



Date:	REGISTRATION OF COURSES	RESPONSIBLE OF REGISTRATION:
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AREA OF KNOWLEDGE	SUB-AREA	UNDERGRADUATE	POSTGRADUATE
BASIC SCIENCES			
ECONOMICS AND SOCIAL SCIENCES			
HEALTH SCIENCES			
ENGINEERING, ARCHITECTURE AND TECHNOLOGY	Architecture	X	
EDUCATION SCIENCES			
HUMANITIES AND ARTS			
AGRICULTURAL AND SEA SCIENCES			
MILITARY ARTS AND SCIENCES			
SAFETY AND CIVIL PROTECTION			
INTERDISCIPLINARY			
OTHERS			

ADSCRIPTION OR BRANCH (ES):

FACULTY	Architecture and Urbanism
SCHOOL	Architecture
INSTITUTE	
DEPARTMENT	Technology Sector
OTHERS	

COURSE:

NAME	CONSTRUCTION MATERIALS
CODE	2062
EXECUTIVE UNIT	
CLASSIFICATION	Compulsory / Theoretical
APPROVAL DATE	
UPDATE DATE	
APPROVAL AUTHORITY	
CREDIT UNITS	3 (THREE)
HOURS/WEEK	4 (FOUR)
REGIMEN	Semi-Annual
ACADEMIC PERIODS	
REQUIREMENTS	Technology and Architecture
PROFESSOR	Marieva Payares Ríos



PURPOSES

That the student comprehends the existing interrelation between the technology of components, elements and construction materials and the design process, and acquires conscience of the importance that has the knowledge of those technologies on the proper decision take in the architectonic work.

LEARNING OBJECTIVES

At the end of the course the student in the technological development context of the country must be able to:

1. Define, describe and evaluate the building materials from its genetical origin, composition, properties, historical evolution, extraction processes, behaviour against mechanical efforts, environmental factors, fires, economic factors.
2. Identify possibilities and limitations of building materials for its proper handle and structural and non-structural application in the design, construction and maintenance of the architectonic work.
3. Establish the functions of the role of the architect on the building stages production.
4. Formulate the existing relations between construction reality and architectonic expression.



CONTENTS

Subject 1. Building materials

The construction fact and its compositional elements. The role of the architect in construction. Needs of the buildings. Building materials evolution and structural typologies. Importance of knowledge of materials for its handling and application. Materials classification.

Subject 2. Natural stone materials.

Rocks: History of its use in the construction, classification, characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, structural and non-structural applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. **Masonry:** Concept, principles.

Subject 3. Artificial stone materials.

Clay as raw material: Definition, composition, history. **Ceramic products** (baked clay): Types (Pottery, porcelain and stoneware), characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, structural and non-structural applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. Traditional earth architecture (Non-baked clay): Rammed earth, bahareque and earth brick.

Quartz as raw material: Definition, composition, history. **Vitreous products:** Definition, characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. Curtain wall: Definition, characteristics, advantages and disadvantages of its use, the risk of fires and earthquakes.

Binders: Definition, composition, history. **Binders types:** Gypsum, lime and cement. Agglomerated products: Pastes, mortar and concrete. **Gypsum** (Pastes raw material): Definition, composition, characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, applications, construction processes, costs, possibilities, limitations, advantages and disadvantages. **Lime** (Pastes and mortars raw material): Definition, composition, characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, applications, construction processes, costs, possibilities, limitations, advantages and disadvantages. **Cement** (Pastes, mortars and concrete raw material): Definition, composition, characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, applications, construction processes, costs, possibilities, limitations, advantages and disadvantages. **Concrete** Definition, most used types,



components, characteristics, mechanical and physical properties, extraction process, commercial forms, structural and non-structural applications, joints, construction processes, costs, possibilities, limitations, advantages and disadvantages.

Subject 4. Bituminous materials.

Hydrocarbonated binders: Asphalt and bitumen: Definition, composition, characteristics, mechanical and physical properties, most used types, extraction process, commercial forms, applications, construction processes, costs, possibilities, limitations, advantages and disadvantages. **Surfaces impermeabilization:** Types, forms and processes.

Subject 5. Metallic materials.

Metals: Definition, most used types on construction. **Iron and steel:** Definition, composition, characteristics, physical and mechanical properties, most used types, extraction process, commercial forms, structural and non-structural applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. **Aluminium:** Definition, composition, characteristics, classification, mechanical and physical properties, most used types, extraction process, commercial forms, structural and non-structural applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. **Other alloys: Copper and bronze.** Definition, composition, characteristics, classification, mechanical and physical properties, most used types, extraction process, commercial forms, applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages.

Subject 6. Organic materials.

Wood: Origin, definition, composition, characteristics, mechanical and physical properties, most used types, extraction process, protection and conservation methods, commercial forms (natural and laminated products), structural and non-structural applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. **Cane, cork and fabrics.**

Subject 7. Chemical materials.

Plastic: Definition, composition, characteristics, classification, mechanical and physical properties, most used types, extraction process, commercial forms, structural and non-structural applications, construction processes, joints, costs, possibilities, limitations, advantages and disadvantages. **Paints:** Definition, classification, characteristics, properties, uses, application form, and performance.



INSTRUCTIONAL STRATEGIES

The contents are dictated through lectures supported by samples of construction materials, catalogues of products and audio-visual resources such as transparencies and illustrative slides of the characteristics, extraction processes and applications of materials in buildings. When the size of the group allows it, visits to construction sites or building materials companies are arranged.

EVALUATION

During the semester four evaluations are carried out: Three theoretical exams and one final work of practical application of knowledge of materials which content is being developed by the student and corrected throughout the semester to finally present it in class.

TEXTBOOKS (If possible, according to contents)

