



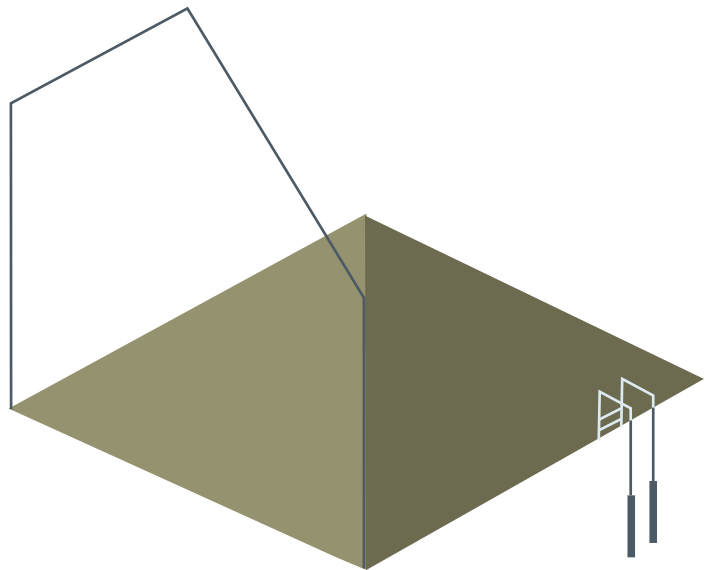
Enhancing of Heritage Awareness and
Sustainability of Built Environment in
Architectural and Urban Design Higher Education

BOOK



OF COURSES

IMAGINING PROGRAM for Sustainability of the Built Environment
and Heritage Awareness



EDITORIAL BOARD

ANA NIKEZIĆ
ANA RADIVOJEVIĆ
JELENA ŽIVKOVIĆ
VLADAN DJOKIĆ
MAR LOREN-MÉNDEZ
KONSTANTINOS SAKANTAMIS
MARIA PHILOKYPROU
EMANUELA SORBO



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PARTNERS:

The University of Belgrade - The Faculty of Architecture // Serbia
The Iuav Università di Venezia // Italy
The University of Cyprus // Cyprus
The Aristotle University of Thessaloniki // Greece
The University of Seville // Spain

CONTRIBUTORS: HERSUS CONSORTIUM MEMBERS

UB-FA

Vladan Djokić
Ana Radivojević
Ana Nikezić
Jelena Živković
Nataša Čuković Ignjatović
Milica Milojević
Jelena Ristić Trajković
Aleksandra Milovanović
Aleksandra Đorđević
Mladen Pešić
Bojana Zeković
Ana Zorić
Nevena Lukić
Tamara Popović

IUAV

Emanuela Sorbo
Enrico Anguillari
Sofia Tonello

UCY

Maria Philokyprou
Aimilios Michael
Panayiota Pyla
Odysseas Kontovourkis
Maria Nodarakis
Theodora Hadjipetrou
Stavroula Thravalou
Andreas Savvides
Chryso Heracleous
Diomedes Myrianthefs

AUTH

Konstantinos Sakantamis
Alkmini Paka
Kleoniki Axarli
Maria Dousi
Angeliki Chatzidimitriou
Sofoklis Kotsopoulos
Dimosthenis Sakkos

USE

Mar Loren-Méndez
José Peral-López
Julia Rey-Pérez
Marta García-Casasola
Daniel Pinzón-Ayala
Enrique Larive-López
Roberto F. Alonso-Jiménez María
F. Carrascal-Pérez Domingo
Galán-Caro
Adrián Rodríguez-Segura
Celia Chacón-Carretón

External collaborators:

Mauro Marzo (Università Iuav di Venezia)
Gianluca Spironelli (Università Iuav di Venezia),
Viola Bertini (Sapienza Università di Roma)

IMPRESUM

EDITORIAL BOARD:

Ana Nikezić, Ana Radivojević,
Jelena Živković, Vladan Djokić,
Emanuela Sorbo, Mar Loren-Méndez,
Konstantinos Sakantamis, Maria
Philokyprou / *HERSUS Scientific
Coordinators*

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IO5 BOOK OF COURSES

IO5 lead: Vladan Djokić, UBFA
IO5 RE:groups coordinators: Ana Radivojević,
Ana Nikezić, Jelena Živković

HERSUS Project leader: Vladan Djokić, UBFA

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Note:

The courses were prepared by individual author/group of authors in relation to their professional expertise and backgrounds and in relation to values, themes and framework defined on the consortium level.

I
- - -
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- - -
V

Università Iuav
di Venezia

Iuav

×

prepared by Emanuela Sorbo and
Gianluca Spironelli

SC09

specializations

book of courses

DIGITAL HUMANITIES AND DIGITAL KNOWLEDGE FOR THE PRESERVATION OF CULTURAL HERITAGE.

COURSE ID CARD

semester	1-3
ECTS	3
status	elective

ACTIVE TEACHING CLASSES

Lectures	4
Exercises	2
OFL	
SRW	
Other	

COURSE TYPES

- Design Studio
- Intensive Workshop
- ▶ Theory Course
- Seminar
- ▶ Laboratory work
- Research Thesis
- ▶ Field Work
- Internship Practical training
- Other

FORMS OF TEACHING

- ▶ Individual work
- ▶ Group work
- Supervision
- Master class

Expected Prior Knowledge

To be eligible for admission to this course, students are expected to have acquired basic knowledge during the architecture-related bachelor studies (basic knowledge of survey methodologies and 3d modelling).

Course objectives

The main educational goal of the course is to achieve students' autonomy in representing the information associated in a built cultural heritage throughout its life cycle. During the course, students will acquire the technical skills and the cultural tools for developing an informative model system that concerns an interpretive, material and constructive reading of a building to characterize its conservation status within a preservation horizon. Lectures and applied exercises will stimulate students' multidisciplinary investigation attitude through three-dimensional representation. Students will deal with a built case study of abandoned buildings or ruins considering three fundamental moments: the historical-critical analysis of the sources, the evaluation of the conservation status through surveys and the identification of possible design actions. The proposed activity will provide the students with the tools to develop an applied methodology for future professional activities.

Course illustration.



RELATION TO IO3 STATEMENTS

NOTIONS

- Cultural Heritage
- Cultural and Collective Memory

HERITAGE TYPES

- Modern Heritage
- Industrial Heritage
- Vernacular Heritage
- Monumental Heritage
- Emerging Heritage
- Archaeological heritage
- Military Heritage

DESIGN APPROACHES

- Whole-Lifecycle Design

DESIGN ACTIONS

- Preventive Conservation
- Conservation
- Restoration
- Consolidation
- Heritage Management MG

TOOLS

- Photogrammetry
- Topographical Surveys
- Data Logger
- Laser Scanning
- As-Built / As-Found Recording
- Mapping, Documenting and Cataloguing
- Historic Building Information Modelling - HBIM
- Conservation Status Evaluation
- Digitalization of Heritage

☰ Course Syllabus

The course proposes a cultural and operative approach to defining a knowledge system for the conservation status of a built Cultural Heritage.

According to specific ontologies and semantic discretization processes, students will be able to construct a digital transposition of the built heritage to time. Starting from the built heritage model, they will connect historical information to the elements of the building and recreate the historical transformation. The final output of the course will be an as-built model deferred over time and based on a critical reading of the character of the building (process scan-to-bim).

The students will deal with theoretical and critical thinking focused on evaluating existing architecture's conservation status (from the perspective of conservation design outlines). The applied component of the course will be developed using Autodesk Revit, BIMvision, and CloudCompare software. The examination will consist of an interview based on the assignments produced during the course.

Specifically, the teaching activities will focus on two levels:

- the introduction to an operative methodology based on the critical approach and a flexible theoretical framework;
- the drawing of architecture as a common language across cultures and disciplines.

TEACHING METHODS

Technical drawings
Analytic drawings
(diagrams)

- ▶ 3D modelling
- ▶ Physical modelling
- ▶ Case Studies
- ▶ Animation
- ▶ Simulation
- ▶ Rendering
- ▶ Specific international bibliography

TEACHING FORMATS

Design Project
Presentation

- ▶ Technical report
- ▶ Research paper
- ▶ Essay
- ▶ Written Exam
- ▶ Oral Exam
- ▶ Other

▶ Demonstration of the syllabus coherence with the course objectives

Through the transmission of theoretical knowledge and the work on an applied case study, the students will be able to develop a critical awareness of the digital tools in conservation design strategies.

The proposed activities on cultural heritage interpretation help students to acquire a method of analysis concerning cultural heritage preservation and transmission. Specifically, the teaching activities will deal with a critical approach to the restoration theory and the digitalisation tools to develop a common graphic language for architecture across cultures and disciplines. Then, the critical approach and the flexible theoretical framework of the study method provide students with an applicative methodology for an analysis of the built heritage and allow the student to insert their creativity in the interpretation and design strategies.

▼ Demonstration of the teaching methodologies coherence with the course objectives

The course includes:

- Ex-cathedra lectures.
- Laboratory-type revision activities.
- Workshop sessions.
- Seminars with invited lecturers

Those teaching activities will promote a methodology of study and analysis for a critical approach to cultural heritage. The presence of operative moments of dialogue through seminars and thematic workshop sessions aimed at defining an interdisciplinary and cultural attitude on the topics of built cultural heritage. Finally, the introduction of scheduled presentations to promote students' interaction with different points of view on the same topic of investigation and a critical discussion on the progress of the work within the course.

METHODOLOGY

ASSESSMENT METHODS

- ▶ Technical drawings
Analytic drawings (diagrams)
- ▶ 3D modelling
Physical modelling
- ▶ Case Studies
Animation
- ▶ Simulation
Rendering
Other

ASSESSMENT FORMATS

- Design Project
- ▶ Presentation
- ▶ Technical report
Research paper
Essay
Written Exam
- ▶ Oral Exam
Other

▼ COURSE STRUCTURE

- 1 **Introduction lecture**
Course introduction - Case study presentation (seminar with invited lecturers)

- 2 **Practical skills 1**
Data systematization - From geometrical models to constructive models.
Key Challenges 1
The role of historical-critical analysis of the sources /
Assignment 1
Individual critics

- 3 **Key Challenges 2**
Management systems and tools for preventive conservation
Assignment 2
Workshop sessions. Critical reading of the character of the building.

- 4 **Pre examination activity 1**
Collective critics

- 5 **Practical skills 2**
Data query and interoperability
Key Challenges 3
The IFC schema

- 6 **Pre examination activity 2**
Assignment discussion

GC1	1.1
	1.2
	1.3
GC2	2.1
	2.2
	2.3
GC3	3.1
	3.2
	3.3
GC4	4.1
	4.2
	4.3
GC5	5.1
	5.2
	5.3
GC6	6.1
	6.2
	6.3
GC7	7.1
	7.2
	7.3
GC8	8.1
	8.2
	8.3
GC9	9.1
	9.2
	9.3
GC10	10.1
	10.2
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LITERATURE

1. Acierno, M., Cursi, S., Simeone, D., Fiorani, D. 2017. Architectural heritage knowledge modelling: An ontology-based framework for conservation process, *Journal of Cultural Heritage*, Vol. 24, pp. 124–133.
2. Della Torre, Stefano. 2018. *The management process for built cultural heritage: Preventive systems and decision making*. In *Innovative Built Heritage Models*, eds. Koenraad Van Balen and Aziliz Vandesande: 13-20. Leiden: CRC Press/Balkema.
3. Della Torre, Stefano. 2020. *A coevolutionary approach as the theoretical foundation of planned conservation of built cultural heritage*. In (Eds.). *Preventive Conservation - From Climate and Damage Monitoring to a Systemic and Integrated Approach.*, eds. Aziliz Vandesande, Els Verstrynghe, Koenraad Van Balen: 11-18. London: CRC Press.
4. Sorbo, Emanuela, Spironelli, Gianluca. 2021. *Informative models of cultural heritage*. The “Unfinished” chu ch of Brendola, in Polytechnic University of Valencia Congress (edited by) ARQUEOLÓGICA 2.0 & GEORES, in ARQUEOLÓGICA 2.0 - 9th International Congress & 3rd GEORES - GEomatics and pREServation, Gangemi, Valencia, pp. 127-133