



NATIONAL TECHNICAL
UNIVERSITY OF ATHENS
[GREECE]



SAPIENZA
UNIVERSITA DI ROMA
[ITALY]



BEZALEL ACADEMY
OF ARTS AND DESIGN
[ISRAEL]

Perpetielsi
SRL

PERPETIELSI SRL
[ROMANIA]



ISRAEL ANTIQUITIES
AUTHORITY
[ISRAEL]



HELLENIC RESEARCH INSTITUTE OF
THE ALEXANDRIAN CIVILIZATION
[GREECE]

EDICULA

Educational Digital Innovative Cultural heritage related Learning Activities

Project Code: 2020-1-EL01-KA203-079108

Intellectual Output: **03 EDICULA hands-on framework**
Deliverable: **D3.1 - Survey of hands-on methodologies**
Lead Organization: **Bezalel Academy of Arts and Design**
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1 | INTRODUCTION

1.1 | OUTPUT 3

EDICULA Project has five main outputs. The third output is (hereafter O3) – **EDICULA Hands-on Framework**. O3 fully meets three of EDICULA project's main objectives (presented here in their relevance to O3) (Quote)¹:

- to proceed with the **organization of multiplier events** such as (i) **hands on events in Jerusalem and Alexandria**, (ii) **special conference sessions** in Athens
- to **reform the curricula of the three postgraduate programs** of the EDICULA partners, in order to exchange good practices and create new courses that in a complimentary approach will lead to the **promotion of a Joint Master's degree in the field of protection of monuments**
- to **promote students to a professional and entrepreneurship mentality** by advancing education in collaboration with enterprises concerning technical works and digital applications, and thus enhance learning outcomes to ensure professional qualifications

Additionally, it serves the expected results of the project (listed here in relevance to O3. Numbered by their original numbering) (Quote)²:

5. **in situ education**, at the **Holy Sepulchre** in Jerusalem, its setting and context, including religious routes and ceremonies functioning as the prime educational nucleus, being a transformation from **a problem-based learning approach into a unique approach towards a real-world learning**, for application to other historic buildings and real or digital applications in the four countries.
1. **Innovative changes of the educational curricula for Cultural Heritage related Master Programmes** in general and specifically.
2. The **development of educational modules that will be attended by students among the Universities of the project**, with **equivalent ECTS accreditation** towards the creation of a new Erasmus Joint Master's degree.
6. **in situ education for archaeologists**, introducing innovation in engineering with emphasis in **non-destructive testing and evaluation methods** and **georeferenced multispectral and multi-semantic data**.

O3 is closely related to two of the five outputs of the project **O1: EDICULA Educational Toolkit** and **O2: EDICULA Curricula Reformation**. Furthermore, O3 is strongly tied to the first Multiplier Event out of four events **E1: The Holy Sepulchre Hands-on Experience**³, where elements of EDICULA Hands-on framework will be applied (Fig. 1.1).

¹ EDICULA Kick-off Meeting 21.10.2020 Presentation (slides 3-4).

² There (slides 5-8).

³ E1 will take place in Jerusalem on March 2022 under the leading of Bezalel Academy of Arts and Design (BEZ) and Israel Antiquities Authority (IAA).

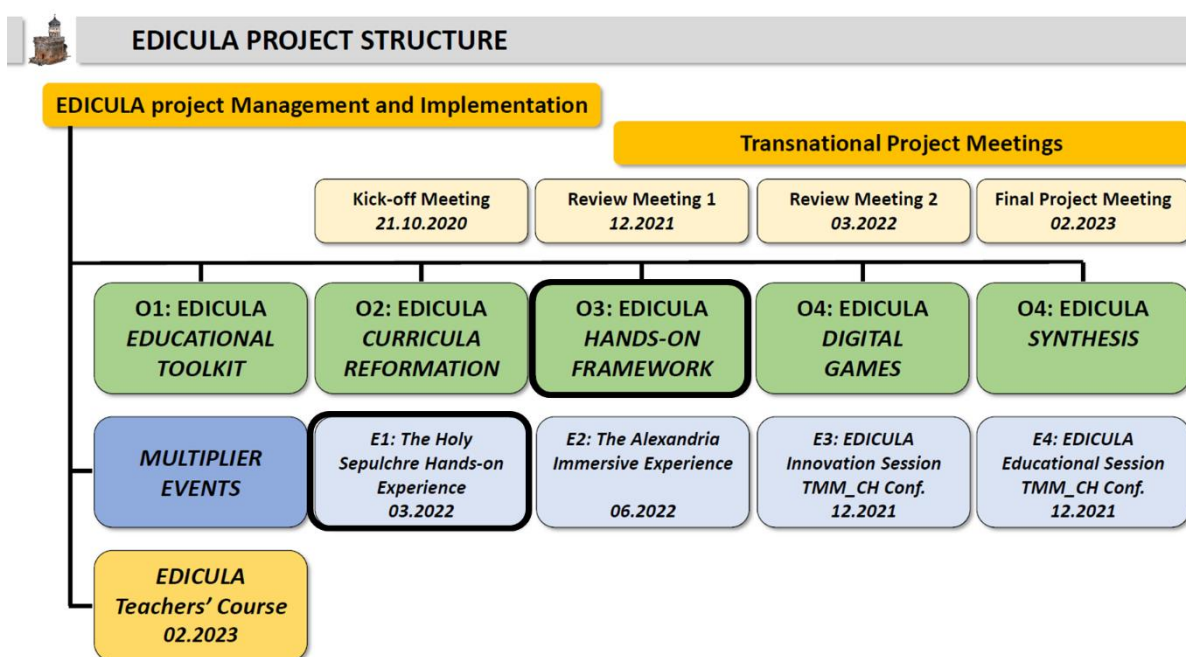


Fig. 1.1 | EDICULA Project Structure (EDICULA Kick-off Meeting 21.10.2020 Presentation)

The final goal of O3 is to consolidate the **EDICULA Guidelines for hands-on education in Cultural Heritage (CH) protection** which is integrated in the project's final output **O5: EDICULA Synthesis**.

1.2 | TASK 3.1

O3 of the EDICULA Project consists of three tasks:

Task 3.1	State-of-the-art of hands-on methodologies in higher education studies
Task 3.2	From authentic learning to real world learning through hands-on and immersive AR
Task 3.3	EDICULA Framework for hands-on education in CH protection

Task 3.1 in its turn is divided to three stages:

Task 3.1	State-of-the-art of hands-on methodologies in higher education studies	
	Stage 1	Focus on postgraduate and undergraduate courses related to protection of monuments, across Europe and third countries;
	Stage 2	Evaluation of the 'state of the art of hands-on methodologies' in the field of Cultural Heritage;
	Stage 3	Evaluation of hands-on methodologies in engineering O3 (Output 3) EDICULA Hands- on Framework

This task (3.1) duration is eight months starting on the project first month – Sep. 2020, ending on its eight months – April 2021. The third task (3.3 EDICULA Framework for hands-on education in CH protection) duration is 14 months, starting in partial parallel to task 3.2, and is scheduled to begin only on the sixteenth month of the project (Dec. 2021).

1.3 | DELIVERABLE 3.1

Four Deliverables are assigned for O3:

D3.1	Survey of Hands-on methodologies
D3.2	AR fusion in hands on training
D3.3	EDICULA Hands on Experience
D3.4	EDICULA Guidelines for hands on education in CH protection

Whereas deliverables D3.2 – D3.4 deadline is scheduled after the first Review Meeting (Dec. 2021), deliverable D3.1 deadline is in advance of this meeting , and therefore it was presented during the **project Scientific Committee meeting** on April 4th, 2021

This report concentrates on deliverable **D3.1: Survey of Hands-on methodologies in higher education studies** which mainly summarises **Task 3.1: State-of-the-art of hands-on methodologies**.

2 | METHODOLOGY

To conduct **Task 3.1: Survey on Hands-on Methodologies** and gather relevant information, an on-line questionnaire was created (see annex 01). It was sent to the EDICULA project partners on Jan. 2021 with a request to fill it out by mid-March thus, to be delivered in April 2021.

The questionnaire aims to accomplish Stage 1 and Stage 2 of Task 3.1 and is composed of two parts: **Part 1 - Technical information**, and **Part 2 - Assessment and evaluation**. Stage 3 of the task was not included in the questionnaire; rather it is based on the first two stages and was performed by the Bezalel team. Following the questionnaires distribution and the reception of the results, it was analysed quantitatively and qualitatively (see annex 03).

The questionnaire introductory part includes some **general information**:

- Name of the contact person from the EDICULA project and name of the institution
- Name of the contributor (the person filling the form) and email address
- Name of the academic institution and the faculty

Part 1: Technical information

The questions in this section are related to postgraduate and undergraduate courses in academic programs in the field of protection of monuments, across Europe and third countries. Some are multiple choices questions and others are open questions.

- Academic Program
name, short description, curriculum, and the scale and focus of the program towards Heritage Conservation as a field of practice
- Hands on postgraduate and undergraduate courses:
Course, seminar, workshop, lab etc (title, short description, syllabus, and type).
Objectives, learning outcomes, methodologies, and assignments.

Part 2: Assessment and evaluation

This section includes three open questions in which the contributor was asked to provide detailed answers and examples, as much as possible. The questions are:

1. Please describe your opinion regarding the constructive alignment between the learning outcomes, course's objectives, or pedagogic tools (with special attention to the hands-on feature) and the evaluation process:
 - a) How do the pedagogic methods applied in the course contribute to the achievement of the declared learning outcomes?
 - b) What is the added value of the hands-on feature and experience to the successful implementation of the learning outcomes?
 - c) To what degree do the course assignments and evaluation mechanism address the declared learning outcomes?
2. In your opinion, to what degree is the course compatible with the relevant conservation principles, architectural and engineering knowledge?
3. Please provide any further insights that you may have.

3 | SURVEY OUTCOMES

3.1 | ACADEMIC PROGRAMS

The on-line questionnaire received a total of 11 responses. The contributors are from nine Academic European institutions as well as from third countries as originally targeted. The Academic institutions are (appear in alphabetical order. For the contributors contact information please see annex 02):

Ariel University	School of Architecture	Israel
Bezalel*	Department of Architecture	Israel
Academy of Art and Design Jerusalem	Master's Program in Urban Design	
KU Leuven	Faculty of Engineering Sciences, Raymond Lemaire International Centre for Conservation	Belgium
National Technical University of Athens	Scholl of Chemical Engineering	Greece
School of Planning and Architecture, New Delhi	Master's in Architectural Conservation	India
Sapienza University of Rome*	Faculty of Sciences Faculty of Civil and Industrial Engineering	Italy
Technion Israel Institute of Technology	Faculty of Architecture and Town Planning	Israel
University of the Basque Country	UNESCO Chair on Cultural Landscapes and Heritage, Micaela Portilla Research Center	Spain
University of Genoa	School of Sciences (not in English)	Italy

* Academic institutions that contributed 2 responses each

Among the listed academic institutions some have masters programs that are solely dedicated to heritage conservation while others integrate courses in heritage conservation within their curriculum.

Programs dedicated solely to Heritage Conservation (Preservation)

[Master of science in Conservation of Monuments and Sites](#)

Raymond Lemaire International Centre for Conservation, Faculty of Engineering Sciences, KU Leuven

[Protection of Monuments: Materials and Conservation Interventions](#)

School of Chemical Engineering, National Technical University of Athens, National Technical University of Athens

[Master's in Architectural Conservation](#)

School of Planning and Architecture, New Delhi

[Science and Technology for the Conservation of Cultural Heritage](#)

Department of Civil and Industrial Engineering, Sapienza University of Rome

[UNESCO Chair on Cultural Landscapes and Heritage, Micaela Portilla Research Centre](#)

University of the Basque Country

Programs that integrate courses within their curriculum

School of Architecture at Ariel University

Department of Architecture, Bezalel

The Master's Program in Urban Design, Bezalel

Faculty of Architecture and Town Planning, Technion

Faculty of Sciences, Sapienza University of Rome

School of Sciences, University of Genoa

The programs in these academic institutions, whether solely dedicated to heritage conservation (preservation) or that integrate specific courses in heritage conservation within the program curriculum, are varied in their attitude in scale and focus. Among the contributors, most programs focus on: Architectural conservation, Material conservation and analysis and/or Urban conservation. Only few focus on two or more scales. Some programs have high specification of scale and focus for example on mobile materials conservation, critical heritage, or cultural landscape (Fig. 3.1).

3. Select the scale and focus of the program towards Heritage Conservation (Preservation) as a field of practice:

11 responses

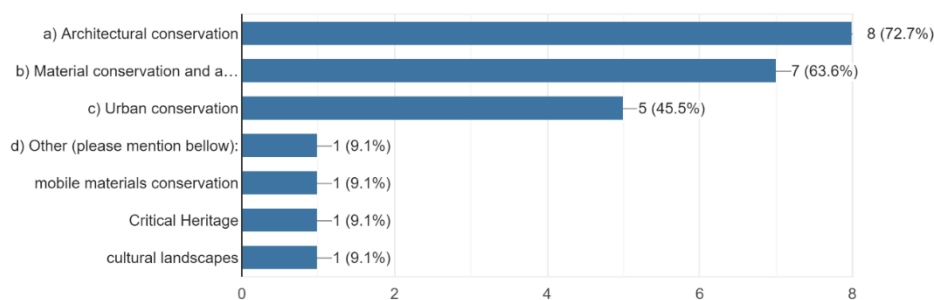


Fig. 3.1 | Scale and focus of the program towards Heritage Conservation (Preservation) as a field of practice

3.2 | HANDS-ON POSTGRADUATE AND UNDERGRADUATE COURSES

| 3.2.1 | CHARACTERISTICS AND DATA

Full list of the courses is attached in Annex 03. Within the above programs the hands-on experience can be divided into two categories:

- A. Courses that provide hands-on experience as the main objectives of the course or are that exclusively dedicated to Hands-on experience (7 courses out of 10).
- B. Courses that offer hands-on experience as part of a broader course syllabus (3 courses out of 10).

Course category. From the ten described courses:⁴

- Category A: 70% of the courses
 Discovering Mirabel Castle Summer School (Ariel University); Cultural Landscapes (School of Planning and Architecture Delhi); Hands-on Conservation: Practice and theory in conservation (Bezalel Academy of Art and Design); Interdisciplinary Documentation, Diagnosis, Revealing and Protection of Cultural Heritage Towards Sustainable Development (National Technical University of Athens); Diagnostic techniques applied to Cultural Heritage (University of Genoa); Decay and Colour (Sapienza University of Rome); Decay and Conservation of Non-Metallic Materials (Sapienza University of Rome).
- Category B: 30% of the courses
 Studio in conservation for fourth year ,Final studio for fifth year (Bezalel Academy of Art and Design); International Workshop Concerning the Conservation and Musealization Of The Worlds Heritage Site of Beit She'arim (Technion - Israel Institute of Technology)

Type of course. Most of the described courses are ONLY for undergraduate students (5) or postgraduate students (3). Some of the postgraduate courses are open for undergraduate students in higher years of the program or to post-professional or Ph.D students (2) (Fig. 3.2).

6. Select the type of course:

11 responses

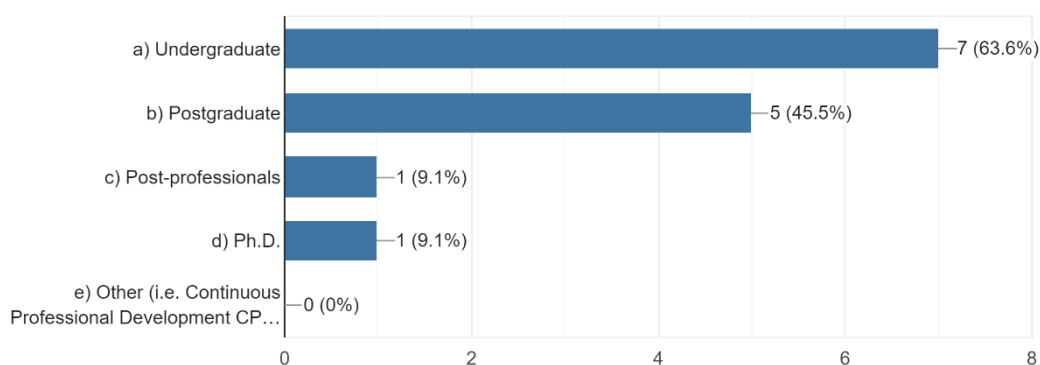


Fig. 3.2 | Type of course

⁴ From the eleven responses, one was not completed and not presented in English. The percentages are related to ten courses.

Credit points. As the survey includes courses from various countries the accreditation system is varied. The most common is the **European Credit Transfer and Accumulation System (ECTS)** of the European Higher Education Area (EHEA), then **Italian Credit (CFU)**, and **Israel Credit points**.

The number of credit points acquired varied from 2 credit points to 12, and was mostly related to type of course. Similarly, the weight of the course within the entire program varied according to the type of course, both as demonstrated by categories A and B, and type of program - Undergraduate or postgraduate.

Notes: 1 Italian Credit (CFU) = 25 working hours = 1 ECTS Credit).

Bachelor programs typically include 180 ECTS credits, and master programs typically include 120 ECTS credits > [link](#)

Terms of entry. Most of the courses in the survey are restricted to specific years of the program (73%), whether for the 3rd semester of a two-year masters program or for the higher years students in the undergraduate program. Though only half of the courses have conditional terms of entry as completing previous courses or requirements for admission like software, theory courses, introductory site visits (Fig. 3.3 and 3.4).

b) Are there any terms of entry to (conditional terms) the course such as completing previous courses?
11 responses

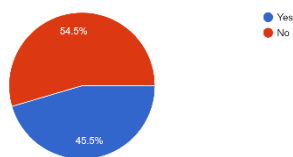


Fig. 3.3 | **Terms of entry**

c) Does the course give a brief introduction to the requirements for admission to course (like software, theory, introductory site visits)?
11 responses

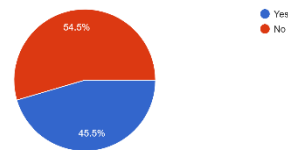


Fig. 3.4 | **Requirements for admission**

Number of students/participants. The average number of participants is 15 to 20 students.

Location of the course. The courses are characterized by an extensive variety of locations were the most popular are on-site courses (6), and a combine course with lectures and workshops (6), although other combinations exist i.e.: field work on site, seminars in studio and classroom lectures; over one-week, theoretic seminars, lab-based exercises, roundtable on profession (Fig. 3.5). The flexibility in the location appears to be a universal character of the courses and is also closely related to the course objectives and the selected methodologies.

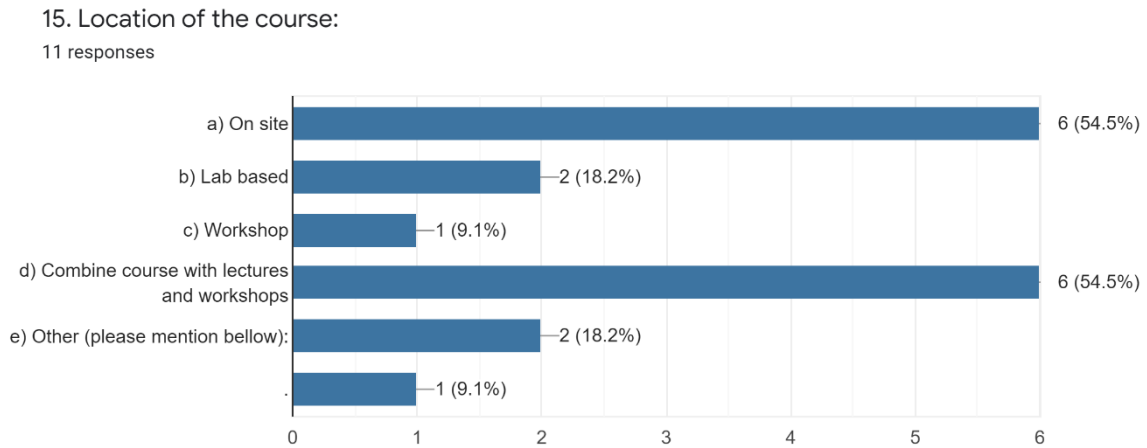


Fig. 3.5 | Location of the course

| 3.2.2 | OBJECTIVES, LEARNING OUTCOMES, METHODOLOGIES AND ASSIGNMENTS

Objectives and Learning Outcomes. A distinction between objectives and learning outcomes of two types of courses may be noted, one - workshops and short-term courses that focus on acquiring a particular skill or specific material mostly appears in the undergraduate courses; and the second - comprehensive and longer courses that award a higher number of credit points. Focusing on the second type of courses, which are usually also designed for postgraduate students, the hands-on experience seeks to emphasize a holistic approach and a multidisciplinary integration of previously acquired training and knowledge, different specializations and practices that were gained separately and jointly expressed in the hands-on course.

Analyzing the contributors' responses, the following characteristics of the objectives and learning outcomes returned:

- Experience a 'real world' project and a simulation of an 'actual conservation project'
- Coping with hands-on experience and field work in-situ whether in a site or a museum
- Multidisciplinary synthesis and interaction in all levels: from the pedagogical approach throughout the methodologies and to the given assignments and their final evaluation
- Collaboration among participants who come from various backgrounds to simulate, at times, a team for a 'real project'
- Expressing variety of skills including educational skills of knowledge and understanding, application skills, autonomy of judgment, communication skills
- Improving and strengthening of problems identification and analysis, critical thinking, reporting, results elaborating and interpreting skills; hands-on skills by applying advanced techniques; and development of initiatives and

Pedagogical Methodologies. Due to the nature of hands-on courses and workshops, in all of them, without exception, the aspect of operating in-situ was emphasized as well as the significance of staying, working and on-site learning was underlined. Driven from a holistic approach and a multidisciplinary attitude the pedagogical methodologies, both the primary ones as well as in the secondary ones, include broad span from lectures, visits and tours, and meeting with stakeholders throughout practical excavation works, conservation works, and field laboratories works, to case studies analyses, problem-based learning, group learning, and constructive learning.

Evaluation Mechanism. The selected evaluation mechanisms are strongly related to the pedagogical methodologies of the course and characteristic as hand-on courses with practical experience and on-site activities. The tasks, even if some are individual, are multidisciplinary in a way that teamwork and collaboration are needed, that are defined in the objectives and expected learning outcomes can be expressed. Moreover, the real-time participation is assessed and the aspect that gives a strong promise of success in hands-on course assignments. Performance of the concluding task or final work of the course is mainly done by oral presentation along with a written paper.

11. please indicate the evaluation mechanism of the course

11 responses

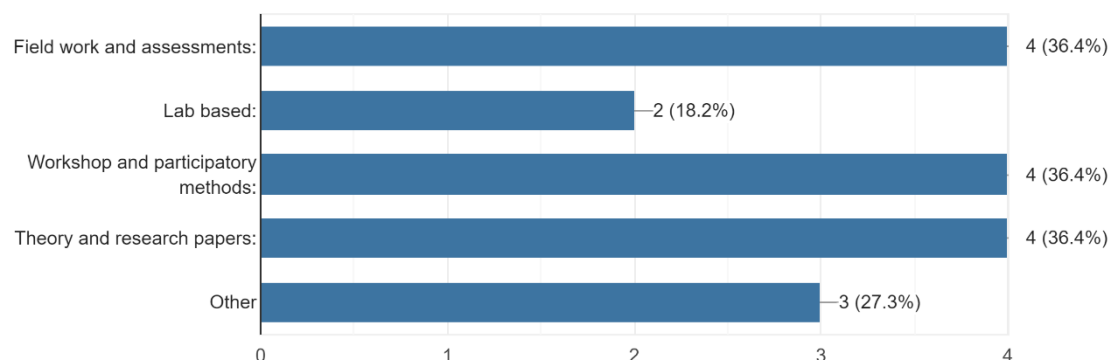


Fig. 3.6 | Evaluation Mechanism

External experts (providers). Here too, as in the previous sections, the nature of the hands-on courses requires the cooperation of not only the participating students, but also external experts in addition to the main tutors. A principal lecturer can provide many aspects of the hands-on course and coordinate it; however, the participation of external experts is crucial to bring in new and innovative perspectives. The external experts (providers) are either other tutors of the program, professors, and staff from other faculties of the academic institution, as well as external professionals, stakeholders from the public sector, private sector and the third sector of the civil sector.

12. Is the course supported by external providers (such as: other faculties and departments, outsourcing instructors and contributors, collaborat...n with other institutions/ industry partners, etc.)?

11 responses

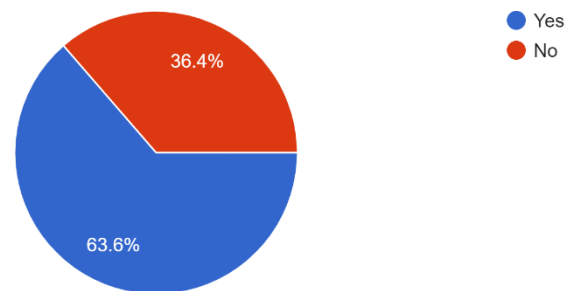


Fig. 3.6 | External providers

3.3 | ASSESSMENT AND EVALUATION

Two open questions dealing with **evaluation of the state of the art of hands-on methodologies in the field of Cultural Heritage** were presented, with an additional space to add open remarks. These final questions were answered by closed to three-quarters (73%) of the contributors. Their insights provide a thorough and important input for the summary and conclusions of Task 3.1 presented in the following chapter. Below are the questions with the full responses. Significant components are highlighted.

1. **Please describe your opinion regarding the constructive alignment between the learning outcomes, course's objectives, or pedagogic tools (with special attention to the hands-on feature) and the evaluation process:**
 - a) **How do the pedagogic methods applied in the course contribute to the achievement of the declared learning outcomes?**

Very important for the two first semesters of the program to achieve interdisciplinary and intercultural collaborative methodologies.

- The **timing** of the course; **interdisciplinary** and **intercultural collaborative methodologies**.

Exercises under the reflected light microscope will allow the student to be able to recognize the main opaque minerals in reflected light and their alteration products.

- **Strengthening of problems identification and analysis.**

The intensive workshop is resulting in good design projects. the mixed groups (Israelis and foreign students) help. Tours of relevant sites add good reference points.

- The **intensity** of the course;
- **Supporting pedagogical methodologies** in the sites;

- **collaboration among participants who comes from various backgrounds.**

The methods gave a significant contribution, so that 99% of the students undertook the course the following academic year.

- The **significant contribution** of **hands-on methodology** to an overall learning process.

The combined (hybrid) approach that is adopted integrates in a rather constructive way the declared learning outcome. Lectures summarize theory by presenting successful interdisciplinary projects, while on-site visits set real problem scenarios that the students select to solve. The hands-on skills of the students' further enhanced by the application of advanced techniques, and the elaboration and interpretation of the results; while their reporting abilities are significantly improved. Furthermore, in pedagogic means, this course is an excellent preparatory cornerstone before laboratory theme projects and the Master Thesis theme undertaking.

- **Multidisciplinary synthesis** and **interaction** in all levels; **broad span of methodologies** both in the primary as in the secondary ones; **strong connection** between the pedagogical approach - the methodologies - the given assignments and their final evaluation.

Expressing a variety of skills including educational skills of knowledge and understanding, application skills, autonomy of judgment, communication skills and ability to learn.

- Strengthening and improving **broad span of methodologies**

The pedagogic methods fully support the declared learning outcome. The connection of the final assignment to the actual practical experience of the hands-on experience whether in documentation workshop or in the stone workshop, demanded a maximum commitment in workshops and vice versa.

- **A holistic approach** and **strong connection** between the course objectives – learning outcomes – assessment and evaluation.

Course combined with theory and site visits, intense studio discussions to generate comprehensive mapping and analysis.

- **Broad span of methodologies.**

Since the course is aimed for architecture students, first-hand experience on site is crucial for the understanding of heritage management and nuances such as materials and degradation, as well as intangible aspects of spirit of place and sense of history. After this stage, planning will be more suitable, sensible and accurate to the sites' needs and conservation of values.

- The **timing** of the course and the **significant contribution** of hands-on methodology to an overall learning process.

b) What is the added value of the hands-on feature and experience to the successful implementation of the learning outcomes?

Experiencing and learning interdisciplinary and intercultural collaboration in small groups, understanding the variety of challenges the preservation of built cultural heritage is facing and learning about possible solutions in a nearly realistic context.

- **Experience a 'real world' project** and a **simulation** of an 'actual conservation project' through **interdisciplinary teamwork**

Practical activities will allow the student to be able to deduce the main processes of metal degradation from the nature of the products.

- **Improvement and strengthening** of various **skills**

The hands-on feature empowers the learning outcomes. The following year due to the COVID 19 pandemic we lost most of hands-on activities, with great difficulties in linking contents, discussion, experience, and skills.

- The **significant contribution** of hands-on methodology to an overall learning process.

Within the above-mentioned framework, the applied hands-on methodology is the core for the success of the course learning outcome. The added value is not limited in the application and results interpretation of advanced techniques applied on real scale to solve real problems; but it also includes the determination of the “problem” that is to be addressed by the students themselves, who also choose the techniques that they think as most appropriate and useful. So, they set the “question”, and they give the “answer” by the “means” they have selected.

- The applied hands-on methodology is the **core** for the **success** of the **course learning outcome**. **Experience a 'real world' project** and a **simulation** of an 'actual conservation project'

In the case of this specific course the learning outcomes are fully tied to the hands-on activities. And experience in hands-on conservation is one of the expected learning outcomes.

- A **strong connection** between the course objectives – learning outcomes – assessment and evaluation.

Apart for the unique activity most architecture students don't get to experience during their studies, hand-on practice has a positive influence on the planning process and architectural plans for the site.

- The **significant contribution** of hands-on methodology to an overall learning process.

c) To what degree are the course assignments and evaluation mechanism addressing the declared learning outcomes?

The student **must demonstrate** that he/she has acquired a **sufficient knowledge** of the main forms of degradation of metals, their alloys, and pigments.

Museum exercise gives the curation aspect of the course as well as the site's visits.

The course assignment and evaluation mechanism are **expressly designed for the objectives**.

In general, students' knowledge and skills **are enhanced at the end of the course according to the anticipated outcomes**. However, **personal skills and commitment of each student play a significant role** on her/his **overall performance**, and therefore on the **learning outcomes**.

Summary of the course assignment and evaluation: The students work in small groups; the project theme is chosen by them; the techniques applied in situ are also of their choice; **they learn to**

elaborate and interpret the obtained results in situ; the report is delivered within a month; the project is orally presented by each group; the above process is closely supervised by assigned tutor(s).

To a very high degree as they all interconnected.

- As clear as it may be, all the above answers undoubtedly demonstrate the **high degree** of which the course assignments and evaluation mechanism address the declared outcomes.

2. In your opinion, to what degree is the course compatible with the relevant conservation principles, architectural and engineering knowledge?

Very much essential!

The course has **high compatibility** as the student will be able to know the main characteristics of the minerals used as pigments, the main forms of degradation of metals and their alloys. Moreover, he/she will be able to communicate the nature of degradation processes and the characteristics of the applied procedures to the restoration personnel.

We try to bring **up to date conservation principles**, yet the design assignment and the open-ended mission definition give the students much freedom.

It is totally relevant, since it applies interdisciplinary documentation that incorporates materials characterization, decay and damage mapping, environmental impact assessment, conservation principles and preservation strategies, structural health monitoring, architectural, geometrical, and engineering knowledge **in real case scenarios on monument scale**.

To a very high degree as each hands-on experience is connected to standard setting documents or principles of interventions.

The course teaches **the framework of nature- culture linkages and sustainability**.

All outcomes are followed and monitored by the teaching staff during the entire period. Some outcomes will be further developed outside the course framework.

- All the contributors indicate the courses' compatibility to relevant conservation principles as well as to relevant architectural and engineering knowledge as inevitable necessity.

4 | SUMMARY AND CONCLUSIONS

Chapter 4 of the current deliverable **D3.1: Survey of Hands-on methodologies** presents the third stage of **Task 3.1: State-of-the-art of hands-on methodologies in higher education studies** which the Evaluation of hands-on methodologies in engineering O3 EDICULA Hands-on Framework.

Hand-on experience is a key part of Problem-Based Learning (PBL). It strengthens personal understanding and examines it in the light of required learning outcomes. Moreover, it plays a key

role in the transition from PBL to "Real-World Learning", as is strongly emphasized in the project expected results (Quote):

5. **in situ education**, at the **Holy Sepulchre** in Jerusalem, its setting and context, including religious routes and ceremonies functioning as the prime educational nucleus, **being a transformation from a problem-based learning approach into a unique approach towards a real-world learning**, for application to other historic buildings and real or digital applications in the four countries (Kick-off Meeting, 21.10.2020).

And as reflected in the contributors' responses in the survey:

The **applied hands-on methodology is the core** for the **success of the course learning outcome**. Experience a '**real world**' project and a **simulation** of an '**actual conservation project**'.

4.1 | Connection to EDICULA Project Outcomes and Multiplier Events

O3 EDICULA Hands-on Framework is closely related to two of the five outputs of the project **O1: EDICULA Educational Toolkit** and **O2: EDICULA Curricula Reformation**. Furthermore, O3 is strongly tied to the second Multiplier Event, out of four events, **E1: The Holy Sepulchre Hands-on Experience** where elements of EDICULA Hands-on framework will be applied. Additionally, EDICULA Hands-on Framework is one of the basic components of **O5 EDICULA Synthesis** as described below:

O1: EDICULA Educational Toolkit⁵

Hands-on experience and methodologies are complementary and support the objectives of O1 to contribute to **raising awareness of the wide audience**, and youth more specifically, of the **engineering and scientific challenges associated with monuments' rehabilitation**, as shown in the Scientific Architecture of the **EDICULA-4-All** and **EDICULA + educational toolkit** (O1: Task 1.1 and 1.2).⁶

O2: EDICULA Curricula Reformation

Hands-on experience is part of the essential methodologies of the **EDICULA Curricula Reformation** (O2) of the project's three academic partners, that intends to merge their different focuses through

⁵ For a detailed information please see **Table 1. Thematic nodes of the EDICUCA Educational Toolkits**, at the complete report of **D1.1 Architecture of the EDICULA-4-all educational toolkit; NTUA 23 April 2021**.

⁶ For example:

[A] Analysis of CH Asset

[A10] Archaeological Study: 11 Archaeological excavations, 12 Archaeological Surveys, 13 Conservation activities

[A50] Materials: 51 Building materials

51B Characterization of materials properties

51B1 In-situ non-destructive characterization and mapping

51B2 Laboratory testing (instrumental and physical methods)

58 Non-destructive testing for assessment & evaluation of materials and interventions

[C] Interventions

12 Organization of in-situ laboratories and workshops

D3.1 | Survey of Hands-on methodologies

the reformation of diverse, yet complimentary, existing master courses towards creating the joint Master's degree, i.e.:

Methodologies for the conservation interventions NTUA PM (MSc)

Techniques of the conservation interventions UNIROMA1 STCCH (MSc)

Documentation and knowledge-based design BEZ (MUrbDes)

The **transferability potential** of the EDICULA project responds to contemporary research priorities relevant to CH is planned to be tried out in case study during the Hand- on Summer Schools to be conducted in addition to multiplier events E1: The Holy Sepulchre Hand on Experience(03.2022) and E2: The Alexandria Immersive Experience (06.2022). It will also contribute to the EDICULA Teachers' Course (02.2023) which will be focusing on 'training the trainers' in the process of approaching a wider audience.

E1: The Holy Sepulchre Hands-on Experience

This multiplier event organized in Jerusalem by BEZ and the IAA will be dedicated to **The Holy Sepulchre Hand-on Experience** as a prime case study to hands-on methodologies framework. E1 covers Task 3.1 which this deliverable D3.1 is focused on.⁷ The transdisciplinary nature of the event in various levels and aspects will allow examination of the methodologies' framework along with the summary and conclusions of this deliverable D3.1.

O5: Assimilation in EDICULA Synthesis

The state-of-the-art hands-on framework will be demonstrated in the teaching approaches at the post-graduate level that will include hand-on experience methodologies suitable for students with advanced educational and professional background and be able to actively work in a holistic approach framework and its challenges. The hands-on framework is expected to be present in each of O5 deliverables.

4.2 | Survey of Hands-on methodologies: Suggested preliminary guidelines

The insights from the contributors' responses along with the provided course examples, both given in the conducted survey, lead to conclusions that can be used to lay down a number of preliminary guidelines. These preliminary suggested guidelines will be weighed with the results and conclusions of the next two deliverables D3.2 and D3.3 to be included in the last deliverable of O3 – D3.4: EDICULA Guidelines for hands on education in CH protection.

The preliminary suggested guidelines are general in a way that they are suitable to the field of CH and can be applied for each of the academic programs' curricula reformation in accordance with their

⁷ E1 is also closely related to deliverable D3.3 to come.

focus and scales – materials – engineering – architectural – urban, as well as for a joint course, of the joint Master's degree program, that can address several focus points.

Suggested preliminary guidelines for Hands-on methodologies in courses of higher education studies	
Characteristics	<p>Multidisciplinary – Collaboration & Cooperation– Integration – Real-world Learning – Imitation of an actual conservation project – Elaboration and interpretation –</p> <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> - A postgraduate course - An elective course - Based on an already acquired knowledge in CH and skills (theoretical and practical) and successful completion of the core courses - Aims to capitalize and maximize the gain knowledge - Integrated project work - Interdisciplinary communication - International standards, guidelines, concepts, and approach
Type	Single semester course, condense course (for example summer courses and short-term courses abroad), workshop
Attendees	<p>Postgraduate students previous background in various aspects of CH is recommended desirable – students from different backgrounds whether cultural or professional limited number of higher years undergraduate students, PhD candidates</p>
Num.	Up to 15-20 participants
Credit points	Mostly 3 to 6
Conditional terms	<ul style="list-style-type: none"> - Successful completion of the core courses and some experience in basic relevant skills (theoretical courses, research, or lab skills) - Not on the first semester of the masters program
Location	<p>Primarily: on the site of the project (in-situ) Additional: laboratories (in the institution or field-labs), classes or lecture halls, workshop facilities Desirable: a combination of on-site work with additional location/s</p>
Pedagogical methodologies	<ul style="list-style-type: none"> a) On-site learning and lecture learning: combine course based on field work on site and supplementary lectures, sites visit and guided tours of the site and its surroundings, studio and workshops, lab and field lab work and experiments, studio, and classroom b) Small group learning: participants should be assigned to small teams or groups c) Problem-based learning: providing a leading case study

	d) Practical and experimental learning: conducting archeological excavation or survey; combining hands-on methodologies with various low-tech and high-tech techniques
External experts (providers)	It is suggested that supplementary tutors with specific areas of knowledge will participate in teaching. are recommended.
Objectives and outcomes	<p>Objectives:</p> <ul style="list-style-type: none"> - Learning cooperation and collaboration in the working group - Developing an interdisciplinary understanding and approaches - Learning to identify problems - Improving existing or new skills - Exercising investigation and interpretation proficiency - Developing a holistic approach - Applying strategies of preservation <p>Learning outcomes (examples):</p> <ul style="list-style-type: none"> - historical and physical documentation report - multilayer 3D model of the site - architectural design proposals for conservation and development of the site - an exhibition for the course outcomes, website, or official publication
Evaluation mechanism	<ul style="list-style-type: none"> - Active participation - Field work assessments - Reports on a particular theme - Theory and research papers - Oral presentation

4.3 | Future steps

A. Further investigation

Working on the report for the current deliverable D3.1: Survey of hands-on methodologies, which is based on the on-line questionnaire contributions, we came across sources of information such as master's degree programs that focus on heritage conservation (preservation), as well as research related to conservation study and training. These sources will be used and explored towards the construction of deliverable D3.4: EDICULA Guidelines for hands on education in CH protection.⁸

B. Future courses design

The Suggested preliminary guidelines for Hands-on methodologies in courses of higher education studies will assist in:

⁸ Margherita Pedroni, Cesar Bagues Ballester, Andrea Canziani, Wessel de Jonge, Chandler McCoy, *A Global Survey on Education and Training for the Conservation of Twentieth-Century Built Heritage - Research Report*; A collaboration between DOCOMOMO International and GCI, 2020 > [link](#)

- 1) Reformation of one core course and two optional courses of each master's program of the three academic institutions, partners of the EDICULA Project, as well as in the courses evaluation (O2: EDICULA Curricula Reformation; Task 2.1: Postgraduate reformation; stage 1 and stage 3).
 - These suggested guidelines are general and can easily be applied to each academic program specialty area.
 - Will enable sharing of knowledge beyond the building disciplines of architecture, engineering and environment – archaeology, arts and design, bio-engineering, 3D printing etc.
- 2) Creating new multidisciplinary, trans-disciplinary hands-on courses for the promotion of a joint Master's degree in the field of cultural heritage and protection of monuments.
- 3) Developing hands-on experience within the courses for the EDICULA teachers' course.
- 4) Consider connections to Continuing Professional Development (CPD) programmes and whether such courses would inherently be theoretical or the need for hands-on activities in visiting labs, giving information on new materials and participating in better technical analyses.

C. Broadening the definition of Hands-on experience

Reviewing the examples that emerged in the survey, and other materials we encountered during the study, highlighted the need to study the concept of hands-on experience and hands-on methodologies in CH. So that the term hands-on experience in CH will have an updated definition to fit multidisciplinary and innovative learning in the 21st century, in a way that an integrated science-based a humanities-based programme would provide a more rounded education with hands-on activities.⁹

This report was written and edited by Architect Adi Sela Wiener – EDICULA Project Local Coordinator with the contribution of Prof. Architect Mike Turner, Architect Shmuel Groag, and Doctoral Candidate Komal Potdar – Bezalel Academy of Art and Design, Jerusalem.
August 2021

⁹ Ibid. p.16-17; 29-31.

ANNEXES:

ANNEX 01: SURVEY OF HANDS-ON METHODOLOGIES - ON-LINE QUESTIONNAIRE

ANNEX 02: CONTRIBUTORS' CONTACT INFORMATION

ANNEX 03: FULL/COMPLETE LIST OF COURSES BY CATEGORIES/GROUPS



EDICULA | Bezalel | Output Title 03: EDICULA hands-on framework | Task 3.1 - Survey of hands-on methodologies

Dear colleagues,

Output 03 of the EDICULA project, of which Bezalel Academy of Arts and Design is the leading partner, deals with hands-on framework, in order to consolidate the EDICULA Guidelines for hands-on education in Cultural Heritage (CH) protection.

The Output is divided into three tasks of which the first:

Task 3.1 - concentrates on Survey of hands-on methodologies.

The task has three stages:

Stage 1: Focus on postgraduate and undergraduate courses related to protection of monuments, across Europe and third countries;

Stage 2: Evaluation of the 'state of the art of hands-on methodologies' in the field of Cultural Heritage;

Stage 3: Evaluation of hands-on methodologies in engineering O3 (Output 3) EDICULA Hands- on Framework (NOT included in the current form).

More information on EDICULA project can be found on: <http://edicula.eu/>

In order to conduct the survey, we seek to gather relevant information according to the three stages detailed above.

As our partners for the EDICULA project, we are looking forward to have your input in the above matters and ask you to fill out the form by March 17th, 2021.

Task 3.1 deliverable date is April 2021.

The form is constructed in two parts:

1. Technical information and general details
2. Assessment and evaluation

If some questions are not clear or if there is a need for additional information that cannot be completed through the form, please do not hesitate to email me directly at

adisewi@gmail.com

Thank you in advance for your collaboration and contribution.

Sincerely,

On behalf on Bezalel team for the EDICULA project,

Adi Sela Wiener, Architect
Bezalel Project Coordinator

General information

General remarks:

- In the questions to follow please indicate only one course.
- For any additional course in the same program, or for any additional program please open a new form.
- Filling the form may take approximately up to an hour and a half.
- Information gathered in the form will be used for the EDICULA project.

Please indicate the name of the contact person from the EDICULA project and the name of the institution: *

Your answer

Contributor:

Please indicate the following details that are related to the contributor (the person filling the form)

Name of contributor: *

Your answer

Email address: *

Your answer

Name of the academic institution and the faculty: *

Your answer

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Clear form

Part I - Technical information

The following questions are related to postgraduate and undergraduate courses in academic program in the field of protection of monuments, across Europe and third countries.

Academic program:

Please provide the following details and information that are related to the academic program

1. The name of the academic program: *

Your answer _____

2. Please write a short description of the selected program, the program curriculum or promotion materials to the program (upload material or provide a link to its homepage):

Your answer _____

Upload promotion materials or program curriculum:

 Add File

Link to promotion materials or to the program curriculum:

Your answer _____

3. Select the scale and focus of the program towards Heritage Conservation (Preservation) as a field of practice:

- a) Architectural conservation
- b) Material conservation and analysis
- c) Urban conservation
- d) Other (please mention bellow):
- Other: _____

Hands on postgraduate and undergraduate courses

Course, seminar, workshop, lab etc. (hereinafter course/the course):

Please provide the following details and information that are related to the selected course

4. Title of the course: *

Your answer

5. Please write a short description of the selected course (upload syllabus or provide a link):

Your answer

Upload syllabus of the course:

 Add File

Link to the course or syllabus of the course:

Your answer

6. Select the type of course: *

- a) Undergraduate
- b) Postgraduate
- c) Post-professionals
- d) Ph.D.
- e) Other (i.e. Continuous Professional Development CPD; Diploma Studies, please indicate):
- Other:

7. Please provide information related to the credit points of the course:

a) The type of credit points: *

CFU

ECTS

SCH

Other: _____

If other please indicate:

Your answer _____

b) Number of credit points per the course:

Your answer _____

c) Total credit points for the entire program:

Your answer _____

8. Conditional terms:

Please provide information related to the conditional terms of the course:

a) Is the course restricted to specific years of the program: *

Yes

No

If yes, please indicate:

Your answer _____

b) Are there any terms of entry to (conditional terms) the course such as completing previous courses? *

- Yes
- No

If yes, please indicate:

Your answer _____

c) Does the course give a brief introduction to the requirements for admission to course (like software, theory, introductory site visits)? *

- Yes
- No

If yes, please indicate:

Your answer _____

8. Please specify the number of students/participants in the course:

Your answer _____

15. Location of the course: *

- a) On site
- b) Lab based
- c) Workshop
- d) Combine course with lectures and workshops
- e) Other (please mention below):
- Other: _____

Please describe

Objectives, learning outcomes, methodologies and assignments

9. Please list the course's objectives or learning outcomes:

Your answer

10. Please describe the pedagogical methodologies used for the course (such as: lecture, workshop, excursions, etc.):

Your answer

11. please indicate the evaluation mechanism of the course *

- Field work and assessments:
- Lab based:
- Workshop and participatory methods:
- Theory and research papers:
- Other

Please describe:

Your answer

12. Is the course supported by external providers (such as: other faculties and departments, outsourcing instructors and contributors, collaboration with other institutions/ industry partners, etc.)? *

- Yes
- No

If yes, please describe:

Your answer

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Clear form

Part II – Assessment and evaluation

Evaluation of the state of the art of hands-on methodologies in the field of Cultural Heritage

In the questions below, please provide us with detailed answers and examples, as much as possible.

1. Please describe your opinion regarding the constructive alignment between the learning outcomes, course's objectives, or pedagogic tools (with special attention to the hands-on feature) and the evaluation process:

a) How do the pedagogic methods applied in the course contribute to the achievement of the declared learning outcomes?

Your answer

b) What is the added value of the hands-on feature and experience to the successful implementation of the learning outcomes?

Your answer

c) To what degree are the course assignments and evaluation mechanism addresses the declared learning outcomes?

Your answer

2. In your opinion, to what degree is the course compatible with the relevant conservation principles, architectural and engineering knowledge?

Your answer

3. Please provide any further insights that you may have:

Your answer

ANNEX 02: CONTRIBUTORS' CONTACT INFORMATION

Ariel University School of Architecture	Yair Varon	yairva@ariel.ac.il
Bezalel, Department of Architecture and Master's program in Urban Design	Shmuel Groag	s.groag@gmail.com
Bezalel Academy of Art and Design	Adi Sela Wiener	adisewi@gmail.com
KU Leuven - Faculty of Engineering Sciences - Raymond Lemaire International Centre for Conservation	Koenraad Van Balen	koenraad.vanbalen@kuleuven.be
Scholl of Chemical Engineering, National Technical University of Athens	Antonia Moropoulou	amoropul@central.ntua.gr
School of Planning and Architecture, New Delhi	Komal Potdar	ar.komalpotdar@gmail.com
Sapienza Università di Roma Facoltà di Ingegneria Civile e Industriale	Maria Laura Santarelli	marialaura.santarelli@uniroma1.it
Sapienza University of Rome - Faculty of Sciences	Silvano Mignardi	silvano.mignardi@uniroma1.it
Technion - Israel Institute of Technology, Faculty of Architecture and Town Planning	Eran Mordohovich	mordohovich.eran@gmail.com
University of Genoa, School of Sciences	Laura Gaggero	laura.gaggero@unige.it
University of the Basque Country - Centro de Investigación Micaela Portilla	Ana Jayone Yarza Pérez	anajayone@gmail.com

ANNEX 03: FULL LIST OF COURSES BY CATEGORIES

Category A | Courses uniquely/exclusively devoted to Hands-on experience

Course title:	Discovering Mirabel Castle Summer School			
Instructors:	Architect Yair Varon - Ariel University, Prof. Cecilia Luschi - Florence University			
Short description:	The goal of the summer school is to provide the participants with a broad overview of current strategies for the study of built heritage sites. Mirabel Castel in Migdal Tsedek National Park (Israel) provides an ideal case in point, thanks to the unparalleled availability of contextual archaeological data, as well as the centuries-long history of exploration, research, and restorations.			
Syllabus	Not provided			
Type of course:	undergraduate		Num. of students:	30
Credit points:	ECTS	Num.	6	Total credit points (program): 230
Conditional terms:	2 nd -5 th year students		Entry terms:	no
Admission requirements intro.	Yes. Not detailed.			
Location:	On site + Workshop			
Objectives, learning outcomes, methodologies, and assignments				
Objectives or learning outcomes				
The Course's outcomes are historical and physical documentation report, multilayer 3D model of the site, architectural design proposals for conservation and development of the site. All outcomes will be presented in an exhibition, website and official publication.				
Pedagogical methodologies used for the course				
(1) Classes on Middle Ages through Ottoman period art and architecture, current methods for archaeological research, the study of artifacts and archaeological materials, the history of the discipline, history of restoration, the collection, visualization, and interrogation of archaeological data in immersive virtual environments.				
(2) Archaeological fieldwork in Migdal Tsedek National Park.				
(3) Guided tours of neighboring sites and museums such as Caesarea, Massada, City of David (Jerusalem).				
Evaluation mechanism:	field work and assessments			
External providers:	Yes. Mainly from Israel Nature and Parks Authority (NPA)			
.				
Course title:	Cultural Landscapes			
Instructors:	Prof. Anuradha Chaturvedi School of Planning and Architecture Delhi			

Short description:	Introduction to concepts of cultural landscapes and sustainability, with inputs and study of cultural geography, urban heritage and governance structures				
Syllabus	Not provided				
Type of course:	Postgraduate			Num. of students:	10-15
Credit points:	NA	Num.	NA	Total credit points (program):	NA
Conditional terms:	students. 3 rd semester			Entry terms:	Need to be enrolled for the 2 years program
Admission requirements intro.	Site visits and theory introduction				
Location:	On site + Combine course with lectures and workshops + other				
Objectives, learning outcomes, methodologies, and assignments					
Objectives or learning outcomes					
Cultural landscape mapping, analysis and shelf of projects. Develop and understanding of nature-culture linkages, community practices and intangible heritage and requirements of sustainability theory for developing a landscape management plan.					
Pedagogical methodologies used for the course					
NA					
Evaluation mechanism:	Field work and assessments + Theory and research papers				
External providers:	Yes. Faculty staff, outsourcing instructors, and contributors				

Course title:	Hands-on Conservation: Practice and theory in conservation
Instructors:	Architect Adi Sela Wiener Bezalel Academy of Art and Design, Department of Architecture
Short description:	<p>The conservation process consists of three basic layers - recognition-understanding-obligation arising from the questions of: What is it to be conserved, Why and How (the Charter on Ethics of Heritage Conservation in Israel, Jerusalem 2016). The hands-on conservation activities focus on the third aspect and deals with the manner of practical conservation to ensure maintaining of the property values according to its conservation objectives.</p> <p>The course aims to enable practical experience in hands-on conservation including workshops such as: traditional lime-based mortars, stone - curving and cleaning; production of prefabricated concrete elements and murals, all as part of experience-based learning. Its importance is in the recognition and understanding of the significance of material and technical aspects, combined with theoretical aspects, in the conservation process.</p> <p>The elective course is given as part of the conservation block studies in the Department of Architecture for students in third, fourth and fifth years, and is recommended for the conservation studio students. It will take</p>

	place at the Museum of Underground Prisoners in Jerusalem, near the new campus of Bezalel in Jerusalem city centre.		
Syllabus	https://www.bezalel.ac.il/en/node/647971		
Type of course:	Undergraduate	Num. of students:	18
Credit points:	C.P Israel	Num.	2
		Total credit points (program):	120
Conditional terms:	3 rd – 5 th year		Entry terms:
			No
Admission requirements intro.	No		
Location:	On site		
Objectives, learning outcomes, methodologies, and assignments			
Objectives or learning outcomes			
The course aims to enable practical experience in hands-on conservation including workshops such as: traditional lime-based mortars, stone - curving and cleaning; production of prefabricated concrete elements and murals, all as part of experience-based learning. Its importance is in the recognition and understanding of the significance of material and technical aspects, combined with theoretical aspects, in the conservation process.			
Pedagogical methodologies used for the course			
The course is based on on-site workshops: documentation and conservation work at the same site. Background lectures and tours are given to provide a more complete understanding of the entire framework.			
Evaluation mechanism:	Field work and assessments + Workshop and participatory methods		
	The evaluation is divided into two equal parts: 1) active participation in the workshop; 2) submitting a final work. The final work is based on the fieldwork exercises and a personal topic explored by each group of students.		
External providers:	Yes. A specialist conservator is the one leading the conservation workshop.		

Course title:	Interdisciplinary Documentation, Diagnosis, Revealing and Protection of Cultural Heritage Towards Sustainable Development
Instructors:	Prof. Antonia Moropoulou National Technical University of Athens, School of Chemical Engineering
Short description:	This is an elective course that can be chosen after the successful completion of the core courses of the program. Its target is to capitalize the so far gained theoretical knowledge and basic lab skills, by cultivating in practice interdisciplinarity, the core perspective of NTUA program. The course includes lectures about the preservation of cultural heritage in terms of sustainability, as well as about scientific support on decision making in terms of interdisciplinarity. Strategies of sustainable preservation are explained and demonstrated through presentations of interdisciplinary projects that took place at the Holy Aedicule in Jerusalem, at the Ancient Acropolis of Rhodes, at the Ancient Temple of Hephaestus in Athens Agora, at the Byzantine Monastery of Varnakova in Western Greece, and at the Historic Building of Villa Klonaridi in Athens.

	Based on these thoroughly presented interdisciplinary projects, students acquire more solid background to address real cases in the future. To enhance this purpose, on site visits are scheduled, to set real problem scenarios that the students' groups select to solve. Then, on monument's scale, students identify the environmental causes of decay, apply Non-Destructive and Remote Sensing Techniques to improve their hands-on skills and elaborate the experimental data in lab. They report their results within a month, and they also present their project work, to successfully complete the course.			
Syllabus	NA			
Type of course:	Postgraduate		Num. of students:	3, up to 16
Credit points:	ECT	Num.	7	Total credit points (program): 120
Conditional terms:	1 st year, 2 nd semester		Entry terms:	Successful completion of the six core courses
Admission requirements intro.	No. It integrates and further enhance the already adopted knowledge and skills			
Location:	Other: Combined course with lectures and on-site visits. The lectures focus on interdisciplinary projects that include architectural, geometrical, structural and materials documentation. During the on-site visits non-destructive and remote sensing techniques are applied, and introduction to sampling methodology take place. Students are working in small groups.			
Objectives, learning outcomes, methodologies, and assignments				
Objectives or learning outcomes				
Objectives				
<ul style="list-style-type: none"> • Learning to cooperate by working in a group • Development of interdisciplinary understanding and approaches, since most possibly students of each group will be of different background disciplines, as they will be during an actual conservation project • Learning to identify the problem that it will be addressed on real scale, as well as which are the most promising techniques to use for its investigation. • Improving documentation, analytical skills, elaboration/interpretation of the results of the in situ applied techniques. • Development of holistic approach, since, depending on the theme chosen, students identify decay patterns on monuments scale, recognize environmental causes that need to be mitigated in order to limit decay, apply strategies of preservation. 				
Outcomes				
<ul style="list-style-type: none"> • Development and enhancement of interdisciplinary interaction and cooperation • Improvement of problem identification and analysis on real scale • Strengthening of hands-on skills by applying advanced techniques • Strengthening of results elaborating and interpreting skills • Improvement of reporting skills • Development of initiatives and critical thinking 				
Pedagogical methodologies used for the course				
<ul style="list-style-type: none"> • lecture learning, 				

	<ul style="list-style-type: none"> • problem-based learning, • group learning, • reverse engineering thinking, • constructive learning, • on-site learning
Evaluation mechanism:	Other: Report on a particular theme, assigned during the on-site visit, chosen by each students' group and approved by the tutor. Oral presentation of the project completes course evaluation.
External providers:	Yes. The tutors of the program are members of the NTUA faculties that participate in the interdisciplinary program, that is staff from the Schools of Chemical Engineering, Architectural Engineering, Civil Engineering and Rural & Surveying Engineering. Moreover, academic and/or professional experts in archaeology, art history, conservation and legislation support the program.

Course title:	Diagnostic techniques applied to Cultural Heritage			
Instructors:	Prof. Laura Gaggero University of Genoa, School of Sciences			
Short description:	The purpose of the degree course is to train researchers and experts in the field of diagnostics, conservation and restoration of cultural heritage, which integrate scientific and historical-artistic skills. Teaching concerns the chemical and physical characterization of materials and related degradation processes, the study of artistic techniques and those of prevention and restoration and the knowledge - theoretical and practical - of the main applied analytical methodologies.			
Syllabus	PDF provided			
Type of course:	Undergraduate		Num. of students:	20
Credit points:	CFU	Num.	4	Total credit points (program): 180
Conditional terms:	No		Entry terms:	NA
Admission requirements intro.	Highlights on professional start			
Location:	On site + Lab based + Combine course with lectures and workshops Over one week, theory seminars, lab-based exercises, roundtable on profession			
Objectives, learning outcomes, methodologies, and assignments				
Objectives or learning outcomes				
1) implement the institutional contents 2) invite professional to witness about perspectives 3) use instruments for jointly elaborate results				
Pedagogical methodologies used for the course				
<ul style="list-style-type: none"> • Lectures • Workshop • laboratory exercises 				

Evaluation mechanism:	Lab based + Workshop and participatory methods Lab based: time on instruments, skill, critical discussion of results; workshop, roundtable: quality of questions, n. of interventions.
External providers:	All departments involved in the course gave a contribution in term of lecturers other than teachers, and laboratory techniques other than those of the course.

Course title:	Decay and Colour			
Instructors:	Prof. Silvano Mignardi Sapienza University of Rome - Faculty of Sciences			
Short description:	The metals in antiquity. Copper and its alteration. Degradation of silver. Alloys: bronze (Cu + Sn) and brass (Cu + Zn). Degradation of bronze. Color: causes of color. Pigments and dyes. Main mineral pigments. Practice: Introduction to the use of metallographic microscope.			
Syllabus	NA			
Type of course:	Undergraduate + Ph.D.	Num. of students:	20	
Credit points:	CFU	Num.	6	Total credit points (program): NA
Conditional terms:	No		Entry terms:	NA
Admission requirements intro.	No			
Location:	On site + Lab based The teaching method adopted includes the combination of lectures and exercises under the reflected light microscope for the acquisition of the basic principles of opaque minerals. During the lectures will also be used films related of the metals and alloys and mineral pigments applied in Cultural Heritage.			

Objectives, learning outcomes, methodologies, and assignments

Objectives or learning outcomes

Educational skills

A - Knowledge and understanding

Knowing the main forms of degradation of metals and their alloys

Knowing the main characteristics of the minerals used as pigments

Knowing the nature of the main forms of pigment degradation

B - Application skills

Being able to deduce the main processes of metal degradation from the nature of the products

Being able to recognize the main opaque minerals in reflected light

C - Autonomy of judgment

Being able to assess the nature of metal degradation products

Being able to propose the most suitable analytical methods according to the type of degradation

D - Communication skills

Knowing how to communicate to restoration personnel the nature of degradation processes

<p>Knowing how to communicate the characteristics of the applied procedures to the restoration personnel</p> <p>E - Ability to learn</p> <p>Being able to consult the scientific literature on metal and mineral pigments degradation processes</p> <p>Being able to assess the degree of alteration of metals in reflected light</p>	
<p>Pedagogical methodologies used for the course</p> <p>The pedagogical methodologies include both lectures and exercises under the reflected light microscope. During the lectures will also be used films related of the metals and alloys and mineral pigments applied in Cultural Heritage. Moreover, excursions are planned to the major Italian archaeological sites for the direct contact of the student with the use of mineral pigments and metals in the world of Cultural Heritage.</p>	
<p>Evaluation mechanism:</p>	<p>Lab based + Theory and research papers</p> <p>The assessment of the actual achievement by the student is through an oral test with open stimulus and open answer, during which the student presents a project on topics agreed with the teacher.</p>
<p>External providers:</p>	<p>No</p>

<p>Course title:</p>	<p>Decay and Conservation of Non-Metallic Materials</p>				
<p>Instructors:</p>	<p>Prof. Maria Laura Santarelli Sapienza University of Rome - Faculty of Civil and Industrial Engineering</p>				
<p>Short description:</p>	<p>Definition of the non-metallic materials: binder and non-binder materials. Materials for monuments based on silica binders and non-binders: crude and fired clays. Chemical-physical and mechanical properties. Ancient and modern manufacturing, ancient and modern uses, decay phenomena. Conservation studies. Materials for monuments based on gypsum: properties, applications, decay and their conservation. Materials for monuments based on calcareous binder and non-binders: Chemical-physical and mechanical properties. Ancient and modern manufacturing, ancient and modern uses, decay phenomena. Conservation studies.</p> <p>The wood and the stones as materials for monuments and decorations: ancient and modern applications: Conservation studies.</p> <p>Polymeric materials as materials for construction and for restoration.</p> <p>Painted and non-painted surfaces on monuments: conservation problems and case studies</p>				
<p>Syllabus</p>	<p>NA</p>				
<p>Type of course:</p>	<p>Undergraduate</p>		<p>Num. of students:</p>	<p>20</p>	
<p>Credit points:</p>	<p>CFU</p>	<p>Num.</p>	<p>6</p>	<p>Total credit points (program):</p>	<p>NA</p>
<p>Conditional terms:</p>	<p>No</p>		<p>Entry terms:</p>	<p>No</p>	
<p>Admission requirements intro.</p>	<p>No</p>				
<p>Location:</p>	<p>Combine course with lectures and workshops</p>				
<p>Objectives, learning outcomes, methodologies, and assignments</p>					

Objectives or learning outcomes	
NA	
Pedagogical methodologies used for the course	
NA	
Evaluation mechanism:	Other: oral examination
External providers:	No

Category B | Courses that offer hands-on experience as part of the course curriculum

Course title:	Studio in conservation for fourth year ,Final studio for fifth year					
Instructors:	Architect Shmuel Groag Bezalel Academy of Art and Design					
Short description:	NA					
Syllabus						
Type of course:	Undergraduate			Num. of students:	22	
Credit points:	C.P. Israel	Num.	6	Total credit points (program):	120	
Conditional terms:	4 th – 5 th year			Entry terms:	Theory and history of conservation	
Admission requirements intro.	No					
Location:	Combine course with lectures and workshops					
Objectives, learning outcomes, methodologies, and assignments						
Objectives or learning outcomes						
NA						
Pedagogical methodologies used for the course						
NA						
Evaluation mechanism:	Theory and research papers					
External providers:	NO					

Course title:	International Workshop Concerning the Conservation and Musealization Of The Worlds Heritage Site of Beit She'arim
Instructors:	Architect Eran Mordohovich Technion - Israel Institute of Technology , Faculty of Architecture and Town Planning
Short description:	The purpose of this workshop is to expose architecture and landscape architecture students to the complexities of designing a project within an archaeological site / national park which is open to a large public. During the excursions and the design workshop, we will examine how

	archaeological national parks — with emphasis on Beit She'arim — were conceived, developed and changed through the years. We will encourage a critical examination of those processes and look to integrate those lessons into the design exercise at the end. Among the topics to be studied and discussed: 1. Archaeological and historical conservation. 2. Museology of archaeology and presenting artefacts in situ. 3. Landscape design — Cultural landscape. 4. Designing/working with the community.		
Syllabus	PDF provided		
Type of course:	Postgraduate + Undergraduate	Num. of students:	24
Credit points:	C.P. Israel	Num.	3
		Total credit points (program):	160 (U.G.)
Conditional terms:	Postgraduate students and open for undergraduates from 3 rd year students and further	Entry terms:	presentation of CVs and a letter of intent - for the Politecnico Di Milano
Admission requirements intro.	No		
Location:	On site + Combine course with lectures and workshops		
Objectives, learning outcomes, methodologies, and assignments			
Objectives or learning outcomes Design project (in a team of 2-4 students) reports on sites visit short exercise in the Museum			
Pedagogical methodologies used for the course 1. Tour to archeological sites and museums focusing World Heritage sites, watching study cases, facing mainly topics related to the seminar: as preservation of historical sites and archaeological finds, accessibility, usability public presentation, match the capacity of the site Load tourist, museum, visitor centers, integrating values in landscape planning and so on (4-6 days). 2. Acquaintance with the site and its surroundings, through meetings and conferences (meeting management, architects and designers in charge, excavation, conservation, mayors, associations) we expect to do two days experience of excavation in site itself (1-2 days). 3. Workshop: planning that will address design issues, such as accessibility and site traffic, visitor center or not museum exhibition of artifacts, resource planning landscape (4-5 days).			
Evaluation mechanism:	Workshop and participatory methods		
External providers:	The course is a collaboration between Politecnico di Milano and the Technion, and a collaboration with the National Parks Authority.		

Course title:	Integrated project work
Instructors:	Prof. Koenraad Van Balen

	KU Leuven - Faculty of Engineering Sciences - Raymond Lemaire International Centre for Conservation				
Short description:	Parallel to the theoretical courses throughout the academic year, students work on projects involving either the conservation of architectural heritage or the rehabilitation of an urban or rural site, aiming at an intense interaction with the matters taught in the various lectures. In the first semester, the 'Integrated Project Work' is introduced through different case-based seminars, relating to the experience of the teaching staff, with site visits.				
Syllabus	https://onderwijsaanbod.kuleuven.be/syllabi/e/H00A5CE.htm#activetab=doelstellingen_idp267232				
Type of course:	Postgraduate			Num. of students:	20 each year in an average (since 1976)
Credit points:	ECTS	Num.	12 3+9	Total credit points (program):	90
Conditional terms:	1st year (semester 1 & 2)			Entry terms:	Completion of various courses and other requirements
Admission requirements intro.	Theoretical courses support the Integrated Project Work				
Location:	Combine course with lectures and workshops Includes field work on site, seminars in studio and classroom				
Objectives, learning outcomes, methodologies, and assignments					
Objectives or learning outcomes					
<ol style="list-style-type: none"> 1. The students gain experience in interdisciplinary communication within the practice of architectural conservation and especially, and acquire the common language and methodology developed in international guidelines, charters and literature; 2. The students apply concepts taught in the preceding five main course groups into practice; 3. The students learn and experience collaboration in an interdisciplinary conservation team; 4. The students develop an integrated project in the field of conservation, passing through the different phases of analysis, synthesis, master plan and design. 					
Design of a conservation and management project, based on a full architectural, historical, theoretical, and technical analysis of the building, or group of buildings, and their environment.					
Pedagogical methodologies used for the course					
Studio, field work on case studies per interdisciplinary and international groups of students					
Evaluation mechanism:	<p>Field work and assessments + Workshop and participatory methods + Theory and research papers</p> <p>Each interdisciplinary student team works on a particular site; results of the survey, analysis, evaluation and synthesis are presented to the teaching staff during the intermediate evaluation and to the teaching staff and invited experts during the final evaluation. A comprehensive report must be submitted. Particular aspects, such as the survey, the analysis of the urban or rural site on different scales, and the technical analysis are the subject of a separate</p>				

	evaluation (https://onderwijsaanbod.kuleuven.be/syllabi/e/H00A5CE.htm#activetab=doelstellingen_idm3443056)
External providers:	External from KU Leuven professor, professors and staff from other faculties and often (local) professionals or responsible from (local) cultural heritage-authorities.