

# **CONTENTS OF COURSES OFFERED IN THE DEPARTMENT OF ARCHITECTURE**

## **ARC 101 - INTRODUCTION TO ARCHITECTURE I (3 Units) (H)**

The meaning of architecture/ role of the architect in society. Multi-disciplinary nature of the profession. Cultural origins. The social context of architecture. The building industry and the co-ordinating role of the architect. Design, as the focus of the architect's training. The design environment (i.e. internal and external); services.

## **ARC 102 - INTRODUCTION TO ARCHITECTURE II (2 Units) (R)**

An introduction to various types of structural forms, as a systematic classification informing structural decisions, in relation to architectural design. A survey of structural systems in various building types. An examination of basic principles, spatial qualities and historical development of each system. Specific topics: structural forms (solid structures, skeletal structures, surface structures); innovative structural systems (arches, domes, cables, shells, pneumatic structures, etc.)

## **ARC 103 - GRAPHIC COMMUNICATION (2 Units) (H)**

Introduction to basic drawing techniques and conventions: presentation tools and techniques. Drawing tools and materials; the representation of common views. Graphic presentation using various media, and sketching for design development, Descriptive Geometry; orthographic projections of simple and complex geometric solids, Isometric, axonometric, oblique and perspective views. Lettering.

## **ARC 104 - INTRODUCTION TO ARCHITECTURAL GRAPHICS (2 Units) (H)**

Introduction to the uses of graphics in architecture. Graphic thinking and building representation. Representation of building elements and materials; their application in plans, elevations and sections. Projection techniques for shade and shadow construction. 3 - Dimensional drawings of building exteriors and interiors. Oblique, isometric, axonometric and perspectives. Rendering.

## **ARC 105/106 - FREEHAND DRAWING (2 Units each) (H & R)**

Introduction to freehand drawing in different media. Composition pattern and rhythm. Contour drawing, foreshortening, elements of drawing; Line, Tone, Shape, form, Texture. Landscape-drawing, figure-drawing, etc. Water and Poster Colours.

## **ARC 201/202 - ARCHITECTURAL DESIGN STUDIO I & II (4 Units Each) (H & R)**

Basic design using abstract forms to demonstrate design principles and the relationship between form and materials. Application of human scale through Anthropometric Studies, especially in relation to domestic spaces. Development of the understanding of design processes involving "Analysis-Synthesis-Evaluation", in the context of simple functional human spaces. Emphasis should be on design programmes of short duration, intended to highlight the problems of synthesizing solution in a creative manner.

### **ARC 203 - COMPONENTS AND METHODS (2 Units) (H)**

Introduction to the principles and forms of building construction. Functions of a building and its enclosure. Methods of building; Traditional, Post-traditional (or conventional), Rationalised. Foundations - Soils and characteristics of foundation types and choice. Lowest floor basements. Walls and Piers. Types of walls; external walls and internal partitions. Openings: door and window-types. Internal divisions and components: partitions, staircases. Suspended floors/ceilings. roof-types and basic principles.

### **ARC 204 - COMPONENTS AND METHODS II (2 Units) (R)**

Introduction to the basic materials and elements of construction including their properties and performances. General characteristics and properties of materials (sand, clay and stone). Laterite and earth construction. Masonry elements; bricks-production, properties of bonding and construction. Cement manufacture, types and properties of concrete: materials mix and properties (water: cement ratio, workability, curing tests). Reinforced concrete, sandcrete and concrete block - production and use. Timber: hardwoods and softwood. Properties and defects. Treatment, forms and uses.

### **ARC 205 - HISTORY OF ARCHITECTURE I (2 Units) (H)**

A survey of Traditional Architecture in Africa with emphasis on form, spatial content, and the factors determining form.

### **ARC 206 - HISTORY OF ARCHITECTURE II (2 Units) (R)**

Prehistoric Architecture of Early Civilization: Ancient Egypt, Babylon, etc. Egyptian Architecture, Greek Architecture and Roman Architecture.

### **ARC 207 - ARCHITECTURAL GRAPHICS (2 Units) (H)**

Introduction to different presentation techniques. Rendering in pencil, pen and other media. Perspective techniques, aids and shortcuts. Lettering types and application. Use of colour in architectural presentation.

### **ARC 208 - BUILDING SERVICES 1 (2 Units) (R)**

Utility and environmental services in buildings and aspects of providing these services. Water supply - various sources of water; mains water-supply, including production and distribution. Drainage - rainfall and stormwater disposal. Sanitation: domestic and industrial waste disposal; materials for plumbing; sanitary appliances. Pipework details, sewage disposal and treatment. Toilet types: pit, V.I.P. toilets Septic tanks/central sewage treatment.

### **ARC 209 - MODELLING WORKSHOP (1 Unit) (H)**

Functions of models in design. Basic model-making materials and finishes. Model-making adhesives. Basic cutting tools for modelmaking. How to make a Site Model. Rough model. Presentation models. Models as Graphic Aids. Using a Modelscope. Increasing the "Reality" illusion. Presentation and exhibition. Hand lettering as a design component. Display: Mounting materials/presenting design ideas. Slide-projector Presentation. Report compilation. Report-binding.

### **ARC 211 - ARCHITECTURAL STRUCTURES I**

Introduction to the mechanics and design of building structures. The object of structural design. Statics of Particles – Forces in a plane and Forces in space. Statics of Rigid bodies in two dimensions. Statics of Rigid bodies in three dimensions. Properties of structural sections – centroid. First Moment, of Area, Moments of Inertia, Compound Sections, Radius of Gyration, Polar Moment of Inertia, Section Modulus, Principal Axes and Principal Moments of Inertia. Mohr's Circle for Moment and Products of Inertia.

### **ARC 212 - ARCHITECTURAL STRUCTURES II**

Shearing Stresses. Analysis of Stress and Strain (2/3 dimensional). Longitudinal Stresses in Beams. Shearing Stresses in Beams. Beams of Two Materials. Combined Bending, Direct Stresses. Torsion. The Principle of Virtual Work and its Application, Strain Energy/Complementary Energy. Deflection of Statically Determinate Beams. Elastic Buckling of Columns and Beams. Vibration in Beams

### **ARC 301/302 - ARCHITECTURAL DESIGN STUDIO V & VI (4 Units each) H & R**

The studio focusses on the development of site-planning issues in the context of different topologies. The appreciation of the peculiarities of different types in architecture, are introduced as rich sources of concept-formation.

### **ARC 303 - COMPONENTS AND METHODS III (2 Units) (H)**

Materials of construction and their various forms, properties and uses. Sand, clay and stone. Laterite and earth construction. Timber products-conversion, sizes and uses. Plywood, blackboard laminate and particle board. Woodwork, softboard. Metals and their uses in construction. The ferrous products and steel. Non-ferrous metals and uses in building components and finishes. Aluminum properties and use. Cement-manufacture and types. Sandcrete and concrete blocks: production and use. Reinforced concrete.

### **ARC 304 - COMPONENTS AND METHODS IV (2 Units) (R)**

Principles of building construction treated in greater depth. Construction detailing as required in working drawings. Advanced foundation types, retaining walls, tanking and basements.

Methods of building and component design. Dimensional coordination, External walls and facings. Panel and curtain-walling. Internal partitioning systems. Timber wall-framing and construction, Roof-training and construction. Staircase-construction and detailing in timber, concrete and steel.

### **ARC 305 - HISTORY OF ARCHITECTURE III (2 Units) (H)**

History of Western architecture from Byzantine Architecture to Post-Renaissance (including Romanesque, Gothic, Renaissance, Baroque and Rococo Architecture).

### **ARC 306 - HISTORY OF ARCHITECTURE IV (2 Units) (R)**

History of Western architecture from the industrial Revolution to the 19th Century. Pre-colonial and colonial Architecture in Africa.

### **ARC 307 - ARCHITECTURE AND CLIMATE I (2 Units) (H)**

Introduction to the major elements of climate; their influences on the built environment and the methods of control used by Environmental Designers. Classification of Tropical climates; their major characteristics. Micro-climate, local factors and the designer's task. Bioclimatic considerations; comfort levels: thermal comfort factors, solar control and shading devices. Graphical methods to determine the sun's path: shade dial and dial charts. Types of shading devices: horizontal, vertical and egg-crate, and their variants. Uses of vegetation in solar control.

### **ARC 308 - ARCHITECTURE AND CLIMATE II (2 Units) (R)**

Solar illumination Factors affecting daylight calculation; components of daylighting; methods of predicting natural lighting levels. Thermal comfort: building heat-loss calculations, heat transfer etc. Ventilation.

### **ARC 309 - INTRODUCTION TO URBAN DESIGN (2 Units) (H)**

Definition and scope of Urban Design. Historic contributions to Urban Design. Physical, psychological and social functions of urban areas. Latent and manifest aims of Urban Design. Elements of Urban Design; space between buildings, human awareness of space in the city. Public space and their functions.

### **ARC 310 - BUILDING SERVICES II (2 Units) (R)**

Electricity; general principles, electricity - generation transmission. Direct and alternating current supply. Three - phase and single-phase supply. Basic domestic wiring systems. Principles of circuit-breakers, fuses, switches, relays and safety precautions. Earthing, lighting protectors, wiring for industrial installation; telephone and communication systems. Gas and its distribution for use in domestic buildings.

### **ARC 311 - ARCHITECTURAL STRUCTURES III**

This course introduces the student to various types of structural forms to enable him make a systematic classification of approaches to structural decisions, in relation to architectural design.

Survey of various structural systems used in building of various types. Basic principles of each system are examined including its relationship to spatial quality and the historical development of the system. Topics covered among others will include the following: Structural forms – solid structures, skeletal structures, surface structures. Innovative structural system - Arches, Domes, Cables, Shells Pneumatic structures, etc.

### **ARC 312 - ARCHITECTURAL STRUCTURES IV**

The objective of this course is to acquaint students with structural analysis which will allow them to take effective design decisions. It is an in-depth study of the behaviour of structures under different types of loading. Topics covered are: Shear and Moment Diagrams. Relationships and Load, Shear and Bending moments. Analysis of Indeterminate Structures. Using slope – deflection and moment – distribution methods.

### **ARC 313 - ENVIRONMENTAL PSYCHOLOGY I (2 Units) (H)**

The development of Environmental Psychology. Architecture and Environmental Psychology. The design process, and the uses of environmental psychology. The thermal environment, the acoustic environment; the luminous environment, the spatial environment.

Building evaluation. Obstacles to the use of results from Environmental Psychology research.

**ARC 314 - ENVIRONMENTAL PSYCHOLOGY II 2-0-0 (2 Units) (R)**

The image of the city: legibility, structure and meaning. Organizing a coherent city form. The city: understanding the city; living in the city. Some social issues and city life. Housing and lifestyle; housing and social issues and city life. Housing and lifestyle; housing and social class. The city and pathology. Housing and stage in the lifecycle.

**ARC 401/402 - ARCHITECTURAL DESIGN STUDIO VII & VIII (5 Units each) (H & R)**

Design problems of increasing structural and planning complexity. Such problems shall provide full opportunity for co-ordinated group-work in conducting physical and/or socio-economic programmes and final drawings.

**ARC 403 - COMPONENTS AND METHODS V (2 Units) (H)**

Building components: their use and detailing. Internal finishes to buildings. Design and fabrication of components. Joinery detailing. Panelling, Windows. Doors and their functional requirements. Suspended ceilings. Finishing to floors, walls and other partitions.

**ARC 404 - COMPONENTS AND METHODS VI (2 Units) (R)**

Glass and glazing. Plastics, rubbers and related products. Bituminous products. Adhesives. Wall-tiling and mosaics. Thin, surface finishes: paints, vanishes and sprays (types and application)

**ARC 405 - HISTORY OF ARCHITECTURE V 2-0-0 (2 Units) (H)**

Current trends and contemporary philosophies in Architecture. Modern movements in Architecture worldwide (including the study of early Modern Architecture in Africa)

**ARC 406 - PROJECT DISSERTATION: (3 Units) (R)**

The student is expected to complete an independent research project that will make a reasonable contribution to Architecture and the general field of Environmental Design. The objectives is to provide an opportunity for the student to synthesize knowledge and skills acquired during his training. The project dissertation should be presented in the form of a bound report with appropriate illustrations.

**ARC 407 - LANDSCAPE ARCHITECTURE (2 Units) (H)**

The nature, needs and objectives of landscape planning design. The relationship between building design and landscape architecture. The relationship between building and external spaces. Garden in history and design principles (as illustrated by the accounts of traditional Nigerian and classical world garden). Landscape-planning and design considerations for different land uses. Planning, design and management. Landscape: construction materials and techniques. Landscape development and ecology. Landscape impact assessment and conservation.

### **ARCH 408 - INTERIOR DESIGN (2 Units) (R)**

Emphasis is on shaping the environment centred on the individual's responses to the living pattern of society. Physical and psychological use of and response to residential, commercial and institutional spaces. The process of design in simple space-programming, and analysis and transmission of materials into an integrated, aesthetic and functional whole. Studio: The process of space/planning/design of commercial office interiors, residual interiors, from programme analysis to presentation drawing. The development of approaches to furniture arrangement, furniture, fabric and color selection. Lighting, interior landscaping, ventilation, air conditioning, materials and methods of construction: their effects on the character and quality of design solutions.

### **ARC 409 - ARCHITECTURAL STRUCTURES V**

Introduction to structural Timber, Analysis of stresses on wood. Properties of Timber and wood – 'based materials structural forms and Design of Timber. Solid structures, skeletal structures, Trusses and Girders'. Portal frames and arches. Spatial structures, surface structures. Design of Joints in Structural Timber. Criteria for selection of structural systems, Design and behaviour of steel structural members, Design for Flexure. Design of compression members.

### **ARC 410 - ARCHITECTUTURAL STRUCTURES VI**

Review of the properties and behaviour of concrete and steel – Strength, Durability, effect of temperature. Examination of reinforced concrete design philosophies – working stress. Limit state ultimate strength etc. Design of one way and two way slabs, Design of beams, for tension and compression columns and foundations. Architectural Structures VI

### **ARC 411 - HOUSING AND URBAN RENEWAL 1 (2 Units) (H)**

The concept of Housing: definitions and functions. Housing needs, demand and supply. Housing and its relationship: socio-economic, cultural, climatic, economics. Technology, housing surveys and data-gathering. Housing in the Third World. Spontaneous settlements and slums. Housing approaches. Types of housing provision. Low-Cost and Low-Income Housing. Site-Planning design considerations and construction. Site-development and sanitary and utility services. Housing design methodologies - densities and topologies.

### **ARC 412 - HOUSING AND URBAN RENEWAL II (2 Units) (R)**

Central Areas of Cities. Their form and functions. Urban decay. Problems of blight and slum areas. Urban-renewal techniques - goals and strategies. Central Area re-housing projects. Resettlement programmes and case-studies. Mass-housing Schemes: economy and design. Implementation of Housing and Urban Development Projects.

### **ARC 413 - FACILITIES MAINTENANCE I (2 Units) (H)**

Concept of maintenance. The significance of facilities maintenance. Resource of facilities maintenance. Nature maintenance. Life-cycle cost and cost of facilities in use. Consideration of maintenance at the design stage. Economics of maintenance.

### **ARC 414 - FACILITIES MAINTENANCE II (2 Units) (R)**

Facilities maintenance problems and their solution. Materials and components and their behaviour over the life-cycle: bricks, concrete, earth-construction; steel and wood. Site and site-condition and the problems of maintenance. Building components and maintenance problems. Execution of maintenance works.