

## The Teaching of Construction and the Rare and Traditional Knowledge

### Competences

#### I. Competences in Conservation and Re-use of Historic Buildings

##### *Case no.1*

##### *The architect facing common historic buildings (not 'listed')*

The common historic buildings forming the 'minor architecture' of our historic towns represent symbols of our cultural continuity in a certain place; they are also considered 're-usable resources'.

Facing the 'minor architecture' the architect has to be able to rationally decide between demolition and conservation.

For taking wise decisions on the use value of an old building, he has to be able to evaluate its technological response to contemporary requirements; this response is based on local constructive tradition.

Building rehabilitation becomes more and more present in the professional life of the architect, requiring specific competences.

In rehabilitation, the architect needs specific competences for 're-designing' old buildings, increasing their use value without losing existing qualities.

The maximum contemporary valorization of a historic building can be achieved by a minimum intervention only by first understanding the original concept of the building generated by traditional knowledge.

An effective rehabilitation requires technological compatibility between the contemporary treatment and the historic building as the product of a pre-modern technological civilization.

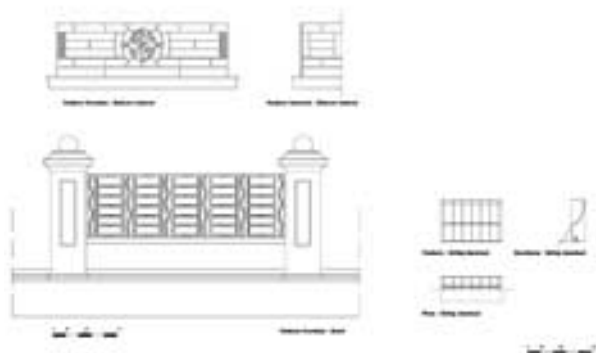
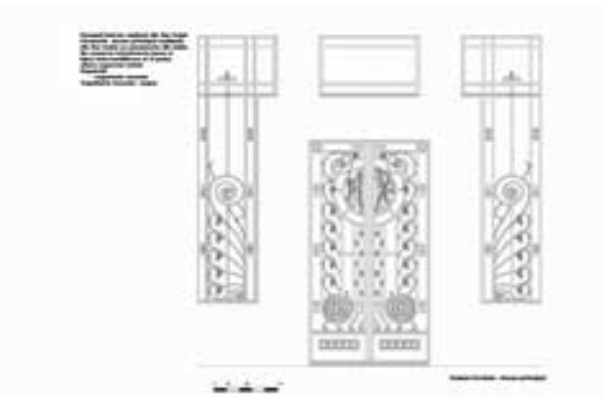
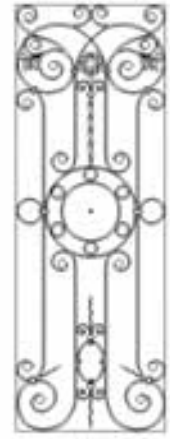
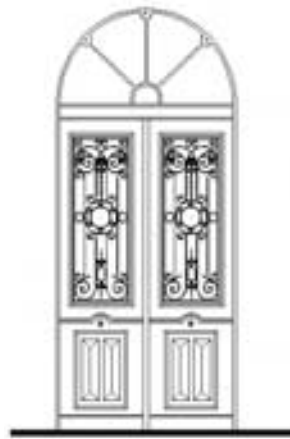
##### *Case no.2:*

##### *The architect involved in the conservation of 'listed' historic buildings*

He needs more specific technical competences concerning the wise management of non-renewable resources.

In this particular field, the conservation of material authenticity is an essential request: it refers to the original materials and workmanship, but also to the building's original technical concept.

The professional has to have a sound judgment and a clear sense of proportion in deciding the restoration treatment, based on a good knowledge of the constructive tradition.



Generally speaking, the growing sensibility of the society for the cultural heritage preservation and the rational use of the built resources generates a special interest for the constructive tradition knowledge.

This knowledge has practical relevance for several reasons:

- The buildings' physical decay depends on the properties of the materials and techniques used.
- The constructive characteristics of the building determine its 'response' to use requirements
- The compatibility of the treatment technology can be ensured only by understanding the old building as the product of a specific technological civilization
- The study of constructive tradition is a source of compatible treatments
- The cultural resource's quality of being a historical document is essentially based on the authentic information supplied by the original materials and techniques.
- The architectural expressivity is supported by materials and techniques; they are an intrinsic part of the artistic expression.

## **II. Competences in New Construction Based on Traditional Constructive Knowledge**

### *Constructive Tradition vs Modern Technologies*

A reconsideration of traditional materials and techniques can be noticed all over the world during the last decades.

In building restoration the return to traditional materials and techniques has accompanied the growing reserves toward new techniques, largely experimented in the past due to great enthusiasm and unlimited confidence in the technological progress.

The abandon of pre-modern techniques represented an unjustified and serious loss of technical culture (not necessarily 'expired') in favor of new materials, insufficiently tested, often proved to be inefficient, even harmful and of doubtful durability.

What happened in the restoration field demonstrates that an exaggerated enthusiasm in front of new achievements and the total abandon of the traditional, long-time verified knowledge, is a risky attitude.

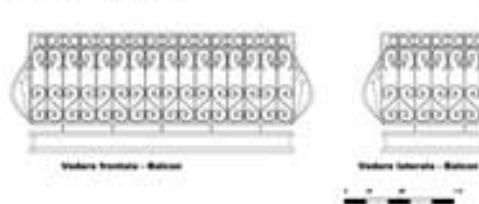
The new construction is also facing new offers of new tempting materials.

Unlike traditional materials, some contemporary, experimental, attractive but untested industrial materials and systems may be not so adequate to local environmental conditions and internal comfort requirements; they could imply exaggerated investments and/or constant and expensive maintenance.

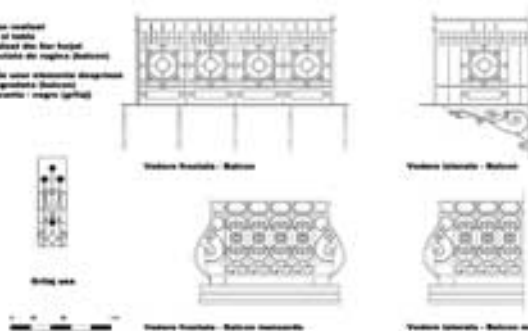
Common architectural production is still strongly tied to tradition. Traditional materials and techniques are still largely used and useful. Their use has been and could still be perfected by the building industry



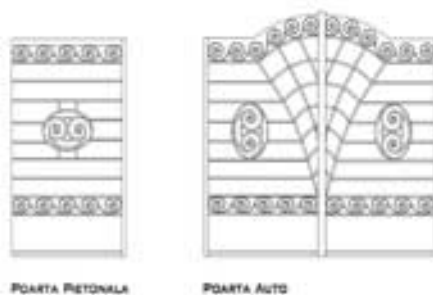
**Parapet balcon realizat din fier forjat si tabla**  
**Elemente afectate de rugina**  
**Reparatii**  
**- suduri ale unor elemente desprinse**  
**Vopsitorie degradata**



**Parapet balcon realizat**  
**din fier forjat si tabla**  
**Grilaj sau scuturati din fier forjat**  
**Elemente afectate de rugina (balcon)**  
**Reparatii**  
**- suduri ale unor elemente desprinse**  
**Vopsitorie degradata (balcon)**  
**Reparatii ruginii / magru (grilaj)**



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and/or by applying new concepts in building design (such as rational energy use or building industrialization)

*The competence in using traditional knowledge for new constructions is still in actuality.*

*The constructive tradition represents a rich heritage of knowledge, tested on site for a long period of time*

*The creative encapsulation and synthesis of the traditional knowledge could help the future graduate to face major requirements of rational use of energy and environmental protection.*

*' There is no dichotomy between modern buildings and historic buildings – they both are used and abused, and have to stand up. However, it is still not realized how sophisticated traditional building techniques were. Since they have failed to understand buildings as a whole, designers using modern technology have now to relearn many lessons.'*

*(FEILDEN, B.M., Conservation of Historic Buildings. Architectural Press, Oxford, 1996)*

#### *The Traditional Bio-Climatic Building Concept*

The increasing interest in producing 'sane' and 'sustainable' buildings has brought in attention the traditional, natural materials; bio-climatic building concepts, belonging to an ancient tradition, almost forgotten, are now rediscovered.

Historic buildings have low energy consumption, climatic adaptability and long life, so the lesson learned from their study is relevant to modern architecture, which should aim at the same qualities.

The way to prepare for the future is not by denying and abandoning the inherited knowledge, but by critically revisiting it so that new and more appropriate methods, technologies, rules and practices may be developed.

## **Educational Strategies and Methods**

### **The History of Techniques as Cultural Reference in Teaching Construction**

A historical approach of the relation between formal expression and technological support can help the student understand the relation between 'architecture' and 'construction' and mentally repair an artificial fracture deeply affecting present society, professional practice and educational system.

The 'History of Building Techniques' (optional course for the 3rd year) tries to facilitate the understanding of architecture in a synergic relation with its constructive part.

The practical exercises are inviting the student to explore a design concept already materialized into a historic building, or to investigate major technical events in the history, which have generated important movements in the architectural expression.

In the same idea, students are asked to make surveys of historic buildings and their components, relevant for the relation between traditional techniques and architectural quality.



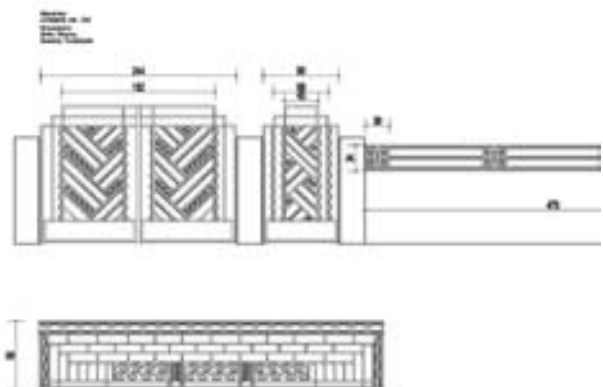
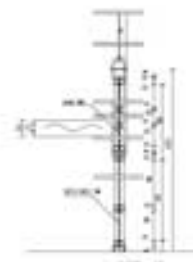
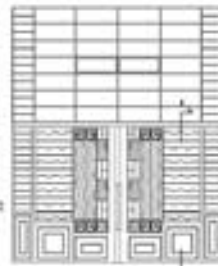
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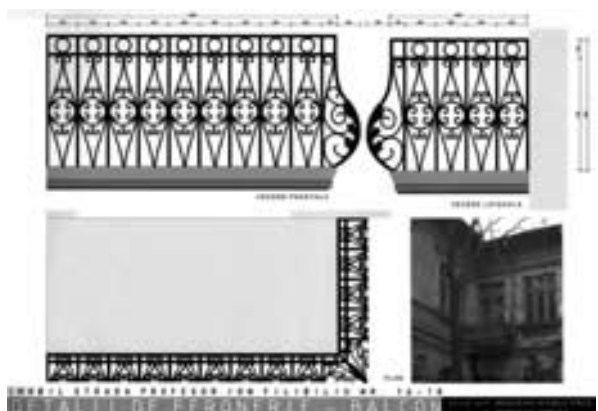
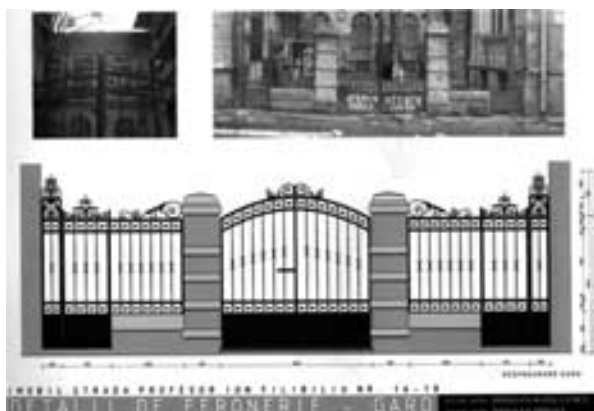
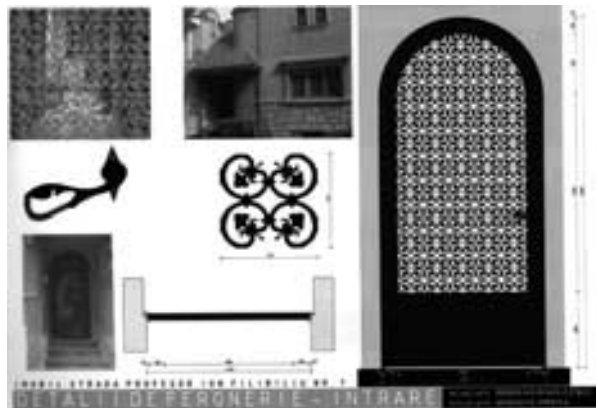
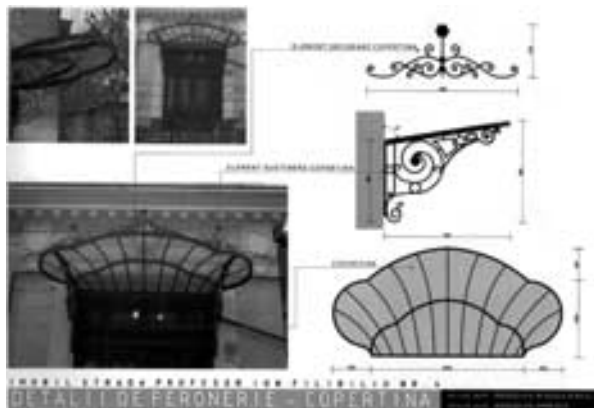
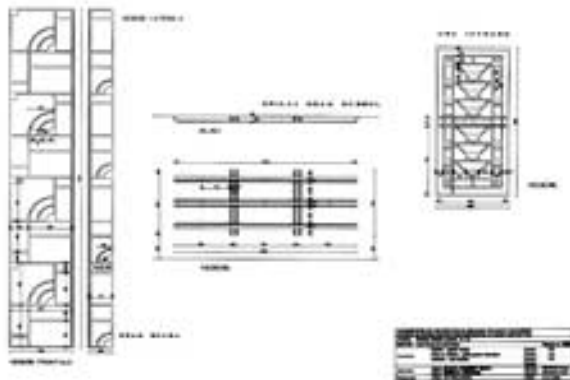


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Historic references are also present in other technical classes, trying to help the student understand the relation between an architectural expression and its technological support.

The 'Static of Built Forms' (new compulsory course for the 1st year) is conceived as an introduction in the constructive logic of architecture; it is mainly based on the static analysis of famous buildings, from ancient times to nowadays.

The 'Building Systems' class (compulsory discipline for the 2nd year) introduces basic notions on different possible ways to build with wood, steel, masonry and reinforced concrete. The didactic approach is based on the exploration of historic and contemporary architecture.

### **The Constructive Tradition as 'Futuring' Instrument**

As the role of anticipation becomes increasingly vital for responding to our fast changing civilization, the 'futuring' (i.e. the thinking about the future) needs to be formally included within architectural practice and education.

Certain technical classes include problems and issues that have within the seed for engaging the future thinking.

The 'History of Techniques' as well as the 'Building Systems' class propose an examination of the way the future has been constructed in the past, pointing out how the technical progress has generated new ways of building and new architectural expressions.

### **Teaching Traditional Knowledge for Historic Building Restoration and Rehabilitation**

The traditional materials and techniques are studied in a specialized (optional) class: History of Building Techniques.

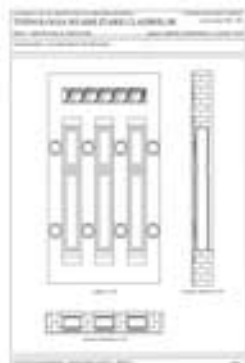
Some other (optional) disciplines dedicated to building restoration and rehabilitation (Technology of Building Rehabilitation, Restoration Techniques, Structural Restoration) also include the study of traditional materials and techniques.

Within these classes, the characteristics of traditional materials are put in relation with specific physical decay symptoms, the diagnosis and the choice of an adequate treatment.

This kind of approach can also help to understand the possibilities to prevent the physical decay phenomena in the case of new construction by correct use of materials and detail design.

The practical exercises associated to disciplines dedicated to the conservation of historic buildings generally consist in case-studies.

For example, the 'Technology of Building Rehabilitation' class requires the student to elaborate the diagnosis and treatment strategy for a historic house, in base of an architectural and technological preliminary evaluation.



Traditional techniques, as well as the relationship between historic buildings and modern treatment technologies, are practically experimented by the students in restoration sites.

