonry structures.

READINGS/BIBLIOGRAPHY

- Bernuzzi, C. Proporzionamento di strutture di acciaio. Hoepli, 2018
- Ballio, G., Mazzolani F., Bernuzzi, C., Landolfo, R. Strutture di acciaio. Teoria e progetto. Hoepli, 2020
- Cosenza, E., Manfredi, G., Pecce, M. Strutture in Cemento Armato, Hoepli, 2019
- Mezzina, M. (a cura di) Fondamenti di Tecnica delle Costruzioni. CittàStudi, 2021

TEACHING METHODS OF THE COURSE (OR MODULE)

Face-to-face lectures and exercises.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

☐ Written

- [x] Oral
- [ ] Project discussion
- [ ] Other

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [ ] Open answers
- [ ] Numerical exercises

b) Evaluation pattern

COURSE DESCRIPTION
TECHNIQUE OF CONSTRUCTIONS

SSD: TECNICA DELLE COSTRUZIONI (ICAR/09)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 02 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 6

REQUIRED PRELIMINARY COURSES

Teoria delle strutture

PREREQUISITES

None

LEARNING GOALS

The course aims at providing students of operative tools for verification and design of structural elements

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student needs to show ability to know and understand problems related to conceptual design and verification of structures. The student will also understand the relationships with the other disciplines that contribute to the development of the project

Applying knowledge and understanding

The student will develop the ability to apply theoretical and methodological knowledge related to the structural aspects of the architectural project

COURSE CONTENT/SYLLABUS

Design approach and verification methods of structural systems. The geometric model, the mechanical and the load model. Measurement methods of structural safety: random variables, characteristic values of material strength and loads. The semi-probabilistic limit state method. Actions on structures and load combinations. Steel structures: structural types, material properties and constitutive models; resistance verification for tensile, bending and shear forces; resistance verifications for combined forces; stability of compressed members; connections and joints; displacement verification at service limit state. Reinforced concrete structures: structural types, materials properties and constitutive models; verification of axial strength; verification of flexural strength with and without axial forces; shear strength mechanisms, verification of normal stresses at service limit state. Seismic actions.

READINGS/BIBLIOGRAPHY

- Bernuzzi, C. Proporzionamento di strutture di acciaio. Hoepli, 2018
- Ballio, G., Mazzolani F., Bernuzzi, C., Landolfo, R. Strutture di acciaio. Teoria e progetto. Hoepli, 2020
- Cosenza, E., Manfredi, G., Pecce, M. Strutture in Cemento Armato, Hoepli, 2019

TEACHING METHODS OF THE COURSE (OR MODULE)

Face-to-face lectures and exercises

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

COURSE DESCRIPTION
RESTORATION

SSD: RESTAURO (ICAR/19)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: POLLONE STEFANIA
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 01 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 6

REQUIRED PRELIMINARY COURSES

None

PREREQUISITES

None

LEARNING GOALS

The course aims to provide students with critical, methodological, and technical knowledge necessary to understand and recognize the specificities of built cultural heritage, with a focus on its protection, restoration, and enhancement. Starting from the relationship between past architects and existing structures, the course examines the origins of modern restoration and its codifications in the 19th and 20th centuries, leading up to current trends in restoration. This will be achieved through an in-depth exploration of the fundamental critical issues within the discipline. Additionally, the course addresses aspects related to the understanding of materials and traditional construction techniques in historic architecture, the diagnosis of structural failures, and

the identification of recurring phenomena of alteration and degradation as well as the factors contributing to the vulnerability of historic built heritage. Particular attention will be paid to the relationships with the framework of current protective regulations. At the end of the course and after passing the exam, the student will be able to understand the evolution of architectural and urban restoration theories and practices in relation to contemporary disciplinary debates, to recognize the material and construction-specific features of historic construction sites, and to apply these skills to the interpretation of historical heritage in its processual nature, with a view to its transmission to future generations.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student is expected to:

- demonstrate knowledge and the ability to interpret the historical contexts and key figures that have shaped the evolution of architectural and urban restoration theories and practices, from classical antiquity to the contemporary disciplinary debate;
- demonstrate an understanding of the major projects and interventions that illustrate the development of architectural and urban restoration theories and practices over the centuries;
- demonstrate to be able to take part in complex discussions dealing with the processes that have led to the progressive recognition of the values of built heritage over time;
- demonstrate a critical understanding of contemporary trends in the disciplinary debate on restoration;
- demonstrate knowledge of the specificities of historic construction sites, with particular attention to material and construction techniques;
- demonstrate the ability to identify the factors of vulnerability, damage, and degradation affecting historic built heritage.

The course aims to provide foundational knowledge, methodological approaches, and technical tools essential for analyzing and understanding the evolution of architectural and urban restoration theories and practices in the context of contemporary disciplinary debates. Students will also learn to critically interpret the material and construction characteristics of historic built heritage, including its main vulnerabilities and forms of damage. Supported by examples and in-depth studies of specific cases from both past centuries and the present, these tools will enable students to grasp the unique qualities of each stratified building in its processual nature. They will learn to view such buildings as a synthesis of historical sedimentation, reflecting transformative and conservative interventions that were carried out with varying degrees of awareness regarding the cultural values they embody. This perspective will also consider the evolving sensitivity toward built heritage over time.

Applying knowledge and understanding

The student must demonstrate:

Independent Judgment

Students must demonstrate the ability to critically analyze the evolution of architectural and urban restoration theories and practices, showing a solid understanding of historical chronology. They should engage with current trends and develop a personal critical perspective that aligns with the

scientifically accepted methodological framework of the Restoration discipline. Additionally, students must be able to recognize the distinctive features of historic construction sites and identify signs of damage affecting historic built heritage. This independent judgment will be progressively refined and assessed through classroom activities, site visits, and the final exam.

Communication Skills

Students should be able to present and discuss the evolution of architectural and urban restoration theories and practices, as well as the specific characteristics of historic construction sites. They must demonstrate a strong grasp of chronology and relevant terminology, relating their knowledge to historical and geographical contexts, and to broader cultural history. Clear communication is essential, particularly in connecting acquired knowledge to contemporary issues in restoration and conservation.

Learning Ability

Students must develop the skills necessary to expand their knowledge through diverse bibliographic sources and participation in seminars, conferences, and workshops, including international events offered by the Department or externally. By the end of the course, students should be able to effectively and critically apply their knowledge to subsequent laboratory work in Restoration, as outlined in the curriculum of the specialized two-year program.

COURSE CONTENT/SYLLABUS

Articulation:

I. CONTEMPORARY ISSUES IN THE CONSERVATION OF ARCHITECTURAL HERITAGE AND LANDSCAPE

- The term "restoration" in its various forms.
- The concept of "monument" as a "document" and the protection of cultural heritage.
- Architectural restoration, urban restoration and landscape restoration.
- Methodological considerations in restoration activities: compatibility, reversibility, distinction, and minimal intervention.
- Architectural restoration and new design: recent experiences in Italy and Europe.

II. HISTORICAL EVOLUTION AND THEORETICAL CONTRIBUTIONS TO RESTORATION

- The history of architecture and restoration.
- Interventions on existing architecture before the 19th century: "restoration" between Antiquity and Renaissance.
- Interventions on existing architecture before the 19th century: restoration issues during the Baroque period.
- The birth of "restoration" in the modern sense: archaeological restoration issues in Paestum, the Vesuvian area and Rome between the 18th and the 19th centuries.
- The development of the "stylistic restoration" and, the contribution of French intellectuals. Eugéne-Emmanuel Viollet-le-Duc: writings and restoration yards.
- The English restoration movement: John Ruskin, William Morris, and the Society for Protection of Ancient Buildings (SPAB).

- Restoration and architectural debate in Italy in the mid-19th century: Camillo Boito and the dialectic between conservation and restoration.
- The protagonists of the "historical restoration" in Italy.
-Gustavo Giovannoni: principles and thoughts on architectural restoration. The "Athens Charter" of 1931 and the "Carta italiana del restauro" of 1932.
- Restoration works in Naples between the two World Wars: the contribution of Gino Chierici.
- Destructions and reconstructions in Italy and Europe after the World War II: the debate between conservation and innovation.
- The "critical restoration" in the contribution by Roberto Pane. The "Venice Charter" of 1964.
- Restoration and "value judgment": the considerations of Cesare Brandi.

III. HISTORICAL ARCHITECTURE AND BUILDING TECHNIQUES. KNOWLEDGE AND APPROACH TO STRENGTHENING DESIGN

- Constructive methods and phenomenology of damage.
- Overview of diagnostic and monitoring project. The diagnosis of masonry instability.
- The role of structural strengthening in the restoration project.
- Soil and the foundation structures in built heritage: materials,construction types andfoundational subsidence.
- Vertical masonries: materials and constructive types with a focus on the Campania context. Mortars in old buildings.
- Architectural surfaces: plasters, stuccos and painting. Materials, construction techniques and decay phenomena. The UNI-Nor.Ma.L 1/88 (2006 update) Recommendations
-Masonry arches and vaults: materials, constructive types and issues of instability.
- Wooden ceilings and roofs: main deterioration and instability problems.

IV. THE PROTECTION OF THE CULTURAL HERITAGE

-Restoration, recovery, protection and "integrated conservation". Theoretical and methodological evolution through the Restoration Charters.
- The European Charter of Architectural Heritage (1975) and the Amsterdam Declaration (1975).
- The meaning of "landscape" and the European Landscape Convention (2000).
- The development of protection guidelines in recent decades. The Cultural Heritage and Landscape Code" (D.L. 42/2004).

READINGS/BIBLIOGRAPHY

References:

I. CONTEMPORARY ISSUES IN CONSERVATION OF ARCHITECTURAL HERITAGE AND LANDSCAPE

J. Jokilehto,*A History of Architectural Conservation*, Butterworth-Heinemann, Oxford 1999, pp. 295-318 ("Area Architettura" Library) (recommended).

G. Carbonara,*An Italian contribution to architectural restoration*, in «Frontiers of Architectural Research», 2012, pp. 2-9 (recommended).

II. HISTORICAL EVOLUTION AND THEORETICAL CONTRIBUTIONS TO RESTORATION

J. Jokilehto,*A History of Architectural Conservation*, Butterworth-Heinemann, Oxford 1999, pp. 1-40; 42 -50; 56-88; 101; 127-132; 137-157; 174-181; 184-191; 200-206; 215-237; 283-292 ("Area Architettura" Library) (recommended).

V. Russo,*Architecture and Memory of Ancient Times: Renewal, Re-Use, Restoration in Seventeenth Century Neapolitan Churches*, in A. Roca de Amicis and C. Varagnoli (eds.), *Alla moderna. Old Churches and Baroque Renovations: a European Perspective*, Artemide, Roma 2015, pp. 69-93 ("Roberto Pane" Library) (optional).

S. Pollone,*Materials tested by time. Quality and durability of the restorations of the temples of Paestum from the nineteenth-century approaches to the contemporary issues of conservation*,in Proceedings of the 4th WTA International PhD Symposium (Delft, 13-16 settembre 2017), R. Van Hees, W. Quist, S. Granneman (eds.), WTA Nederland-Vlaanderen, Delft-Heverlee 2017, pp. 107-114 (academia.edu) (optional).

C. Brandi,*Theory of Restoration*(trad. Cynthia Rockwell; rev. Dorothy Bell; cur. Giuseppe Basile), Nardini, Firenze 2005 (optional).

•see also: M. Glendinning, *The conservation movement. A history of architectural preservation: antiquity to modernity*, Routledge, London-New York 2013 (https://books.google.it) (optional).

III. HISTORICAL ARCHITECTURE AND BUILDING TECHNIQUES. KNOWLEDGE AND APPROACH TO THE STRENGTHENING DESIGN

B. Feilden, *Conservation of Historic Buildings*, Routledge, London 2023 ("Area Architettura" Library) (recommended).

D. Fiorani,*Seismic issues in historical constructions and sites: the conservation aspects*, in *InternationalWorkshop on Seismic Risk. Preparedness and Mitigation of Archeological and Historical Sites*, Jerusalem 2014, pp. 1-4 (www.academia.edu) (optional).

E. Coisson and F. Ottoni,*Structural monitoring of historical construction: increasing knowledge to minimizeinterventions*, in L. Toniolo, M. Boriani, G. Guidi (eds.),*Built Heritage: Monitoring Conservation Management*,Springer, London 2015, pp. 83-92 (optional).

L. Romano, M. Falcone, *Wooden vaults in Naples between survey and construction knowledge: the case of the church of Santa Maria Egiziaca all'Olmo*, in «Timber and construction», Proceedings of the Ninth Conference of the Construction History Society, (Cambridge, 1st-3rd April 2022), edited by J. Campbell et al., The Construction History Society, Cambridge 2022, pp. 157-170 (optional).

IV. THE PROTECTION OF THE CULTURAL HERITAGE

J. Ziesemer, M. Petzet,*International charters for conservation and restoration*, ICOMOS 2004, pp. 7-9; 13-15 ("Roberto Pane" Library) (optional). All documents (Charters and regulations) reported in the program are easily available online.

TEACHING METHODS OF THE COURSE (OR MODULE)

The course is structured into lectures, seminars, and on-site visits.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [ ] Written
- [x] 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 oral exam evaluates the theoretical knowledge that students have acquired regarding the contemporary debate on the conservation and protection of architectural heritage. This includes insights into the origins of modern restoration and the evolution of the discipline's codifications through the centuries, culminating in twentieth-century formulations. Additionally, the assessment measures the students' skills in understanding the material and construction techniques of historical built heritage, as well as their ability to recognize the main phenomena of decay and instability.

COURSE DESCRIPTION
RESTORATION

SSD: RESTAURO (ICAR/19)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: ROMANO LIA
PHONE: 081-2538022
EMAIL: lia.romano2@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 02 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 6

REQUIRED PRELIMINARY COURSES

None.

PREREQUISITES

None.

LEARNING GOALS

The course aims to provide students with critical, methodological, and technical knowledge necessary to understand and recognize the specificities of built cultural heritage, with a focus on its protection, restoration, and enhancement. Starting from the relationship between past architects and existing structures, the course examines the origins of modern restoration and its codifications in the 19th and 20th centuries, leading up to current trends in restoration. This will be achieved through an in-depth exploration of the fundamental critical issues within the discipline. Additionally, the course addresses aspects related to the understanding of materials and traditional construction techniques in historic architecture, the diagnosis of structural failures, and

the identification of recurring phenomena of alteration and degradation as well as the factors contributing to the vulnerability of historic built heritage. Particular attention will be paid to the relationships with the framework of current protective regulations.
At the end of the course and after passing the exam, the student will be able to understand the evolution of architectural and urban restoration theories and practices in relation to contemporary disciplinary debates, to recognize the material and construction-specific features of historic construction sites, and to apply these skills to the interpretation of historical heritage in its processual nature, with a view to its transmission to future generations.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student is expected to:

- demonstrate knowledge and the ability to interpret the historical contexts and key figures that have shaped the evolution of architectural and urban restoration theories and practices, from classical antiquity to the contemporary disciplinary debate;
- demonstrate an understanding of the major projects and interventions that illustrate the development of architectural and urban restoration theories and practices over the centuries;
- demonstrate to be able to take part in complex discussions dealing with the processes that have led to the progressive recognition of the values of built heritage over time;
- demonstrate a critical understanding of contemporary trends in the disciplinary debate on restoration;
- demonstrate knowledge of the specificities of historic construction sites, with particular attention to material and construction techniques;
- demonstrate the ability to identify the factors of vulnerability, damage, and degradation affecting historic built heritage.

The course aims to provide foundational knowledge, methodological approaches, and technical tools essential for analyzing and understanding the evolution of architectural and urban restoration theories and practices in the context of contemporary disciplinary debates. Students will also learn to critically interpret the material and construction characteristics of historic built heritage, including its main vulnerabilities and forms of damage. Supported by examples and in-depth studies of specific cases from both past centuries and the present, these tools will enable students to grasp the unique qualities of each stratified building in its processual nature. They will learn to view such buildings as a synthesis of historical sedimentation, reflecting transformative and conservative interventions that were carried out with varying degrees of awareness regarding the cultural values they embody. This perspective will also consider the evolving sensitivity toward built heritage over time.

Applying knowledge and understanding

The student must demonstrate:

Independent Judgment

Students must demonstrate the ability to critically analyze the evolution of architectural and urban restoration theories and practices, showing a solid understanding of historical chronology. They should engage with current trends and develop a personal critical perspective that aligns with the

scientifically accepted methodological framework of the Restoration discipline. Additionally, students must be able to recognize the distinctive features of historic construction sites and identify signs of damage affecting historic built heritage. This independent judgment will be progressively refined and assessed through classroom activities, site visits, and the final exam.

Communication Skills

Students should be able to present and discuss the evolution of architectural and urban restoration theories and practices, as well as the specific characteristics of historic construction sites. They must demonstrate a strong grasp of chronology and relevant terminology, relating their knowledge to historical and geographical contexts, and to broader cultural history. Clear communication is essential, particularly in connecting acquired knowledge to contemporary issues in restoration and conservation.

Learning Ability

Students must develop the skills necessary to expand their knowledge through diverse bibliographic sources and participation in seminars, conferences, and workshops, including international events offered by the Department or externally. By the end of the course, students should be able to effectively and critically apply their knowledge to subsequent laboratory work in Restoration, as outlined in the curriculum of the specialized two-year program.

COURSE CONTENT/SYLLABUS

Articulation:

I. CONTEMPORARY ISSUES IN THE CONSERVATION OF ARCHITECTURAL HERITAGE AND LANDSCAPE

- The term "restoration" in its various forms.
- The concept of "monument" as a "document" and the protection of cultural heritage.
- Architectural restoration, urban restoration and landscape restoration.
- Methodological considerations in restoration activity: compatibility, reversibility, distinction and minimal intervention.
- Architectural restoration and new design: recent experiences in Italy and Europe.

II. HISTORICAL EVOLUTION AND THEORETICAL CONTRIBUTIONS TO RESTORATION

- The history of architecture and restoration.
- Interventions on existing architecture before the 19th century: "restoration" between Antiquity and Renaissance.
- Interventions on existing architecture before the 19th century: restoration issues during the Baroque period.
- The birth of "restoration" in the modern sense: archaeological restoration issues in Paestum, the Vesuvian area and Rome between the 18th and the 19th centuries.
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- The "critical restoration" in the contribution by Roberto Pane. The "Venice Charter" of 1964.
- Restoration and "value judgment" : the considerations of Cesare Brandi.

III. HISTORICAL ARCHITECTURE AND BUILDING TECHNIQUES. KNOWLEDGE AND APPROACH TO STRENGTHENING DESIGN

- Constructive methods and phenomenology of damage.
- Overview on the diagnostic and monitoring project . The diagnosis of masonry instability.
- The role of structural strengthening in the restoration project.
- Soil and the foundation structures in built heritage: materials, construction types and foundational subsidence.
- Vertical masonries: materials and constructive types with a focus on the Campania context. Mortars in old buildings.
- Architectural surfaces: plasters, stuccos and painting. Materials, construction techniques and decay phenomena. The UNI-Nor.Ma.L 1/88 (2006 update) Recommendations
- Masonry arches and vaults: materials, constructive types and issues of instability.
- Wooden ceilings and roofs: main deterioration and instability problems.

IV. THE PROTECTION OF THE CULTURAL HERITAGE

- Restoration, recovery, protection and "integrated conservation". Theoretical and methodological evolution through the Restoration Charters.
- The European Charter of Architectural Heritage (1975) and the Amsterdam Declaration (1975).
- The meaning of "landscape" and the European Landscape Convention (2000).
- The development of protection guidelines in recent decades. The Cultural Heritage and Landscape Code" (D.L. 42/2004).

READINGS/BIBLIOGRAPHY

References:

I. CONTEMPORARY ISSUES IN CONSERVATION OF ARCHITECTURAL HERITAGE AND LANDSCAPE

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G. Carbonara, *An Italian contribution to architectural restoration*, in «Frontiers of Architectural Research», 2012, pp. 2-9 (recommended).

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S. Pollone, *Materials tested by time. Quality and durability of the restorations of the temples of Paestum from the nineteenth-century approaches to the contemporary issues of conservation,* in Proceedings of the 4th WTA International PhD Symposium (Delft, 13-16 settembre 2017), R. Van Hees, W. Quist, S. Granneman (eds.), WTA Nederland-Vlaanderen, Delft-Heverlee 2017, pp. 107-114 (academia.edu) (optional).

C. Brandi, *Theory of Restoration* (trad. Cynthia Rockwell; rev. Dorothy Bell; cur. Giuseppe Basile), Nardini, Firenze 2005 (optional).

•see also: M. Glendinning, *The conservation movement. A history of architectural preservation: antiquity to modernity*, Routledge, London-New York 2013 (https://books.google.it) (optional).

III. HISTORICAL ARCHITECTURE AND BUILDING TECHNIQUES. KNOWLEDGE AND APPROACH TO THE STRENGTHENING DESIGN

B. Feilden, *Conservation of Historic Buildings*, Routledge, London 2023 ("Area Architettura" Library) (recommended).

D. Fiorani, *Seismic issues in historical constructions and sites: the conservation aspects*, in *International Workshop on Seismic Risk. Preparedness and Mitigation of Archeological and Historical Sites*, Jerusalem 2014, pp. 1-4 (www.academia.edu) (optional).

E. Coisson and F. Ottoni, *Structural monitoring of historical construction: increasing knowledge to minimize interventions*, in L. Toniolo, M. Boriani, G. Guidi (eds.), *Built Heritage: Monitoring Conservation Management*, Springer, London 2015, pp. 83-92 (optional).

L. Romano, M. Falcone, *Wooden vaults in Naples between survey and construction knowledge: the case of the church of Santa Maria Egiziaca all'Olmo*, in «Timber and construction», Proceedings of the Ninth Conference of the Construction History Society, (Cambridge, 1st-3rd April 2022), edited by J. Campbell *et al*., The Construction History Society, Cambridge 2022, pp. 157-170 (optional).

IV. THE PROTECTION OF THE CULTURAL HERITAGE

J. Ziesemer, M. Petzet, *International charters for conservation and restoration*, ICOMOS 2004, pp. 7-9; 13-15 ("Roberto Pane" Library) (optional).

All documents (Charters and regulations) reported in the programme are easily available online.

TEACHING METHODS OF THE COURSE (OR MODULE)

The course is structured into lectures, seminars, and on-site visits.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [ ] Written
- [x] 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 oral exam evaluates the theoretical knowledge that students have acquired regarding the contemporary debate on the conservation and protection of architectural heritage. This includes insights into the origins of modern restoration and the evolution of the discipline's codifications through the centuries, culminating in twentieth-century formulations. Additionally, the assessment measures the students' skills in understanding the material and construction techniques of historical built heritage, as well as their ability to recognize the main phenomena of decay and instability.

COURSE DESCRIPTION
ENVIRONMENTAL TECHNICAL PHYSICS

SSD: FISICA TECNICA AMBIENTALE (ING-IND/11)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: MINICHIELLO FRANCESCO
PHONE: 081-2538665 - 081-7682335
EMAIL: francesco.minichiello@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 01 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 8

REQUIRED PRELIMINARY COURSES

Istituzioni di Analisi matematica e Geometria.

PREREQUISITES

None.

LEARNING GOALS

Acquisition of knowledge and operational skills that allow the student to identify the thermal and energy aspects related to the design of the building components and the overall building, to illustrate the connected problems with autonomy and language properties and to propose solutions in harmony with the architectural project.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must show to know and understand the energy relationships that exist between the indoor environment, the building envelope, and the outdoor environment, with reference to the different contexts in which the aforementioned relationships can be configured. The student must show familiarity with the main physical parameters describing the conditions of indoor comfort, at the basis of thermo-technical and system design.

Applying knowledge and understanding

The student must show to be able to verify and size simple components of the building envelope, with the aim of containing heat loss and controlling solar radiation. Student must also show the ability to evaluate the possible solutions with reference to the thermal and energy behavior of the building-plant system, as well as awareness in applying calculation models, in harmony with the architectural project.

COURSE CONTENT/SYLLABUS

Topic A. Units of measurement (0.3 CFU): References on the main physical quantities (displacement, speed, acceleration, force, energy, power, pressure, density, temperature, mass and specific volume). Fundamental quantities. Systems of units of measurement. The International System. Multiples and submultiples. Conversions between units of measures. References to linear interpolation. Numerical exercises.

Topic B. Basic concepts and definitions (0.3 CFU): System and environment. Closed, open and isolated system. Thermodynamic equilibrium. Properties, thermodynamic state. Internal and external properties. Total, specific, extensive and intensive parameters. Thermodynamic state, transformations. State postulate. Pure substance, phase, simple compressible system. Equations of state. The ideal gas. Numerical exercises.

Topic C. Calculation of properties (0.4 CFU): Graphic Pressure-Temperature. Saturated steam. Undercooled liquid. Superheated steam. Determination of the phase of a substance. Internal energy and enthalpy. Calculation of properties in cases of ideal gas, incompressible liquid, solid. Specific heat. Thermal capacity. Numerical exercises.

Topic D. Mass and energy balances for closed systems (1 CFU): Thermal and mechanical energy. Balance equation. Mass balance. Energy balance (first law of thermodynamics for closed systems). Numerical exercises.

Topic E. Mass and energy balances for open systems (1.0 CFU): Hypothesis of local equilibrium. One-dimensional motion. Steady regime. The control volume. Mass balance. Mass flow rate. Volumetric flow rate. Energy balance (first law of thermodynamics for open systems). Expansion work. Thermal and mechanical power. Numerical exercises.

Topic F. Notes on the second law of thermodynamics (0.2 CFU): Notes on limits to energy conversion, energy degradation, entropy. The second law of thermodynamics: Clausius statement and Kelvin-Planck statement.

Topic G. Introduction to heat transfer and conduction (1.0 CFU): The mechanisms of heat exchange: conduction, convection and radiation. Heat flow. Fourier's law. Indefinite flat sheet: temperature trend, flow and thermal power, conductance and thermal resistance. Mechanisms in series and in parallel. Numerical exercises.

Topic H. Radiative heat exchange (0.8 CFU): Wave, speed, frequency, period and length of wave. Electromagnetic radiations and frequencies. Total and monochromatic radiative quantities: emissive power, irradiation and radiance. Absorption, reflection and transmission factors (monochromatic and total). Black body. The laws of radiative heat exchange: Planck, StefanBoltzmann, Wien. Total and monochromatic emissivity. Gray body. The geometric configuration factor. Energy balance in the evaluation of radiative heat exchange. Greenhouse effect. Numerical exercises.
Topic I. Heat exchange for combined mechanisms (0.5 CFU): Examples of combined mechanisms. Calculation of the thermal power exchanged for combined mechanisms. Mean unitary conductance (radiative, convective, total). Thermal resistance of air gaps. Overall heat transfer coefficient (stationary unitary thermal transmittance). Notes on the current legal requirements. Numerical exercises.
Topic L. Humid Air (1 CFU): Definitions. thermal-hygrometric properties: dry bulb, wet bulb, adiabatic saturation and dew point temperatures. Specific enthalpy. Specific volume. Specific humidity and relative humidity. Psychrometric chart. Transformations of humid air: heating, simple cooling, cooling with dehumidification. Adiabatic humidification. Adiabatic mixing. Numerical exercises.
Topic M. Thermo-hygrometric verification of building envelopes (1 CFU): The condensation of water vapor in the walls, simplified procedure for the thermal and hygrometric analysis of building envelopes. Corrective actions for a wall that has condensation formation. Thermo-hygrometric verification of roofs. Notes on the ISO 13788 standard. Numerical exercises.
Topic N. Notes on thermal bridges and dynamic thermal parameters of the building envelope (0.5 CFU): Thermal criticalities of the building envelope (thermal bridges) and hints on dynamic behaviour of building envelope opaque components, through the thermal parameters that allow to evaluate the transient heat exchange (so-called dynamic thermal parameters of the walls, to optimize above all the thermal behavior of buildings in summer: surface mass, phase shift, attenuation, dynamic thermal transmittance).

READINGS/BIBLIOGRAPHY

- Notes, handouts, tables and diagrams made available by the teachers.
- About humid air thermo-hygrometric verification of building envelopes, the following book (chapters 1 and 3, plus appendixes) will be used: L. Bellia, P. Mazzei, F. Minichiello, D. Palma: Aria umida. Climatizzazione ed involucro edilizio –Ed. Liguori, 2006.

TEACHING METHODS OF THE COURSE (OR MODULE)

The teaching consists of lectures, including numerical exercises.

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 test includes exercises to be carried out and oral interview, during which the student is asked to illustrate and verify the skills and knowledge expected, through questions on the topics of the program.

COURSE DESCRIPTION
ENVIRONMENTAL TECHNICAL PHYSICS

SSD: FISICA TECNICA AMBIENTALE (ING-IND/11)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: MAURO GERARDO MARIA
PHONE: 081-2538894
EMAIL: gerardomaria.mauro@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 01 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 8

REQUIRED PRELIMINARY COURSES

Istituzioni di Analisi matematica e Geometria.

PREREQUISITES

None.

LEARNING GOALS

Acquisition of knowledge and operational skills that allow the student to identify the thermal and energy aspects related to the design of the building components and the overall building, to illustrate the connected problems with autonomy and language properties and to propose solutions in harmony with the architectural project.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must show to know and understand the energy relationships that exist between the indoor environment, the building envelope, and the outdoor environment, with reference to the different contexts in which the aforementioned relationships can be configured. The student must show familiarity with the main physical parameters describing the conditions of indoor comfort, at the basis of thermo-technical and system design.

Applying knowledge and understanding

The student must show to be able to verify and size simple components of the building envelope, with the aim of containing heat loss and controlling solar radiation. Student must also show the ability to evaluate the possible solutions with reference to the thermal and energy behavior of the building-plant system, as well as awareness in applying calculation models, in harmony with the architectural project.

COURSE CONTENT/SYLLABUS

Topic A. Units of measurement (0.3 CFU): References on the main physical quantities (displacement, speed, acceleration, force, energy, power, pressure, density, temperature, mass and specific volume). Fundamental quantities. Systems of units of measurement. The International System. Multiples and submultiples. Conversions between units of measures. References to linear interpolation. Numerical exercises.

Topic B. Basic concepts and definitions (0.3 CFU): System and environment. Closed, open and isolated system. Thermodynamic equilibrium. Properties, thermodynamic state. Internal and external properties. Total, specific, extensive and intensive parameters. Thermodynamic state, transformations. State postulate. Pure substance, phase, simple compressible system. Equations of state. The ideal gas. Numerical exercises.

Topic C. Calculation of properties (0.4 CFU): Graphic Pressure-Temperature. Saturated steam. Undercooled liquid. Superheated steam. Determination of the phase of a substance. Internal energy and enthalpy. Calculation of properties in cases of ideal gas, incompressible liquid, solid. Specific heat. Thermal capacity. Numerical exercises.

Topic D. Mass and energy balances for closed systems (1 CFU): Thermal and mechanical energy. Balance equation. Mass balance. Energy balance (first law of thermodynamics for closed systems). Numerical exercises.

Topic E. Mass and energy balances for open systems (1.0 CFU): Hypothesis of local equilibrium. One-dimensional motion. Steady regime. The control volume. Mass balance. Mass flow rate. Volumetric flow rate. Energy balance (first law of thermodynamics for open systems). Expansion work. Thermal and mechanical power. Numerical exercises.

Topic F. Notes on the second law of thermodynamics (0.2 CFU): Notes on limits to energy conversion, energy degradation, entropy. The second law of thermodynamics: Clausius statement and Kelvin-Planck statement.

Topic G. Introduction to heat transfer and conduction (1.0 CFU): The mechanisms of heat exchange: conduction, convection and radiation. Heat flow. Fourier's law. Indefinite flat sheet: temperature trend, flow and thermal power, conductance and thermal resistance. Mechanisms in series and in parallel. Numerical exercises.

Topic H. Radiative heat exchange (0.8 CFU): Wave, speed, frequency, period and length of wave. Electromagnetic radiations and frequencies. Total and monochromatic radiative quantities: emissive power, irradiation and radiance. Absorption, reflection and transmission factors (monochromatic and total). Black body. The laws of radiative heat exchange: Planck, StefanBoltzmann, Wien. Total and monochromatic emissivity. Gray body. The geometric configuration factor. Energy balance in the evaluation of radiative heat exchange. Greenhouse effect. Numerical exercises.
Topic I. Heat exchange for combined mechanisms (0.5 CFU): Examples of combined mechanisms. Calculation of the thermal power exchanged for combined mechanisms. Mean unitary conductance (radiative, convective, total). Thermal resistance of air gaps. Overall heat transfer coefficient (stationary unitary thermal transmittance). Notes on the current legal requirements. Numerical exercises.
Topic L. Humid Air (1 CFU): Definitions. thermal-hygrometric properties: dry bulb, wet bulb, adiabatic saturation and dew point temperatures. Specific enthalpy. Specific volume. Specific humidity and relative humidity. Psychrometric chart. Transformations of humid air: heating, simple cooling, cooling with dehumidification. Adiabatic humidification. Adiabatic mixing. Numerical exercises.
Topic M. Thermo-hygrometric verification of building envelopes (1 CFU): The condensation of water vapor in the walls, simplified procedure for the thermal and hygrometric analysis of building envelopes. Corrective actions for a wall that has condensation formation. Thermo-hygrometric verification of roofs. Notes on the ISO 13788 standard. Numerical exercises.
Topic N. Notes on thermal bridges and dynamic thermal parameters of the building envelope (0.5 CFU): Thermal criticalities of the building envelope (thermal bridges) and hints on dynamic behaviour of building envelope opaque components, through the thermal parameters that allow to evaluate the transient heat exchange (so-called dynamic thermal parameters of the walls, to optimize above all the thermal behavior of buildings in summer: surface mass, phase shift, attenuation, dynamic thermal transmittance).

READINGS/BIBLIOGRAPHY

- Notes, handouts, tables and diagrams made available by the teachers.
- About humid air thermo-hygrometric verification of building envelopes, the following book (chapters 1 and 3, plus appendixes) will be used: L. Bellia, P. Mazzei, F. Minichiello, D. Palma: Aria umida. Climatizzazione ed involucro edilizio –Ed. Liguori, 2006.

TEACHING METHODS OF THE COURSE (OR MODULE)

The teaching consists of lectures, including numerical exercises.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [x] Written
- [x] Oral
- [ ] Project discussion

☐ Other

In case of a written exam, questions refer to

☐ Multiple choice answers

☐ Open answers

☑ Numerical exercises

b) Evaluation pattern

The test includes exercises to be carried out and oral interview, during which the student is asked to illustrate and verify the skills and knowledge expected, through questions on the topics of the program.

COURSE DESCRIPTION
ENVIRONMENTAL TECHNICAL PHYSICS

SSD: FISICA TECNICA AMBIENTALE (ING-IND/11)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: ASCIONE FABRIZIO
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EMAIL: fabrizio.ascione@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL: 02 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 8

REQUIRED PRELIMINARY COURSES

Institutions of Mathematical Analysis and Geometry (Istituzioni di Analisi Matematica e Geometria).

PREREQUISITES

None.

LEARNING GOALS

Acquisition of knowledge and operational skills that allow the student to identify the thermal and energy aspects related to the design of the building components and the overall building, to illustrate the connected problems with autonomy and language properties, and to propose solutions in harmony with the architectural project.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must show to know and understand the energy relationships that exist between the indoor environment, the building envelope, and the outdoor environment, with reference to the different contexts in which the aforementioned relationships can be configured. The student must show familiarity with the main physical parameters describing the conditions of indoor comfort, at the basis of thermo-technical and system design.

Applying knowledge and understanding

The student must show to be able to verify and size simple components of the building envelope, with the aim of limiting heat loss and controlling solar radiation. Student must also show the ability to evaluate the possible solutions with reference to the thermal and energy behavior of the building-plant system, as well as capability in applying calculation models, in harmony with the architectural project.

COURSE CONTENT/SYLLABUS

Topic A. Units of measurement (0.3 CFU): References to the main physical quantities (temperature, pressure, mass, volume, density and specific volume, speed, acceleration, force, energy, power). Fundamental quantities. Systems of units of measurement. The International System. Multiples and submultiples. Conversions of units of measures. References to linear interpolation. Numerical exercises.

Topic B. Basic concepts and definitions (0.3 CFU): System and environment. Closed, open, and isolated system. Thermodynamic equilibrium. Properties, thermodynamic state. Internal and external properties. Total, specific, extensive and intensive parameters. Thermodynamic state, transformations. State postulate. Pure substance, thermodynamic phase, simple compressible system. Equations of state. The ideal gas. Numerical exercises.

Topic C. Calculation of properties (0.4 CFU): Graphic Pressure-Temperature. Saturated steam. Undercooled liquid. Superheated steam. Determination of the phase of a substance. Internal energy and enthalpy. Calculation of properties in cases of ideal gas, incompressible liquid, solid. Specific heat. Thermal capacity. Numerical exercises.

Topic D. Mass and energy balances for closed systems (1 CFU): Thermal and mechanical energy. Balance equation. Mass balance. Energy balance (first law of thermodynamics). Numerical exercises.

Topic E. Mass and energy balances for open systems (1.0 CFU): Hypothesis of local equilibrium. One-dimensional motion. Steady regime. The control volume. Mass balance. Mass flow rate. Volumetric flow rate. Energy balance (first law of thermodynamics). Expansion Work. Thermal and mechanical power. Numerical exercises.

Topic F. The second law of thermodynamics (0.2 CFU): Statements of Clausius e di Kelvin-Plank. Notes on limits to energy conversion, energy degradation, entropy. The implications of the second law of thermodynamics.

Topic G. Introduction to heat transfer and conduction (1.0 CFU): The mechanisms of heat exchange: conduction, convection, and radiation. Heat flow. Fourier's law. Indefinite flat sheet: temperature trend, flow and thermal power, conductance, and thermal resistance. Heat transfer

mechanisms in series and in parallel. Numerical exercises.
Topic H. Radiative heat exchange (0.8 CFU): Wave, speed, frequency, period, and wavelength. Electromagnetic radiations and frequencies. Total and monochromatic radiative quantities: emissive power, irradiation, and radiance. Absorption, reflection, and transmission factors (monochromatic and total). Black body. The laws of radiative heat exchange: Stefan-Boltzmann, Planck, Wien. Total and monochromatic emissivity. Gray body. The geometric configuration factor. Energy balance in the evaluation of radiative heat exchange. Greenhouse effect. Numerical exercises.
Topic I. Heat exchange for combined mechanisms (0.5 CFU): Examples of combined heat transfer mechanisms. Calculation of the thermal power exchanged for combined mechanisms. Mean unitary conductance (radiative, convective, total). The thermal resistance of air gaps. Overall heat transfer coefficient (stationary unitary thermal transmittance). Notes on the current legal requirements. Numerical exercises.
Topic L. Humid Air (1 CFU): Definitions. Thermal-hygrometric properties: dry bulb, wet bulb, adiabatic saturation, and dew point temperatures. Specific enthalpy. Specific volume. Specific humidity and relative humidity. Psychrometric chart. Transformations of humid air: heating, simple cooling, cooling with dehumidification. Adiabatic humidification. Adiabatic mixing. Numerical exercises.
Topic M. Thermo-hygrometric verification of building envelopes (1.0 CFU): The condensation of water vapor in the walls, simplified procedure for the thermal and hygrometric analysis of building envelopes. Corrective actions for a wall that has condensation formation. Thermo-hygrometric verification of roofs. Notes on the ISO 13788 standard. Numerical exercises.
Topic N. Notes on thermal bridges and dynamic thermal parameters of the building envelope (0.5 CFU): Thermal criticalities of the building envelope (thermal bridges) and hints at the dynamic behavior of building envelope opaque components, through the thermal parameters that allow evaluation of the transient heat exchange (i.e., the so-called dynamic thermal parameters of the walls, to optimize above all the thermal behavior of buildings in summer: surface mass, time lag, decrement factor, dynamic thermal transmittance).

READINGS/BIBLIOGRAPHY

- Notes, handouts, tables, and diagrams are provided by the teachers.
- For what concerns the humid air and the thermo-hygrometric verification of building envelopes, the following book will be used: L. Bellia, P. Mazzei, F. Minichiello, D. Palma: ARIA UMIDA - Climatizzazione ed involucro edilizio –Ed. Liguori, 2006.

TEACHING METHODS OF THE COURSE (OR MODULE)

The teaching consists of lectures, including numerical exercises.

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
- [x] Numerical exercises

b) Evaluation pattern

The test includes exercises to be carried out and oral interviews, during which the student is asked to illustrate and verify the skills and knowledge expected, through questions concerning the topics of the program.

COURSE DESCRIPTION
ARCHITECTURE OF LANDSCAPE

SSD: ARCHITETTURA DEL PAESAGGIO (ICAR/15)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: GIOFFRE' VINCENZO
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EMAIL: vincenzo.gioffre@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: NOT APPLICABLE
MODULE: NOT APPLICABLE
TEACHING LANGUAGE: ITALIANO
CHANNEL:
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 6

REQUIRED PRELIMINARY COURSES

no required preliminary courses

PREREQUISITES

no prerequisites

LEARNING GOALS

The aim of the course is to train technicians able to know and be able to apply environmental engineering techniques, park and garden construction techniques, techniques aimed at the restoration of historic parks and gardens.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student knows the issues related to the aspects of Landscape Architecture and understands the relationships with the other disciplines that contribute to its definition.

Applying knowledge and understanding

Ability to apply knowledge and understanding

The student develops the ability to address issues, including planning, relating to Landscape Architecture by addressing theoretical topics and design elaborations that are confronted with the specificities of landscape architecture in relation to the different degrees of complexity and different scales.

COURSE CONTENT/SYLLABUS

The most avant-garde landscape architecture has been transformed into a therapeutic tool, it repairs the innumerable damages present in the urban environment, abandoned places and places of indefinite use, inventing new spaces more suited to life under the banner of industrial decline.
(Michael Jakob, 2009)
Landscape Architecture is a 'young' discipline, in Italy the first courses were included in degree courses about 15 years ago to supplement the courses of 'Garden Art', a discipline that has historically always been present since the beginning of architectural studies. In the same way, the concept of landscape has recently undergone a radical reinterpretation: from a category with a prevalent aesthetic-perceptual character, it is now considered an interpretative/operational category capable of reading and intervening in the complex interrelation between social, productive and ecological characteristics of contemporary cities and territories. An essential contribution in this conceptual evolution is determined by the European Landscape Convention, a Council of Europe document of 2000, which has welcomed and synthesised the most original and innovative contributions of the international debate on the meaning of landscape in a contemporary key. The Convention defines landscape as an ever-changing entity, encompassing both places of extraordinary quality and heritage excellence and those of everyday life and even degradation. Furthermore, the Convention states that the community of inhabitants plays a central role in any process of landscape interpretation or transformation. In line with the most current theoretical and applied research in the field of Landscape Architecture on the international scene, the Course intends to propose an approach to the transformation of the contemporary human habitat centred on the renewed relationship between human activities and natural elements (animals, plants, minerals, water, wind, light, soil); in the study and interpretation of behavioural and social aspects of communities of inhabitants (also with the aid of participatory practices); in the consideration of perceptual aspects and aesthetic quality (not only of landscapes of excellence, but also and above all of everyday and degraded landscapes). Landscape Architecture is understood as an approach capable of providing some possible answers to the global crises we are experiencing in the contemporary world, from health to environmental and social crises, through a new design attitude, a new operating mode, a new sensitivity towards Nature in its multiple declinations and specificities. The teaching is divided into a series of theoretical lectures - on the etymological meaning and historical evolution of the concept of landscape - on the work of the great masters of landscape architecture of modern and

contemporary times; - on the most interesting and recent international experiences focused on the realisation of new landscapes that interpret the themes of ecological transition, urban agriculture, sustainable mobility, the valorisation of the material and immaterial heritage of communities of inhabitants, and new forms of public space. As part of the didactic experience, a design exercise will be carried out on a site that will be described and presented in the first lesson on the calendar.

READINGS/BIBLIOGRAPHY

Bibliographic references relating to the subject matter will be given in each lesson. Amongst these, some general bibliographical references are given here:

V. Gioffrè (2018) *Latent Landscape*, Letteraventidue edizioni
Gioffrè V (2019). Strategie rigenerative per paesaggi mediterranei negletti. In Archistor Extra
Gioffrè V (2020). Riciclare paesaggi: da rifiuto a risorsa. L'industria delle costruzioni,
F. Zagari (1988), *L'architettura del giardino contemporaneo*, Mondadori
V. Vercelloni (1990), *Atlante storico dell'idea del giardino europeo*, Jaca Book
M. Venturi Ferriolo (2003), *Etiche del paesaggio, il progetto del mondo umano*, Editori Riuniti
P. Grimal(2005), *L'arte dei Giardini, una breve storia*, Donzelli editore
M. Jacob (2009), *Il paesaggio*, il Mulino
M. Zardini (1996), *Paesaggi ibridi. Un viaggio nella città contemporanea*, Skira
L. Kroll (1999), *Tutto èpaesaggio*, Testo &immagine
P. Donadieu (2006), *Campagne urbane. Una nuova proposta di paesaggio nella città*, Donzelli
G. Clément (2005), *Manifesto del terzo paesaggio*, Quodlibet
I. McHarg (2007), *Progettare con la natura*, Franco Muzzio Editore
M. Desvigne (2009), *Intermediate natures. The landscapes of Micheal Desvigne*, Birkhäuser
S. Marini (2010), *Nuove terre, Architetture e paesaggi dello scarto*, Quodlibet Studio
G. Clément (2011), *Il giardino in movimento*, Quodlibet
F. Zagari (2008), *Giardini. Manuale di progettazione*, Mancosu Editore

TEACHING METHODS OF THE COURSE (OR MODULE)

Lectures, tutorials, project activity.

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

COURSE DESCRIPTION
TECHNOLOGY OF ARCHITECTURE (FINAL SYNTHESIS STUDIO)

SSD: TECNOLOGIA DELL'ARCHITETTURA (ICAR/12)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: LEONE MATTIA FEDERICO
PHONE: 081-2538726
EMAIL: mattia.leone@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20028 - LABORATORIO DI SINTESI FINALE IN PROGETTAZIONE ARCHITETTONICA
MODULE: 20973 - TECNOLOGIA DELL'ARCHITETTURA (LAB SINT FIN)
TEACHING LANGUAGE: ITALIANO
CHANNEL:
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 4

REQUIRED PRELIMINARY COURSES

None

PREREQUISITES

None

LEARNING GOALS

The Final Synthesis Architectural Design Studio consists of the teachings of Architectural Design and Architectural Technology.
The Studio aims to increase students' design skills through a critical-interpretative approach to places, investigated in their social, economic and environmental dimensions, and a performance-based approach to set up the intervention strategy, providing methods and tools to control the quality of design solutions from the urban to the building scale.

In line with the objectives of the Degree Course, the Architectural Technology module aims to:
a) understand the issues relating to the operational, procedural, construction and regulatory dimensions of the project, with particular reference to the technological, energy and environmental aspects;
b) address and resolve issues concerning the control of design outcomes through appropriate technological solutions and related performance checks;
c) autonomously evaluate the design choices and technological-environmental solutions;
d) apply the methodological concepts and operational tools necessary to govern the interaction between formal, functional and technical aspects to guarantee the general quality of the work and the reduction of economic and environmental impacts along the life cycle;
e) produce drawings, visuals/infographics and descriptive documents necessary for the development of the proposed design and for the correct and clear transmission of the project to expert and non-expert stakeholders.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The students must know and be able to understand the technological and environmental aspects of the architectural project, developing the ability to discuss the theoretical and operational advances in the field of technological and environmental design, in order to govern the project in relation to the complexity of the building process. The students will acquire the knowledge of theoretical and methodological tools necessary to analyze the interaction between formal, functional and technical aspects of the project, taking into account the relationship between project objectives and the construction of the work in anticipation of the entire life cycle.

Applying knowledge and understanding

The students must be able to apply theacquired knowledge by developing an architectural project, according to a systemic approach and in relation to the environmental and climatic context, user needs, technical procedures and the regulatory framework. The students will increase their ability to solve problems concerning the control of design outcomes through appropriate technological-constructive solutions and performance checks.

COURSE CONTENT/SYLLABUS

The course intends to provide the theoretical, methodological and operational tools to develop technical and design solutions characterized by levels of detail appropriate to the technological and environmental design of the architecture, controlled in the performance characteristics in relation to the main sector regulations, with particular reference to the themes of green building and the sustainability of the building process.
Students will develop specific skills related to the choice and control of the technological alternatives available to the designer, the integration of building systems/products in the architectural project and their correct description also in support of technical specifications and reports.

Within the course, starting from the project theme of the Final Synthesis Studio, the students will develop a series of technological-constructive insights, integrating the architectural project with the appropriate performance specifications relating to structural elements, building envelope, plant systems and spaces open.
Specific focuses will concern the control of technological and environmental requirements, including aspects related to the sustainable management of material and energy resources, indoor and outdoor comfort, tecnical systems' integration, applying the Minimum Environmental Criteria for building and techincal protocols for energy and environmental quality, such as the LEED and WELL certification systems
The course will be articulated through seminars, workshops and studio activities which will correspond to a series of deliverables, mainly carried out in the classroom and in teams, which will contribute to the final evaluation.
The course contents focus on the following topics:
•Environmental planning, sustainability and climate neutrality: the objectives of Agenda 2030 and the European Green Deal
•Technological design of architecture, materials and construction techniques
•Building envelope and environmental performance: sustainability, resilience and performance control (Climate resilience; Bioclimatic design and energy efficiency; Nature-Based Solutions; Acoustic design; Technical protocols and environmental criteria for project performance control)

READINGS/BIBLIOGRAPHY

•Bellew, P. (2015), *Invisible Architecture: Atelier Ten*, Laurence King Publishing.
•Buckminster Fuller, R. (1969). *Operating manual for spaceship earth*. New York: EP Dutton &Co.
•Braungart, M., McDonough, W. (2002), *Cradle to Cradle: Remaking the Way We Make Things*, North Point Press.
•Liedl, P., Hausladen, G., &Saldanha, M. (2012). *Building to suit the climate: A handbook*. Walter de Gruyter.
•Tucci F. (2018), *Costruire e abitare green*, Altralinea edizioni, Firenze.
•U.S. Green Building Council (2013), *LEED Reference Guide for Building Design and construction* , USGBC.
•Walker, B., &Salt, D. (2012). *Resilience thinking: sustaining ecosystems and people in a changing world*. Island Press.
•Educational materials provided during the course

TEACHING METHODS OF THE COURSE (OR MODULE)

The course includes: a) lectures for about 30% of the total hours, b) seminars held by external experts for about 10% of the total hours, c) laboratory activities to deepen the applied knowledge for about 60% of the total hours. The lectures and teaching materials will be made available online on the TEAMS teaching channel.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [ ] Written
- [x] Oral
- [x] Project discussion
- [ ] Other

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [ ] Open answers
- [ ] Numerical exercises

b) Evaluation pattern

The final evaluation will take into account the levels of participation in the teamwork in the workshop and exercise activities carried out, as well as the ability to convey the main theoretical contents in the final presentation (which may include tables, videos, real and virtual models) and in the discussion of the design documents of the course starting from the results of the design experiments conducted. The final assessment relating to the teaching module will contribute to the overall assessment for the Final Synthesis Studio, weighting the final grade on the basis of the credits provided for each course.

COURSE DESCRIPTION
INTERIOR ARCHITECTURE AND MOUNTING

SSD: ARCHITETTURA DEGLI INTERNI E ALLESTIMENTO (ICAR/16)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: FLORA NICOLA
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: U1726 - LABORATORIO DI SINTESI FINALE IN ARCHITETTURA DEGLI INTERNI E DISEGNO INDUSTRIALE
MODULE: 15172 - ARCHITETTURA DEGLI INTERNI E ALLESTIMENTO
TEACHING LANGUAGE: ITALIANO
CHANNEL:
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 6

REQUIRED PRELIMINARY COURSES

those provided for by the course of study regulations

PREREQUISITES

The student who starts the synthesis laboratory in Interior Architecture must have knowledge
of two-three-dimensional drawing and rendering techniques and have aptitude for working with physical study models.

LEARNING GOALS

Train a student who is aware of the processes of construction of the architectural
project from the inside, from the body of people, towards the outside, be it built
(architectural interior) or natural (the landscape)

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

At the end of the course the student will be able to dimension the internal space
(domestic and otherwise) starting from not only the physical and quantitative needs of people,
but emotional and psychological ones, the form of architecture remaining an overall service
(physical and psychological precisely) to the person.

Applying knowledge and understanding

At the end of the course the student will be able to understand phenomenological
project start-up methodologies but always paying attention to the technical-constructive
aspects typical of the small scale of the architectural project

COURSE CONTENT/SYLLABUS

The objective of the course is to train the student in the awareness that the construction
of the space in which man lives, works and lives always arises where man "gathers" - physically and psychologically -
to "put order" one's things, one's thoughts, one's affections. It always determines - the space - ways
of interaction between people and their mutual ability to relate fruitfully with the city and with nature.
The internal/interior space, moreover, is the place where people tactilely come into contact with architecture
also on a material and constructive level.
1. redesign of Knut Hjeltnes' summer cabin and 1/50 model
2. development of the course project, i.e. an extension as homes for artists and guests in two aseismic houses in Aquilonia (AV), now abandoned and in need of redevelopment
3. preparation of final presentation ppt, project tables (2 vertical A1 format tables), 1/50 templat

READINGS/BIBLIOGRAPHY

Specific teaching material will be delivered at the beginning of the course, and will concern the course project area
among the basic teaching material, a minimum of bibliography is considered which orients the point

of view on the project that will be pursued during the course
Bibliography:
Inaki Abalos, Good living, Marinotti, Milan, 2009.
Italo Calvino, American Lessons, Garzanti, Milan, 1988.
Adriano Cornoldi, The houses of architects, Venice, 2001.
Nicola Flora, Francesca Iarrusso, Mobile projects, LetteraVentidue, Siracusa, 2017. Eduard T. Hall, The hidden dimension, Bompiani, Milan, 1968.
Christian Norberg-Schulz, Living, Electa, Milan, 1984.

TEACHING METHODS OF THE COURSE (OR MODULE)

The course will develop starting from knowledge (direct if possible) of the project areas.
Theoretical-disciplinary lessons of a general nature will be alternated with seminar work which
will take place in small groups of a maximum of 3 people constantly followed (both in person and
online according to university provisions) by the teacher and teaching tutors. The lessons held
by the teacher will be alternated, according to the calendar that will be provided at the beginning
of the course, with some conferences by international guests who will integrate the teaching on
individual and specific themes. The specific theme of the course for this year will be to create
a house/workshop for an artistic operator (musician, writer, sculptor, painter, singer, film-maker, dancer)
starting from the recovery of at least two small buildings, among the nine today existing (to also be related
to the spaces of the streets of the small complex). In compliance with the original construction system,
possible vertical and horizontal expansions, in steel and/or wood, opening rooms where necessary and
removal of the small superimposed additions from 1930 will ensure that the new complex is adequate
for a function that will have to balance the private guest (minimum) and the necessary public sharing
of his actions. A series of collective reviews will ensure that the projects of the different groups
communicate in the best possible way.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [ ] Written
- [x] Oral
- [x] Project discussion
- [x] Other : presentation of summary ppt of max 5 minutes, two vertical A1 format tables on rigid support illustrating the project in plan, section, significant three-dimensional views and photo insertions, with 3D model and final model, in addition to the presentation of study and final models

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [ ] Open answers
- [ ] Numerical exercises

b) Evaluation pattern

The final grade, based on the results and skills demonstrated in the discussion of
the design work as well as the Interior Architecture themes, will be weighted on the CFU
of each of the two courses that together make up the integrated teaching of the final synthesis
laboratory (Architecture of Interiors Interiors 3/5 of the final grade, and Industrial Design 2/5 of the final grade)

COURSE DESCRIPTION
INDUSTRIAL DESIGN (UNIT)

SSD: DISEGNO INDUSTRIALE (ICAR/13)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: RISPOLI ERNESTO RAMON
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EMAIL: ernestoramon.rispoli@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: U1726 - LABORATORIO DI SINTESI FINALE IN ARCHITETTURA DEGLI INTERNI E DISEGNO INDUSTRIALE
MODULE: 27862 - DISEGNO INDUSTRIALE (MODULO)
TEACHING LANGUAGE: ITALIANO
CHANNEL:
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 4

REQUIRED PRELIMINARY COURSES

those established in the course regulations

PREREQUISITES

The student starting the final laboratory in Interior Architecture must have knowledge of two-dimensional drawing and rendering techniques, as well as aptitude for working with material study models.

LEARNING GOALS

To train a student who is aware of the construction processes of architecture from the inside (the human body) to the outside, whether built (architectural interior) or natural (landscape).

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

At the end of the course the student will know how to dimension an interior space (domestic and non-domestic) starting from from the needs (not only physical and quantitative but also emotional and psychological) of people, the form of architecture being an overall service, both material and psychological, to the human being.

Applying knowledge and understanding

At the end of the course the student will be able to understand phenomenological methodologies for approaching the project, while also paying attention to the technical-constructive aspects that are typical of the small-scale architectural design.

COURSE CONTENT/SYLLABUS

- Objects and things: material culture and symbolic investments.
- Design as a rhetorical practice. The language of objects: denotation and connotation.
- Commodity fetishism: design and aesthetisation in the age of advanced capitalism.
- Kitsch and cheap design. Non-conventional aesthetics: camp design.
- Introduction to human-centered design and human-machine interaction. Visibility and comprehensibility in design, from affordance to mental models.
- Design for social innovation, transition design, systemic design.
- Design and the myth of neutrality. Hostile design and architecture.
- Design and politics: adversarial design, technological disobedience, radical cartographies.

READINGS/BIBLIOGRAPHY

Bodei, R. (2009). *La vita delle cose.* Laterza.
Davis, J. (2020). *How Artifacts Afford. The Power and Politics of Everyday Things*. MIT Press.
DiSalvo, C. (2012). *Adversarial Design.* MIT Press.
Kuang, C., &Fabricant, R. (2019). *User Friendly: How the Hidden Rules of Design Are Changing the Way We Live, Work, and Play.* WH Allen.
Manzini, E. (2015). *Design, when Everybody Designs: An Introduction to Design for Social Innovation.* MIT Press.
Norman, D.A. (2014). *La caffettiera del masochista. Il design degli oggetti quotidiani*. Giunti editore.

Further readings will be provided by the teacher in due course.

TEACHING METHODS OF THE COURSE (OR MODULE)

The course is structured in theoretical lectures (70% of the total amount of hours) and exercises (30% of the amount of hours) aimed at the concrete application of the theoretical contents. The exercises will subsequently be gathered into a dossier.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [ ] Written
- [x] Oral
- [ ] Project discussion
- [x] Other : dossier of exercises

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [ ] Open answers
- [ ] Numerical exercises

b) Evaluation pattern

The final examination of the course - an integral part of the evaluation of the Final Synthesis Workshop - will consist of an oral interview on the theoretical contents as well as on the dossier of excercises prepared by each student.

COURSE DESCRIPTION
TECHNOLOGY OF ARCHITECTURE (UNIT)

SSD: TECNOLOGIA DELL'ARCHITETTURA (ICAR/12)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: PONE SERGIO
PHONE: 081-2538727
EMAIL: sergio.pone@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20033 - LABORATORIO DI SINTESI FINALE IN TECNOLOGIA DELL'ARCHITETTURA
MODULE: 27858 - TECNOLOGIA DELL'ARCHITETTURA (MODULO)
TEACHING LANGUAGE: ITALIANO
CHANNEL:
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 6

REQUIRED PRELIMINARY COURSES

Studio Technologycal Design of Architecture

PREREQUISITES

None

LEARNING GOALS

The objective of the third year course of the Bachelor’s degree in "Architecture Sciences""Final Synthesis Laboratory" is aimed at providing the student architect, now in the last semester of the three-year student career and therefore close to graduation, the tools and methodologies to create a harmony between the many disciplines that over time has studied and faced.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The "synthesis" between the various skills of a future designer has to be formed with implementation of a complex formative experience that requires the student to combine, not only the various disciplines present in this laboratory, but also the results of the numerous previous examinations, studied and successfully completed, through the deepening of a theme of architecture.

The peculiarity of this synthesis laboratory, in addition to the presence of the aforementioned modules, is identified with the will to introduce the students to some current priorities in the field of digital fabrication and parametric design.

Applying knowledge and understanding

The Laboratory aims to broaden the knowledge and skills of students in the field of digital in architecture. In particular in the field of computational design will be used, with the support of the teaching staff, parametric design software particularly useful to manage complex shapes and to control, throughout the whole process, the design development thanks to the necessary use of the so-called "computational thinking". Then in the field of digital construction, students will be asked to deepen the main issues about digital fabrication through the study of dedicated texts; they will know the main tools to be used to design the constructive system of pavilion that will be those inspired by the paradigm of "subtractive manufacturing" such as numerical control milling machine and laser cutters. The fundamental objective of the Laboratory will be to allow students to experience the mutual influences between the building system and the architectural form in an iterative path that provides continuous references from one sector to another.

COURSE CONTENT/SYLLABUS

The project work begins with the analysis of someùè+ pavilions designed and built recently, starting with Serpentine Pavillion (2005) by Álvaro Siza and Eduardo Souto de Moura with Cecil Balmond, a true paradigm of the genre. The analysis will be filtered through the type of device to be used for construction and through the influences of the constructive system on the final shape of the architecture. In this sense the typologies adopted will be the Folded Surfaces, the Developable Surfaces, the Weaving Patterns, the Reciprocal Frames, the Polyhedrical Shapes, the systems based on Cross Panels and Modular Boxes, and finally those deriving from Active Bending. Once chosen one of the possible types of reference students, divided into groups, will begin the metaphorical dialog between compositional issue and technological issue to deepen the structural typology and the constructive strategy up to the elaboration of the files to factory necessary (to guide the CNC machines - Computer Numerical Control) and nesting and labeling processes aimed at minimising production waste.

READINGS/BIBLIOGRAPHY

Pone S., Colabella S., Maker, La fabbricazione digitale per l’architettura e il design, Progedit, Bari 2017.

Tedeschi A. (2014). AAD_Algorithms-Aided Design. Le Penseur Publisher, Potenza.

Baricco A., The games, Einaudi, Torino 2018.

Anderson C., Makers. Il ritorno dei produttori. Per una nuova rivoluzione industriale, Rizzoli Etas, Milano 2013.
Carpo M., The Digital Turn in Architecture 1992-2012, AD Reader, Wiley Editions, Sussex (UK), 2012.

TEACHING METHODS OF THE COURSE (OR MODULE)

The teaching staff will hold lectures about digital design and aboout the evolution of digital manufacturing with particular reference to techniques and tools. It will then be developed a theme of the year that will focus on the design of a pavilion that will be conceived for the architectural part using the tools of computational design and for the constructive part using the techniques of digital fabrication.

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 evaluation will be weighted 60 percent on the results obtained in the course "Architectural Tecnhology" and 40 percent on the outcome of the integrated course "Architectural Design."

COURSE DESCRIPTION
ARCHITECTURAL DESIGN (FINAL SYNTHESIS STUDIO)

SSD: COMPOSIZIONE ARCHITETTONICA E URBANA (ICAR/14)

DEGREE PROGRAMME: SCIENZE DELL'ARCHITETTURA (N13)
ACADEMIC YEAR 2024/2025

COURSE DESCRIPTION

TEACHER: AMIRANTE ROBERTA
PHONE: 081-2538662
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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 20033 - LABORATORIO DI SINTESI FINALE IN TECNOLOGIA DELL'ARCHITETTURA
MODULE: 27859 - PROGETTAZIONE ARCHITETTONICA (LAB. SINT. FIN.)
TEACHING LANGUAGE: ITALIANO
CHANNEL:
YEAR OF THE DEGREE PROGRAMME: III
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II
CFU: 4

REQUIRED PRELIMINARY COURSES

Studio Technologycal Design of Architecture

PREREQUISITES

None

LEARNING GOALS

The objective of the third year course of the Bachelor’s degree in "Architecture Sciences""Final Synthesis Laboratory" is aimed at providing the student architect, now in the last semester of the three-year student career and therefore close to graduation, the tools and methodologies to create a harmony between the many disciplines that over time has studied and faced.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The "synthesis" between the various skills of a future designer has to be formed with implementation of a complex formative experience that requires the student to combine, not only the various disciplines present in this laboratory, but also the results of the numerous previous examinations, studied and successfully completed, through the deepening of a theme of architecture.

The peculiarity of this synthesis laboratory, in addition to the presence of the aforementioned modules, is identified with the will to introduce the students to some current priorities in the field of digital fabrication and parametric design

Applying knowledge and understanding

The Laboratory aims to broaden the knowledge and skills of students in the field of digital in architecture. In particular in the field of computational design will be used, with the support of the teaching staff, parametric design software particularly useful to manage complex shapes and to control, throughout the whole process, the design development thanks to the necessary use of the so-called "computational thinking". Then in the field of digital construction, students will be asked to deepen the main issues about digital fabrication through the study of dedicated texts; they will know the main tools to be used to design the constructive system of pavilion that will be those inspired by the paradigm of "subtractive manufacturing" such as numerical control milling machine and laser cutters. The fundamental objective of the Laboratory will be to allow students to experience the mutual influences between the building system and the architectural form in an iterative path that provides continuous references from one sector to another.

COURSE CONTENT/SYLLABUS

The design of the pavilion will be linked to an in-depth study of a number of key words: position (the relationship of the pavilion to the "context"), size (the logics and measures of controlling the pavilion's space and form), and relationship (the recognition and control of the complex system of which the pavilion "is a product" and which it in turn "produces").

Instead, the design process will be organized in three stages:

1. from prescription to transcription
2. from transcription to inscription
3. from inscription to description/narrative

Special attention will be paid to the latter stage, and the action of "storytelling" will be linked to the main examination paper.

READINGS/BIBLIOGRAPHY

R. Arnheim, *Arte e percezione visiva* (1954) Feltrinelli, Milano 1997.

Atlante di progettazione architettonica, a cura di R, Palma e C. Ravagnati, Cittàstudi, Torino 2014.

R. Amirante, *Il progetto come prodotto di ricerca. Un'ipotesi*, Letteraventidue, Siracusa 2018.

TEACHING METHODS OF THE COURSE (OR MODULE)

The teaching staff will hold lectures about digital design and aboout the evolution of digital manufacturing with particular reference to techniques and tools. It will then be developed a theme of the year that will focus on the design of a pavilion that will be conceived for the architectural part using the tools of computational design and for the constructive part using the techniques of digital fabrication.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [ ] Written
- [x] Oral
- [x] Project discussion
- [ ] Other

In case of a written exam, questions refer to

- [ ] Multiple choice answers
- [ ] Open answers
- [ ] Numerical exercises

b) Evaluation pattern