

HARMATTAN SEMESTER 100 LEVEL ARC 111 FUNDAMENTALS OF DESIGN I: 2 Credit Units

Spatial analyses: anthropometric data, determination of minimum spaces for human comfort in diverse functional compositions in small domestic and public buildings. Determination of minimum spatial requirements for bed rooms, living rooms, kitchen, toilet etc. as well as corridors, stairways and hallways in shopping malls, office complexes, hospitals, schools, etc.

Assignment will be in the form of determination of minimal spatial requirements for simple functions in public buildings: a small reception room for a doctor's consulting room, reception room for a chief executive officer, a small public dining room in a small restaurant, a small architectural studio (for about 20 students) etc.

ARC 121 ARCHITECTURAL GRAPHICS AND LETTERING I: 2 Credit Units

Studio work in two and three dimensional graphics vocabulary. The emphasis is on the conceptual and perceptual techniques with measured and freehand drawings. Each student is to maintain an A3 size portfolio of drawings containing freehand sketches of buildings and their surroundings, measured drawings in orthographic, isometric and axonometric projections. Drawings in varying media, (ink, water, colour, oil, poster, etc). Students are to present a portfolio of work at the end of the semester.

ARC 123 FREEHAND DRAWING: 2 Credit Units

A freehand studio drawing course limited to pencil and pen, this introductory class concentrates upon seeing, describing, and analyzing form through linear graphic means.

It is an introduction to freehand drawing focused on the delineation of interior and exterior space, starting with drawing from observation to speculative drawings, including the study of light conditions.

Sketching and architectural drawing from life. The course aims at developing graphic language by which an architect explains buildings and other objects to himself and others using dry media such as pencils, crayons etc.

MTH 101 ELEMENTARY MATHEMATICS I: 4 Credit Units

Number systems, indices, surd and logarithms. Polynomials. Remainder and factor theorems. Polynomial equations. Rational functions. Partial fractions. Ordered fields. Inequalities mathematics induction. Permutations and combinations. Binomial theorem. Sequences and series. The quadratic equations and function. Relation between the roots and the coefficients. Complex numbers. Addition, subtraction, multiplication and division. Argand diagram, De-moivre's theorem. N-the roots of complex numbers. Elementary set theory. Venn diagrams and applications. De-Morgan's laws.

Trigonometry. Elementary properties of basic trigonometry function. Addition formula and basic identities. Sine and cosine formulae. Half angle formulae. Area of triangle. Solution of trigonometric equations. Inverse trigonometric functions. Functions, concepts and notations. Examples. Compositions. Exponential and logarithmic functions. Graphs and properties. Limits and continuity. Techniques for finding limits. The derivative. Calculation from first principles. Techniques of differentiation. Chain rules. Higher order derivatives. Extreme problems. Mean-value theorem. Applications. Indeterminate forms and L'Hospital's rule. Taylor's and Maclaurin's series. Curve sketching. Integration as the reverse of differentiation, as area, as limit of infinite sums. Definite Integrals. Properties of definite integration applications.

PHY 101 GENERAL PHYSICS I: 4 Credit Units

(Three 1-hour lectures, one hour tutorial and three hours laboratory per week).

Mechanics: space and time, units and dimensions; vectors; kinematics, Newton's Galilean invariance, statics and dynamics of particles; universal gravitation; work and potential energy; conversion of energy and momentum; rigid bodies, fluid mechanics. Thermal physics; thermal properties, including elementary thermodynamics and kinetic theory. (Pre-requisites; credit in O'level physics and mathematics and concurrent registration in MTH 101.)

ENG 101 WORKSHOP PRACTICE I: 1Credit Unit

General; use of engineering measuring instruments e.g., callipers gauges etc. introduction to hand tools, e.g. practice in wood planers, saws; sanders pattern making; sampling sizing techniques of raw materials. Sheet-metal work; production of sheet-metal work; production of sheet metal products- layout cutting and shaping, gas welding, soldering, brazing, fastening, assembly. Woodwork; basic woodworking principles and tools- layout methods cutting and shaping, finishing evaluation finished products.

ENG 103 ENGINEERING DRAWING I: 1 credit unit

Graphic tools introduction to drawing, measuring lettering and dimensioning of objects in various positions, sketching, engineering geometry. Fundamentals of orthographic projection. Graphs charts and presentation of data and results.

GST 101 USE OF ENGLISH I: 2 Credit Units

Use of library, use of words and sentences - purpose structure, correct use of verbs (action word) word order and punctuation, essay/composition writing. Paragraphs - structure links and style. Exposition - description and explanation.

Special type of exposition e.g. letter writing, layout of a business letter, technical reports-including terms of reference, drafting and editing of reports.

GST 103 HUMANITIES I: 1 Credit Unit

The nature and scope of economics. The Nigerian political system; policy and means of production in Nigeria. The structure of Nigerian economy; aspects of economics and technological dualism; internal migration-rural to urban migration and inform section.

The role of capital growth and development; public investment criteria; choice of appropriate of relevant technology, human resources and development in Nigeria-labour utilization education and man power development and planning. Agriculture in the development process; land tenure and reform, agricultural technology and green revolution and integrated rural development, industrialization; role and type of industry. Choice of techniques, import substitution and export expansion. The economic role of the government. Government expenditure and taxation, federal structure, fiscal federalism and revenue collection; the financial system. Problems of development planning and planning implementation in the Nigerian federal system of government. Prospect of the Nigerian economy.

IGB 101 INTRODUCTION TO IGBO GRAMMAR: 1 Credit Unit

Composition and comprehension. This course will equip the student with the basic skills: listening, speaking, reading and writing in the approved orthography as the basics for standard Igbo.

FRN 101 FRENCH LANGUAGE I: 1 Credit Unit

This course will introduce the students to the basics of French Language such as greeting in French, French alphabets, vowels, pronunciation and accents. The students will also learn the components of French grammar as the article, verb, etc.

RAIN SEMESTER 100 LEVEL:

ARC 112 FUNDAMENTALS OF DESIGN II: 2 Credit Units

Presentation of architectural sketches (free-hand sketches and measures drawings) of simple case-studies using monochromatic and polychromatic techniques. Techniques for coding of architectural drawings.

Semester project to be presented in the form of a portfolio consisting of simple, functional analyses, freehand sketches and measured drawings of a specified case-study (an existing drawing) on A- 3 paper; to be graded; preferably by a departmental jury or panel.

ARC 122 ARCHITECTURAL GRAPHICS AND LETTERING II: 2 Credit Units

A continuation of Architectural Graphics I. Introduces techniques of architectural communication including orthographic projection and sketching as well as 3D views and modelling. Requires the production of plans, sections, elevations and 3D views and models of a simple building including dimensioning and detailing.

The skill of communicating through the graphic media of freehand and instrumental drawing including measured drawings. Architectural presentation, isometric, simple perspective, shades and shadows.

Development of skills in graphic visualization, representation and communication as used in architecture and related design fields. Concepts and conventions, from freehand to digital media and production, used as a means to imagine, develop and represent design ideas.

MTH 102 ELEMENTARY MATHEMATICS II: 4 Credit Units

Transcendental functions. Hyperbolic functions. Inverse functions. Logarithmic differentiation Method of integration, integration of rational functions. Integration by substitution. Integration by parts. Improper integrals Applications of areas and volumes. Centre of mass, ordinary differential equations, first-order equations with variable, first-order equation second-order equation, homogenous equations with constant coefficients. Applications of plane analytical geometry. Rectangular Cartesian coordinates. Distance between two points. The straight line loci. The circle parabola, eclipse and hyperbola. Second degree curves. Plane polar coordinate system.

Graph of plane equations. Plane areas in polar coordinates. Vectors: vector addition and multiplication, product of three or more vectors. Vector functions and their derivatives. Velocity and acceleration matrix, algebra. Addition and multiplication to the solution of determinants. Inverse of non-singular matrices. Cramer's rule and application to the solution of linear equations. Examples should be limited to non-matrices where $m=3, n=2$). Composition of the plane. Translation, reflection, rotation, enlargement, shear.

Composition of transformations. Invariant points and lines. (Pre-requisite; credit pass in O'level mathematics)

PHY 102 GENERAL PHYSICS II: 4 Credit Units

(Three 1hour lecture, one hour tutorial and three hours laboratory per week).Electricity and magnetism; electro-statics; conductors and currents; dielectrics and magnetic fields and induction; Maxwell's equations; electromagnetic, oscillations and waves.

Geometrical optics; geometrical methods applied to the optics; of mirrors, lenses and prisms. (Pre-requisites; previous registration,

PHY101 and MTH 101).

ENG 102 WORKSHOP PRACTICE II: 1 Credit Unit

Industrial safety; behaviour analysis and safety consciousness. Survey of source of common accidents. Accident prevention and control. Machines- workshop; lathe work instruction of metal working process, shaping milling, grinding, and metal spinning, etc, design of simple jigs fixtures. Automobile work; simple automobile diagnosis and repairs. Electric workshop practice; convention and application of colour codes and signs etc use of the electrical tools. Machine cables and conductors.

ENG 104 ENGINEERING DRAWING II: 1 Credit Unit

Guide, sketching, freehand creative thinking and multi-view representation, revolution and conventional practices.

Sectional auxiliary views. Spatial relationships; basic descriptive geometry, development and intersection, pictorial presentation.

GST 102 THE USE OF ENGLISH II: 2 Credit Units

Comprehension and interpretation - reading efficiency of technical and nontechnical materials. Note taking; techniques of note taking from reading and from lectures, precise-writing or summarizing methods, technical vocabulary, word formation, use of classical terms and phrases, special terms, acronyms, new words, choice of correct words, definition by example, synonyms and antonyms, analytic or operational definitions, basic words in fields or specialization, e.g. mechanical, electrical, civil, aeronautical, automobile engineering, metallurgy, mathematics.

GST 110 SCIENCE, TECHNOLOGY, SOCIETY: 1 Credit Unit

Science in society; history and nature of science. Methods and tools of science; research and inventions, unit and dimensions. Science and culture. Frontier of science; food, materials, energy population control, environmental pollution.

Careers in science and agriculture. Introduction to engineering; what engineers do and how it is done. Tools and engineering unit dimensions. Social, political and ecological consequences of engineering projects. Professional ethics and conduct.

Careers in engineering. History and impact of technology on society; roles of scientists and engineers in government decision making. Case study of contemporary problems; agriculture, rural development, industrialization, import/export, the economy and culture; past and present attitudes and concerns of society.

GST 108 SOCIAL SCIENCE I: 2 Credit Units

A global perspective of economics, institutions and developments. The law of scarcity and the technological choices open to any society. Trade development with special reference to trade in primary products, imports substitution and export possibilities in Nigeria and third world countries; Nigeria's balance of payments and commercial policies. Economic integration or unions. State and structure of economics of ECOWAS: prospect for industrialization, trade; fiscal and monetary policies for accelerated industrialization. Nigeria the ECA and economic co-operation in Africa.

IGB/FRN 102 INTRODUCTION TO IGBO LANGUAGE II: 1 Credit Unit

This course will expose students to various aspects of human life among the ndi-Igbo as follows: Igbo world-view, Igbo culture and history, Igbo in a world of art and civilisation. It will also provide a good exposure in area of Igbo Literature which embodies the totality of the Igbo world-view, including their social and cultural perspective, their aspirations and amenities, as some contemporary texts will be incorporated in the study.

IGB/FRN 102 INTRODUCTION TO FRENCH LANGUAGE II: 1 Credit Unit

Here the students will be drilled in French grammar proper, dialogue and other oral exercises. The student will also be introduced into reading, starting with France Afrique Book I. At the end of this course, the students should be able to speak basic French and be able to tell time in French.

HARMATTAN SEMESTER 200 LEVEL:

ARC 211 ARCHITECTURAL DESIGN I: 4 Credit Units

Foundational design studio sequence initiating awareness in the creative language of architecture through practical assignments in drawing, modelling, and artful making. Basic concepts of design as well as elements and principles of design are studied in-depth, including shapes, forms, scale, proportion, rhythm, unity, accent, texture, and pattern, as applied to two-dimensional and three-dimensional drawings. This studio, consisting of weekly exercises, addresses issues of architectural composition and form. These exercises are intended to establish proficiency with “the language of architecture,” as well as encourage Confidence in personal, formal proclivities.

Students are responsible for their weekly designs as well as for critiquing the projects of their fellow students; the goal is not only formal and compositional dexterity but also eyes that can see the organizational paradigms at work in any piece of architecture.

Semester project on forms to be presented, in the form of a portfolio comprising the full complement of architectural presentation drawings rendered in pen and ink (monochromatic technique), to the departmental jury. The portfolio should, in addition, include 3 dimensional presentations (exterior perspective and axonometric drawings), and an appropriate architectural model.

ARC 221 ARCHITECTURAL GRAPHICS AND LETTERING III: Credit Units

Continuation of ARC. 122. More exercises in freehand drawings and measured drawings in monochromatic and polychromatic techniques.

Perspective drawings, including 2-point exterior perspectives (normal eye-level and aerial) and 1-point interior perspectives. Advanced techniques in production of presentation drawings, with emphasis on rendering: colour, line, texture and form as effective elements of visual communication.

ARC 223 DESCRIPTIVE GEOMETRY I: 1 Credit Unit

Basic principles in orthographic projections, first-angle and third angle projections. Points, lines in space, planes and geometrical solids in orthographic protections. Auxiliary planes and the application of the concept of transformation on designated planes to determine true shapes and true dimensions, etc. Other projections: isometric, oblique and axonometric projections.

ARC 231 INTRODUCTION TO ARCHITECTURE I: 1 Credit Unit

An introductory course to the study of architecture, intended to grant the student understanding of the elements of architecture;

A course designed to introduce concepts, theories, and practices of the discipline of architecture. Includes the study of perception, environmental and historical concepts through lectures and individual projects in observing and making architectural space. The remote origins of architecture as a distinct form of human endeavour in the course of human civilization.

Definitions of architecture and of the architect.

Opportunities within the architectural profession are explored. The national structures for the promotion and regulation of training and professional practice of architecture in Nigeria: the roles of the Nigerian Institute of Architects (NIA), the Architects Registration Council of Nigeria (ARCON) and the Association of Architectural Educators of Nigeria (AARCHES).

The sub-regional and global (international) structures for the promotion and regulation of small shops and enterprises (like chemist shops, bookshops, beauty salons, etc): bubble diagrams and functional-flow diagrams (developed on the basis of field- studies and case-studies conducted by the students).

Interpretation of the elementary concepts of form in architecture (points, lines, planes, volumes etc.). Methods of expression of form in architecture: rigid, geometrical, organic forms, etc. Plastic composition and composition of form in architecture: symmetrical, asymmetrical and random compositions of form in architecture: rhythm, repetition, balance, harmony, proportion etc. Composition and treatment of surfaces in architecture: texture, contrast, colour, visual illusions etc.

Semester project to be presented in the form of a portfolio of drawings (on A-3 paper) to be graded preferably by a departmental jury or panel.

ARC 241 BUILDING COMPONENTS & METHOD I: 2 Credit Units

Study of components and methods of construction of simple building (bungalow and single-story) using masonry construction in conventional building types. Foundations, walls, basements, timber floors and roofs (with roof coverings in: slates, tiles, shingles, asbestos, metal roofing sheets etc) Modelling of structural members of any building type assigned by the course lecturer.

ARC 243 BUILDING MATERIALS I: 1 Credit Unit

Sand, Soil and clay-based building products: Types, Properties: strength, density, porosity, moisture absorption, efflorescence, thermal properties, durability etc. of these natural building materials.

Wood and woody materials: Types and classification of woods, uses of woods in buildings. Properties of wood: Strength, density, porosity, moisture-absorption, aesthetic qualities etc.

Stones, Gravels, and granites: classification of stones, uses of stones in buildings. Properties of building stones: Density, porosity, moisture- absorption, void-space, aesthetic qualities etc. Tests on building stones.

CAC 201 Computer and Applications I: 4 Credit Units

The discipline of computer science, evolution of computer systems; classification of computer; computer hardware, functional components, modern input/output units. Computer software, operating system, application packages, word processing, spreadsheet, rudiments of database, statistical packages, presentation of graphics and expert systems. Program development; flowcharts and algorithms. Data processing systems, data representation in digital systems. Number systems, Introduction to computer networks and the internet. Computer and society.

SVG 211 FUNDAMENTALS OF SURVEYING: 2 Credit Units

General History of Surveying. Use and care of surveying instruments. Design and adjustment of surveying instruments. Chain surveying. Theodolite and compass traversing. Levelling tachometry. Subtense bar and its uses. Preparation of large scale plans; contouring and plane tabling for large scale plans.

GST 201 SOCIAL SCIENCE II: 1 Credit Unit

Concept and meaning of development; traditional African - its geographic and ethnographical review, view its family structure, kingship, etc. socio-economic pre-occupation, political system, art and music, music modes of communication; Africa and processes of modernization, education, writing and the press, urbanization and social change, modern trends in art and aesthetics, nationalism and cultural revival, mass media and cultural development.

MTH 211 STATISTICS AND PROBABILITY: 3 Credit Units

Frequency distribution, measures of location and dispersion in simple grouped data. Laws of probability, the binomial, poisson and normal distribution. Estimation and test of regression and correlation contingent, tables and X2 applications

RAIN SEMESTER 200 LEVEL

ARC 212 ARCHITECTURAL DESIGN II: 4 Credit Units

Studio investigations of fundamental design concepts, issues and processes. Projects and exercises focus on the concepts of creating three- dimensional forms, massing and organization. Application of proportion, scale. Human activities, and site/building design relationships. Studio investigations of architectural designs based on small spaces in supporting human activities, structure and theory. Includes individual criticism, studio investigations of architectural designs based on supporting human activities, structure and theory. Includes individual criticism, lectures and seminars.

Development of design brief and definition of scope of project. Spatial analyses. Functional analyses and representations: bubble diagrams, functional-flow diagrams etc.

Presentation: submission of port-folio of presentation drawings for assessment at jury. Port-folio to include 3-dimensional presentations: exterior and interior perspectives, axonometric projections. Models: Portfolio of presentation drawings must be accompanied with an appropriate architectural model.

ARC 222 ARCHITECTURAL GRAPHICS AND LETTERING IV: 2 Credit Units

Advanced techniques in architectural rendering and presentation. Rendering in pencil, pen and ink, etc. 3-D presentations in deferent perspective methods in 2-point perspectives, interior perspective and sectional perspectives etc., Rendering of 3-D presentation drawings, with emphasis on monochromatic presentation techniques only. Advanced techniques in construction of architectural models.

ARC 224 DESCRIPTIVE GEOMETRY II: 2 Credit Units

Further work on orthographic projects: simple intersection of lines with planes, with solids, solids with solids. Construction of simple geometric forms: n-sided polygon in a given circle, n-sided polygon with a given side etc. Construction of curves and conic sections: circles, ellipse, parabola and hyperbola. Involutives to a square, cycloid and Archimedean spiral, locus of point, link mechanisms, and intersections of more complicated geometric forms. Developments of surfaces of solids, geometrical figures, before and after intersection.

ARC 232 HISTORY ARCHITECTURE I: 2 Credit Units

The course introduces students to leading developments in the history and theory of architecture and urban design from ancient times through the Renaissance. Architecture in the antiquity and classical era: Egyptian, Mesopotamian, Gothic and Roman architecture. Architecture in the early Christian era and Byzantine architecture etc. Innovation and change in architectural conception, stylistic expression, building typology, and construction technique are examined.

Attention is also paid to the way architecture has historically been shaped by varying combinations of the formal and theoretical intentions of the architect, the preferences and needs of the client, and the particular mix of social, economic, cultural, and technical factors operating to define the specific characteristics of a given time and place.

ARC 242 BUILDING COMPONENTS & METHOD II: 2 Credit Units

Construction of different types of staircases and their detailing. Construction and detailing of Doors, windows and Ironmongery,

ARC 244 BUILDING MATERIALS II: 1 Credit Unit

Concrete: cement, aggregates, water, mineral additives, etc. Types of concrete: normal-weight, heavy-weight and light-weight concrete. Special types of concrete: no-fines, aerated concrete, etc. Properties of fresh and hardened concrete. Tests on concrete.

Metals: Physical and chemical properties of ferrous and non-ferrous metals. Application of metals in buildings (galvanized iron, aluminium, brass, iron, mild steel, medium carbon steel, nickel and nickel alloys etc.). Characteristics of metals and building components. Corrosion of metal. Treatment of metals: cold-working, re-crystallization and hot-working of metals. Tests on metals.

ARC 246 STRENGTH OF MATERIALS: 2 Credit Units

Analyses of forces in a plane and in beams. Types of beams and supports. Forces, moments and calculation of supports in beams. Conditions of equilibrium in beams and structures. Shear forces and bending moments. Shear force diagrams and bending-moment diagrams. Pin-jointed frames and calculation of forces in members. Forces in girders, trusses etc. and redundant frames.

ARC 264 HUMAN SETTLEMENT I: 1 Credit Unit

Introduction to settlement. Geographical conditions necessary for human habitation. Early settlement patterns in Europe and Nigeria. A look at some Nigerian cities.

ARC 272 INTRODUCTION TO COMPUTER FOR ARCHITECTURE STUDENTS: 2 Credit Units

Basic computer terminology and software applications utilizing the microcomputer in architecture and design are studied. Introduction to computer-assisted design. Course focus on software as used in the architectural field. This skill-building course explores various applications of computer and computer-based technologies in the field and practices of architecture, including computer-aided designs, ICT, computerized management information systems etc. particular emphasis given to computer aided design (CAD) Software (AutoCAD, Archi-CAD, Revit architecture, Sketchup) application to simple Architectural design projects, y Courses must be taken with desktops computers or Laptops.

URP/EST 202 ENVIRONMENTAL EDUCATION AND AWARENESS: 1 Credit Unit

Definition of environment and sciences. Consideration of human species, needs, nature and interaction of above factors, materials, assets and culture heritage. Sustainability. The basic resources, air, water, energy, land and their significance to man, animal and plants. Environmental degradation and its impacts. Relationship of planning and other environmental disciplines, nature and planning as an activity planning process and communication skills.

HARMATTAN SEMESTER 300 LEVEL

311 ARCHITECTURAL DESIGN III: 4 Credit Units (PREREQUISITE: PASS IN ARC 211 AND ARC 212)

Integrated Project Method (IPM); RURAL COMMUNITY STUDIES. At the beginning of Non Domestic Design programme, 1 week of seminar/workshop on site planning should be carried out. The seminar should be centred on; definition, significance of site planning in the design of the total environment. Site investigation and analysis. Site selection considerations: environmental considerations, site comparison checklist. Criteria for site selection for: residential buildings, multifamily housing, schools, industrial layouts, commercial districts etc. Site improvement: hard-grading, cut and fill and slope stabilization. Causes of erosion and methods of control. Causes of floods, flood prevention and control. Building location and orientation factors. A project should be given to test students' understanding of concepts and applications.

ARC 315 ARCHITECTURAL WORKING DRAWING: 1 Credit Unit

This course consists of professional training in architectural working drawing and office practice. Students are meant to develop their knowledge of execution of drawings and specifications as a building working document.

ARC 321 ARCHITECTURAL WRITING AND PRESENTATION: 2 Credit Units

This course covers graphic communication in architecture. Students learn to use manual and digital representation tools. They acquire representation techniques of space and form in 2D and 3D using both manual and digital modelling. The course covers complex interpretation of forms and volumes. In parallel, students continue their exploration of free-hand representation of form, space, urban scenery and landscape

ARC 333 HISTORY OF ARCHITECTURE II: 2 Credit Units

The architectural contributions of Ancient, Classical, Medieval, Renaissance, Romanesque, Gothic etc. societies are surveyed, along with their relationships to the cultural heritage of the Western World. Introduction to the Modern Movement in Architecture from the 19th Century Architecture to Postmodernist architecture to Deconstruction.

ARC 341 BUILDING COMPONENTS AND METHOD II: 2 Credit Units

Use of framed structures. Various types of concrete floors of various spans in buildings, precast concrete floors, hollow-pot floors, partitions etc. Fenestration in high-rise buildings curtain-walling. Special treatment of walls (e.g. for acoustics, moisture penetration, thermal insulation etc). Special building details.

ARC 343 BUILDING MATERIALS III: 1 Credit Unit:

Glass: constituents of glass, manufacture of glass and types of glass. Chemical and physical properties of glass. Glass in Architecture. Special glass building components and products.

Ceramic building components: materials used in the manufacture of ceramic building products: - clay, kaolinite, dolomite, oxides (MgO, CaO, Fe², O, K², etc.), influence of water on ceramic building products. Types of ceramic building components. Physical, thermal and structural properties of ceramic materials, crystalline structure of silicates etc.

Polymers: stress and time dependent deformations in polymers. Thermoplastics and thermo-setting plastics. Types of plastics used in buildings: PVC, UPVC, PVA, polystyrene, silicones etc. Characteristic and properties of plastic building components.

Rubber: the technology of vulcanization, Rubber-based building Components- characteristics and application.

ARC 345 BUILDING STRUCTURES I: 2 Credit Units

Strength of materials: the study of the properties of materials and cross-sectional shapes of structural elements with respect to their effectiveness in resisting stresses. Topic areas include stress and strain, section properties, analysis and design of beams and columns. Static force analysis; the study of external forces and force systems and their analytical solutions as applied to bodies at rest (equilibrium). Topic areas include beams, trusses, determinate frames, and load tracing. The slope-deflection and moment-distribution methods and their applications.

ARC 361 BUILDING SERVICES I (MECHANICAL): 1 Credit Unit

Water distribution in buildings: general principles, basic Plumbing systems, piping for water systems, reticulation in buildings, entry into buildings, distribution lines, supply systems, waste lines and systems, regulations, mechanical terms.

SVG 213 LAND SURVEYING AND PHOTOGRAMMETRY I: 2 Credit Units

Introduction to surveying, chaining and pacing; direct and profile leveling, measurement of angles, instrument traversing, traverse analysis, calculation of areas.

Definition of Photogrammetry. Historical development of the principles and techniques of photogrammetric acquisition of terrain data and information. Optics for Photogrammetry, metric camera, ground coverage and resolution

ENS 301 INTRODUCTION TO ENTREPRENEURSHIP/INNOVATION: 2 Credit Units

This course will explore the historical and economic role of entrepreneurship, interpersonal or personal characters and behavioural traits of the entrepreneur; financial aspects of entrepreneurship in which business success is most commonly reflected. External aspect of entrepreneurship identification and evaluating new venture opportunities; resource utilization strategy development and successful planning. How to present a business plan; determine the capital requirement and financing strategies, feasibility analysis of establishment of cottage building material industries.

RAIN SEMESTER 300 LEVEL

ARC 312 ARCHITECTURAL DESIGN IV: 4 Credit Units

An extension of ARC311-Integrated Project Method (IPM); RURAL COMMUNITY STUDIES.

ARC 314 ARCHITECTURAL DETAILING: 1 Credit Unit

Advanced study of building components and detailing methods. A careful and detailed consideration of the components, finishing's, coupling and fixtures. Emphasis is drawn to door, window, iron-monger, kitchen cabinet details, functions, constructability, visualization and illustration.

ARC 326 ARCHITECTURAL PHOTOGRAPHY: 1 Credit Unit

This course aims at providing architecture students with a comprehensive understanding of the basics of black and white and colour photography, its techniques, and aesthetics. Students learn how to use their cameras and light meters and are taught, through hands-on practice, the fundamentals needed in traditional black and white printing in the darkroom. The course includes slide lectures and discussions around the works of classic masters and contemporary experts of the medium, field trips, as well as presentations by well-established photographers specializing in architectural photography. Students develop in-depth photo essays relating to architecture, the urban movement, or landscape design. Lectures, seminar, and discussion.

ARC 332 THEORIES OF ARCHITECTURE I: 1 Credit Unit

An introduction to the range of theoretical issues and approaches through which architecture has been and can be conceptualized, designed, produced, explained and assessed. This is a writing intensive course, emphasizing writing process, critique, and revision, and employing writing to make clear arguments and to articulate positions relevant to the discipline of architecture. Students are expected to develop their abilities to understand, discuss and write about architectural issues in a clear, rigorous way.

ARC 342 BUILDING COMPONENTS AND METHODS IV: 2 Credit Units

Advanced methods in building construction and technology. Advanced concepts in foundations: walls, floors and roofing systems (concrete and steel domes, membrane, roof structures and folded plates etc.). Introduction to cable structures and pneumatic structures. Building finishes: Floor finishes, ceiling finishes, external and internal renderings to walls, special treatments (e.g. acoustic envelops, radio-active screening) etc.

ARC 344 BUILDING STRUCTURES II: 2 Credit Units

Elementary structural design: synthesis of the previous structures coursework with applications to design of determinate concrete, timber and steel structures. Examination of forces on buildings: live loads wind and earthquake. An introduction to concept of continuity.

Design of steel girders, beams, columns, stanchions and stanchion-bases, roof trusses, beam/column connections in steel. Design of foundation elements, walls and floors in steel. Detailing of steel structures.

ARC 352 SOCIOLOGY OF HOUSINGS Credit Unit

Concept and types of housing. Housing demand and supply. Housing and social roles and statuses. Study of the human behavioural aspects of housing; including how housing conditions impact on the physical, mental, social and emotional aspects of human health.

ARC 362 BUILDING SERVICES II: 2 Credit Units

Electricity distribution in buildings: general principles, basic wiring systems, ducts for electrical systems in buildings, entry into buildings, distribution circuits, emergency supply systems, lightning-protection systems, regulations, electrical terms.

ARC 364 ENVIRONMENTAL CONTROL: 2 Credit Units

The course addresses sustainability and climate-responsive architecture and site planning. After a brief overview of energy issues as they relate to architecture and site planning, the course examines the interaction between climate, people and buildings, and presents basic principles of passive design and sustainable site planning. An introduction to climatic parameters and thermal comfort is followed by a study of the elements of sun, wind and daylight as they pertain to passive design, focusing on building form and solar radiation, natural ventilation strategies and day lighting design principles and applications. The course also briefly addresses other sustainable design strategies and includes an overview of active systems (solar, photovoltaic panels, geothermal), water reduction and reuse, green materials, and acoustics.

ARC 372 COMPUTER AIDED DESIGN: 2 Credit Units

With the beginning of the millennium, traces of traditional drawing in architecture have been replaced by digitized layouts. With computer software exponentially evolving, a new vision of architecture is now possible. From schematic design, visual construction, to final renderings, software tools have proven to be of the utmost efficiency. This course introduces three CAD software albeit ArchiCAD, AutoCAD and Sketchup for the purpose of architectural CAD rendering and techniques. By this course, students should

be able to prepare, design and plot architectural drawings to scale within accepted architectural standards and execute 3D modelling of architectural forms.

ARC 451 HOUSING: 2 Credit Units

The course will consider the design and development of new housing, the conservation and rehabilitation of existing housing, user needs, and the ways in which housing is related to and dependent on a larger community, social, economic, and land use context. The primary objective of the courses to familiarize students with basic aspects of the housing system to enable them to function as effective future members of interdisciplinary teams doing housing planning and design.

EVT 425 ENVIRONMENTAL IMPACT ASSESSMENT: 2 Credit Units

National legislation relation to environment management, description of environment setting in Nigeria predictions and assessment of impact on air quality (chemical, biological), pollution control measurement of different types of pollution) case studies, local, national and global.

RAIN SEMESTER 400 LEVEL:

SIW 400 INDUSTRIAL TRAINING IN ARCHITECTURE: 6 Credit Units

HARMATTAN SEMESTER 500 LEVEL:

ARC 511 ARCHITECTURALDESIGN STUDIO VI: 6 Credit Units (PREREQUISITE PASS IN ARC 411)

Integrated Project Method (IPM); EMERGING CITIES STUDIES (SEMI URBAN STUDIES).

Students are required to carry out non domestic design projects of multiple functions such as institutional buildings, religious centres, industrial shopping and other commercial facilities, cultural recreational and health facilities etc. resulting from IPM

ARC 515 CONSTRUCTION DRAWING AND DETAILING IN ARCHITECTURE: 2 Credit Units

The objective of this course is to explore the relationship between the ideas behind a project and the process of giving those ideas substance in architectural terms. The seminar explores “design” as a process which extends through to the completion of a building, where “detailing” is an integral part of the design process and in which the nature and assembly of the parts can be informed by or can inform the larger design issues of the building as a whole. The course does not attempt to develop a catalogue

of typical detail solutions to be applied, but rather stresses a way of observing, thinking about the issues presented in the seminar and exploring them in each student's individual projects.

There will be preparation of architectural working drawing and construction details and projects specifications for large and complex projects selected from 400 level.

ARC 541 BUILDING COMPONENTS AND METHOD V: 2 Credit Units

The objective of this course is to explore recent innovative in building arc environmental technologies. Recent advancements in building technology, promoting intelligence and automation/rapid constructions are reviewed and explorations of a new generation of buildings and building technologies are pursued. The main topics of the course are:

- Direction of technological advancements
- Building automation and fast track building technologies
- Prototype buildings of the future in details.

ARC 545 BUILDING STRUCTURES IV: 2 Credit Units

Introduction to pre-stressed concretes design; the design of steel beams, girders; cantilevers; welded and reverted plates girders and trusses; welded and riveted connections. Columns; bearing plates etc. the plastic method of design. Studio work in calculation and layout of simple steel buildings, mostly the behaviour of various systems and materials.

ARC 553 RESEARCH METHODOLOGY I: 1 Credit Unit

Study of techniques and methods of empirical research applied to Architecture

ARC 557 BUILDING CONTRACTS AND ARBITRATIONS Credit Units

Formation of building contracts, contract documents, distinction between tendering procedures and contractual arrangement. Types of contract: lump sum schedule, contractor obligations, quality control and protection of employer, bankruptcy and insolvency. Arbitration procedure and practices. The course also reviews other aspects of legal ramifications of architectural practice.

ARC 563 SUSTAINABLE ARCHITECTURE I: 1 Credit Unit

This course is designed to view Sustainable architecture as the creation of buildings for which only renewable resources are consumed throughout the process of design, construction and operation. Sustainability status must also include the manufacture and transportation of materials, components and construction equipment.

The objective of this course is to explore Sustainable architecture that seeks to minimize the negative environmental impact of buildings by efficiency and moderation in the use of materials, energy, and development space and the ecosystem at large. The course also investigates vernacular architecture in the discourse of architectural sustainability with an emphasis on the way that vernacular architecture has been constructed, represented and consumed in the environmental histories of architecture.

ARC 571 COMPUTER DESIGN STUDIO: 1 Credit Unit

This course is designed for students with previous computer-aided design knowledge. Students will use both 2-dimensional and 3-dimensional CAD software to further develop their abilities to apply CAD techniques to the solution of architectural work. The course is essentially aimed toward today's architecture students, providing them with everything needed to complete the construction, rendering, and presentation of architectural ideas.

ARC 547 QUANTITIES AND ESTIMATING (Elective): 2 Credit Units

Standard measurement of building works below and above ground level, internal and external works, finishes. Principles of estimating and quantitative surveying standards of building costs. Bill of quantities and related administrative costs.

EST 507 ENVIRONMENTAL MANAGEMENT: 2 Credit Units

The concept of ecology as applied to natural environment: the use and abuse of the natural environment and natural resources; the built environment an environmental planning problems; solutions and conservation of natural environment and build environment.

RAIN SEMESTER 500 LEVEL:

ARC 512 ARCHITECTURAL DESIGN STUDIO VII: 8 Credit Units

A continuation of ARC. 511. Students are required to carry out Domestic design projects (Housing Estates) from the semi urban or emerging city proposals. At the end of the day students are expected to write a degree project based on the design projects. The format for the project writing is as follows:

DEGREE PROJECT FORMAT - *Chapter One*

Introduction

Background of the Study

Statement of the Research Problem

Aim and Objectives of the Study

Research Question/Hypothesis

Significance of the Study

Scope of the Study

Delineation of the Study Area.

Chapter Two

Literature Review: this should contain subheadings as may be necessary.

Chapter Three

Research Methodology

Research Design

Population of Study

Sample Frame/Size

Method of Data Collection

Data Collection Instrument

Method of Data Analysis

Chapter Four

Data Collection and Analysis. This should contain case studies as may be necessary

Chapter Five

Discussion of Findings and Summary

Conclusion from Findings

Recommendations and Summary

References

Appendix

ARC 516 INTERIOR DESIGN: 2 Credit Units

The course is intended to visualize all living environment. Interior design is a multi-faceted profession in which creative and technical solutions are applied within; including subdivisions, furniture, colour, lighting and finishes.

ARC 554 SOCIO-CULTURAL ISSUES IN PLANNING AND ARCHITECTURE: Credit Units

The central premise of this class is that urban design - the practice of shaping the built environment, is a socially and culturally engaged process. In light of this, social and cultural issues are as significant to planning and design processes as are issues of aesthetics, order, and form. This course focuses on the socio-cultural effects and implications of architectural design and urban planning-at both the theoretical and site-specific levels.

ARC 556 SPECIFICATION WRITING: 2 Credit Units

The preparation of a written document describing in detail the scope of work, materials to be used methods of installation and quality of workmanship in building construction; project documentation; approaches to specification writing principles; process standards; sources of material; nature of specification and cost control; schedules.

ARC 558 PROFESSIONAL PRACTICE: 2 Credit Units

This course is intended to provide an opportunity to explore the essential elements of professional practice and related professions. It will equip the student with the fundamental knowledge and skills requisite to an understanding of, and participation in, the conduct of practice in the design profession. Salient areas of administration and management, including organization of the architectural office, professional services of the architect, fee structures and fee management, contracts, and resource management/monitoring/marketing/project delivery are explored in lectures and through case problems.

ARC 564 SUSTAINABLE ARCHITECTURE: 1 Credit unit

The objective of this course is to provide students with an understanding of ecological principles in architecture. Principles of life-cycle design, economy of resources and humanistic design are introduced and ecological factors associated with each of these principles are examined. Design strategies to increase environmental sustainability in buildings are investigated. An emphasis is given to how environmental factors (heat, light, and sound) influence thermal, visual, and acoustic qualities in built-in environments.

Field trips to visit selected buildings, to analyse their ecological characteristics comprise an important part of the course.

EVT 506 POLLUTION CONTROL: 2 Credit Units

The concept and meaning of pollution and control, kinds of environmental pollution, the nature of pollutions. The effect of pollution of the natural environment. Various techniques and methods of atmospheric pollution, water pollution, noise and soil pollution control. Waste (solid and liquid) disposal control and monitoring in urban and rural areas in Nigeria. The ecological effects of industrial and motor exhausts on natural environment. Environmental monitoring, abatement and control of pollution. Environmental impact assessment. Review of environmental protection and waste disposal legislations. Legislation on kinds of environmental pollution. Evaluation of physical planning, measures and environmental pollutions control within Nigeria and elsewhere; prevention, environmental protections, land use zoning control, open green space control, supervision of physical planning projects.

PHE 508 PUBLIC HEALTH ENGINEERING: 2 Credit Units

Sources of water supply and their exploitation - both for urban and rural areas. Water consumption (uses) and factors governing consumption, physical, chemical and biological characteristics of raw water, their determination and significance; water-related diseases - mode of transmission and their control in relation to water supply. Water treatment and general features of water treatment plants. Theory and principles of the following until treatment processes: flocculation and coagulation, sedimentation, filtration, disinfections, removal of iron and manganese in water, water softening and odour removal, storage and distribution in water supply system. Water quality; pollution control; general discussion and definition of pollution, sources and types of pollution; Air pollution, Water pollution, Soil/land pollution, general effects of environmental pollution. Man as an agent of environmental pollution. Water management; sewage - defined; physical, chemical and biological characteristic of sewage, digestibility of waste, mechanics of aerobic and anaerobic biodegradation, need for sewage treatment as a water pollution control method; description of the various sewage treatment methods; solid waste collection and disposal methods.