



**DEPARTMENT OF ARCHITECTURE
UNIVERSITY OF THE PUNJAB, LAHORE.**

**BACHELORS OF ARCHITECTURE (B. ARCH)
5 YEARS PROGRAM**

COURSE OUTLINE

Course Title	Material and Construction Systems I
Course Code	ARCH-151
Credit Hours	2
Semester	Spring
Prerequisites	NA
Tutor	As per Timetable
Student Advising	As per Timetable
Contact	-

Teacher Signature

Chairman Signature

Course introduction

Material and construction systems are a course the familiarizes the student with construction material and their installation techniques the course. Is offered in three levels the material and construction I focuses on the basic construction materials including line timber cement motor, concrete and substructure.

Learning Objective:

This course will give students a detailed understanding of materials commonly employed in Architecture and construction (line, timber, masonry, concrete) including their methods of manufacture, material properties, and life-cycle impact. The course will provide detailed guidance on material preparation (e.g. concrete) and material testing that are commonly employed in the construction and civil engineering disciplines.

Outcome

Course learning outcomes are as following.

1. Explain the specification of basic construction material and appropriate Industry standards.
2. Describe the manufacture process of Basic construction materials
3. Describe the basic material properties of a range of construction materials and the means by which they can be obtained through testing.
4. Undertake detailed mix design for a range of concretes.

Learning Methodology:

- Lectures as provided in the schedule of the semester activities
- Study of Archival Material and recommended books
- Guest Lectures as per requirement
- Presentation on allocated topics

Grade Evaluation Criteria

Following, is the criteria for the distribution of marks to evaluate final grade in a semester.

Marks Evaluation	Marks in percentage
Sessional (Assignments, Quizzes, Presentations)	30
Mid Term	30
Final examination	40
Total	100

Content	
Unit 1	Introduction to building Construction I
Unit 2	Brick , Physical and chemical Properties of Material, Types of Brick, Brick work, testing and physical appearance of brick and characteristic of brick
Unit 3	Classification (type a, type b, type c, kinghar etc), bricks bond (English bond, Flemish bond ect), installation techniques and Manufacturing Process of bricks
Unit 4	Student Presentation
Unit 5	Physical and chemical properties of Building Stones, types of building stones available in Pakistan, quarrying method, perform are of installation and different techniques of installation
Unit 6	Lime material in construction chemical and physical properties, lime stone quarry crushing pulverization of lime production of lime, lime stone, lime stone block, work ability, hydraulic lime, kankar lime and Pozzolanas
Unit 7	Cement, different brand of cement manufacturing process of cement chemical and physical properties, port land cement, environmental impacts, uses of cement, field test of cement.
Unit 8	Timber, qualities of timber, different types of timber, chemical and physical properties of timber, extraction wooden logs, durability of service life, environmental impact and timber framing and joining

	detail.
Unit 9	Mid Term Exam
Unit 10	Cement Mortar, uses of cement mortar, formation of mortar, incept mortar, line mortar, cement and sand mortar, strength and resistance, method of lining, design and fluting, setting time, estimation of cement sand and water in mortar
Unit 11	Concrete, formation of concrete, ready mix concrete, slurry tenside strength, physical and chemical properties, formation (Cement Sand, aggregate and water) reinforced concrete, add mixture and fly ash.
Unit 12	Glass, physical and chemical properties, manufacturing process of glass, types of glass, uses of glass, manufacturer of glass, tempered glass, sand blasting, inlay design and framing for glass.
Unit 13	Field Trip (Visit to Ghani glass factory)
Unit 14	Metals, physical and chemical properties of metals, periodic table, alloys, life cycle and different uses of metals in Architecture and construction.
Unit 15	Foundations, types of foundation (deep foundation, shallow foundation), isolated footing, combined footing, material use for foundations
Unit 16	Walls, load bearing walls, non load bearing walls, partition walls, material use for the constructions of walls, thickness of mortar, scaffolding.
Unit 17	Final Presentation
Unit 18	Final Exam

Recommended Books/References	Simmons, Construction: Principles, Materials and Methods (7 th Edition) Bary, The Construction of Buildings (Vol. I) Bary, The Construction of Buildings (Vol. II) Bary, The Construction of Buildings (Vol. III) Bary, The Construction of Buildings (Vol. IV) Bary, The Construction of Buildings (Vol. V) ZH Syed, Materials for Construction
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