### UNIVERSITY OF MALTA  
**FACULTY FOR THE BUILT ENVIRONMENT**  
**DEPARTMENT OF THE BUILT HERITAGE**

**MASTER of SCIENCE IN**  
**CONSERVATION TECHNOLOGY FOR MASONRY BUILDINGS**  

**STUDY-UNIT DESCRIPTIONS**

<table>
<thead>
<tr>
<th>Code</th>
<th>MAS 5101</th>
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<tbody>
<tr>
<td>Title</td>
<td>History and Theory of Conservation</td>
</tr>
<tr>
<td>Type</td>
<td>Lectures and seminars</td>
</tr>
<tr>
<td>ECTS credits</td>
<td>4</td>
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<tr>
<td>Year in which it is being offered &amp; Semester</td>
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<tr>
<td>Pre-requisite study –unit</td>
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<tr>
<td>Method of assessment</td>
<td>Assignment</td>
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<tr>
<td>Result</td>
<td>Percentage mark &amp; grade</td>
</tr>
</tbody>
</table>
| Lecturer     | Arch. K. Buhagiar  
Arch. S. Cefai  
Arch. C. Busuttil |

**Description**  
This set of lectures will discuss the history and theory of conservation, starting with definitions of the most important terms. It will go on to discuss the attitudes of different eras, including the neo-classical period, the development of restoration in England and France, and the philosophies of some of the important names in the field, as well as the modern school of thought of restoration. Case studies will also be used. International Charters and Conventions will be discussed.

**Reading List**  
**Essential reading**
- In Italian: G. Basile (ed.) 2000. Istituto Centrale per il Restauro, Italy.

Further reading


1932 Movie *Grand Hotel*

1935 Movie *Mutiny on the Bounty*

1984 Remake *The Bounty*
This study-unit will include a series of lectures on themes which are of fundamental importance in the conservation of historic buildings. It will consist of discussions on the importance of ethics in conservation, including the danger of “fashion” ethics. Also discussed will be the issues of values and sustainability. Historiography will be introduced as a tool to understanding 'history of history' before any intervention is carried out on a building, and will include information on various schools. One common use of a historic building is as a museum – lectures on museum studies will give the student the background knowledge required for the correct presentation of buildings and their contents, the importance of understanding the needs of different visitors to a museum, and how to cater for them.

Reading List

**Essential reading**


**Further reading**
University of South Carolina Press.
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<tr>
<th>Code</th>
<th>MAS 5103</th>
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<tbody>
<tr>
<td>Title</td>
<td>Urban, Legislative and Economic Contexts of Conservation</td>
</tr>
<tr>
<td>Type</td>
<td>Lectures and seminars</td>
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<tr>
<td>Lecturer</td>
<td>Various</td>
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<tr>
<td><strong>Description</strong></td>
<td>This study-unit will deal with legislative and economic aspects of conservation. The legal context will be explained through a discussion of the local past and present laws which directly relate to our cultural heritage. Students will be exposed to existing local planning legislation in general and in more detail on aspects of the law and planning process which regulate our cultural heritage both architectural and archaeological. The unit will include an overview of how the local built environment has evolved through history, helping the student identify various urban patterns by using a number of tools. The built environment is however continually developing, and an important factor here is the economic context. Thus, the importance of economic value, discussing the potential sources of revenue such as tourism, commerce, use and amenities, forms part of this study-unit. This includes also lectures on cost-benefit analysis, financial analysis and economical analysis.</td>
</tr>
</tbody>
</table>
| **Reading List** | **Essential reading**
Cost Analysis - The Economic Value of Benefits Resulting from Environmental Restoration
Cost Analysis - Overview of Benefit-Cost Analysis
*Cost Benefit Analysis for the Cultural Built Heritage: Principles and Practice.*
Malta Development Control Guidelines for Urban Conservation Areas. 1995.
<table>
<thead>
<tr>
<th>Code</th>
<th>MAS 5104</th>
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<tbody>
<tr>
<td>Title</td>
<td>Documentation and Research</td>
</tr>
<tr>
<td>Type</td>
<td>Lectures, seminars and visits</td>
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<tr>
<td>Lecturer</td>
<td>Dr N. Vella</td>
</tr>
<tr>
<td></td>
<td>Visiting lecturers</td>
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</table>

**Description**

This set of lectures on documentation and research will deal with the importance, purposes and objectives of documentation. It will discuss approaches and techniques, including also carrying out the initial survey, preserving the record and analytical recording. An important part of this unit will be on the location of archival information and other sources of information. Other aspects to be dealt with include process and tools for the compilation of a document, including specialised instruments for documentation, the methodology of archiving documents, and documentation of landscape archaeology.

**Reading List**

**Essential reading**


**Further reading**


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<tr>
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<tbody>
<tr>
<td>Title</td>
<td>History of Technology and Building</td>
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<tr>
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<td>Result</td>
<td>Percentage mark &amp; grade</td>
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<td>Attendance</td>
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</table>
| Lecturer | Prof. A. Torpiano  
Arch. C. Busuttil  
Visiting lecturers |

**Description**

This set of lectures will discuss the history of technology and building, including a history of trades and tools used for building purposes, particularly traditional ones used locally. The unit will also include lectures on the history of technology and structural design, illustrated with particular case studies. Development of the structural form and constructional techniques, particular those applicable to local historic buildings, will also be discussed.

**Reading List**

**Essential reading**

**Further reading**


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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>Title</td>
<td>Masonry Materials and Structures</td>
</tr>
<tr>
<td>Type</td>
<td>Lectures, seminars and visits</td>
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<td>Result</td>
<td>Percentage mark &amp; grade</td>
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<tr>
<td>Attendance</td>
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</table>
| Lecturer | Prof. J. Cassar  
Ms R. De Angelis  
Prof. A. Torpiano |

**Description**

This set of lectures introduces the student to the wide range of materials, usually inorganic ones, traditionally used in buildings. These include stone, mortars and plasters. There will be an introduction to minerals and more general lectures on rocks, with emphasis being placed on the ones commonly used as building materials, particularly local ones. Another part of this unit will focus on mortars and renders traditionally used in the construction of historic buildings and their repairs, including the composition and properties of the most common constituent materials used for the production of traditional mortars. Also discussed in this unit will be the structural aspects of historic buildings, particularly local ones.

**Reading List**

**Essential reading**
Further reading
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<tbody>
<tr>
<td>Title</td>
<td>Ancillary Materials in Buildings</td>
</tr>
<tr>
<td>Type</td>
<td>Lectures, seminars and visits</td>
</tr>
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<td>Assignment</td>
</tr>
<tr>
<td>Result</td>
<td>Percentage mark &amp; grade</td>
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</tbody>
</table>
| Lecturer | Dr J. Betts  
Dr J. Buhagiar  
Dr S. Golfomitsou  
Ing. Arch. G. Tampone |

**Description**

This set of lectures introduces the student to the wide range of ancillary materials, used in historic buildings. In this study unit, the composition and properties of wood, ceramics, glass and metals will be discussed. An introduction to organic materials, such as polymers, oils and waxes, used for conservation/restoration purposes will also be given.

**Reading List**

**Essential reading**


**Further reading**


Taschen.

*La terracotta e la maiolica ai tempi dei della Robbia*

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<th>Code</th>
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<tr>
<td>Title</td>
<td>Environment and Monitoring</td>
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<td>Percentage mark &amp; grade</td>
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<td>Attendance</td>
<td>Dr J. Schembri</td>
</tr>
<tr>
<td></td>
<td>Dr E. Sinagra</td>
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<td></td>
<td>Dr V. Buhagiar</td>
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**Description**

The aim of this study unit is to integrate the variations in the local climate with the physical elements of the urban landscape. The course first gives a general overview of the important indicators that mark out a climate, the proceeds to present the general conditions of the Mediterranean climate and the main features of Maltese climatic environment. A discussion on atmospheric pollution will follow, including the physical structure and chemistry of the atmosphere, agents of change in the atmosphere and sources, fates and environmental effects of some important gaseous and particulate pollutants, including both inorganic and organic species. These two themes will be then linked to the built environment through lectures on the effects of climate and microclimate on traditional Maltese architecture, thermo-hygro conditions in buildings, including environmental monitoring and passive systems vs HVAC systems in historic buildings: an energy sensitive approach.

**Reading List**

**Essential reading**


Thomson G. 19… *The Museum Environment …..


**Further reading**

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<td>Title</td>
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</tr>
<tr>
<td>Type</td>
<td>Lectures, seminars and visits</td>
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<td>Prof. A. Torpiano</td>
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**Description**

This study-unit will introduce the student to the deterioration of traditional building materials. This will include porous inorganic building materials such as stone, mortars and plasters. The deterioration of concrete will also be tackled. The various causes of deterioration, both intrinsic and extrinsic, will first be covered, followed by examples of the manifestation of deterioration and an understanding of how the various causes contribute to decay. Mapping of deterioration forms as an aid to the understanding of deterioration will also be discussed.

**Reading List**

**Essential reading**


NORMAL 1/88 *Alterazioni Macroscopiche dei Materiali Lapidei: Lessico*. ICR – CNR, Rome, Italy. UNI-NORMAL.


Further reading


This study-unit will introduce the student to the deterioration of traditional ancillary building materials and will the materials metals, ceramics, glass and wood. The objectives of the course are to describe the degradation of materials used for architectural applications, including fired products and glass. The various causes of deterioration, both intrinsic and extrinsic, will be covered. Major types of corrosion of metals with typical examples will also be included. This series of lectures will also include information on the deterioration of wood, including biodeterioration.

Reading List

**Essential reading**

**Further reading**
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<tr>
<th>Code</th>
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<tr>
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<td>Deterioration of Masonry Fabric</td>
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<td>Lecturer</td>
<td>Prof. A. Torpiano</td>
</tr>
<tr>
<td>Description</td>
<td>This study-unit will deal with the problems associated with the degradation of the masonry fabric. It will include lectures on the diagnosis and monitoring of cracks, especially in the case of historic buildings. Structural degradation will also be discussed, with appropriate examples. This study-unit will also include information on the nature and diagnosis of geotechnical problems which can affect a historic building.</td>
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<tr>
<td>Title</td>
<td>Structural Masonry Interventions</td>
</tr>
<tr>
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<td>Lectures and visits</td>
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<tr>
<td>Lecturer</td>
<td>Prof. A. Torpiano</td>
</tr>
<tr>
<td>Description</td>
<td>This set of lectures will discuss the many types of interventions which can take place on a historic building with structural problems. It will discuss the issues of stone replacement as well as patch repairs, especially in the local context. The various methods for strengthening a structure will be explained, with relevant examples. Geotechnical interventions will also be discussed.</td>
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<td>Conservation of Masonry Materials</td>
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<td>Result</td>
<td>Percentage mark &amp; grade</td>
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<td>Attendance</td>
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</table>
| Lecturer | Arch. H. Bonnici  
    Prof. J. Cassar  
    Arch. I. Farrugia  
    Dr. S. Golfomitsou  
    Ing. Arch. G. Tampone  
    Visiting lecturers |

**Description**
This study-unit will tackle the problem of the treatment of various materials traditionally used in buildings. It will deal with inorganic building materials such as stone, mortars and plasters, ceramics and glass and metals. The conservation and restoration of wooden structures will also be tackled. This will include lectures on the methods of conservation of stone, including cleaning, consolidation and protection. The use of lime based mortars and plasters for restoration purposes will also be discussed. Other lectures will include the conservation of ceramics, glass and metals in buildings, including discussion on when a conservator should be called in, what conservators can do. Wooden Historic Structures in general will also be discussed, as well as Criteria and Techniques of Repair of degraded wooden load bearing structures. Preventive maintenance will also be discussed.

**Reading List**

**Essential reading**


Further reading


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<tr>
<th>Code</th>
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<td>Title</td>
<td>Conservation Projects</td>
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<tr>
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<tr>
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<td>Ms K Stroud</td>
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**Description**

This multi-faceted study-unit will delve into particular problems associated with the conservation of historic buildings. It will discuss the problems of humidity in buildings, and how to treat this problem. The specific problems associated with the conservation and restoration of archaeological sites will also be discussed. Project organization and management, and particularly interesting case studies will also be tackled.

**Reading List**

**Essential reading**

- Council of Europe Conventions: Granada, Valletta, Florence.

**Further reading**


Proceedings of STREMA International Symposia on *Structural Repair and Maintenance of Historical Buildings*. 
**Description:** Students will carry out a research project on an original topic pertinent to one or more of the study units taken during the taught part of the course. This will include a critical review of the relevant literature, laboratory or site research work and a critical discussion of the results. The written thesis will be not less than 20,000 words long, and not exceeding 25,000 words, and will contain the results of the research project.

**Learning Outcomes:**

- Highly specialised knowledge in aspects of the conservation of masonry buildings, some of which is at the forefront of knowledge in a field of conservation work or study, as the basis for original thinking.

- Critical awareness of knowledge issues in the field of the humanities and/or sciences and at the interface between the different fields related to the conservation of masonry buildings.

- Ability to apply specialised problem-solving skills in research and/or innovation in the conservation of masonry buildings to develop new knowledge and procedures and to integrate knowledge from different fields to perform conservation and restoration work on masonry buildings.

- Ability to consider and integrate both ethical and aesthetic issues, as independent professionals, and/or in cooperation with specialists (i.e. art historians, archaeologists, conservators etc.) who contribute to conservation-restoration study/work.

- Ability to apply expertise in management and administration to generate solutions to specific problems in the field of conservation of masonry buildings.

- Competence in managing and transforming conservation study that is complex, unpredictable and requires new strategic approaches through effective planning and coordination.

- Competence to take responsibility for contributing to professional knowledge and practice in conservation of buildings.

- Competence to disseminate information gained from research.